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ERDF 2007-2013 Analytical Programme Workstream One

Economic Impact Counterfactual Assessment

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Ministry of Housing, Communities and Local Government

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Note: While the Department for Communities and Local Government changed its official title to the Ministry of Housing, Communities and Local Government in 2018, this report refers to activity between 2007-2013 and so it is referenced by its former name throughout the document.

Executive Summary

- i. DCLG¹ has a responsibility for evaluating the performance, impact, implementation and lessons for the 2007-13 European Regional Development Fund (ERDF) programme. As part of this responsibility, DCLG commissioned Regeneris Consulting, Cambridge Econometrics and Professor Peter Tyler in November 2012 to progress a research and evaluation programme. The analytical programme consisted of three workstreams:
 - Workstream One: An assessment of the economic impacts of the current ERDF programme 2007-13.
 - Workstream Two: An assessment of the economic effectiveness and lessons to be drawn from different types of interventions in supporting local economic growth.
 - Workstream Three: A review of the role for and effectiveness of decentralised delivery and local incentives in local economic growth.
- ii. Workstream One set out to:
 - Assess the net economic impacts of ERDF interventions allowing for the counterfactual and overall impact on the target economies, identifying differences thematically and spatially where possible.
 - Identify the effectiveness of the range of interventions pursued and the value for money these provide.
 - Provide recommendations about how best to approach the ex-post evaluation of the 2007-13 programmes.
- iii. The first strand of research under workstream one provided an initial analysis of programme and project performance information and an assessment of the existing evidence about the emerging economic impacts of the existing programmes, based on interim evaluations. This strand of the research also explored potential impact and counterfactual assessment methods. The second strand of workstream one focused on the development and implementation of the counterfactual impact assessment and development of recommendations for the 2014-20 programme and other relevant business support interventions.
- iv. The full findings of strand one are presented in the interim Workstream One report and in summary in chapters three and four of this report. The remainder of this report focuses on strand two of the workstream.

Approach to the counterfactual impact assessment

- v. There are a number of inherent challenges in evaluating any economic development interventions. These relate to determining the counterfactual and disentangling the impact

¹ DCLG was renamed the Ministry of Housing, Communities and Local Government in January 2018.

of other interventions and the lag between support, changes in behaviour and impact and the timing of evaluations, given the need to use this information in refining project activities and designing new programmes.

- vi. Alongside these inherent challenges, there are a range of wider evaluation issues that are specific to ERDF. These include the nature of geographical coverage of ERDF and lack of geographical targeting and heterogeneity of interventions. Practical factors relating to the economic context for the 2007-13 programme and the quality and coverage of monitoring data are also relevant here.
- vii. There are various possible methods for an impact evaluation for the 2007-13 programme and all have limitations. The review of possible methods undertaken as part of workstream one concluded that the use of control groups and difference in difference methods offers the greatest potential to provide a robust assessment that was most in line with the standards set out in the National Audit Office report.² A method was devised to trial an approach which would:
 - **Observe change** on key business performance measures using the Inter Departmental Business Register (IDBR) rather than rely on self-reported change using survey research. The IDBR collects data on turnover and employment for all live enterprises trading above the VAT threshold each year, allowing changes in the financial performance of beneficiaries of ERDF funded support to be tracked over time and the pre and post support performance to be identified.
 - Drawing again on the IDBR, create a representative **comparator group** of businesses that have not received ERDF funded support. The assumption here is that the post-policy outcomes in the comparator group provides an estimate of what would have happened to the treatment group in the absence of the ERDF support.
 - Use **difference in difference**³ to assess the strength of the effect of support on business performance.
- viii. While this approach was deemed to offer potential for a robust assessment, it has some limitations in the context of the 2007-13 ERDF programmes. In particular, this approach is only appropriate to measure the impact of interventions which have direct SME beneficiaries i.e. only a portion of ERDF investment. The counterfactual assessment covers 358 ERDF projects with direct SME beneficiaries and represents £532 million contracted ERDF. This is a relatively small proportion (24 per cent) of total contracted ERDF across the nine regional programmes.

Research Questions

- ix. The analysis uses IDBR data to examine whether participation in the ERDF programme since 2007 has led to improved economic performance. The principle questions it investigates are:

² Cross Government Report on Evaluation in Government, National Audit Office, December 2013

³ use non-random treatment and control groups but subtract and pre-policy differences in outcomes in these groups from the post policy differences

- **Q1: Has the ERDF programme had a positive impact on particular measures of business performance of those firms participating?** This question examines whether the business performance of participating firms is better than it would have been if they had not engaged in the programme. That is, is there an improvement relative to non-participating firms? This question does not identify whether performance is greater than it was before participating in the programme, just whether performance is better than would otherwise have been expected.
 - **Q2: Did those firms participating grow faster than non-participants after being in the scheme?** In contrast to question 1, this question considers whether the absolute performance of firms that engaged in ERDF programmes was better than firms that did not. That is, while the first question looks at the difference between the relative performance of assisted and non-assisted businesses, the second looks at the absolute difference and considers whether the rate of growth was stronger amongst those who received assistance than those who did not.
- x. The measures of performance used for the analysis are driven by the availability of data from the IDBR. The analysis considers
- Business growth (measured by turnover and employment)
 - Business productivity (measured by turnover to employment ratio).
- xi. Drawing on wider administrative data held on the ERDF programmes, the analysis also considers a number of supplementary questions related to the type of support which is most effective in improving performance and the circumstances under which impact is greatest. The analysis explored the influence of the intensity of assistance, broad business sector and the type of ERDF project on performance.

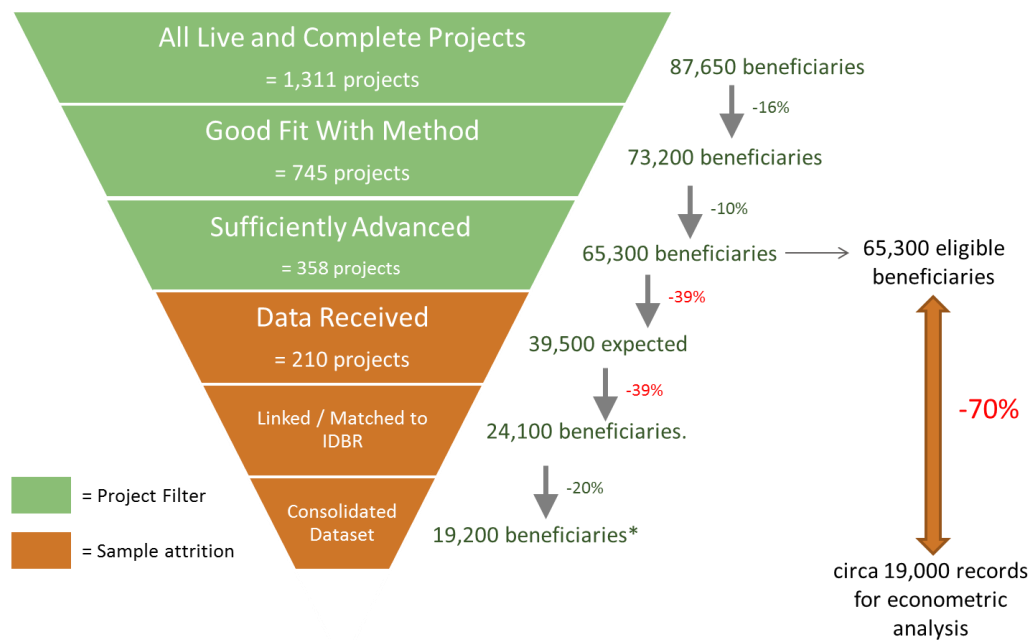
Research Process

- xii. The methodology for the assessment involved the following steps:

1 - Develop a Matched Beneficiary and Control Dataset

- xiii. The matched beneficiary and control dataset underpins the impact and counterfactual analysis. The process for compiling the matched beneficiary and control dataset is outlined in Figure 1.1

Figure 1.1 Matched Sample Development Process and Attrition



Source: Regeneris Consulting

- xiv. Various practical challenges were encountered in compiling the matched beneficiary dataset. These challenges introduced a number of sources of sample attrition which have implications for the coverage and representativeness of the beneficiary dataset. Just 30 per cent of the 65,000 SMEs beneficiaries included within the scope of the assessment were included in the beneficiary dataset. The high rate of sample attrition was due to the following factors:
- A large proportion of beneficiaries was excluded from the sample as a result of the low response rate from projects to the request for beneficiary data. Some 40 per cent of eligible projects (148) did not provide beneficiary data, which resulted in 26,000 SMEs being lost from the sample.
 - The proportion of beneficiaries which were identified on the IDBR (61%) was relatively low. This was linked partly to incomplete data (company reference numbers were not provided in all cases) but might also point towards issues of data quality. Even where company reference numbers were provided, the matching rate (67%) was low, and suggests that a large proportion of the reference numbers provided were incomplete or inaccurate.
- xv. The **sample structure (particularly the balance between beneficiaries of projects of different types and in different regions) changed substantially in compiling the matched beneficiary dataset.** The effect of this on the representativeness of the characteristics of SMEs cannot be assessed as information is not held centrally on the characteristics of SME beneficiaries.

2 - Identify Suitable SMEs from the Dataset for Econometric Analysis

- xvi. Not all of the beneficiaries included in the matched beneficiary dataset could be included in the econometric analysis. The sample needed to be limited to take account of:
- The availability of historic data from the IDBR: the analysis needs to draw upon IDBR data for a minimum of four years, two before and two after support. This time series is not available for a substantial proportion of SMEs in the matched beneficiary dataset as some did not start trading until mid-way through the analysis period, whilst others ceased trading before the end of the analysis period.
 - The timing of support: a period of two years post-support data is needed to assess the post-support performance of beneficiary businesses. As the most up to date IDBR data available is for 2012, the econometric analysis is limited to those who had received all or any of their support before 2010.
 - The availability of full contextual information on the support received by beneficiaries: A large number of beneficiaries were excluded because of incomplete data. Poor data coverage for support dates meant that a quarter of the beneficiaries included in the matched beneficiary sample had to be excluded from the econometric analysis.
- xvii. Due to these factors, a large proportion of the matched beneficiary dataset was not included in the econometric analysis. The sample that was eventually used for the econometric analysis is less than 3 per cent of the total number of eligible beneficiaries for the approach.
- xviii. Although it is not possible to test how representative the sample is of the whole population of eligible SMEs, it is clear that the sample does not cover all in-scope projects. Projects focused on resource efficiency and access to finance are particularly under-represented in the sample. This imbalance in project coverage means that beneficiaries of projects focused on SME competitiveness projects are over-represented in the sample, whilst there is very little representation of beneficiaries of access to finance projects.

3 - Econometric Analysis

- xix. The econometric analysis uses a difference in difference equation. The basic form of the difference in difference equation is:

$$EQ(1): \Delta g_i = \alpha + \beta P_i + \gamma EconStates_i + \delta FirmCharacteristics_i + \varepsilon_i$$

Where:

Δg_i = difference in average growth in performance indicator of interest of firm before and after support

P_i = indicator of whether firm i participated in the ERDF programme

$EconStates_i$ = factors associated with the economic environment firm i is operating in (e.g. sector, location)

$FirmCharacteristics_i$ = factors specific to firm (e.g. size)

- xx. The equation was estimated for three alternative performance indicators: employment, turnover and productivity.
- xxi. The findings of the counterfactual impact assessment need to be carefully considered in light of issues relating to sample coverage and composition. While there are undoubtedly limitations to the analysis, the assessment has found some statistical evidence that, amongst the firms included in the sample at least, support from ERDF funded projects has had a positive impact on performance. While the evidence is not overwhelming, it suggests that:
- the scale of impact increases with the intensity of funding
 - the impacts are greater for manufacturers than service sector firms
 - the impact is more noticeable on turnover than employment. This could indicate a more noticeable effect on productivity or might simply reflect the lag between turnover and employment growth.
 - schemes focused on strengthening of the R&D base have less of an impact on performance in the period observed than other types of scheme, although this is because impacts of this sort of assistance take longer to materialise
 - firms, particularly manufacturers, that completed participating in ERDF programmes prior to 2011 saw better turnover growth over 2010-12 than non-participating firms. This favourable outcome appears to be associated with faster productivity growth rather than to stronger employment growth.
- xxii. The econometric analysis has found only tentative evidence of impact but this should not be interpreted as an indication that the ERDF funded support has yielded no impact as various methodological factors could have affected the outcome of the analysis. The following factors have constrained the ability of the assessment to detect impact:
- **The size and coverage of the sample:** a large number of projects and beneficiaries have been excluded from the analysis. The final sample used for the impact analysis covered less than 3 per cent of the total population of eligible beneficiaries. Bearing in mind the tendency for the majority of project impacts to be created by a small proportion of businesses in programme evaluations this sample attrition is a serious limitation. The limited sample coverage and resultant issues of representativeness are the most substantial limitations to this approach in this context.
 - **Timing of the analysis:** the timing of the impact assessment has constrained the depth of the insight that the analysis supports. There might have simply been insufficient time for beneficiaries to make changes and realise bottom line impacts on performance and importantly for these to appear on the IDBR.
 - **The measures covered by the IDBR:** the IDBR was identified as the most appropriate database for this approach although it has various limitations in the context of this analysis. Not all impacts of support will manifest themselves in the measures of business performance included in the IDBR. For example, safeguarded business performance would not be reflected in the IDBR. This is an

important consideration given the economic context of the time period covered by this analysis.

xxiii. The counterfactual impact assessment is also constrained by methodological factors, in particular:

- **The lack of explanatory variables:** The IDBR does not provide data on all of the business characteristics or behaviours which could influence performance such as management style, receipt of other business support, investment in R&D. Because of this, the explanatory power of the difference in difference equations is limited and there is lots of 'noise' in the data.
- **Possible contamination of the control group:** It is not possible to identify and exclude all of the control group businesses that have received ERDF funded support. We can only exclude those which appear on the matched beneficiary dataset, which covers only a small proportion of the beneficiary population.

Study Conclusions

xxiv. The counterfactual impact assessment sought to explore an alternative approach to impact assessment which avoids some of the challenges that are frequently encountered in impact evaluation, namely identifying changes in business performance and attributing changes in performance to the support received. The analysis has provided some insight into the impact supported by the ERDF programme but this is supplemented by lessons related to the implementation of this method, possible adjustments to make it more appropriate for ERDF programme evaluation and implications for the 2014-20 programme.

Impact of the 2007 to 2013 Programmes

xxv. It is important to note that the analytical approach trialled here is only appropriate to assess the impact of investments which have direct SME beneficiaries. As a result it does not offer complete coverage of the impacts supported by all types of ERDF assistance.

xxvi. While the analysis has provided some tentative evidence of impact, the findings are not sufficiently robust to support recommendations for the design of future programmes.

Evaluation Methodology

xxvii. The approach that has been trialled offers, in theory at least, two important advantages over the alternative methods of impact and counterfactual assessment that were considered in developing the impact assessment approach for workstream one:

- Firstly, it avoids issues associated with recall bias by providing a means to directly observe change in business performance amongst beneficiaries
- Secondly, it draws on a large control group and offers the possibility of a detailed and robust counterfactual assessment.

xxviii. While there are theoretical advantages to the approach, various practical challenges in the implementation of the control group approach have limited the insight that it provides in the context of the 2007-13 ERDF programme.

- 1.2 The review of potential impact assessment methods as part of workstream one highlighted a number of evaluation challenges. Our assessment of the adequacy of this method in addressing these challenges is summarised in 1.1.

Table 1.1 Assessment of the approach to resolving evaluation issues

Issue	Assessment	Possible Adjustments to the Approach
Identifying Impacts	Offers scope to identify impact in a more robust way than self-reported methods but the approach covers only a limited range of impact measures. Because of this, it provides only a partial picture of impact .	In the absence of alternative datasets, this method should be implemented in conjunction with survey research to provide data on intermediate impacts / changes to business operations measures of business performance not included in the IDBR (e.g. investment, profitability) Survey data could also be used to capture self-reported impacts and compare these to those reported on the IDBR.
Determining the counterfactual and disentangling impact of other interventions	The use of IDBR data to observe impact and compare to a control group offers a strong approach in theory but in practice its successful implementation relies on the quality and coverage of beneficiary data and linked to this the ability to test whether ERDF supported businesses are in the control group. The IDBR does not provide sufficient explanatory variables to feed into the counterfactual assessment. This undermines the ability to identify the relative importance of ERDF support in determining business performance. The approach does not deal with issues of displacement and leakage	Recognition that this approach cannot be successfully applied in the absence of quality beneficiary data is needed. Even where strong beneficiary data is available, these methods should be applied in conjunction with survey research to supplement variables included in the IDBR and capture data relating to displacement and leakage. The survey research would need to be carried out in both the assisted business and control groups.
Timing of impact	Insufficient time has elapsed since the ERDF projects were implemented for the impacts in business to materialise and be detectable on the IDBR. The timing of the analysis is a real constraint on ability to detect impact These issues are particularly pronounced here as a large proportion of beneficiaries was assisted towards the end of the programme. This had wider implications for the size of the sample and contributed to the issues of coverage and representativeness outlined above.	Allow more time between assistance and implementation of this method
Heterogeneity of ERDF	The thematic project groups used for the analysis help to disaggregate the	Consider including various analytical tags in programme data <i>at the time of</i>

Issue	Assessment	Possible Adjustments to the Approach
interventions	assessment by the general focus of the ERDF investments but there is substantial variation in the characteristics of projects within these groups. This limits the usefulness of the typology as a framework for understanding impacts. The scope to develop a detailed typology is limited by the depth and consistency of information held on MCIS.	<i>project</i> approval to support more in-depth impact analysis. Relevant analytical tags would cover project focus, type of support, target sector / beneficiary type.

Implications for 2014-20 EU Programmes

xxix. Although the assessment has not provided a robust dataset to inform the design of the 2014-20 programme the methodological insights generated through trialling this approach highlight some important lessons for the 2014 – 20 programme.

xxx. In particular, DCLG should:

- Consider now the methods that will be used to evaluate the impact of the 2014-20 programme and the role of control group analysis in this. The design of the evaluation approach for the 2014-20 programme needs to recognise that CIE methods using national datasets to source company performance data are of limited value until the later stages of the programme period. There is limited merit in using these approaches at the mid-term review stage and other evaluation methods should be used. There is a role for IDBR-based control group analysis in a final evaluation but this should be combined with other evaluation methods including:
 - Surveys to assess the manner in which support was used, satisfaction with the provision, self-reported impact which can be compared to the control analysis and help establish likely displacement effects.
 - Project reviews and other forms of qualitative research with beneficiaries.

These other methods are valuable in both enhancing the analysis of economic impact, as well as exploring other wider but nevertheless important evaluation issues.

- **Consider supplementary approaches to measuring the impact of ERDF investment with no direct SME beneficiaries.** It should also be noted that this approach will not be able to measure the impact of spatial ERDF investment where there are no recorded or identified beneficiaries. These will require a different and bespoke evaluation approach.
- **Reflect the data requirements of the selected method on the monitoring arrangements for the programme.** Particular emphasis on ensuring that monitoring data is complete and reliable is needed. To support an approach which uses CIE methods, monitoring systems will need to:

- Identify ERDF beneficiaries early on and build up a central beneficiary database which includes key analysis variables
- Enable performance of different cohorts of ERDF beneficiaries to be tracked over time, using the IDBR (changes in employment and turnover and in survival rates)
- Enable the generation of a matched sample of non-ERDF assisted firms
- Ensure that permissions for use of beneficiary data built into project approvals and monitoring and evaluation requirements.

1. Introduction

Background to the Analytical Programme

- 1.1 The European Regional Development Fund (ERDF) is a key funding instrument of EU Cohesion Policy which aims to promote economic, social and territorial cohesion across the whole territory of the European Union. ERDF is specifically focused upon investment to support economic growth and job creation in order to reduce intra and inter regional economic disparities within the EU. A further round is under development for 2014 to 2020.
- 1.2 The UK government's priority is to restore the health of the national economy. This includes targeted interventions in support of local economic growth to strengthen the overall performance of the UK economy and support the rebalancing of the economy, in favour of a strengthened private sector. The government's objectives reflect the current and future priorities for the use of EU Structural and Cohesion Funds across England and the Devolved Administrations in the funding period 2014-2020.
- 1.3 In the current context of constrained public spending, the ERDF is an important potential source of public funding to support local economic growth. The Department for Communities and Local Government (DCLG) in its capacity as the Managing Authority for ERDF in England has strengthened local management arrangements and increased local influence over the direction of funds.
- 1.4 DCLG, as the Managing Authority, has a responsibility for evaluating the performance, impact, implementation and lessons for the 2007-13 programme, as well as to build on this in developing the new programme for 2014-20 with the European Commission. As part of this responsibility, DCLG commissioned Regeneris, Cambridge Econometrics and Professor Peter Tyler in November 2012 to progress a research and evaluation programme.
- 1.5 The primary purpose of the analytical programme was to deliver a package of evidence that informed the implementation and effective delivery of the next round of ERDF. It consisted of three workstreams:
 - **Workstream One:** An assessment of the economic impacts of the current ERDF programme 2007-13. DCLG required an economic evaluation of the types of funding interventions that have worked and, linked to workstream two, the factors which have been critical to success. The focus was on using counterfactual impact evaluation techniques, informed by the National Audit Office⁴ report on evaluation on government, to test the robustness of these approaches.
 - **Workstream Two:** An assessment of the economic effectiveness and lessons to be drawn from different types of interventions, across a range of relevant policy areas, in supporting local economic growth, as well as the factors which contribute to successful local economic development.
 - **Workstream Three:** A review of the role for and effectiveness of decentralised delivery and local incentives in local economic growth and the manner in which this can contribute to national economic growth.

⁴ Cross Government Report on Evaluation in Government, National Audit Office, December 2013

Outputs from the Analytical Programme

- 1.6 A range of reports have been produced as part of the analytical programme.
- Workstream one has been completed over the course of 2013 and the first part of 2014. Given the nature of the counterfactual approach adopted, it was necessary to focus the analysis on the beneficiaries of ERDF funded SME interventions. It has taken longer to complete the analysis, primarily due to delays in accessing and the matching of beneficiary data to the corresponding business records on the Business Structure Database, which is part of the Inter Departmental Business Register (IDBR) held by the Office of National Statistics, and the selection of suitable control groups from the same source.
 - Draft final versions of the reports for workstream two and three were completed in November and August 2013 respectively. The workstream three report informed DCLG's consideration of the approach to the delivery and management of ERDF through Local Enterprise Partnership areas (LEPs) in the new programme period. The workstream two report informed DCLG's consideration of the types of intervention that could be effective in supporting local economic growth through the new ERDF programme and the lessons which should be considered. The report was also shared with the LEPs to inform them in the preparation of their European Structural and Investment Fund plans, which were initially submitted at the end of November and revised in January

Purpose and Focus of Workstream One

- 1.7 The main objectives set for workstream one were to assess the progress of the ERDF programmes for England, to review the existing evidence on economic impacts and to assess the net economic impacts which are being realised. More specifically it set out to:
- Assess the net economic impacts of ERDF interventions allowing for the counterfactual and overall impact on the target economies, identifying differences thematically and spatially where possible
 - Identify the effectiveness of the range of interventions pursued and the value for money these provide
 - Provide recommendations about how best to approach the ex-post evaluation of the 2007-13 programmes.
- 1.8 The workstream was split into distinct components:

Strand One

- An initial analysis of programme and project performance information for the ten ERDF programmes using Management Control Information System (MCIS) data received, as well as consultations with officers within DCLG responsible for managing the English ERDF programmes
- An assessment of emerging economic impact from the ten existing programme interim evaluations and a review of the findings of those final project evaluations we were able to access, as well as those from the devolved administrations

- The development of the proposed method for undertaking the counterfactual impact assessment using a control group based approach, as well as the possibility of undertaking a beneficiary survey.

Strand Two

- The further development and implementation of the counterfactual impact assessment
 - The development of recommendations for the evaluation of the 2014-20 programme and other relevant business support interventions.
- 1.9 During the course of exploring and developing the proposed method for undertaking the counterfactual impact assessment using a control group based approach, it was concluded that this approach should be focused on interventions providing support to SMEs. The main reason for this was the scope to use an official government data source capturing performance data for all established businesses, the Inter Departmental Business Register (IDBR), as the basis for both matching to the ERDF beneficiary records and the selection of suitable control groups. A similar dataset was not available for other forms of ERDF funded intervention.
- 1.10 As explained in section three, the techniques for undertaking counterfactual impact assessments have not been commonly used in the evaluation of all or particular investment priorities of ERDF programmes. However, these techniques offer the potential to significantly improve the robustness of the evaluation of some ERDF investment priorities (as outlined in the National Audit Office's recent report⁵). Workstream one has therefore provided an opportunity to test these approaches and to learn valuable lessons for the future.

Structure of the Report

- 1.11 This report explores the practicalities of implementing this approach and the effect of this process on the design of the econometric analysis and subsequent findings in detail. It is intended to provide a concise summary of the findings of the analysis. Detailed tables relating to the sample structure are presented in Appendices A and B.
- 1.12 The report is structured as follows:
- Section three provides a summary of strand one of workstream one, namely the review of programme performance and the emerging findings from the mid-term evaluations of the ERDF programmes and project level evaluations
 - Section four sets out the range of approaches proposed for the counterfactual impact assessment and the reasons for the preferred approach
 - Section five explains the approach to the formation of the matched SME beneficiary dataset and formation of the control group sample
 - Section six focuses on the formation of suitable samples for the econometric analysis
 - Section seven presents the results from the difference in difference analysis
 - Section eight summarises the conclusions which can be drawn from the implementation and interpretation of the analysis.

⁵ Cross-departmental Study on Evaluation Methodologies, National Audit Office, December 2013

2. Progress on Programme Delivery

Summary

- By the end of January 2013, half of the ERDF available within England had been defrayed, although a large proportion of this was via investments in JEREMIE or JESSICA funds which were yet to be invested. The overall headroom in the programme equated to roughly £500m although there was a strong pipeline of projects which equate to 106 per cent commitment of available ERDF.
- Although the broad types of investments are similar across ERDF programmes, they demonstrate some distinctiveness in their focus which reflects the flexibility built into the 2007-13 programmes to design strategies around regional distinctiveness.
- Analysis of achievements of English ERDF programmes in terms of outputs and results is challenging in part due to the wide range and often inconsistent use of indicators across the regions. Based on analysis of one output and five result indicators, the programmes as a whole were in a reasonable position in terms of contracting outputs and results. Aggregate performance masks substantial regional differences however.
- Some of the existing mid-term programme evaluations have sought to assess the net additional economic impacts of investments to date but none have used a control group to assess the counterfactual. Similarly, none of the programme evaluations have sought to assess value for money (largely as this was not their purpose).

- 2.1 This section provides a summary of the findings of the first strand of workstream one. This analysis, completed in February 2013, included an analysis of programme and project performance data and consultations with officers within DCLG. The summary also includes an assessment of the messages about the emerging economic impact from the ten existing programme interim evaluations and a review of the findings of those final project evaluations we were able to access.
- 2.2 The findings are presented here in summary form and expanded upon in the Interim workstream One Report.

Overall programme and project performance

- 2.3 The 2007-2013 ERDF programmes were managed and administered by the nine Regional Development Agencies. The overall amount of ERDF available in England for the period 2007-13 is around £2.7bn, or £390m (depending on the £/€ exchange rate) per year. The allocation varied widely by region reflecting economic need, with the North West, West Midlands and Yorkshire and Humber regions, as well as the Cornwall Convergence area, accounting for two thirds of these resources. The relative importance of these resources in terms of ERDF as a proportion of regional GVA basis varied enormously, with Cornwall and to a lesser extent the North East gaining much higher amounts of investment per capita or unit of GVA. ERDF is a tiny proportion of the regional GVA of London, the South East and Eastern regions.
- 2.4 By the end of January 2013, half of the ERDF available within England had been defrayed (although 14 per cent of this was via investments in JESSICA and JEREMIE funds which have yet to be invested). A further 30 per cent has been contracted but had yet to be defrayed and claimed by projects. This left headroom across the programme of a further fifth (roughly £500m) which had to be contracted by the end of 2013. However,

there was a strong pipeline of projects, which equated to 106% commitment of available ERDF.

- 2.5 The situation in terms of spend, contracting and the project pipeline varied across the English regions, with most being in a strong position to achieve the full contracting of resources by the end of 2013. The greatest challenge would appear to be in the North West, where there is currently a shortfall in the pipeline to achieve full commitment. In some other regions, such as the North East and Yorkshire and Humber, the challenge was one of effectively rationing resource in the face of a strong pipeline (and in Yorkshire and Humber, a large amount of still as yet not contracted ERDF).
- 2.6 Although the broad types of investment were similar across ERDF programmes, they demonstrated some distinctiveness in their focus which reflects the flexibility they had at the time to design their strategies around previous regional priorities. The programmes in the West Midlands and North of England (and Cornwall, which is a Convergence area) tended to be wider ranging reflecting the breadth of the economic challenges they faced and the greatest resources available. The regions with less ERDF resource have tended to concentrate their resources on a narrower range of interventions.
- 2.7 The analysis of the achievements of the English ERDF programmes in terms of outputs and results was challenging in part due to the wide range and often inconsistent use of indicators across the regions, as well as many projects contributing to complex bundle of outputs and results. Also many of the original targets are now judged to be unrealistic given the economic conditions and the more challenging circumstances in which many projects operated. It is clear that quite different assumptions about outputs and results per unit of ERDF investment were made across programmes: there was no consistency in the way targets were set. We therefore do not consider comparing actual performance against these original targets by programme to be a particularly helpful exercise.
- 2.8 Our analysis focused on six output and result indicators (one output and five result indicators respectively). Whilst it was challenging at the interim stage in the evaluation to judge where the programme as a whole was in terms of the contracting of outputs and results, the picture looked reasonable at that time. However, this masks significant variance in terms of specific outputs/results and across regions. For example, the achievement of the floor space target was challenging given the delay in investment through the JESSICA funds and slow progress with other sites and premises projects in many regions. There was a significant shortfall in terms of contracted job creation against regional targets in the North West and Yorkshire and Humber, the two regions with by far the greatest targets.
- 2.9 Based on the contracted spend and outputs for live and completed projects the median ERDF cost per gross job created across all programmes is £23,000 and for jobs safeguarded is £15,000. There is an extremely wide variation between median and mean for both measures, reflecting the impact of large capital intensive projects with few reported jobs. There is notable variation across projects with a very large interquartile range for cost per job created (£7,000 to £70,000). This masks further variations across the regions, with the larger programmes, notably Cornwall, Yorkshire and Humber and the North West, showing the largest degree of variability in the cost per job. The mean ERDF cost per gross job created or safeguarded is £50,000. At first glance these are high cost per jobs benchmarks and require further analysis to understand what are driving them.

Findings from ERDF Programme & Project Evaluations

Programme Evaluations

- 2.10 Whilst all English regions undertook an interim evaluation of their 2007-13 programmes, few of these sought to assess the emerging net additional economic impacts. Of the four interim evaluations available at that time, all used beneficiary surveys of exiting and start-up businesses to collect self-reported assessments of the impacts upon SME and start-up performance and prospects, as well as deadweight, displacement and leakage. None of the evaluations used control groups in any form to assess the counterfactual.
- 2.11 The overall sample covered by these surveys was around 1,200 SMEs across the four areas. A weighted average of the net to gross additionality ratio⁶ suggests an overall ratio of 30 per cent (i.e. 30 out of 100 gross jobs created are net additional).
- 2.12 There was a significant range in measures of net additionality across evaluation surveys which is perhaps surprising. The Regeneris survey work and evaluations tending to show lower ratios of net to gross impacts than those of SQW. We suspect that this is likely to be due in part to different methods of asking and analysing questions rather than actual differences in underlying project or wider economic performance.
- 2.13 There were some tentative signs about the higher impact of more intense interventions, those focussed on knowledge transfer and those from direct financial assistance, although there was a need for caution in drawing firmer conclusions at that stage.
- 2.14 In most cases the actual reported impacts by SMEs was rather lower than the forecast impact – adding a degree of uncertainty to measurement. In the case of Cornwall the time taken for impacts to fully materialise was stated as up to seven years. However, the additionality of support is likely to become increasingly diffuse over these lengths of time.
- 2.15 Finally, none of the evaluations were used to assess value for money⁷ overall for the ERDF programme or for different intervention types, largely because this was not their purpose. Rather they were focussed on trying to gross up the potential overall impact of the programme.

Project Evaluations

- 2.16 Till the time this strand of analysis was completed, the research team had access to 106 evaluation documents for the 2007-13 ERDF programmes, of which 21 were final evaluations which use try to assess the economic impacts of the projects, including assessments of net impacts in some form.
- 2.17 The overall sample was thus small, and did not cover all the 10 programme areas and far from the full spectrum of ERDF interventions. The numbers of evaluations for specific project types were too small at this stage to draw conclusions about the impacts of interventions by type, and the overall sample had insufficient depth to enable general conclusions to be drawn about either impacts or methodologies.
- 2.18 The project evaluation material reviewed pointed to a number of emerging messages about how impact assessment could be approached:

⁶ excluding multiplier effects but accounting for deadweight, leakage and displacement

⁷ cost per job or £1 of extra GVA

- Wide variation in the net impacts reported in evaluations both for GVA and jobs created
- Limited use of gross-net impact assessment methodologies, and apparently no use of control group and counterfactual methods
- A primary focus on project's strategic fit and processes which provided a useful source of material on the wider or softer impacts of projects, but was of limited value in understanding their economic impacts.

3. Approach to the Counterfactual Impact Assessment

Summary

- There are inherent challenges in evaluating any economic development intervention. These relate to (i) determining the counterfactual and disentangling the impact of other interventions (ii) the lag between support, changes in behaviour and impact, and the timing of the evaluations given the need to use this information in refining project activities and designing new programmes, and (iii) clarity on the spatial areas of impact.
- In addition, there are a range of wider evaluation issues that are specific to ERDF. These include the nature of geographical coverage of ERDF and lack of geographical targeting, heterogeneity of interventions, timing lags in the rollout of ERDF. Practical factors relating to the economic context for the 2007-13 programme and the quality and coverage of monitoring data are also relevant here.
- There are various possible methods for an impact evaluation for the 2007-13 programme and all have limitations. The use of control groups and difference in difference methods offers greatest scope to overcome many of the challenges in impact evaluation but needs to be carefully considered to reflect some of the limitations of the approach.
- Given the requirements of this approach and the availability of reliable data sources upon which to construct control groups, in this instance the control group approach is only appropriate to measure the impact of interventions which have direct SME beneficiaries.

3.1 The purpose of any impact evaluation is to measure the actual net impact of a policy, project or programme compared to the situation in the absence of the intervention⁸. The report by the National Audit Office (NAO)⁹ on evaluation in government identified a wide variation in the quality of past evaluations in the four areas of government policy it reviewed¹⁰. The key point it made was that “*although [there are] many government sponsored evaluations that look at outcomes they do not use credible strategies to assess the causal impact of policy interventions*”.

3.2 The report makes a number of clear points about what is required to truly measure impact:

- Assessing the causal impact of policy interventions requires the construction of a valid counterfactual
- It is important to establish that individual opinions of benefits or perceptions of events genuinely relate to the policy implementation
- The way in which this counterfactual is constructed is the key element of programme evaluation design. A standard part of this design is to create a comparator [or control] group of individuals [or businesses] not participating in or not eligible for the programme being evaluated.

⁸ usually called the counterfactual

⁹ “*Review of Government Evaluations: a report for the NAO*”, Gibbons, Sandra McNally and Overman (Draft version 2013)

¹⁰ active labour markets, business support, education and spatial policy

- The assumption is that the post-policy outcomes in the control group provide an estimate of what would have happened to the treatment group in the absence of the policy. The challenge to effective programme evaluation is to ensure and demonstrate that this assumption is plausible, given theoretical reasoning, the institutional context and the evidence in the data.
- Standard regression analysis can go some way in achieving this, by statistically ‘controlling’ for differences in characteristics between the [policy on treatment] and control groups. However, this method can only control for ‘observable’ factors for which there is data and imposes some potentially quite restrictive (‘functional form’) assumptions about the way in which these observed characteristics affect the outcome in question.

3.3 The NAO report identifies that there are broadly four ways in which the control groups can be designed or adjusted to make it the best possible comparison:

- 1) **Randomised control trials:** randomly assign units to the [policy on] treatment and control groups as part of the programme design so that on average the control and treatment group characteristics are the same
- 1) **'Difference-in-difference':** use non-random treatment and control groups but subtract any pre-policy differences in outcomes in these groups from the post-policy differences
- 2) **Matching:** make the control group look more like the treatment group in terms of the observable characteristics of the members, by sampling a subset of the control group, or by weighting some members more than others, and then compare outcomes for this subset post-policy. The assumption here is that matching process using observable factors controls for any difference due to unobservable factors
- 3) **Focus on variables:** focus only on differences in outcomes between units in the treatment and control groups that can be considered as randomly assigned, even if the groups as a whole are not.

3.4 The conclusion from the review of the four areas was that historically evaluations had generally not adequately addressed these evaluation challenges especially in the areas of business support and spatial interventions. The review acknowledged the inherent difficulties in carrying out evaluations and generating useful control groups in these policy areas.

3.5 One point that was not covered in any great detail in the NAO report was that of displacement and how the techniques proposed could assess the spill over effects of policies (positive or negative) on non-beneficiaries.

Evaluation Issues

Generic Evaluation Issues

3.6 There are inherent challenges in evaluating the impact of any economic development intervention programme and those specific to ERDF. The generic challenges include:

- Determining the **counterfactual** and **disentangling** the impact of other interventions is a challenge and as we shall see there are limitations on the extent to which these can be addressed. Most economic development

programmes are designed in a way that is a far cry from the gold standard of evaluation – randomised trials where businesses or individuals or areas are randomly allocated to a policy on or policy off position. It is also the case that there are particular challenges where the policy (ERDF) is positively correlated with many other publicly funded interventions and indeed where beneficiaries may well have received a range of other non-ERDF assistance.

- The **timing** of impacts and evaluations – most interventions have a time lag between support activities being started to be delivered, changes in behaviour and impact. This is true for revenue-support activity such as business advice or loans/grants where a lag of 12 to 24 months between the start of the intervention and when the greatest impact occurs is common. It is particularly an issue for capital based interventions, which are an important feature of ERDF.
- Determining the spatial **area** of intervention is a challenge as is the need to assess leakage and displacement.

3.7 Unfortunately the evaluation literature is not very helpful in distinguishing the time it takes for impacts to materialise during or post any intervention – either some of or all the benefits. Support that leads to significant capital investments by firms (FEI investments) will clearly take longer to see impact materialise than more immediate support (say on marketing activity, stock control etc.). Generally, we expect to see the time it takes for discernible impact to materialise and time it takes for any maximum annual impact to be reached to be positively associated with the relative scale of the intervention for the SME¹¹.

Issues Specific to ERDF

3.8 In addition, the ERDF programmes raise specific evaluation issues for ERDF

1 – Nature of Geographical Coverage

3.9 In principle ERDF covers 100 per cent of England so there are no obvious control/policy off areas. However, there are clearly significant national variations in the overall intensity of investment. The highest is in Cornwall, then Merseyside/South Yorkshire, then the rest of the north of England and the Midlands, then greater South East and the rest of the South West.

- There has been some place-based investment with specific geographical targeting within regions, but in the main other programmes are available to all businesses across the region but targeted by sector or lifecycle. So in the main within most regions there has been **little or no geographical targeting**.
- The resources in the 2007-13 Programmes were:
 - First, focussed in areas that had relatively high per capita levels of ERDF in the 2000-2006 programme period
 - Second, focussed on areas that have had larger per capita levels of other funding

¹¹ The national evaluation of SFIE/RSA reported that 50% of recipients of SFIE had already realised all benefits or expected to do within 12 months, a further 30% in the next 2 years and 13% in 3 to 5 years BERR Occasional Paper No. 2, Evaluation of Regional Selective Assistance (RSA) and its successor, Selective Finance for Investment in England (SFIE), March 2008

- Third, are therefore to a large degree focussed in parts of the UK most vulnerable to retrenchment in the public sector and which have seen their economic fortunes worsen most in relative and absolute terms since 2008.

3.10 This **severely limits the practicality of an area-based control group econometric assessment of performance** as has been undertaken for Local Enterprise Growth Initiative (LEGI) areas for instance. In short the intensity of availability of ERDF is, by design, positively correlated with the scale of economic problems in a region or area and also to some degree with the past amount of other public interventions to tackle these problems. There are therefore no obvious policy-off control areas that can be used spatially.

2 - Interventions are heterogeneous

3.11 ERDF is not in itself a particular type of or approach to economic development intervention. It acts as match funding to an enormous variety of activity. It means that the question as to whether ERDF delivers value for money is an almost meaningless question; it is only as effective as the types of projects and programmes it chooses to support.

3.12 Although there is of course a major focus on the Lisbon Agenda, this covers a wide range of projects. In addition there are specific types of projects supported for instance green infrastructure in London, innovation demonstrators in the West Midlands, innovation connectors in the North East, broadband investment in South Yorkshire and tourism projects in the North West). All programmes have a mix of capital investments and revenue support, with an increased focus on the former (e.g. broadband investment projects) with the loss of Regional Development Agency match funding.

3.13 There is also a different focus of programmes as between the Convergence Programme in Cornwall, which has a larger focus on infrastructure investments and the Competitiveness Programmes in the rest of England.

3 - Delivery approaches for the same broad type of intervention

3.14 The evidence we have uncovered in our evaluation work is that two projects may seem to be the same apparent type intervention but could have very different targeting by size of firm, sector etc. or the scale of projects could be very different.

3.15 This raises the issue that there could be as much variation between the value for money of projects that are the same broad type of intervention and between different types of intervention. This means that any interpretation of evidence on the relative success or failure of particular types of intervention needs to be treated carefully. In short the variation within types of intervention is in many respects as great as that across types of interventions.

4 – Timing Lags

3.16 The timing of the roll out of ERDF and delivery time lags make evaluation challenging. The issues relate to:

- First, the general delay and time lags in projects starting and then delivering activity. Although as noted above 76,000 SMEs are reported as having been assisted
- Second, the delay between the interventions being delivered and impacts occurring

- Third, the lags between defrayment of ERDF into FEIs and the actual investment and then impact
- Fourth, the inherent time lags from investment to impact for larger capital intensive activities.

3.17 All this means that many of the impacts of ERDF will not at this stage be observable and those that are observable may not capture the full effects that will occur.

5 – Impact of external economic conditions

3.18 This is a very important factor. Pretty much all the investment by the current ERDF programmes has been against the backcloth of the most difficult economic conditions in England for many decades. Clearly, this will impact on the ability to disentangle impacts for both recipients of ERDF and potential control businesses.

6 – Quality of the reported performance information

3.19 The ERDF programme generates lots of information, some of which is needed to be able to scale-up any impact evidence to an overall picture. However, there are inherent challenges in doing any gross-up. For as we noted earlier there has been variability in how regions and projects have defined and reported on outputs and results. We are particularly nervous about the robustness of reported jobs safeguarded and how this is interpreted locally.

Possible Methods for the Impact Evaluation

3.20 Four main approaches to measuring the impact of ERDF investment were considered. These are:

- Self-reported impact
- Control groups
- Control areas
- Application of evidence from elsewhere to reported outputs and results.

3.21 The merits and applicability of each of these approaches is considered below.

Self-reported impact

3.22 This is a method that has been commonly used in the evaluation of many regional business support programmes and in the past in ERDF programmes. It involves asking beneficiaries to carry out a self-assessment of the additionality of any support they have received. This approach has its strengths and weaknesses that were recently explored for the Department of Business, Innovation and Skills.¹² Many of the weaknesses relate to the reliability of information received from participants due to factors such as “recall bias” and the inability to attribute value to the impact of the intervention and so systematically under-reporting impacts. The report concludes that self-assessment approaches are more likely to be useful where:

- Limited funds are available to undertake a more thorough evaluation
- The programme is visible and discrete

¹² Survey Questions for Impact Evaluations Which Rely on Beneficiaries Self-Assessment, Evidence and Guidance, June 2011

- The benefits of participation are clearly understood and the costs and benefits are easily quantifiable
- It is relatively straightforward to envisage the world in the absence of participation
- Potential knock-on effects from the programme to other firms are not large
- There are other evaluation tools available against which to benchmark the impact estimate derived from self-assessment (i.e. triangulation)
- It is important to gain an understanding of the participation process, such as the costliness of participation, the clarity of programme rules, the helpfulness and usefulness of staff.

3.23 Some of these conditions are met in the case of ERDF support, but not many of them as ERDF interventions are complex. Nevertheless the views of the authors do highlight some of the challenges and limitation of self-assessment approaches. As noted in the NAO report relying on self-reported impacts does not allow for the creation of a robust counterfactual other than that guessed at by the beneficiary contacted.

Use of control groups and difference in difference methods

3.24 The theoretical underpinning of using econometrics to identify the impact of ERDF or other programmes is well established although the body of work where it has been applied is not extensive. It is widely seen as the way forward and the demands placed by the method for information are increasingly being considered at the start of programmes when the monitoring and evaluation systems are being designed and put in place.

3.25 In broad terms, the programme impact is identified by comparing the performance of firms that received funding from the programme with the performance of firms not participating and controlling for other influences like sector, location, age and size of company. The analysis would look at difference-in-difference analysis, comparing change in an indicator (e.g. growth in employment, turnover or rates of firm survival) between the two groups.

3.26 The use of such an econometric approach has been a recommendation from previous evaluation exercises. For example, it was used to consider the impact of LEGI¹³ although the unit of analysis was the small area economies rather than individual firms, and the impact on SMEs of participation in the EC-funded Framework programmes on SMEs¹⁴. It is relatively commonly used in evaluation of business support such as Regional Selective Assistance/SFIE¹⁵ although here more detailed policy-off research was carried out on a control group sample.

3.27 There are a number of factors that can reduce the effectiveness of the approach in practice. First, to apply the method usually requires matching data on individual firms from a number of sources/databases.

- For example, in the context of this ERDF evaluation, it will be necessary to match information identifying firms receiving funding support from the ERDF programme databases with data on company performance (e.g. Inter

¹³ Einio and Overman (2011) and also the Final National LEGI Evaluation, Amion for DCLG (2010)

¹⁴ Impact assessment of the SME-specific measures of the Fifth and Sixth Framework Programmes for Research on their SME target groups outsourcing research, D6 – Final evaluation report, IDEA Consult, 2010 see http://ec.europa.eu/research/sme-techweb/pdf/sme_impact_assess_2009_long.pdf

¹⁵ BERR Occasional Paper No. 2, Evaluation of Regional Selective Assistance (RSA) and its successor, Selective Finance for Investment in England (SFIE), march 2008

departmental Business Register or commercial databases on company accounts such as FAME). The extent to which this is straightforward will depend on the quality and consistency of information identifying companies in each database.

- Sources such as the IDBR or FAME do not hold comprehensive data on all companies. The information in FAME is limited by the legal requirements on companies for filing accounts, while it is recognised that the IDBR has relatively poor representation of businesses that are not registered for VAT or PAYE. If the policy being assessed is strongly focused on these types of companies then the number of firms for which data can be sourced for the analysis will be much more limited.
- In an evaluation of ERDF in Wales¹⁶, only 56 per cent of the sample of companies receiving funding through ERDF being used in the analysis could be matched to data in the IDBR. Our knowledge of ERDF programme records based on interim evaluations of six regional programmes in England did not lead us to consider that the matching rate would be substantially different in an England context, with the only caveat that more time had elapsed to increase the potential matching rate.

- 3.28 Second, there is also the matter of whether it is likely that **any impact from the programme will be identified in firm-level data**. There is a wide variety of activities that can be funded by ERDF and also variety in the average level of funding. We would expect impact to be more likely to be observed the higher the level of support and the longer the support was provided for. However, the eventual benefit to the firm of the support may not be seen in terms of additional sales or employment for some time after the funding was received. It may be necessary to examine data on company performance for some period after the funding.
- 3.29 Also, given the timeliness of data in the IDBR or FAME¹⁷, data for this extended period is unlikely to be available at this stage except for intensive interventions carried out very early on in ERDF programmes (in 2008 or 2009). Although data provided by DCLG suggested that 3,800 SMEs and 9,800 start-ups had been supported, our experience of interim evaluations is a very substantial time lag from the official start of programmes to when a significant amount of deep interventions with businesses have been completed.
- 3.30 Finally, as the data analysis is at a firm level this approach does not address the issue of **displacement**¹⁸. This may require further modelling based on the Standard Industrial Classification (SIC) code of the business as a proxy for its likely market areas and degree of “export orientation”.

Use of control areas

- 3.31 This is a variation on the above approach where the unit of analysis is an area rather than firm or individual. As noted this approach was used to evaluate LEGI. We considered whether this approach could be used for ERDF and concluded that it is not viable for the following reasons:
- First, apart from at a regional level and, potentially, in the case of South Yorkshire, Merseyside and of course Cornwall there is no reliable data on

¹⁶ ERDF Business Survey, Final Report, Old Bell 3 Ltd in association with Cardiff University and IFF Research

¹⁷ company accounts will report on performance of a 12-month period ending perhaps 9 months before the data are filed

¹⁸ i.e. one firm’s success is at the expense of another in the same or adjacent area

ERDF spend by other geographical units. There would simply not be enough observations to carry out any meaningful econometric analysis.

- Second, as noted earlier generally there is a positive association between poor economic performance and other public sector funding for regeneration and economic development and levels of ERDF received.
- Third, this means therefore that there would be no valid control areas for analysis. The areas with lower levels of ERDF do, by definition, have vastly different characteristics than those who benefitted for higher levels of ERDF.
- Finally, at a regional level the amount of ERDF is relatively trivial compared to say past RDA investments and so is likely to be drowned by wider noise about the economy and other public policy.

3.32 We therefore did not recommend this approach.

Application of evidence from elsewhere to reported outputs and results

3.33 This approach in essence involves combining real live data on results achieved or forecast which are measuring gross impacts with benchmarks from other evaluations for that relevant type of intervention. Such an approach provides a way of developing bounded estimates of the potential net impact. Clearly such an approach relies on:

- The robustness and transferability of previously developed benchmarks, which were developed in a different set of economic circumstances and for non-ERDF programmes
- The ability to apply the right benchmarks to different types of projects.

3.34 This approach would involve using the evidence of past project level evaluations of ERDF and other programmes and applying it to MCIS monitoring data to gross up to the overall programme level. It would use our review of the range of evaluation evidence on ERDF supported projects in England and other areas such as Wales for different types of projects. It would require an assessment of the robustness of the methodology used for the individual evaluations and the issues such as the timing of any impacts. To be useful it would require a good spread of completed and useable evaluations across each type of ERDF project.

3.35 Although there is some useful evidence from project level evaluations this is patchy and in nearly all cases project level evaluations do not involve the development of robust control groups. There could therefore be serious biases in the results.

3.36 We therefore did not recommend this approach.

The Control Group Approach

3.37 Although all of the approaches set out above have limitations, the control groups approach was considered to offer the greatest potential for a robust impact assessment of the 2007-13 programmes and to provide an assessment that was most in line with the standards set out in the NAO report.

3.38 A method was devised to trial an approach which would:

- 1) **Observe change** on key business performance measures using the Inter Departmental Business Register (IDBR) rather than rely on self-reported change

(e.g. using survey research). The IDBR collects data on turnover and employment for all live enterprises trading above the VAT threshold each year so allows changes in the financial performance of beneficiaries of ERDF funded support to be tracked over time and the pre and post support performance identified.

- 2) Drawing again on the IDBR, create a representative **comparator group** of businesses that have not received ERDF funded support. The assumption here is that the post-policy outcomes in the comparator group provides an estimate of what would have happened to the treatment group in the absence of the ERDF support.
- 3) Use **difference in difference**¹⁹ to assess the strength of the effect of support on business performance.

Scope of the Analysis

- 3.39 The range of beneficiaries of ERDF projects includes:
- Individuals receiving enterprise support and start-up businesses
 - Small and medium sized enterprises (SMEs)
 - Graduates, company employees and, in fewer instances, the unemployed.
- 3.40 All of these beneficiaries could be the focus of the control group analysis. However, the range of beneficiaries for which the impacts of ERDF could be tested was subject to a number of constraints associated with the need to capture reliable and appropriate performance data and to construct control groups. Table 3.1 assesses the potential to use a control group approach for different types of beneficiary.

Table 3.1 Beneficiary Types and Potential for Control Group Analysis

Beneficiary Type	Potential for Control Group Approach
<i>SMEs</i>	<ul style="list-style-type: none"> • Established businesses can be tracked through Inter Departmental Business Register. This contains some data on business characteristics and performance, which is a key objective of ERDF e.g. creation of employment, improved business performance in terms of turnover. • Possible to construct control groups of businesses with similar characteristics.
<i>New businesses created</i>	<ul style="list-style-type: none"> • Limited potential because substantial numbers of new start-ups receiving ERDF funded support unlikely to exceed VAT threshold in early stages. No means of tracking these businesses through IDBR.
<i>Individuals supported to access employment</i>	<ul style="list-style-type: none"> • Would require direct contact with ERDF beneficiaries to understand outcomes (most beneficiaries would not be picked up by the Individual Learner Record database). • No easily accessed and reliable official source of data on outcomes for individuals e.g. salaries, employment status. Would require access to confidential national data e.g. Inland Revenue records, prohibitive in terms of data protection and cost of obtaining data.
<i>Graduates assisted with placements, employment</i>	<ul style="list-style-type: none"> • Would require direct contact with ERDF beneficiaries to understand outcomes of support.

¹⁹ use non-random treatment and control groups but subtract pre-policy differences in outcomes in these groups from the post policy differences

	<ul style="list-style-type: none"> No easily accessed single source of data to track graduates and construct control groups. Data on individual graduates is held by universities, and there would be significant data protection and complexity issues involved in obtaining data.
<i>New businesses created</i>	<ul style="list-style-type: none"> Limited potential because substantial numbers of new start-ups receiving ERDF funded support unlikely to exceed VAT threshold in early stages. No means of tracking these businesses through IDBR.

3.41 A number of other practical considerations also influenced the range of beneficiaries on which the evaluation would focus. That is, the need to draw on data sources for both beneficiaries and non-beneficiaries which are reliable and can be relatively easily accessed within the time period and resources available for the study.

3.42 The second step in devising the scope of the analysis was to classify ERDF projects by type of intervention, which would enable the evaluation to consider the impacts of different forms of intervention spanning the broadest possible range of ERDF investments. The purposes of developing a typology were as follows:

- Provide the means to capture differences in the ways in which ERDF interventions are delivered and their outcomes, including wide variations in the intensity of support and the range of mechanisms by which the performance of beneficiaries is influenced.
- Enable the evaluation to identify the specific interventions which are and are not suited to this approach.

3.43 A typology of 17 interventions was developed by the project team and used in classifying projects. The typology is shown in Table 3.2.

Table 3.2 Typology of Interventions

Type of Intervention	Description	Examples
<i>SME competitiveness</i>	Mainstream enterprise support to established and growing businesses to improve productivity and promote growth	Information, diagnostic and brokerage services; mentoring & coaching; general business premises; export advisory services; supply chain development
<i>Sector development</i>	Interventions targeted at specific sectors	Sector or cluster development programmes e.g. manufacturing advisory services
<i>Business formation and entrepreneurship</i>	Business start-up support and activities to promote entrepreneurship	Enterprise coaching; social enterprise start up services; youth enterprise services; incubator facilities
<i>SME innovation</i>	Interventions to promote innovation by SMEs	Knowledge transfer projects; innovation advisory services
<i>Strengthening the R&D base</i>	Capital and revenue investments to strengthen and exploit regional science bases, and promote the commercialisation of research.	Investment in university research facilities; commercialisation support services
<i>Access to employment</i>	Interventions to improve availability of and access to employment opportunities, most likely to be targeted at deprived communities	Business premises in deprived areas; travel schemes linking employment areas to deprived communities
<i>Sites and Premises</i>	Range of capital investments to support the development of employment land and premises	Employment site infrastructure; land remediation; business premises; JESSICA

Type of Intervention	Description	Examples
<i>Infrastructure</i>	Investment in specific infrastructure projects	Superfast broadband networks; transport infrastructure e.g. station facilities, interchanges
<i>Access to finance</i>	Range of financial engineering instruments providing business capital or funding for development projects	Venture Capital and Loan Funds e.g. JEREMIE, transitional loan funds; SME grant schemes
<i>Marketing</i>	Tourism and investment promotion marketing	Town visitor economy marketing
<i>Social Enterprise</i>	Actions to support development of social enterprise	Advisory and start up schemes
<i>Tourism</i>	Investment in specific tourist facilities	As per description
<i>Public Realm</i>	Investments in environmental improvements, gateways etc.	See description
<i>Community</i>	Investments which appear to be aimed solely at community facilities, networks etc.	See description
<i>Resource Efficiency</i>	Investments targeted at SMEs' use of energy and uptake of low carbon technologies Might also include a small number of low carbon retrofitting projects for homes where SMEs are identified as beneficiaries	Energy efficiency advisory services; demonstrator projects
<i>Low Carbon Sector Development</i>	Investments targeted at the development of new technology, supply chains etc.	Low carbon technology demonstrators in HEIs; low carbon sector development programmes

3.44 This typology was applied to all contracted projects across England. This process presented the following challenges both in terms of allocating projects to types and the extent to which the type of intervention was suited to impact analysis based on the IDBR:

- The practical issue of sufficiently understanding the nature of the project to allocate it to a category in an appropriate manner, as well as to understand how the intervention was designed to impact upon a beneficiary.
- Individual projects may span several categories. For example, sector development projects could provide general advice aimed at improving business competitiveness, specific services aimed at commercial innovation and activity that leads to the start-up of new businesses.
- Setting the project's value against the number of outputs (e.g. business assists) and/or beneficiaries provides a simple method of establishing the intensity of interventions. Those projects with higher cost per output and/or beneficiary should in general represent more intensive forms of ERDF assistance. However, some projects combine high value capital investment and lower value revenue investment. In these cases, the correct measure of intensity would in many cases be the revenue element of this investment. The capital element could only be included if the beneficiaries were the sole beneficiaries of the scheme over its lifetime, which is highly unlikely given the long term nature of capital investment.
- The characteristics of project beneficiaries, which are not immediately accessible from project output and results data. For example, some beneficiaries are single business unit SMEs receiving ERDF support, while others will be part of multi-unit operations with ERDF support benefiting each

of these units. This presents difficulties in terms of assessing the role of business structure and location in the impact of ERDF investment, but also some practical problems in linking a beneficiary to the IDBR.

- 3.45 The process enabled a clearer assessment of the suitability of the intervention categories for the control group approach – some are much more suited than others.
- 3.46 The outcome of this process was recognition that, for some categories, the prospects of obtaining a significant linked and matched sample using the IDBR or other sources were negligible or heavily constrained. Projects in which beneficiaries were not SMEs would be excluded from the project sample.
- 3.47 It is therefore important to note that **the preferred analytical approach is only appropriate for identifying impacts associated with ERDF interventions which have direct SME beneficiaries.** Projects which do not have direct beneficiaries (such as investments in infrastructure or public realm improvements) could equally support improved business performance but beneficiaries would be widely dispersed and therefore less readily identified and the impacts on individual businesses most likely too slight to allow the effect of the ERDF investment to be isolated from the range of other factors which affect business performance.
- 3.48 The focus on performance (measured by growth and productivity) means that the analysis focuses on businesses that are trading and does not explicitly deal with the question of business survival rates. This is an important point as business survival is a feature of some programmes. Although ERDF is not intended to support failing businesses it is reasonable to assume that ERDF funded support, particularly for less well established firms, could have an influence on survival rates.

Table 3.3 Suitability of Intervention Types for Econometric Analysis

	Characteristics of Beneficiaries	Suitability for Econometric Analysis
<i>SME competitiveness</i>	Predominantly SMEs with improved performance (turnover, jobs and productivity)	Strong fit with IDBR based approach
<i>Sector development</i>	Typically SMEs, again with improved performance - a core objective	Good fit with IDBR based approach
<i>Business formation and entrepreneurship</i>	Focused on creation of SMEs, so some business assists but also on individual entrepreneurs	IDBR unsuitable (i) few businesses likely to be registered for VAT/PAYE (ii) uncertainty about survival (iii) difficult to match non-ERDF start ups
<i>SME innovation</i>	Mainly SMEs working with universities, R&D facilities and large companies. Emphasis on improved business performance but collaboration or new products/services may be output targets in own right, plus some proof of concept investments.	Good fit with IDBR based approach, although long lead time to generate business benefits from new product/service development means impacts may not show in IDBR. Proof of concept investment unlikely to be reflected in established SMEs.
<i>Strengthening the R&D base</i>	Mix of capital and revenue investment, frequently targeted at universities results in a mix of institutional and business beneficiaries. Improved business performance is objective, but collaboration often a focus of activity.	Seek to link ERDF SMEs to IDBR, but may be a need for caution about attributing impacts to ERDF capital and/or revenue
<i>Access to employment</i>	Mix of investments focused on assisting individuals to secure employment (e.g. travel to work support schemes) or start an enterprise (e.g. business coaching schemes)	Focus on individuals makes the category unlikely to be suited to IDBR linking and matching
<i>Sites and premises</i>	Some SME beneficiaries are reported, but generally indirect recipients of ERDF through developer and operator of premises	Limited potential to use IDBR given indirect nature of ERDF support, and practical difficulties identifying beneficiaries
<i>Infrastructure</i>	Investment in specific infrastructure projects ranging from transport gateways to superfast broadband investment	Limited scope: much transport infrastructure investment does directly assist SMEs and most SFB projects are still rolling out networks
<i>Access to finance</i>	Extensive range of SME beneficiaries receiving loan, mezzanine and equity finance with primary objectives to improve business performance, support growing companies. Some ERDF schemes support stabilisation of businesses, other support business formation	Strong fit with IDBR approach with large numbers of SMEs benefiting from ERDF backed finance measures; but less suited to proof of concept, micro-finance and some seedcorn funding focused on pre-revenue companies.
<i>Marketing</i>	Tourism and investment promotion marketing	No potential to use IDBR and limited potential to use other suitable control group approaches within parameters for this study
<i>Social Enterprise</i>	Actions to support development of social enterprise	Some potential for SMEs in the social and community sector but same constraint as for general start-up beneficiaries
<i>Tourism</i>	Investment in specific tourist facilities	No potential to use IDBR and

		limited potential to use other suitable control group approaches within parameters for this study
<i>Public Realm</i>	Investments in environmental improvements, gateways etc.	No potential to use IDBR and limited potential to use other suitable control group approaches within parameters for this study
<i>Community</i>	Investments which appear to be aimed solely at community facilities, networks etc.	No potential to use IDBR and limited potential to use other suitable control group approaches within parameters for this study
<i>Resource Efficiency</i>	Investments targeted at SMEs' use of energy and uptake of low carbon technologies. Might also include low carbon retrofitting projects for homes (with SME beneficiaries)	Some uncertainty about how ERDF support will be reflected in changes in business performance, but substantial number of SMEs
<i>Low Carbon Sector Dev.</i>	Investments targeted at the development of new technology, supply chains etc.	As above

Research Questions

3.49 In short, the analysis uses IDBR data to examine whether participation in the ERDF programme since 2007 has led to improved economic performance. The principle questions it investigates are:

Q1: Has the ERDF programme had a positive impact on particular measures of business performance of those firms participating?

3.50 This question examines whether the business performance of participating firms is better than it would have been if they had not engaged in the programme. That is, is there an improvement relative to non-participating firms? This question does not identify whether performance is greater than it was before participating in the programme, just whether performance is better than would otherwise have been expected.

Q2: Did those firms participating grow faster than non-participants after being in the scheme?

3.51 In contrast, this question considers whether the absolute performance of firms that engaged in ERDF programmes was better than firms that did not. That is, was their growth stronger?

3.52 The measures of performance used for the analysis are driven by the availability of data from the IDBR. The analysis considers:

- Business growth (measured by turnover and employment)
- Business productivity (measured by turnover to employment ratio).

3.53 Drawing on wider administrative data held on the programmes, the analysis also considers a number of supplementary questions related to the type of support which is most effective in improving performance and the circumstances under which impact is greatest.

Process

3.54 The methodology for the impact assessment contained a number of steps. These, and the influence on sample structure and data reliability, are explored in more detail in sections 3 and 4 of this report. In short, the process involved:

- 1) Identifying direct SME beneficiaries of ERDF funded projects in all English regions using MCIS data
- 2) Collecting basic information about the SME beneficiaries and the support they had received from project delivery bodies
- 3) Using this information to form a matched sample by identifying SME beneficiaries on the IDBR and drawing down historical data on the business performance (2001 to 2012) for these businesses
- 4) Forming a control group from the IDBR on the basis of the characteristics of this matched sample of beneficiaries
- 5) Identifying suitable SMEs from the matched beneficiary dataset for the econometric analysis, based on the dates of support received (leaving sufficient elapsed time after the end of assistance and the most recent IDBR data).
- 6) Conducting difference in difference analysis to identify impact and test the counterfactual.

4. Developing the Matched Beneficiary and Control Datasets

Summary:

- Various practical challenges were encountered in compiling the matched beneficiary dataset. These challenges introduced a number of sources of sample attrition which has implications for the coverage and representativeness of the beneficiary dataset.
- Projects without direct SME beneficiaries are not suitable for this analytical approach. The counterfactual assessment covers 358 ERDF projects, representing £532 million contracted ERDF. This is a relatively small proportion (24%) of total contracted ERDF across the nine regional programmes.
- Based on MCIS data, we estimate that the 358 ERDF projects included in the population had assisted circa 65,000 SMEs. Just 30 per cent of these are included in the matched beneficiary dataset.
- A large proportion of beneficiaries were excluded from the sample as a result of the low response rate from projects to the request for beneficiary data. Some 40 per cent of eligible projects (148) did not provide beneficiary data, which resulted in 26,000 SMEs being lost from the sample.
- The proportion of beneficiaries identified on the IDBR (61%) was low. This was linked partly to incomplete data but might also point towards issues of data quality. Even where company reference numbers were provided, the matching rate (67%) was low, and suggests that a large proportion of the reference numbers provided were incomplete or inaccurate.

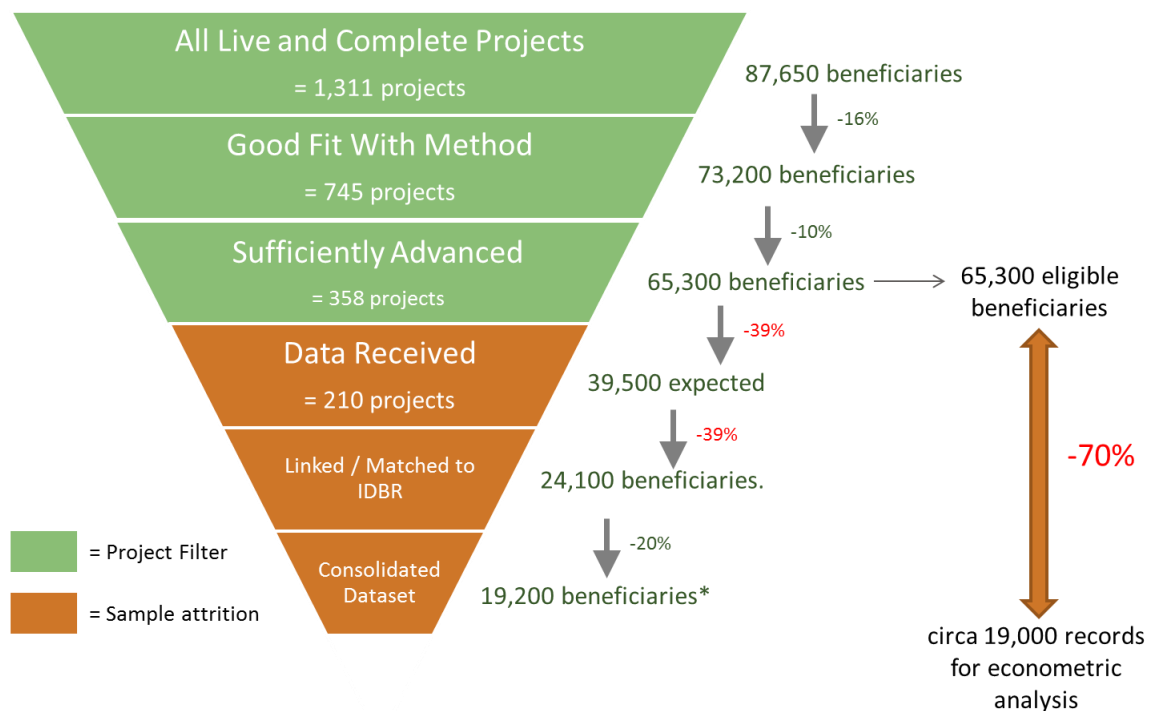
- The sample structure, particularly the balance between beneficiaries of projects of different types and in different regions, changed substantially in compiling the matched beneficiary dataset. The effect of this on the representativeness of the characteristics of SMEs cannot be assessed as information is not held centrally on the characteristics of SME beneficiaries.

4.1 Data from MCIS was used as the basis for the matched beneficiary and control datasets. This data was accessed in January 2013 and contains information on contracted and reported ERDF investment, outputs and results for all ERDF funded projects.

Matched beneficiary dataset

4.2 The process of compiling the matched beneficiary dataset (summarised in Figure 4.1) introduced different sources of sample attrition at each stage. This section explores these stages in more detail, highlights the practical challenges encountered and the implications of the associated sample attrition for the representativeness of the sample. Detailed charts and tables relating to the sample structure are provided in Appendix A.

Figure 4.1 Matched Sample: Development Process



Source: Regeneris Consulting

Step 1 - Identify Suitable ERDF Projects

- 4.3 The sample frame provided by the MCIS data indicates that the nine regional 2007 – 2013 ERDF programmes had supported some 1,300 projects. This represents **£2,190 million** of contracted ERDF investment.
- 4.4 These projects were classified into thematic areas (see Table 3.3) based on the brief project descriptions included in MCIS.
- 4.5 An initial set of filters were applied to the project database to focus on the projects which would be most suitable to the econometric analysis. These were:

- **Remove projects in themes which would not have a strong fit with the analytical approach.** For example, themes where projects would not have direct and hence reported business beneficiaries (e.g. infrastructure or public realm projects). While investments in these themes could support improved business performance, beneficiaries would be widely dispersed and cannot be readily identified for this analysis.
- **Remove projects which were not sufficiently advanced in their delivery to have started generating impacts amongst businesses.** Projects that were suspended and those which had claimed fewer than 50 SME assists at the time of the MCIS data export were excluded at this stage.

4.6 There were 358 projects remaining in the sample after these filters were applied. These covered £530 million of contracted ERDF. This group of projects is the base population for the counterfactual analysis as it consists of sufficiently advanced projects providing assistance of the type where impacts can feasibly be measured through IDBR analysis. This base population represents a small proportion (24%) of investments made by the ERDF programmes.

4.7 Together these projects had reported 65,300 completed SME assists. While the actual number of SME assists is expected to have been different from this due to lags in reporting, recording the assistance, the 65,300 is taken as the sample size. The majority of these were assisted by projects in the SME Competitiveness, Resource Efficiency and SME innovation themes although it should be noted that, by value of contracted ERDF, the access to finance theme is the largest.

Table 4.1 Suitable ERDF Projects by Strand

Theme	Number of Projects	Contracted ERDF £m	Estimated Number of Beneficiaries
SME Competitiveness	73	£123	27,500
Resource Efficiency	58	£52	13,050
SME Innovation	75	£74	10,500
Sector Development	53	£50	5,100
Access to Finance	40	£164	3,400
Low Carbon Sector Development	24	£33	2,800
Strengthening the R&D Base	25	£27	1,750
Social Enterprise	7	£4	900
Enterprise Formation and Entrepreneurship	3	£4	300
Grand Total	358	£532	65,300

Source: MCIS Data Accessed in January 2013. Analysis by Regeneris Consulting.

Step 2 - Access beneficiary data

- 4.8 Basic information about beneficiary SMEs²⁰ is needed to locate businesses on the IDBR. This information was requested directly from project delivery bodies as beneficiary records are not held centrally by the programmes.
- 4.9 A data proforma was sent to the delivery bodies for the 358 projects and 238 of these returned the requested information (66% of the total). The low rate of return is linked to a number of factors:
- In some instances delivery organisations for closed projects were no longer in existence or records were not accessible from archives.
 - There were also a number of instances where beneficiary records were not held in a format that would allow them to be supplied without significant resource implications for delivery bodies.
 - A small proportion of the returns was incomplete and rejected.
- 4.10 As a result of non-response, 148 ERDF funded projects were excluded from the analysis. Analysis of the variation in response rates for projects of different types²¹ indicates that:
- The distribution of beneficiaries by project type remained largely unchanged and there were no substantial differences in response rates by project type.
 - Low response rates in the East of England and East and West Midlands means that a greater proportion of projects from these regions were excluded. As a result, beneficiaries of projects in these regions are underrepresented in the sample.
 - The dataset is slightly biased towards beneficiaries in the North East and South West (note: the approach was piloted in these regions).
 - Larger ERDF projects were more likely to respond and as a result are better represented within the sample.
- 4.11 Information about the characteristics of assisted SMEs is not held centrally so it is not possible to test whether non-response at this stage has an effect on sample characteristics or representativeness.

Data Cleaning

- 4.12 The actual number of beneficiary records provided (45,400) was somewhat larger than the expected 36,000 based on the claimed SME assists to date for each project. The quality of returned beneficiary data was variable and a substantial number of SMEs were excluded due to incomplete data.
- 4.13 There was also substantial duplication within the dataset:
- SMEs listed as beneficiaries multiple times for a single project – efforts were made to remove these project level duplicates before the data was sent to ONS for IDBR matching
 - SMEs which were assisted by multiple projects – these were left in the dataset at this stage.

²⁰ i.e. company name, address and VAT Registration or Company Reference number

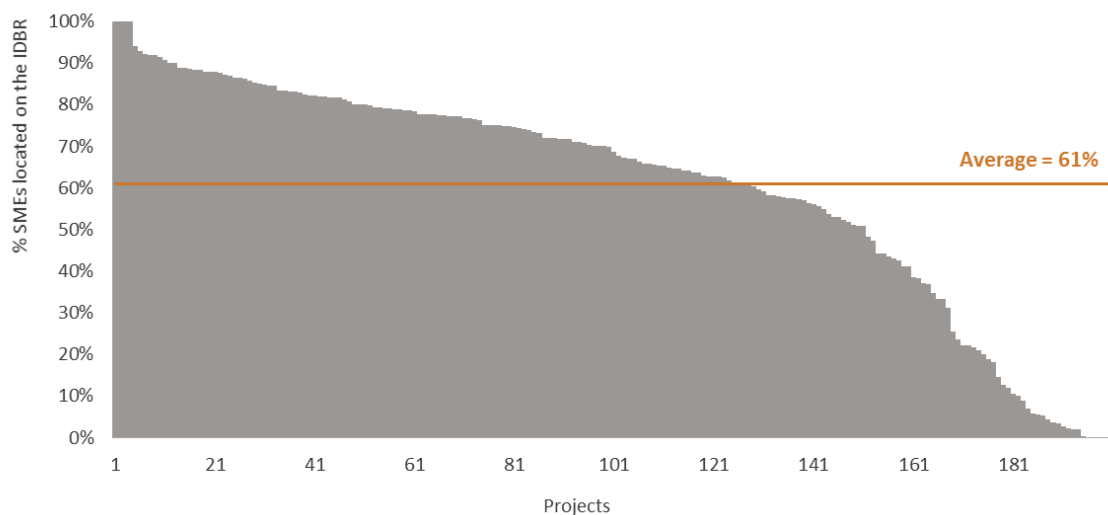
²¹ See Appendix A

- 4.14 A large number of projects were not able to provide company reference or VAT registration numbers for all or in some cases any, beneficiaries. These records not excluded from the dataset at this stage as it is possible to identify companies on the IDBR without these fields.
- 4.15 Once the dataset had been cleaned, **39,550 beneficiary records remained**. These were sent to ONS for IDBR matching.

Step 3 - Identify beneficiaries on the IDBR

- 4.16 The SMEs were identified on the IDBR via a two stage process. Firstly, those SMEs for which company reference or VAT registration numbers had been provided were matched to the IDBR using these fields. This is the most robust way of identifying businesses on the IDBR and has the greatest success rate.
- 4.17 For those companies where the reference numbers were missing, a process of fuzzy matching was carried out whereby the company name and postcode was used to locate the businesses on the IDBR. This method has a lower matching rate and the results are slightly more uncertain.
- 4.18 Overall, 61 per cent of SMEs (24,150) were matched to an IDR record. The matching rate was slightly greater (67%) for beneficiaries where reference numbers were provided, although it was not as high as expected. This suggests that a large proportion of the reference numbers provided were incomplete or inaccurate. Where no reference number was provided, the matching rate was 56 per cent.
- 4.19 The matching rate varied substantially amongst the projects as shown below.

Figure 4.2 Summary of Matching Rate by Individual Project



Source: Regeneris Consulting

- 4.20 The analysis of matching rates by project type, region, size and start date²² points to variation in the overall matching rate for projects of different characteristics. In particular, this points to a disproportionate amount of attrition from:

²² See Appendix A

- The North East and South East regions – matching rates here were particularly low at 26 per cent and 36 per cent respectively
- Enterprise and social enterprise projects – matching rates for these projects were most likely lowest as beneficiaries are less likely to be of a type or scale to be included on the IDBR. These themes are a relatively minor part of the overall sample
- Larger projects – ERDF projects with more than £2 million ERDF investment had low matching rates.

- 4.21 The factors which led to this large variation in matching rates are not clear, although we expect the quality and accuracy of data to have played a central role. The influence of closed businesses on the matching rate is difficult to ascertain. Although some closed businesses are cleaned from the IDBR periodically, this does not always take place. It is therefore not advisable to make the link between low matching rates and business survival as this cannot be verified.
- 4.22 As with beneficiary returns, it is not possible to assess whether SMEs with particular characteristics were more or less likely to be matched to the IDBR as information on the characteristics of beneficiaries is not available.

Step 4 - Consolidate dataset

- 4.23 The matching process returned a unique enterprise reference number for each matched beneficiary. Using this reference, the dataset was consolidated to take account of the SMEs which had been assisted by more than one ERDF project. A total of 19,227 unique businesses were identified at this stage and annual histories drawn down from the IDBR.
- 4.24 This dataset represents the base sample for the control group selection and econometric analysis.

Representativeness of Matched Beneficiary Dataset

- 4.25 The sample of 19,000 matched beneficiaries forms the basis of the control group selection but it is not the final sample which was used for the econometric analysis. The samples for the econometric estimations are selectively limited to take account of the timing of support and availability of beneficiary information needed for each estimation (see section 3). Although this is not the final sample, it is important to take stock of the sample characteristics at this stage as:
- The scale of sample attrition up to this point has been large - 70% of eligible beneficiaries have been lost in forming the matched beneficiary dataset
 - The matched beneficiary dataset is used as the basis for the control groups selection
- 4.26 There are two factors to consider when looking at the characteristics of the matched beneficiary dataset.

1 - Coverage of Eligible ERDF Projects

- 4.27 Of the 358 projects eligible for this analysis – only 230 are represented within the matched beneficiary dataset. The process removed full projects from the analysis (i.e. where beneficiary data was not returned) and also reduced how well represented

beneficiaries of some projects are within the matched beneficiary dataset (i.e. because the matching rate for some projects is much lower than others).

4.28 The charts in Figure 4.3 and Figure 4.4 provide an overview of the scale of sample attrition which occurred in developing the matched beneficiary dataset and how this has affected the structure of the sample. The key point here is that **the sample structure, and particularly the balance between beneficiaries of projects of different types and in different regions has changed substantially in moving from the 65,000 eligible SMEs to the 19,000 in the matched beneficiary dataset.** In particular:

- A large number of beneficiaries of SME Competitiveness projects have been removed and as a result, this theme is under-represented in the sample, whilst beneficiaries of resource efficiency, SME innovation and access to finance projects are slightly over-represented.
- Regional differences are the most marked – low response to the request for beneficiary data and regional variations in matching rates have caused the sample to become unbalanced geographically. The South West region is over-represented and sample sizes in the North East and South East are very small and under-represented.

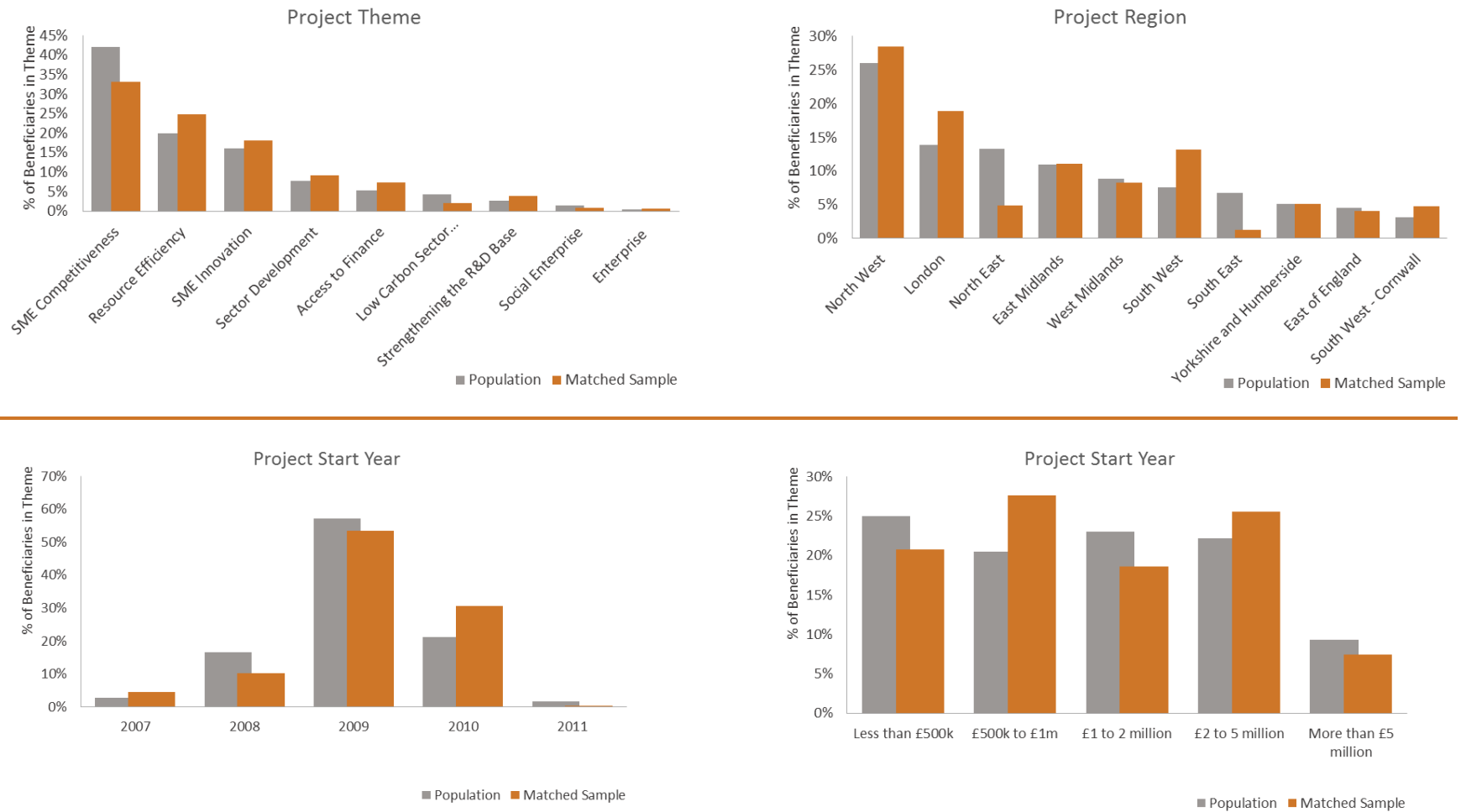
4.29 **Although the econometric analysis can deal, to a large extent, with any imbalances within the matched beneficiary dataset it cannot account for the incomplete coverage of the sample.** The process has excluded a large number of eligible projects from the matched beneficiary dataset and there is no way to test robustly whether these projects might be likely to support greater or lesser level of impact, or impacts of different types amongst beneficiaries.

Figure 4.3 Scale of Sample Attrition: Project Types, Regions, Start Years and Sizes



Source: MCIS data accessed January 2013 and beneficiary data returns. Analysis by Regeneris Consulting.

Figure 4.4 Change in Sample Structure and Representation of Project Types, Regions, Start Years and Sizes



Source: MCIS data accessed January 2013 and beneficiary data returns. Analysis by Regeneris Consulting.

2 - Characteristics of SME beneficiaries

- 4.30 The 358 ERDF projects included in the population had assisted circa 65,000 SMEs. Once the various steps outlined above had been followed, **just 30 per cent of these remained in the matched beneficiary dataset.**
- 4.31 As the characteristics of SME beneficiaries (such as their size, age and sector) could influence the scale of impact created, it would be appropriate to test the representativeness of the sample at this stage. Unfortunately, as information on the characteristics of the 65,000 eligible SMEs is not available, this important test cannot be performed.
- 4.32 Given the scale of the attrition, there might be some systematic differences between the characteristics of the population and the sample, particularly given that response and matching rates vary for projects in different regions and of different types. It is not possible to test or adjust for any bias which has arisen as a result.

Control Group Selection

- 4.33 The control group was selected on the basis of the 19,000 matched beneficiary dataset. The region, sector and size of the companies were used as the basis for the selection of the control group – the criteria are shown in Table 4.2.

Table 4.2 Summary Criteria for Control Group Selection

Type	Criteria for Matching
Business Size	Matched via broad size bands: <ul style="list-style-type: none"> • < 2 employees • 2 to 24 employees • 25 to 49 employees • 50 to 99 employees • 100 to 249 employees • 250 to 500 employees • 500 plus employees
Sector	Matched to 3 digit sectors using the 2007 Standard Industrial Classification
Geography	Matched businesses firstly sought within the same sub-region as the beneficiary business. Where no match is found within the 3 digit SIC classification in the sub-region then the scope of the geographical search is extended to regional level.

- 4.34 For each member of the matched beneficiary dataset, up to ten matches were drawn down from the IDBR. The ten control group members were selected randomly from the pool of all potential matches to each beneficiary business. Where fewer than ten potential control group members existed, all possible matches were included. For businesses that were part of a larger group, the selection process was carried out at the level of the enterprise, not the unit.
- 4.35 An approach whereby control group members were selected on the basis of the characteristics of SMEs in the year in which support was received was explored. For various practical reasons, ONS were unable to draw the control group on this basis. The control group was selected on the basis of the characteristics of the firms in 2012. This is not ideal given overlap between the selection criteria for the control group and the measures of performance. However, ONS were unable to select the control group on an alternative basis.

- 4.36 The initial selection process resulted in 133,000 businesses being selected but 31,000 of these were subsequently removed from the control group. Those removed from the data provided were:
- Ghost records – almost 20% (25,000 records) that ONS included in the control group dataset had ceased trading before 2001. These businesses had not been cleaned from the IDBR and their status as closed businesses did not become apparent until historical records for these businesses were extracted from the IDBR.
 - Beneficiary businesses – some 3,800 beneficiary businesses that were included in the matched beneficiary dataset were also included in the control group. These were removed.
 - Incomplete data – 2,000 records were removed from the control group as the data was incomplete.
- 4.37 The final control group filter was to limit the sample to those which were still trading in 2012.

Summary and Implications

- 4.38 The process for compiling the matched beneficiary and control datasets contained a number of steps, each of which resulted in beneficiaries or in some cases whole projects being excluded. Based on MCIS data, we estimate that the 358 ERDF projects included in the population had assisted circa 65,000 SMEs. Although the approach sought to include all of these SMEs within the scope of the analysis, just 30% of these beneficiaries were included in the matched beneficiary dataset.
- 4.39 The main sources of this sample attrition were
- The need to contact project delivery bodies to access beneficiary data and the associated low response rates
 - Low matching rates, even where complete beneficiary data including company reference numbers was available.
- 4.40 Data availability and quality was a major factor in sample attrition. A large number of beneficiary records were excluded because they did not include the required information and other sources of attrition were more severe than they would have been if more and better quality data about beneficiaries was available.
- 4.41 This has implications for both the coverage of the sample in terms of ERDF projects and its representativeness in terms of the characteristics of the SMEs which are included in the sample versus the whole population. Unfortunately, data limitations mean that only the former can be explored in any depth. Analysis of the dataset suggests that the sample structure, and particularly the balance between beneficiaries of projects of different types and in different regions has changed substantially in moving from the 65,000 eligible SMEs to the 19,000 in the matched beneficiary dataset.

5. The Sample of ERDF Beneficiaries

Summary:

- The sample size for econometric analysis and the characteristics of businesses which are included differs depending on the time periods under consideration.
- A minimum of two years IDBR data is needed to analyse post-support performance. As the most up to date IDBR data available at that time was for 2012, the sample for the econometrics is limited to those who had received all or any of their support before 2010.
- A large number of beneficiaries were excluded because of incomplete data. Poor data coverage for support dates meant that a quarter of the beneficiaries included in the matched beneficiary sample had to be excluded from the econometric analysis.
- The need to limit the sample for econometric analysis according to the dates of support means that a large number of beneficiaries are removed from the analysis. If additional years of post-support IDBR records were available (i.e. if the analysis was conducted in future) this issue would be less problematic.
- The sample that was eventually used for the econometric analysis is less than 3 per cent of the total number of eligible beneficiaries for the approach. The sample does not cover all in-scope projects and the characteristics of included SMEs and the support they have received is not representative of the beneficiaries in the matched beneficiary dataset. It is not possible to test how representative the sample is of the whole population of eligible SMEs.

5.1 The matched beneficiary dataset includes some 19,000 beneficiary SMEs but not all of these are included in the samples used for econometric analysis. The samples used for the econometric analysis are subsets of the matched beneficiary dataset as this needed to be limited to take account of:

- The availability of historic data from the IDBR: historic data is not available for all 19,000 SMEs due to variations in the dates when these businesses were established or closed.
- The timing of support: a period of two years post-support is needed to assess the post-support performance of beneficiary businesses.
- The availability of full contextual information on the support received by beneficiaries.

5.2 These three factors have together shaped the size and characteristics of the samples used for the econometric analysis. The effects of this on sample quality are described in this section.

Availability of Historic Data from IDBR

5.3 IDBR history data for each business in the matched beneficiary dataset was drawn down for each year between 2006 and 2012 (inclusive). The historical

data included details on business sector, employment and company turnover. Other fields included in the historical data are outlined in Appendix B.

- 5.4 It is important to bear in mind that historical data is not available for all 19,000 businesses in all years as some businesses did not form until mid-way through the analysis period, others ceased trading before 2012. This means that the size of the sample and its characteristics will change depending on the time periods considered by the analysis. The impact of this on the potential sample sizes for econometric analysis is shown in Table 5.1.

Table 5.1 Availability of Timeseries IDBR data by year (000s SMEs)

		Analysis End Year											
		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Analysis Start Year	2001	8.1	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3
	2002		2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.4
	2003			9.3	9.3	9.3	9.2	9.2	9.2	9.1	9.0	8.9	8.7
	2004				10.1	10.1	10.0	10.0	9.9	9.9	9.8	9.6	9.4
	2005					10.8	10.8	10.8	10.7	10.6	10.5	10.3	10.0
	2006						11.7	11.6	11.5	11.5	11.3	11.1	10.8
	2007							12.6	12.5	12.4	12.2	12.0	11.6
	2008								13.6	13.5	13.3	12.9	12.5
	2009									14.7	14.4	14.0	13.5
	2010										15.8	15.3	14.6
	2011											16.5	15.7
	2012												16.4

Source: Matched Beneficiary Dataset

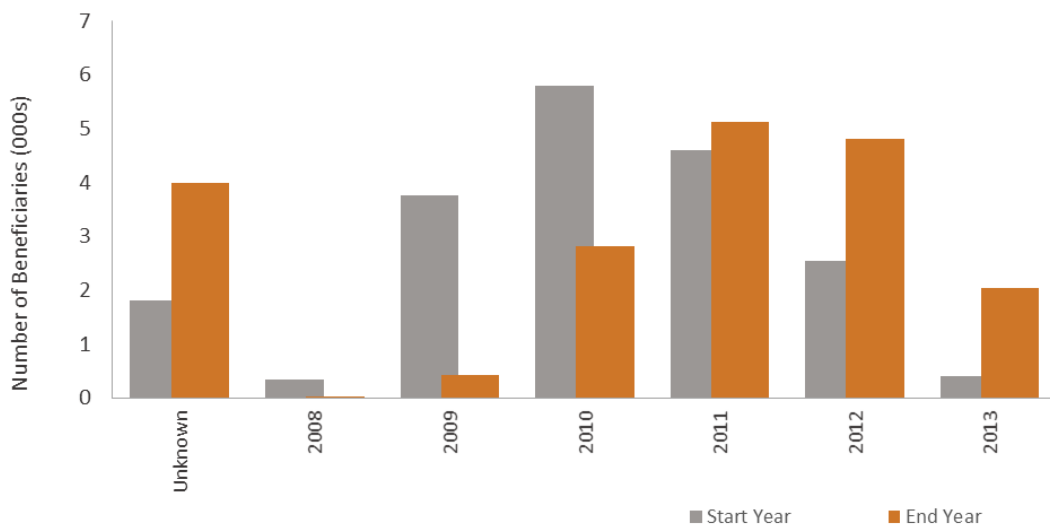
- 5.5 It would be desirable to compare how this affects the characteristics of the sample and its representativeness of the overall population of ERDF supported SMEs. As for other sources of sample attrition, the lack of data on the characteristics of the population of SME beneficiaries mean that this analysis cannot be completed.

Timing of support

- 5.6 A large proportion of project delivery bodies were unable to provide information about the timing of support provided to beneficiaries. This data was not provided for a large proportion (24%) of the matched sample. Although it is theoretically possible to estimate dates of support²³ this approach would lead to inaccuracies. Bearing in mind the importance of this variable, beneficiaries for which date information was missing were excluded from the analysis.
- 5.7 A minimum of two years post-support IDBR data is needed to analyse post-support performance. As the most up to date IDBR data available is for 2012, this means that the sample for the econometrics should be limited to those whose support ended before 2010. A large proportion of the beneficiaries were still receiving support in 2011, 2012 and 2013 and a substantial proportion only started to receive support after 2010.

²³ This could be achieved, for example, based on the delivery periods of relevant projects

Figure 5.1 Summary of Dates of Support for Matched Beneficiary Sample



Source: Matched Beneficiary Dataset

- 5.8 The selection of the samples and designation of time periods for the econometric analysis is complicated by the prevalence of firms whose support spanned a number of years. According to the information provided by projects, 38 per cent of beneficiaries had received support which spanned more than one calendar year.
- 5.9 Analysis of the time periods over which beneficiaries in the matched dataset had received their support led to the definition of four sample frames for the econometric analysis. These, and the number of beneficiaries included in each are shown in Table 5.2.
- 5.10 The combined effect of missing data and extended support periods for many beneficiaries, means that the sample is very small when limited to only those SMEs who have completed their assistance before 2010, as shown below. Alternative time periods were therefore included to include those who had received but not completed their support by 2010.

Table 5.2 Summary of alternative sample frames examined in the analysis

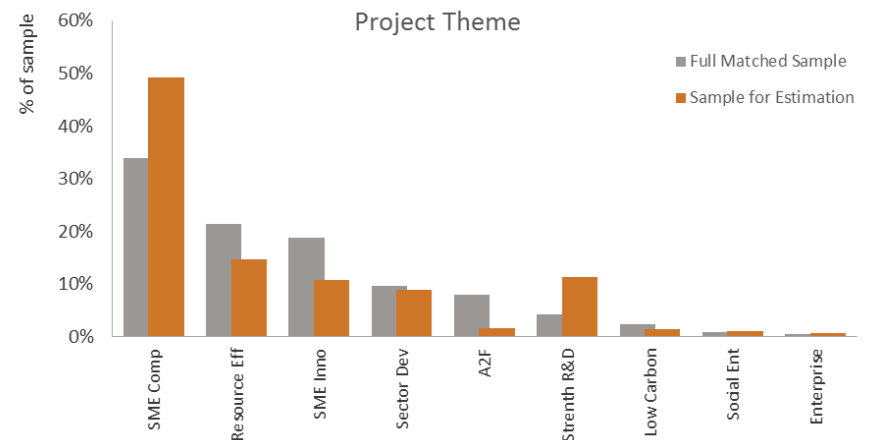
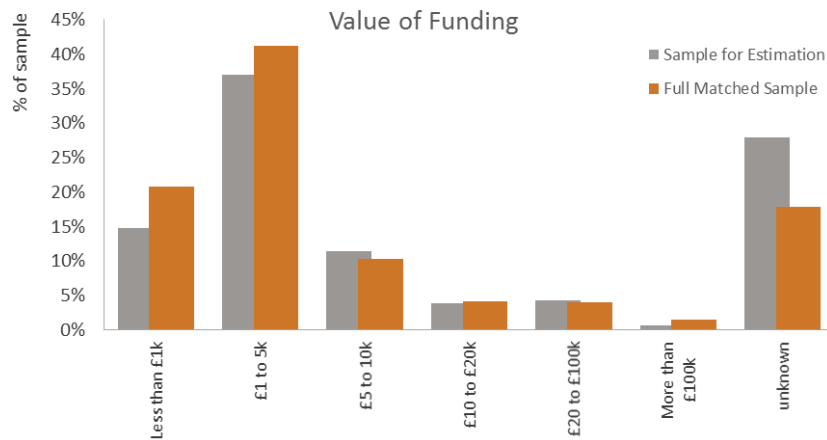
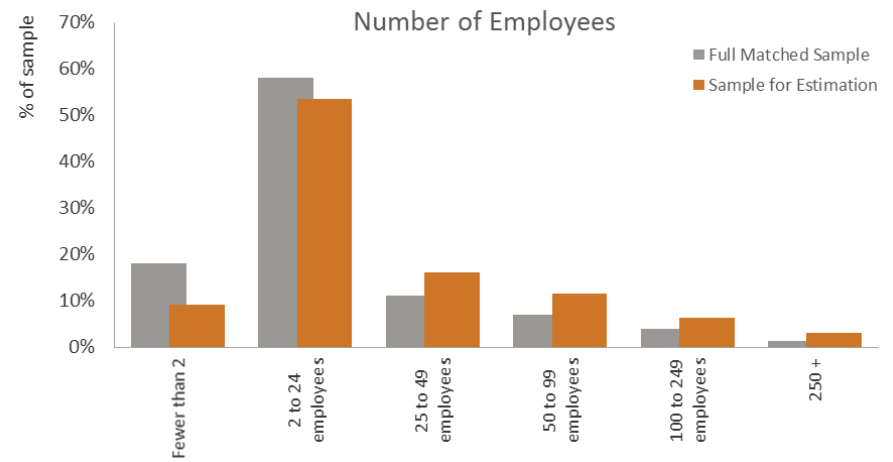
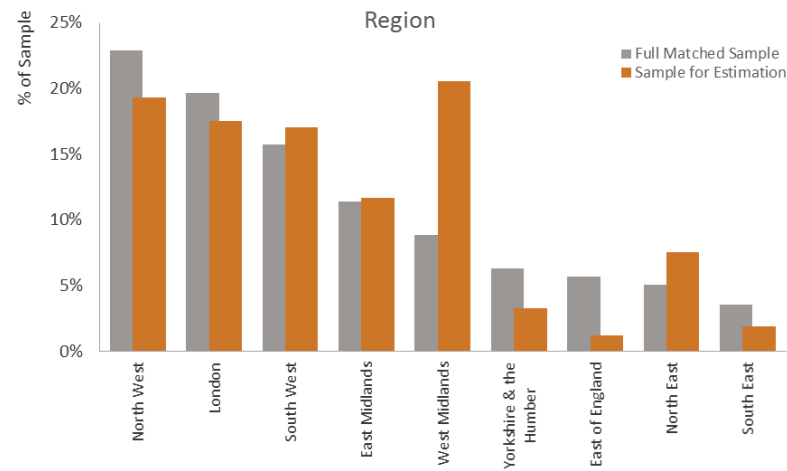
Pre-participation period	Post participation period	Funding criteria	Sample size
2006-08	2010-12	Received <i>any</i> funding before end of 2010	4,677
2006-08	2010-12	Received <i>all</i> funding before end of 2010	1,812
2006-08	2009-12	Received <i>any</i> funding before end of 2009	2,301
2006-08	2009-12	Received <i>all</i> funding between before end of 2009	224

- 5.11 The need to limit the sample in this way removes a large number of beneficiaries from the analysis. This is exacerbated by missing data but is also linked to the data profile shown in Figure 5.1. If additional years of post-support IDBR records were available (i.e. if the analysis was conducted in future) this issue would lessen in importance.

Influence on Sample Structure

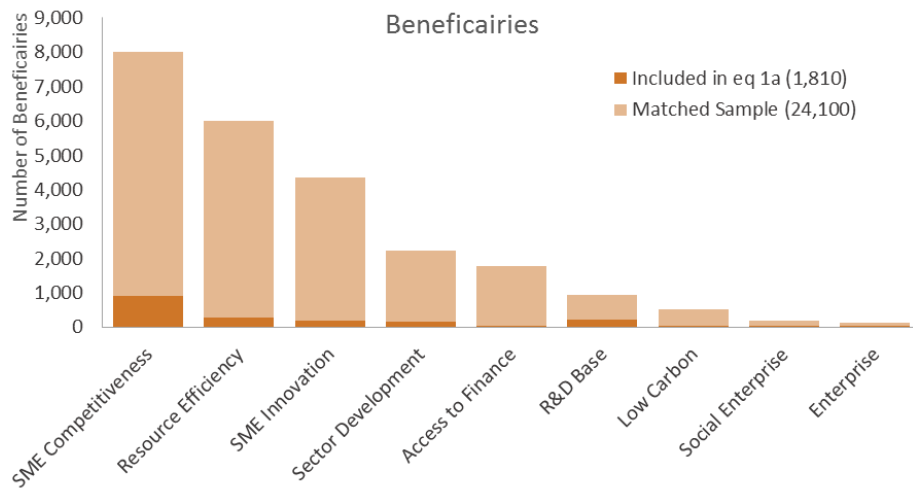
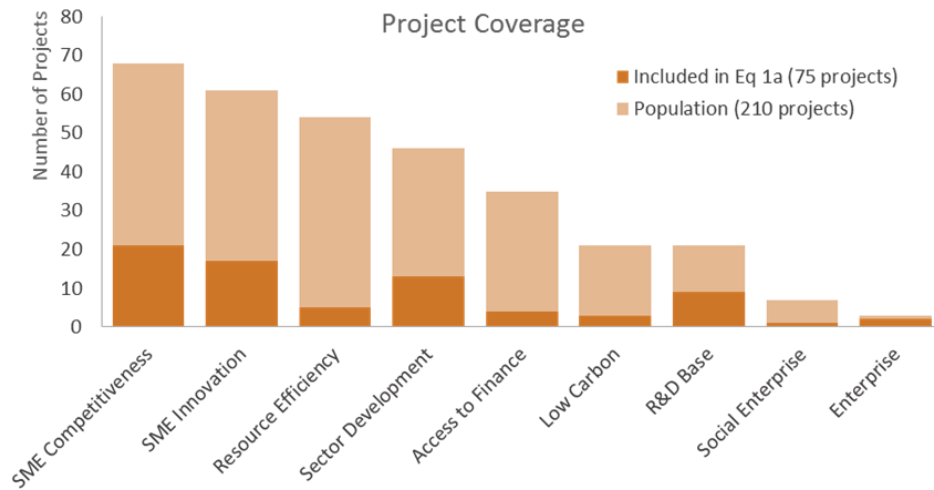
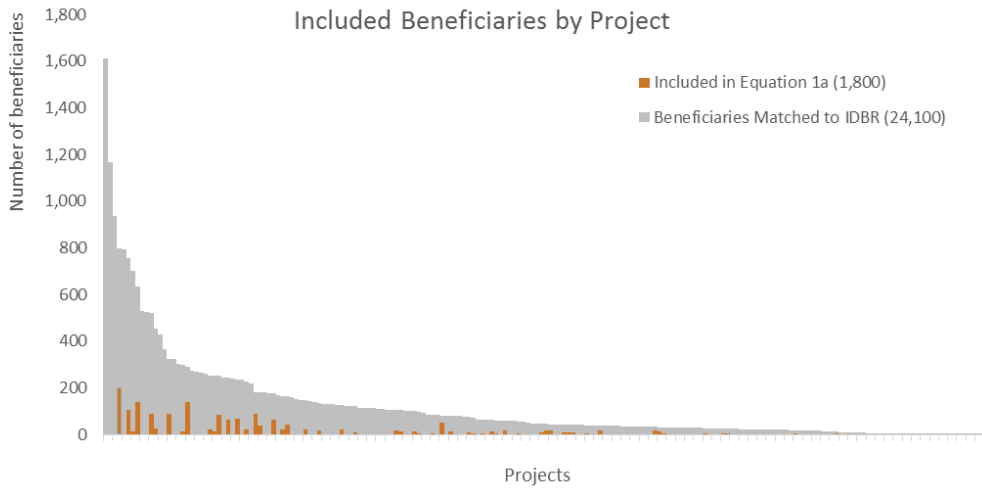
- 5.12 The number of beneficiaries removed from the analysis at this stage adds scope for the sample to become unrepresentative. The actual sample used for the analysis (and its characteristics) differs according to:
- The time periods considered in each estimation – as shown in Table 5.2, the sample size varies for each of the four sample frames under consideration
 - The availability of data on other variables for the analysis (i.e. some estimations consider the influence of the intensity of support and this data is not available for all beneficiaries so the sample is limited further for these estimations).
- 5.13 Bearing in mind this complexity, an *illustrative* analysis of the representativeness of the samples used for estimation has been carried out. This focuses on beneficiaries which received all funding before the end of 2010 (Sample Frame 2 in Table 5.2). As the actual characteristics of beneficiaries (i.e. employment, turnover, region etc.) will change moving through the period, the characteristics of beneficiaries in 2012 have been used for this illustrative analysis. The analysis compares the characteristics of the sample used for econometrics with that of the matched beneficiary dataset. Ideally, it would be possible to compare the characteristics to the full population of beneficiaries but available data does not support this analysis.
- 5.14 Summary charts of this analysis are provided in Appendix A and Figure 5.2. In summary, the illustrative analysis indicates that **there are significant differences between the characteristics of SMEs included in the econometric estimation samples and the matched beneficiary dataset**. In particular:
- By sector: manufacturing businesses are over-represented and higher value services under-represented
 - By region: the West Midlands is now very over-represented.
 - By company size: smaller companies are slightly under-represented and larger ones now more prevalent. This is the case for both employment and turnover.
 - By project type: beneficiaries assisted by SME Competitiveness and Strengthening the R&D Base projects are now over-represented.
 - By intensity of support: Large increase in the representation of those for which the intensity of support is unknown.
- 5.15 As the analysis effectively controls for the influence of these factors, the over or under-representation of some groups is not an issue per se, as long as there are sufficient observations to support the analysis. But, the extent to which the sample structure has changed raises concern about the coverage of the sample and the extent to which it provides a full representation of the population of ERDF projects.

Figure 5.2 Sample Structure of Matched Dataset and Econometric Sample



Source: Matched beneficiary dataset. Note: This is an illustrative analysis based on the sample used for equation 1(a) and using 2012 beneficiary characteristics.

Figure 5.3 Illustration of Sample Coverage for Econometric Analysis



Source: Matched beneficiary dataset. Note: This is an illustrative analysis based on the sample used for equation 1(a)

- 5.16 Figure 5.3 illustrates the impact of these factors on sample coverage. Using the example of equation 1a, this shows that **sample attrition at this stage both reduces the number of beneficiaries that are covered by the analysis (by more than 90 per cent) and removes a large number of projects from the analysis.**
- 5.17 The beneficiaries which are included in equation 1a are drawn from just 75 projects, two thirds fewer than in the matched analysis. Resource efficiency, access to finance and low carbon projects are under-represented in this sample. This imbalance in project coverage means that beneficiaries of SME Competitiveness projects are over-represented, whilst there is very little representation of beneficiaries of access to finance projects.

Summary and Implications

- 5.1 The samples used for the econometric analysis are a sub-set of the matched beneficiary dataset as the full dataset needs to be limited to take account of the availability of data from both the IDBR and the matched beneficiary dataset and the timing of support.
- 5.2 The combined effect of the missing data and the extended time period over which support was received for many beneficiaries means that the sample for econometric analysis covers only a small proportion of total eligible beneficiaries (3 per cent). This limited coverage has been achieved by compromising on the time periods for the analysis – the analysis covered beneficiaries who had received but not completed their support by 2010 to maximise the sample size. This is not an ideal configuration – it would be preferable to distinguish more clearly between the pre and post support periods.
- 5.3 The removal of a large number of beneficiaries to reflect dates of assistance changes the characteristics of the sample substantially. The issues here are exacerbated by missing data but more closely linked to the narrow timeframe available for the analysis of pre and post support performance²⁴. This, together with the time taken for assistance to be delivered and changes in business performance to materialise, and the need for at least two years' post-support data are the key factors which have contributed to the reduction of the sample size. If the analysis were conducted over a longer timeframe (i.e. in the future) these issues would have less of an effect.

²⁴ 2007 to 2012

6. Econometric Analysis

Summary

- Findings in this section need to be interpreted in the context of the various factors which have limited the coverage and representativeness of the sample of SMEs included in the analysis. The samples used for the econometric analysis cover less than 3 per cent of SME beneficiaries that are eligible for the approach and only around a quarter of projects that are within scope of the analysis.
- There is some statistical evidence showing that participating in the ERDF programme had a positive impact on performance of participants but this is limited overall.
- The analysis provides tentative evidence that impact is more visible among those that received the most intensive funding and among manufacturers.
- The analysis suggests that schemes focused on strengthening of the R&D base had less of an impact on performance in the period observed than other types of scheme. This could be related to the tendency for impacts of this sort of support to take longer to materialise.
- Firms that participated in ERDF programmes prior to 2011 saw better turnover growth over 2010-12 than non-participating firms. This favourable outcome is achieved by faster productivity growth rather than by stronger employment growth.

The tentative nature of these findings should not be interpreted as an indication that the support has yielded no impact. There are various methodological factors which could have limited the scope to detect impacts. These include:

- The size and coverage of the sample: a large number of projects and beneficiaries have been excluded from the analysis. Bearing in mind the tendency for the majority of project impacts to be created by a small proportion of businesses or in programme evaluations this sample attrition is a serious limitation.
- Timing of the analysis: there might have simply been insufficient time for beneficiaries to make changes and realise bottom line impacts on performance and importantly for these to appear on the IDBR.
- The measures covered by the IDBR: not all impacts of support will manifest themselves in the measures of business performance included in the IDBR. For example, safeguarded business performance would not be reflected in the IDBR. This is an important consideration given the difficult economic conditions that prevailed during the period covered by this analysis.

Overview of Approach

- 6.1 The analysis uses data on the performance of individual firms over time to examine whether participation in the ERDF programme since 2007 has led to improved economic performance. The principle question to be investigated is:

Q1: Has the ERDF programme had a positive impact on particular measures of business performance of those firms participating?

6.2 A secondary question to be considered is:

Q2: Did those firms participating grow faster than non-participants after being in the scheme?

- 6.3 In practice, question 1 considers whether the business performance of participating firms is better than would have occurred if they had not engaged in the programme; is there an improvement in performance *relative* to non-participating firms? It is not examining whether growth is greater than it was before participating in the programme, just better than would otherwise have been expected.
- 6.4 In contrast, question 2 is considering whether the *absolute* performance of firms that participated was better than firms that did not participate; was their growth stronger.
- 6.5 The analysis applies a 'difference in differences' approach, which considers the growth of a firm participating in the ERDF programme during a period before its participation and during a period post-participation and compares this to the performance over the same time periods of similar firms that did not participate in the ERDF programme.
- 6.6 In answering question 1, participation in the programme is seen to have had a positive impact on the relative performance of the participant if the difference between its growth and that of the non-participating firms improved²⁵ in the post-funding period.
- 6.7 The analysis for question 2 is concerned only with the post-participation period, and so does not require a difference in differences approach.
- 6.8 Data on the performance of individual firms, both participating and non-participating, is taken from the IDBR. Other data used in the analysis are the administrative information for participating firms²⁶ and other published socio-economic data²⁷. A number of alternative specifications on the basic model are estimated, for example using alternative definitions of potential explanatory variables, to examine the robustness of the findings. The analysis is also carried out for a number of alternative sectors, again to examine the robustness of the findings.
- 6.9 The need to assess performance post-funding restricts the number of matched beneficiaries that can be used in the analysis. Of interest is examining whether there have been changes to the underlying performance of participating firms, and so it would be more appropriate to calculate post-participation performance as average growth over a number of years rather than relying on the outcome for any one year only. So, as the last year of performance data from the IDBR is 2012, the shortest post-participation period that can be used is 2010-2012²⁸. If it is only appropriate to judge the impact on performance over this time for those firms that have completed their engagement with the programme, then the analysis will be limited to those participants that received *all* their funding by the end of 2010.

²⁵ A favourable differential to the participant widened, or an adverse differential to the participant closed.

²⁶ Described in Section 2

²⁷ These other socioeconomic data are spatial, rather than firm-level indicators.

²⁸ i.e. growth over 2 years from end 2010.

Approach in more detail

The estimation framework

6.10 The basic form of the 'difference in differences' equation estimated is

$$EQ(1): \Delta g_i = \alpha + \beta P_i + \gamma EconStates_i + \delta FirmCharacteristics_i + \varepsilon_i$$

Where:

Δg_i = difference in the average growth in the performance indicator of interest of firm i in period 1 (pre-funding) and period 2 (post funding)

P_i = indicator of whether firm i participated in the ERDF programme

$EconStates_i$ = factors associated with the economic environment firm i is operating in (e.g. sector, location)

$FirmCharacteristics_i$ = factors specific to firm i (e.g size)

6.11 This is the basic framework for addressing question 1, while for question 2 the dependent variable is replaced by just g_i , the growth of firm i in period 2.

6.12 A significant coefficient on the participation term P indicates that the programme had an impact on the performance of those participating.

6.13 The equation is estimated for three alternative performance indicators: employment, turnover and productivity. The measure of productivity used is turnover per employee.

6.14 For each variable, a number of alternative variant equations are estimated:

- Using alternative definitions for the independent variables. For example, a measure of intensity of participation and the type of programme that was undertaken were tested in addition to a simple participation / non-participation distinction. Similarly, alternative sector classifications were used to control for the influence of the sector that the firm operates in.
- Estimating over a number of broad sector groupings²⁹ to test the sensitivity and robustness of the analysis.
- Using different periods for post-funding performance to see whether there is any evidence of there being a lag in impact.

Data and sampling

6.15 The source of information on beneficiaries and non-beneficiaries is described earlier in Section 2. The performance indicators are taken from the IDBR. The average growth rate for a period is calculated as the difference in the natural log values between the start and end year of the period.

6.16 In selecting the sample of beneficiaries to be used in the analysis careful consideration is needed as to the period of funding and post funding. There is considerable variation in the scale of engagement in programmes, in terms of the level, intensity and duration of funding. It was agreed in discussion with DCLG that it would be inappropriate to include firms in the analysis that were still receiving funding *during* the period selected to reflect post funding performance. So, taking post-funding performance as being

²⁹ manufacturing, financial & business services, lower value services

growth over 2010-12³⁰ restricts the sample of beneficiaries to those that had received all their funding before the end of 2010. A further complicating factor is that firms can have received support from more than one ERDF project which are likely to run over different periods. The sample used in the analysis is restricted to those firms whose entire funding is received before the end of 2010.

- 6.17 Some of the specifications estimated are less demanding on data. For example, while we know whether or not a firm participated in the programme, we do not have complete information on the level of funding of all participants. Therefore, a specification that uses a simple ‘yes/no’ indication of participation can be estimated using a larger sample of beneficiaries than a specification that uses the level or intensity of funding as its participation indicator.
- 6.18 The alternative combination of pre and post-participation periods and funding periods that have been considered in the analysis are shown in Table 6.1 below, together with an indication of the maximum sample size that could be used in the analysis³¹.

Table 6.1 Summary of alternative sample frames examined in the analysis

Pre-participation period	Post participation period	Funding criteria	Sample size
2006-08	2010-12	Received <i>any</i> funding before end of 2010	4,677
2006-08	2010-12	Received <i>all</i> funding before end of 2010	1,812
2006-08	2009-12	Received <i>any</i> funding before end of 2009	2,301
2006-08	2009-12	Received <i>all</i> funding between before end of 2009	224

Research Question One: Has the ERDF programme had a positive impact on particular measures of business performance of those firms participating?

- 6.19 Tables 6.2 and 6.3 show results of selected equations estimated for employment and turnover respectively using firms from all sectors that range from a simple specification to a more detailed one³². The estimations take the pre-participation period as 2006-08, the post-participation period as 2010-12 and select only those participants that received all funding by end of 2010³³. A complete set of results are provided in Appendix B.

³⁰ This is the shortest period that could be considered as it is not appropriate to use growth in a single year as an indication of underlying performance. Even so, ideally a longer period would be used to estimate underlying performance, but this is not possible due to the limited timeseries of data available.

³¹ These are the number of firms for which we had data on start and end year of funding. Not all of these firms had data for the level of funding and so the sample that could be used for some of the more detailed equations estimated (those involving level of funding or intensity of funding as a potential driver of performance) will be smaller than shown.

³² We focus on the equations using an industry control at the level of SIC section. The comparable equations controlling for industry factors at the level of the SIC section are also estimated, and as is discussed later, the choice of industry control does not influence the results noticeably.

³³ For the reasons discussed above; it provides the minimum period ‘post funding’ to assess a change in underlying performance, and accommodates our recommendation that performance be assessed only after engagement in the programme is complete.

Table 6.2 : Selected estimation results for growth in employment

Dependent Variable = Difference in Growth in Employment					
Equation	1 (a)	1 (b)	1 (c)	1 (d)	
Number of beneficiaries	1,811	1,810	1,329	1,329	
Number in control group	31,524	31,523	31,523	31,523	
Participation Indicators	Yes/No dummy	-0.0031	-0.0049	0.0110	0.0075
	Funding as % turnover			0.0003	
	Funding 0.5-1% turnover				0.0466
	Funding 1-1% turnover				-0.0115
	Funding 5-10% turnover				0.0055
	Funding 10-50% turnover				0.1108
	Funding +50% turnover				0.1086
Type of Programme	Resource Efficiency			0.0027	0.0028
	Access to Finance			0.0317	-0.0050
	Enterprise Formation and Entrepreneurship			0.4157	0.4233
	Low Carbon Sector Development			-0.0671	-0.0698
	Sector Development			-0.0039	-0.0076
	SME Innovation			0.0097	0.0059
	Social Enterprise			-0.1041	-0.1006
	Strengthening the R&D Base			-0.1673*	-0.1670*
Control	Location	Region	Region	Region	Region
	Sector	SIC section	SIC section	SIC section	SIC section
	Firm size	No	Yes	Yes	Yes
	Firm density	No	Yes	Yes	Yes
Base case that being compared to ³⁴	Firms in WM, in Sector C: Manufacturing	Firms in WM in Sector C: Manufacturing in SizeBandSIZE0 1:0-50	Firms in: WM in Sector C: Manufacturing in SizeBandSIZE01 :0-50 in FundType2: SME Competitiveness	Firms in: WM in Sector C: Manufacturing in SizeBandSIZE0 1:0-50 in FundType2: SME Competitiveness in Fund ClassFUND01 :0-0.5% turnover	

Note(s): * indicates significant at 5%, ** significant at 1%, and ***significant at 0.1%.

³⁴ In an estimation involving a dummy variables to signify presence within a classification, for example, whether or not a firm is within sector A or Sector B, it is necessary that one element of each classification is taken as the 'base' against which the other variables from that classification are compared. The choice of the 'base' condition does affect the value of the coefficients estimated for the other elements of the classification (for example, using WM as the base region will result in a different value estimated for the NW regional coefficient than if the SE was chosen as the base region. This is because the estimate coefficient is showing, in this case, the influence of the NW region over that of the base region. While the choice of base condition affects the estimated coefficients, it does not affect the interpretation of the relative ranking of the different components of the classification that are included. In each case, the chosen base condition is that segment that had the largest number of observations within the sample. So, in the case of equation 1(a) within the sample used, the largest number of beneficiaries were manufacturing firms in the West Midlands.

Table 6.3 Selected estimation results for growth in Turnover

Dependent Variable = Difference in Growth in Turnover					
Equation		1 (a)	1 (b)	1 (c)	1 (d)
Number of beneficiaries		1,811	1,810	1,329	1,329
Number in control group		31,524	31,523	31,523	31,523
Participation Indicators	Yes/No dummy	-0.0182	-0.0325	0.0485	0.0431
	Funding as % turnover			0.0020*	
	Funding 0.5-1% turnover				-0.0641
	Funding 1-1% turnover				0.0452
	Funding 5-10% turnover				0.1329
	Funding 10-50% turnover				0.1374
	Funding +50% turnover				0.5820*
Type of Programme	Resource Efficiency			-0.0313	-0.0284
	Access to Finance			-0.2256	-0.2839
	Enterprise Formation and Entrepreneurship			-0.0366	-0.0456
	Low Carbon Sector Development			0.0657	-0.0008
	Sector Development			-0.0294	-0.0439
	SME Innovation			-0.1086	-0.1268
	Social Enterprise			-0.2015	-0.1959
	Strengthening the R&D Base			-0.2937*	-0.2894*
Other Controls	Location	Region	Region	Region	Region
	Sector	SIC section	SIC section	SIC section	SIC section
	Firm size	No	Yes	Yes	Yes
	Firm density	No	Yes	Yes	Yes
Base case that being compared to		Firms in: WM in Sector C: Manufacturing	Firms in: WM in Sector C: Manufacturing in SizeBandSIZE 01:0-50	Firms in: WM in Sector C: Manufacturing in SizeBandSIZE 01:0-50 in FundType2: SME Competitiveness	Firms in: WM in Sector C: Manufacturing in SizeBandSIZE01:0-50 in FundType2: SME Competitiveness in Fund ClassFUND01: 0-0.5% of turnover

Note(s): * indicates significant at 5%, ** significant at 1%, and ***significant at 0.1%.

- 6.20 In specification 1(a) the difference in growth of a firm between the two periods is explained by whether or not the firm participated³⁵, the region and sector in which the firm is located³⁶. These regional and sector variables are included as underlying conditions for growth between the two periods of time may have improved more in manufacturing, say, than in retailing. Similarly the underlying growth conditions may have improved more in one locality than another.
- 6.21 Controlling for these other influences will mean that any change in performance of a participant that is operating in a 'favourable' sector and/or locality is not attributed to participation alone. In equation 1(a) sector influences are controlled for at the level of the SIC section³⁷. The spatial location of firms is controlled for at the level of the region.

³⁵ Using a dummy variable value 1 to indicate the firm is a participant.

³⁶ See under 'Other controls' in Table 6.2.

³⁷ Identifying manufacturing firms separately from construction firms or those in, say, information and communications.

- 6.22 For the employment growth equation (Table 6.2) the coefficient on the participation dummy is interpreted as the difference in pre and post participation performance. This indicates that performance of participants has worsened by 0.3pp, controlling for sector and location effects. So, if a non-participant firm achieved employment growth of 1 per cent per annum in the pre-engagement period and 0.75 per cent per annum in the post-participant period, then if a participating firm had also achieved growth of 1 per cent per annum in the first period it would, on average have only achieved growth of 0.2 per cent per annum in the second period. However, in this case the coefficient is not statistically significant, indicating no discernible difference in the relative employment performance of beneficiary firms from other similar firms.
- 6.23 The other specifications shown in Table 6.2 and subsequent tables provide more detailed explanatory variables:
- Specification 1(b) adds a term to control for possible influences of firm size as the impact of participating may be felt more among small firms than large firms or vice versa.
 - Specification 1 (c) supplements the 'yes/no' participation dummy with an indicator of the intensity of support received (indicated by a measure of funding as a % of turnover) and adds control for the type of programme the firm was involved with.
 - Specification 1 (d) replaces the specific measure of intensity of funding with one indicating bands of intensity (was funding less than ½% of turnover, between ½% and 1%, between 1% and 5% etc.).
- 6.24 The results in Table 6.2 show that allowing for the intensity of support results in a positive coefficient on the participation terms but they are insignificant at even a 5% level (1(c)). Characterising the intensity of support in terms of bands rather than a continuous variable (1(d)) does not improve the statistical significance of the results.
- 6.25 Looking at the influence from the type of project that firms participate in (specifications 1(c) and 1(d)), the results show that programmes characterised to 'strengthening the R&D base' had a weaker impact than other programmes, a finding that was statistically significant. This does not, however, mean that the effect of participating in the programme was detrimental to performance as the coefficient reports the impact compared to that of firms engaged in SME competitiveness programmes. Also, the impact on the performance indicators of schemes to develop the R&D base might, by the nature of R&D, be felt with a greater lag than that from other projects.
- 6.26 Looking at the results for turnover (Table 6.3) shows the same broad findings, though the intensity of funding is seen to have a statistically significant impact on performance (specification 1(c)). This seems likely to be due to the outcome for firms receiving the most intensive support (specification 1(d)).
- 6.27 We draw the following conclusions from the full set of estimation results (see Appendix B), but draw most heavily on the findings from the sample of beneficiaries that completed their involvement with the ERDF programme by end 2010.

Table 6.4 Summary of findings for impact of ERDF Involvement on Business Performance

Variable	
Growth in turnover	There is evidence of a positive impact on relative performance from the intensity of funding. This is most visible among those that received the most intensive funding. Schemes focused on strengthening of the R&D base had less of an impact on business turnover than other types of scheme. This could be because the financial impact of this sort of R&D focused assistance takes longer to materialise. Estimations at a sector level show both impacts are only evident among manufacturing firms; there is no statistically significant impacts identified for either lower value services or business services.
Growth in employment	There is little evidence to show that beneficiaries have seen an impact. The results for the sample as a whole do at first sight suggest some tentative evidence of a positive impact and that more intensive funding is associated with greater impact. However the results are not statistically significant and are not replicated when the sample is restricted either just to manufacturing firms or those in business services. The one significant result is that participation in Strengthening the R&D Base has less of an impact on measured performance than other types of programme.
Growth in productivity	The findings for any impact on productivity growth are broadly in line with those for turnover, which is as expected as no statistically significant impact on employment was identified, namely: <ul style="list-style-type: none"> • a positive impact from the intensity of support, but primarily associated with those receiving the most intensive support • impact of funding is greater among manufacturers than business service companies. Manufacturing firms engaged with programmes focusing on SME innovation and access to finance seeing less of an impact than those participating in other types of programmes. The type of programme had no discernible impact among service-sector firms.

- 6.28 Superficially, the magnitude of the estimated coefficients gives a plausible interpretation of impact: firms engaged in ‘SME competitiveness’ projects experience a greater impact than other types of project, the scale of the impact rises alongside the banding of funding intensity. However, in most cases the coefficients are not statistically significant due to large standard errors being estimated. Indicating that there remains much of the variation in firm performance that is not explained by the small number of variables we consider. The data available for the analysis does not include anything on the characteristics of the firm other than its sector, location and size; there is no information on, for example, management capabilities or style, which could both impact on the growth performance of firms.
- 6.29 There are other potential factors that limit the statistical robustness of the estimations. Those firms that have not been part of ERDF programmes may have been in receipt of business support from other similar programmes. If this is the case, and these other programmes led to a performance impact as they surely would be designed to do, then this would dampen or potentially overturn the differential impact that ERDF participants might expect to see over those not participating in ERDF schemes. Equally, it might be that ERDF participants are also benefiting from other sources of business support and that not controlling for this additional support is giving a false picture of the impact the ERDF programme is providing. The information on other support given to firms is not available. By not accounting for it explicitly in the analysis the assumption is that the incidence of other support is equally distributed between participants and non-

participants. The analysis is focused on identifying impact on just three measures: employment, turnover and productivity. It may be that the impact of the ERDF programmes is experienced on other indicators, for example the cost base or profitability³⁸. That said, the effort to construct a sample of beneficiaries has focused on those projects where the impact on company turnover or employment would expect to be more direct (see Section 2 for further discussion). Another possible factor is that the level and duration of support provided to the firms (in the case of the results shown in Tables 7.2 and 7.3 those who had received all support by end 2010) was too small to lead to an identifiable impact³⁹.

- 6.30 Another reason for not identifying an effect is that there is a lag between participating in the ERDF programme and the impact on performance being realised. This may be because of the nature of the ERDF programme itself. For example, if the support was to help develop export markets then the impact in terms of sales may not be seen for several years. It may be that the ERDF programme provided a 'first step', and access point, to other follow-up support which would be more focused on impacting directly on sales or productivity. In this case the differential impact on performance of those receiving ERDF support may expect to be greater over a period of two to four years after the support was given than in the first two years following support.
- 6.31 The ability to test for the possible presence of a lag is restricted by the limited time series available. Table 6.5 compares the results from estimating the difference in difference equation on using different post-performance periods.
- 6.32 The sample of beneficiary firms are all those that received any funding over 2008-09. A suggestion that the impact from participation emerges only after a lag would be shown by a larger coefficient on the participation term in the later post-funding performance period than in the earlier one. The estimated coefficients in Table 6.5 do indeed exhibit this characteristic but as the results for each of the two periods are not statistically significant at a 5 per cent level, there is no firm basis to suggest that any impact on performance is delayed. However, it is worth restating that this analysis has used a very small sample of beneficiaries and, given the nature of projects funded in the first year or two of the programme is likely to have involved projects that have required less planning and design, are less complex, so perhaps less likely to have a delayed impact and perhaps less representative of the projects delivered by the programme through its lifetime. It may be worthwhile addressing the question of the timing of impacts again when there is a greater number of beneficiaries and necessary post funding period of data to deepen the analysis.

³⁸ However, a reduction in costs could be expected to lead to higher turnover in due course as a result of the boost given to the firm's competitive position.

³⁹ Of those where the level of funding was known, half received funding of between £1,000 and £5,000, and as Figure 3.1 shows, most of the firms in the estimation sample completed their funding in 2010.

Table 6.5 Comparing estimation results using alternative periods to measure post-participation impact.

Dependent Variable = Difference in Growth in Employment					
		2009-12		2010-12	
Equation		1 (a)	1 (b)	1 (c)	1 (d)
Number of beneficiaries		157	157	157	157
Number in control group		31299	31299	31299	31299
Participation Indicators	Yes/No dummy	0.0075	-0.0605	0.0190	-0.0622
	Funding as % turnover	0.0002		0.0002	
	Funding 0.5-1% turnover		0.0212		0.0799
	Funding 1-1% turnover		0.2582*		0.2738*
	Funding 5-10% turnover		0.1890		0.2210
	Funding 10-50% turnover		0.0451		0.0547
	Funding +50% turnover		0.2379		0.2345
	Type of Programme	Resource Efficiency	-0.1435	-0.1140	-0.0508
Access to Finance		0.2466	0.0682	0.2589	0.0796
Enterprise Formation and Entrepreneurship		0.1027	0.1607	0.0896	0.1313
Low Carbon Sector Development		0.0196	0.0821	0.0277	0.0886
Sector Development		-0.0409	-0.0555	-0.0289	-0.0447
SME Innovation		-0.0788	-0.0667	-0.1209	-0.1080
Social Enterprise		0.0000	0.0000	0.0000	0.0000
Strengthening the R&D Base		-0.0200	0.0126	-0.0863	-0.0432
Base case that being compared to ⁴⁰		Firms in: LO in Sector C: Manufacturing in SizeBandSIZ E01:0-50 in FundType2: SME Competitiveness	Firms in: LO in Sector C: Manuf. SizeBandSIZ E01:0-50 in FundType2: SME Comp in Fund ClassFUND0 1: 0-0.5% of turnover.	Firms in: LO in Sector C: Manuf. SizeBandSI ZE01:0-50 in FundType2: SME Competitive ness	Firms in: LO in Sector C: Manufacturing in SizeBandSIZE01: 0-50 in FundType2: SME Comp in Fund ClassFUND01: 0-0.5% of turnover.

Note(s): * indicates significant at 5%, ** significant at 1%, and ***significant at 0.1%.

Research Question Two: Did those firms participating grow faster than non-participants after being in the scheme?

6.33 Research question 2, which examines whether participating firms grew faster than non-participating firms after participating in ERDF programmes, can be analysed using a modified version of the 'difference in difference' equation, where the dependent variable is simply the growth in the performance indicator in the post-participation period. As

⁴⁰ In an estimation involving a dummy variables to signify presence within a classification, for example, whether or not a firm is within sector A or Sector B, it is necessary that one element of each classification is taken as the 'base' against which the other variables from that classification are compared. The choice of the 'base' condition does affect the value of the coefficients estimated for the other elements of the classification (for example, using WM as the base region will result in a different value estimated for the NW regional coefficient than if the SE was chosen as the base region. This is because the estimate coefficient is showing, in this case, the influence of the NW region over that of the base region. While the choice of base condition affects the estimated coefficients, it does not affect the interpretation of the relative ranking of the different components of the classification that are included. In each case, the chosen base condition is that segment that had the largest number of observations within the sample. So, in the case of equation 1(a) within the sample used, the largest number of beneficiaries were manufacturing firms in the West Midlands.

with the preceding analysis, the sample of beneficiaries used in the estimation are those that had completed funding by the start of the period being considered. The results shown in Tables 6.6 and 6.7 are again based on beneficiaries that had completed funding by the end of 2010 and the performance indicator is the average growth in employment or turnover 2010-12.

Table 6.6 Selected estimation results for growth in Employment

Dependent Variable = Average Growth in Employment 2010-2012				
Equation	2 (a)	2 (b)	2 (c)	2 (d)
Number of beneficiaries	1,811	1,810	1,329	1,329
Number in control group	31,524	31,523	31,523	31,523
Yes/No dummy	-0.0078	-0.0053	0.0226	-0.0078
Funding as % turnover			0.0000	
Funding 0.5-1% turnover				0.0507
Funding 1-1% turnover				0.0051
Funding 5-10% turnover				0.0134
Funding 10-50% turnover				0.1184
Funding +50% turnover				0.0120
Resource Efficiency			0.0710	0.074324
Access to Finance			0.0371	-0.00713
Enterprise Formation and Entrepreneurship			0.3542	0.3616
Low Carbon Sector Development			-0.0692	-0.06484
Sector Development			-0.0369	-0.03712
SME Innovation			-0.0182	-0.02139
Social Enterprise			-0.1988*	-0.1899*
Strengthening the R&D Base			-0.1509*	-0.1493*
Location	Region	Region	Region	Region
Sector	SIC section	SIC section	SIC section	SIC section
Firm size	No	Yes	Yes	Yes
Firm density	No	Yes	Yes	Yes
Base case that being compared to	Firms in: WM in Sector C: Manufacturing	Firms in: WM in Sector C: Manufacturing in SizeBandSI ZE01:0-50	Firms in: WM in Sector C: Manufacturing in SizeBandSI ZE01:0-50 in FundType2: SME Competitiveness	Firms in: WM in Sector C: Manufacturing in SizeBandSI ZE01:0-50 in FundType2: SME Competitiveness in Fund ClassFUND01: 0-0.5% of turnover.

Note(s): * indicates significant at 5%, ** significant at 1%, and ***significant at 0.1%.

Table 6.7 Selected estimation results for growth in Turnover

Dependent Variable = Average Growth in Turnover 2010-2012					
Equation		2 (a)	2 (b)	2 (c)	2 (d)
Number of beneficiaries		1,811	1,810	1,329	1,329
Number in control group		31,524	31,523	31,523	31,523
Participation Indicators	Yes/No dummy	0.0206	0.0212	0.0609*	0.0646*
	Funding as % turnover			0.0008*	
	Funding 0.5-1% turnover				-0.0802
	Funding 1-1% turnover				0.0326
	Funding 5-10% turnover				0.0046
	Funding 10-50% turnover				0.0575
	Funding +50% turnover				0.0858
Type of Programme	Resource Efficiency			0.0050	0.0051
	Access to Finance			-0.1302	-0.1544
	Enterprise Formation and Entrepreneurship			-0.0062	-0.0205
	Low Carbon Sector Development			-0.0104	-0.0196
	Sector Development			0.0068	0.0055
	SME Innovation			-0.0661	-0.0685
	Social Enterprise			-0.1955	-0.1989
	Strengthening the R&D Base			-0.2061*	-0.2028*
Other Controls	Location	Region	Region	Region	Region
	Sector	SIC section	SIC section	SIC section	SIC section
	Firm size	No	Yes	Yes	Yes
	Firm density	No	Yes	Yes	Yes
Base case that being compared to		Firms in: WM in Sector C: Manufacturing	Firms in: WM in Sector C: Manufacturing in SizeBandSIZ E01:0-50	Firms in: WM in Sector C: Manufacturing in SizeBandSIZ E01:0-50 in FundType2: SME Competitiveness	Firms in: WM in Sector C: Manufacturing in SizeBandSIZE01 :0-50 in FundType2: SME Competitiveness in Fund ClassFUND01: 0-0.5% of turnover.

Note(s): * indicates significant at 5%, ** significant at 1%, and ***significant at 0.1%.

6.34 The results indicate that turnover growth over 2010-12 was faster among participating firms than among similar firms that did not engage with the ERDF programme⁴¹ but that firms engaged in projects classified to 'Strengthening the R&D base' had much weaker growth than similar firms participating in projects with a different focus and, given the size of the coefficient on the project type, than similar non-participating firms. This favourable outcome is achieved by faster productivity growth rather than by stronger employment growth and, as with the other findings, only really identified among manufacturing companies.

⁴¹ illustrated by positive and statistically significant coefficients on the participation terms in specifications 2(c) and 2(d)

Summary and Implications

- 6.35 The econometric analysis has found only tentative evidence of impact. This should not be interpreted as an indication that the ERDF funded support has yielded no impact as various methodological factors could have affected the outcome of the analysis. In particular:
- **The size and coverage of the sample:** a large number of projects and beneficiaries have been excluded from the analysis. Bearing in mind the tendency for the majority of project impacts to be created by a small proportion of businesses or in programme evaluations, projects this sample attrition is a serious limitation.
 - **Timing of the analysis:** there might have simply been insufficient time for beneficiaries to make changes and realise bottom line impacts on performance and importantly for these to appear on the IDBR.
 - **The measures covered by the IDBR:** not all impacts of support will manifest themselves in the measures of business performance included in the IDBR. For example, safeguarded business performance would not be reflected in the IDBR. This is an important consideration given the economic context of the period covered by this analysis.
- 6.36 These factors have served to constrain the ability to detect impacts in the group of assisted businesses. It is worth noting also that the limited set of impact metrics offered by the IDBR means that this analytical approach is less appropriate during economic difficulties when the focus shifts to business survival and the safeguarding of employment, the latter measured as an output in several regional ERDF programmes.
- 6.37 The counterfactual impact assessment is also constrained by methodological factors, in particular:
- **The lack of explanatory variables:** The IDBR does not provide data on all of the business characteristics or behaviours which could influence performance such as management style, receipt of other business support, investment in R&D. Because of this, the explanatory power of the difference in difference equations is limited and there is lots of 'noise' in the data.
 - **Possible contamination of the control group:** It is not possible to identify and exclude all of the Control Group businesses that have received ERDF funded support. We can only exclude those which appear on the matched beneficiary dataset, which covers only a small proportion of the beneficiary population.
- 6.38 The scope to adjust the method to take account of these limitations is discussed in the next section.

7. Conclusions and Lessons Learned

Summary:

- While there are theoretical advantages to the approach trialled as part of workstream one, the various practical challenges in its implementation have limited the insight it provides.
- Sample attrition and the timing of the impact assessment served to substantially reduce the sample size for the econometric analysis. The limited sample coverage and resultant issues of representativeness are the most substantial limitations to the approach. The coverage of the IDBR, in terms of impact metrics and explanatory variables also constrained the potential for this approach to detect and explain impacts.
- While there are undoubtedly limitations the assessment has found some statistical evidence that, amongst the firms included in the sample at least, support from ERDF funded projects has had a positive impact on performance. Unfortunately, these findings are not sufficiently robust to support recommendations for the design of future programmes.
- The assessment highlights a number of limitations to the approach in terms of identifying impact. While it offers scope to identify impact in a more robust way than self-reported methods, it provides only a partial picture of impact. In the absence of alternative datasets this method should be implemented in conjunction with survey research to provide data on measures of business performance not included on the IDBR. Survey data could also be used to capture self-reported impacts and compare these to those reported on the IDBR.
- In theory, the approach provides a strong means of assessing the counterfactual but its successful implementation relies on the quality and coverage of beneficiary data. In addition, the lack of explanatory variables in the IDBR means that it is difficult to use this approach to identify the relative importance of ERDF support in determining business performance.
- The analysis has highlighted some important lessons for the 2014-20 programme. In particular DCLG should consider now the methods that will be used to evaluate the impact of the 2014-20 programme and reflect the data requirements of the selected method on the monitoring arrangements for the programme.

- 7.1 The counterfactual impact assessment strand of workstream one has sought to explore an alternative approach to impact assessment which avoids some of the challenges that are frequently encountered in impact evaluation, namely:
- identifying changes in business performance; and
 - attributing changes in performance to the support received.
- 7.2 The analysis provides some insight into the impact of the ERDF programme. This is supplemented by lessons related to the implementation of this method, possible adjustments to make it more appropriate for ERDF programme evaluation and implications for the 2014-20 programme.

Impact of the 2007-2013 ERDF Programmes

- 7.3 The findings of the counterfactual impact assessment need to be carefully considered in light of issues relating to sample coverage and composition. While there are undoubtedly limitations to the analysis, the assessment has found some statistical

evidence that, amongst the firms included in the sample at least, support from ERDF funded projects has had a positive impact on performance. While the evidence is not overwhelming, it suggests that:

- the scale of impact increases with the intensity of funding.
- the impacts are greater for manufacturers than service sector firms.
- the impact is more noticeable on turnover than employment. This could indicate a more noticeable effect on productivity or might simply reflect the lag between turnover and employment growth.
- schemes focused on strengthening of the R&D base have less of an impact on performance in the period observed than other types of scheme. This finding should be interpreted in light of the limited time-frame covered by the analysis and the type of performance measures used. R&D focused assistance could take longer to affect a firm's financial performance than other types of assistance.
- firms, particularly manufacturers, that finished participating in ERDF programmes prior to 2011 saw better turnover growth over 2010-12 than non-participating firms. This favourable outcome appears to be associated with faster productivity growth rather than by stronger employment growth.

7.4 Unfortunately, these findings are not sufficiently robust to support recommendations for the design of future programmes and the type of investments that should be supported.

7.5 It is also important to note that the analytical approach trialled here is only appropriate to assess the impact of investments which have direct SME beneficiaries. As a result it does not offer complete coverage of the impacts supported by all types of ERDF assistance.

Evaluation Methodology

7.6 The approach that has been trialled as part of workstream one offers, in theory at least, two important advantages over the alternative methods of impact and counterfactual assessment that were considered in developing the impact assessment approach for workstream one:

- Firstly, it avoids issues associated with recall bias by providing a means to directly observe change in business performance amongst beneficiaries.
- Secondly, it draws on a large control group and offers the possibility of a detailed and robust counterfactual assessment.

7.7 While there are theoretical advantages to the approach, various practical challenges in its implementation of the control group approach have limited the insight it provides in the context of the 2007-13 ERDF programme. There are three sets of issues to consider here:

1 – Sample Attrition

7.8 The team encountered numerous practical issues in implementing the approach. Together, these substantially eroded the beneficiary sample and the final sample used for the impact analysis covered less than 3 per cent of the total population of eligible beneficiaries. Although factors related to the timing of the analysis and variables covered in the IDBR have also served to limit the insights created, **limited sample coverage and resultant issues of representativeness are the most substantial limitations to the approach in this context.**

- 7.9 Although there are some sources of sample attrition which cannot be avoided, for example those relating to business trading dates and the timing of support, the largest sources of sample attrition were related to the availability and quality of beneficiary data. In particular:
- The need to contact delivery bodies to access beneficiary data and associated low response rates resulted in 25,000 beneficiaries (39%) being excluded from the sample.
 - Missing fields from data returns, particularly relating to the dates of support, resulted in a substantial number of records being excluded.
 - The overall low matching rates to the IDBR, even where company reference numbers were included, point towards issues with data quality.
- 7.10 The coverage and representativeness of the sample and as a result the reliability of the analysis would be substantially improved if the sample attrition associated with data quality and access could be reduced or eliminated. This would still leave a number of unavoidable sources of sample attrition (e.g. the need to limit the sample to just the businesses which were trading throughout the analysis period) but the scale of attrition would be lower overall. This would improve data confidence and reduce the scope for bias in the sample.

2 – Timing of Assessment

- 7.11 The timing of the impact assessment has constrained the depth of the insight that the analysis supports in two ways.
- 7.12 Firstly, the most up to date IDBR data available for this analysis was for 2012. As two years' post support IDBR data is needed as a minimum to assess change in performance, this meant that the sample was limited to just the businesses that had received support after 2010. As businesses receiving support after 2010 made up a large proportion of the sample, this was a further and substantial source of sample attrition.
- 7.13 Secondly, the use of a two, rather than three year post-support period may have reduced the ability to identify impact. For some types of support (R&D and innovation related support in particular) impacts may take a longer time to materialise. With a longer post-support period the analysis might be more likely to detect impacts on business performance, and would provide more insight into the persistence of impacts. In addition to this, a longer post-support period would leave the analysis less sensitive to annual fluctuations in business performance which could be explained by a variety of factors. A minimum of three but ideally more years' post support IDBR data would allow the analysis to capture underlying trends in performance in the assisted and control groups. This would strengthen the analysis, or at least eliminate the lack of longitudinal data as a factor which constrains ability to identify impact.
- 7.14 The need for analysis of this type of be conducted using an extensive time-series is, to some extent, at odds with the evaluation requirements of ERDF programmes. ERDF evaluation requirements mean that evaluation evidence is needed quite quickly after programme delivery is completed, both to satisfy the Commission's requirements and also to feed into the development of subsequent programmes. Although the issue of timing affects most impact evaluation methods, it is slightly more pronounced here than it might be for self-reported methods. Time is needed to allow impacts to materialise irrespective of the method used, but here the lag between changes in performance being realised and appearing on the annual IDBR records adds further delay.

3 – Coverage of the IDBR

- 7.15 The IDBR was identified as the most appropriate database for this approach, although it has various limitations in the context of this analysis.

Impact Metrics

- 7.16 ERDF funded support can be expected to lead to beneficiaries changing some aspect of their activities, and produce improvements in some aspects of their intermediate performance. It is important to recognise that these changes do not necessarily manifest themselves in the more easily measurable economic development outcomes that provide the justification for policy (e.g. increased employment, financial turnover, productivity). The limited variables covered by the IDBR places these measures at the centre of the impact analysis, but in doing so could fail to detect impacts such as:
- increased profitability without any change in turnover or employment (e.g. as a result of new investment in capital equipment)
 - increases in turnover but decreased profitability as a result of increased investment by the business.
- 7.17 The IDBR is focused on businesses which trade above the VAT / PAYE threshold so the approach is not well designed to yield robust evidence for the impact of interventions which are designed to create new enterprises and support micro-businesses, many of which would be unlikely to exceed the VAT/PAYE threshold.
- 7.18 Indeed, it should be noted that the limited set of impact metrics offered by the IDBR means that this analytical approach is less appropriate during economically difficult periods given the focus on business survival and the safeguarding of employment, the latter measured as an output in several regional ERDF programmes. The structure of the IDBR, particularly the lag in cleaning closed enterprises from the register, together with the limited set of metrics that it covers, means that it is difficult to use the IDBR as the basis for analysis of business survival rates.
- 7.19 As the metrics provided by the IDBR data do not allow changes in business activities and intermediate performance to be identified, this approach does not produce data which helps to *explain* bottom line financial performance. Because of this, the ability to use the analysis to understand how different types of support generate impacts is constrained. It is also difficult to use the IDBR to look at the impact of support on survival rates because of inconsistency in how business deaths are detected and reported in the IDBR.

Explanatory Variables

- 7.20 ERDF support is one of many factors which can affect business performance. These include firm characteristics, market trends and geographical factors. Difference in difference analysis controls for these factors and seeks to isolate the effect of support on business performance.
- 7.21 The IDBR includes data on only a limited set of firm-level characteristics, such as business size, location, sector, and therefore limits the explanatory variables that can be included in the econometric analysis. Firm-level variables from the IDBR can be supplemented with some spatial indicators constructed from published data (e.g. firm density in an area) the number of variables that can be controlled for in the econometric analysis using this approach alone is very limited. The limited coverage of the IDBR means that it is not possible to control for the full range of firm-level influences on

business performance, such as management competence, growth ambitions, workforce development practice.

- 7.22 Omitting such variables from difference in difference analysis infers that they have no influence on the *change in growth* performance only, potentially, on the level of performance. This leaves substantial noise in the dataset and could explain why the analysis has not found strong evidence of impact.

Lessons

- 7.23 The review of potential impact assessment methods as part of workstream one highlighted a number of evaluation challenges. Our assessment of the adequacy of this method in addressing these challenges is summarised in Table 7.1.

Table 7.1 Assessment of Approach in Resolving Evaluation Issues

Issue	Assessment	Possible Adjustments to the Approach
Identifying Impacts	Offers scope to identify impact in a more robust way than self-reported methods but the approach covers only a limited range of impact measures. Because of this, it provides only a partial picture of impact .	In the absence of alternative datasets, this method should be implemented in conjunction with survey research to provide data on intermediate impacts / changes to business operations measures of business performance not included in the IDBR (e.g. investment, profitability) Survey data could also be used to capture self-reported impacts and compare these to those reported on the IDBR.
Determining the counterfactual and disentangling impact of other interventions	The use of IDBR data to observe impact and compare to a control group offers a strong approach in theory but in practice its successful implementation relies on the quality and coverage of beneficiary data and linked to this the ability to test whether ERDF supported businesses are in the control group. The IDBR does not provide sufficient explanatory variables to feed into the counterfactual assessment. This undermines the ability to identify the relative importance of ERDF support in determining business performance. The approach does not deal with issues of displacement and leakage	Recognition that this approach cannot be successfully applied in the absence of quality beneficiary data is needed. Even where strong beneficiary data is available, these methods should be applied in conjunction with survey research to supplement variables included in the IDBR and capture data relating to displacement and leakage. The survey research would need to be carried out in both the assisted business and control groups.
Timing of impact	Insufficient time has elapsed since the ERDF projects were implemented for the impacts in business to materialise and be detectable on the IDBR. The timing of the analysis is a real constraint on ability to detect impact These issues are particularly	Allow more elapsed time between assistance and implementation of this method

Issue	Assessment	Possible Adjustments to the Approach
	pronounced here as a large proportion of beneficiaries were assisted towards the end of the programme. This had wider implications for the size of the sample and contributed to the issues of coverage and representativeness outlined above.	
Heterogeneity of ERDF interventions	The thematic project groups used for the analysis help to disaggregate the assessment by the general focus of the ERDF investments but there is substantial variation in the characteristics of projects within these groups. This limits the usefulness of the typology as a framework for understanding impacts. The scope to develop a detailed typology is limited by the depth and consistency of information held on MCIS.	Consider including various analytical tags in programme data <i>at the time of project approval</i> to support more in-depth impact analysis. Relevant analytical tags would cover project focus, type of support, target sector / beneficiary type.

7.24 This assessment highlights a number of lessons for the practical design of future evaluations which draw upon these methods. In particular:

- 1) **Data quality and access is crucial to successful implementation.** Many of the sources of sample attrition are avoidable and could be substantially reduced or eliminated through improved quality and coverage of beneficiary data.
- 2) **Timing of the analysis is critical.** At least three years post-support data is needed to fully assess the change in performance after support. In practice, this means that four years elapsed time is required after support, to allow changes in bottom line performance to be reflected on the IDBR.
- 3) **Additional data sources should be used to strengthen the analysis.** The limited variables covered by the IDBR means that it has limitations in both identifying and explaining impacts of SME performance. In principle wider information on the characteristics of participating firms could be gathered as part of the administrative data on participants but to be incorporated into a control group approach the equivalent is needed for a control group. This would have to be carried out through a survey, which in practice results in a smaller control group sample than was used here.
- 4) **Additional research questions should be considered where data availability is a challenge.** The research questions for this analysis focused on the difference in business performance in the pre and post support period. This placed the date of assistance and availability of IDBR histories for the full analysis period at the centre of the analysis and the sample size was severely constrained as a result. Alternative research questions and configurations of the econometric analysis could reduce the need to limit the sample. For example, the addition of a research question which looks at the importance of ERDF funded support in business performance, relative to other factors and over a given period would allow the analysis to:
 - look at performance over a particular period

- use participation in ERDF funded support *at any point in this period* as a variable
- include the data of support as a variable
- include business survival as a measure of performance.

Implications for 2014-20 EU Programmes

7.25 Although the assessment has not provided a robust dataset to inform the design of the 2014-20 programme the methodological insights generated through trialling this approach highlight some important lessons for the 2014 – 20 programme.

7.26 In particular, DCLG should:

- **Consider now the methods that will be used to evaluate the impact of the 2014-20 programme and the role of control group analysis in this.** The design of the evaluation approach for the 2014-20 programme needs to recognise that counterfactual impact evaluation methods using national datasets to source company performance data are of limited value until the later stages of the programme period. There is limited merit in using these approaches at the mid-term review stage and other evaluation methods should be used. There is a role for IDBR-based control group analysis in final evaluation but this should be combined with other evaluation methods including:
 - Surveys to assess the manner in which support was used, satisfaction with the provision, self-reported impact which can be compared to the control analysis and help establish likely displacement effects,
 - Project reviews and other forms of qualitative research with beneficiaries.

These other methods are valuable in both enhancing the analysis of economic impact, as well as exploring other wider but nevertheless important evaluation issues.

- **Consider supplementary approaches to measuring the impact of ERDF investment with no direct SME beneficiaries.** It should also be noted that this approach will not be able to measure the impact of the spatial ERDF investment where there are no recorded or identified beneficiaries. These will require a different and bespoke evaluation approach.
- **Reflect the data requirements of the selected method on the monitoring arrangements for the programme.** Particular emphasis on ensuring that monitoring data is complete and reliable is needed. To support an approach which uses counterfactual impact evaluation methods, monitoring systems will need to:
 - Identify ERDF beneficiaries early on and build up a central beneficiary database which includes the variables outlined in Table 7.2
 - Enable performance of different cohorts of ERDF beneficiaries to be tracked over time, using the IDBR (changes in employment and turnover and in survival rates)

- Enable the generation of a matched sample of non-ERDF assisted firms
- Ensure that permissions for use of beneficiary data are built into project approvals and monitoring and evaluation requirements

Table 7.2 Monitoring Data Variables

Group	Variable
Basic Business Information	Business name
	Business contact
	Address
	Postcode
	Company reference number or VAT registration number
Contact Details	Main point of contact for assistance
	Telephone number
	Email address
Details of Assistance	Project providing assistance
	Start date of ERDF assistance
	End date of ERDF assistance
	ERDF value of assistance

Appendix A - Sample Structure

Sample Frame

Table 7.3 All ERDF Funded Projects by region

	Number of Projects	Contracted ERDF (£m)	Contracted SME Assists	SME Assists Claimed to Date
East Midlands	193	£151	16,600	8,200
East of England	53	£85	7,800	3,050
London	94	£130	22,400	10,450
North East	172	£323	31,550	9,950
North West	265	£488	51,600	22,950
South East	25	£15	6,600	4,400
South West	72	£78	10,950	5,800
South West - Cornwall	133	£321	11,150	2,450
West Midlands	166	£247	12,350	6,800
Yorkshire and Humberside	140	£349	25,900	13,800
Grand Total	1,313	£2,186	196,800	87,800

MCIS Data. Accessed January 2013

Table 7.4 ERDF Funded Projects Within Scope for Analysis, by Region.

	Number of Projects	Contracted ERDF (£m)	Contracted SME Assists	SME Assists Claimed to Date
East Midlands	54	£49	9,650	7,200
East of England	22	£33	5,050	3,000
London	48	£37	14,250	9,050
North East	51	£127	11,350	8,700
North West	80	£118	26,350	16,950
South East	17	£10	4,800	4,400
South West	24	£30	6,650	4,900
South West - Cornwall	15	£25	2,550	2,000
West Midlands	26	£53	5,750	5,800
Yorkshire and Humberside	21	£51	4,300	3,300
Grand Total	358	£532	90,700	65,300

MCIS Data. Accessed January 2013

Table 7.5 All ERDF Funded Projects by Project Type

	Number of Projects	Contracted ERDF (£m)	Contracted SME Assists	SME Assists Claimed to Date
Sites and Premises	196	£507	5,950	650
Access to Finance	89	£302	16,150	4,700
SME Competitiveness	172	£226	66,550	32,600
Infrastructure	53	£192	6,100	-
SME Innovation	144	£158	21,450	10,600
Enterprise Formation and Entrepreneurship	122	£149	20,350	9,000
Strengthening the R&D Base	65	£132	6,450	1,850
Sector Development	98	£127	13,300	5,600
Resource Efficiency	112	£116	22,700	13,500
Low Carbon Sector Development	45	£65	6,350	2,800
Public Realm	48	£64	150	-
Technical Assistance	90	£55	-	-
Tourism	19	£54	550	150
Access to Employment	23	£15	8,200	4,850
Social Enterprise	16	£13	1,700	1,200
Marketing	8	£5	200	-
Community	11	£3	350	100
Grand Total	1,311	£2,184	196,600	87,650

MCIS Data. Accessed January 2013

Table 7.6 ERDF Funded Projects Within Scope for Analysis, by project type

	Number of Projects	Contracted ERDF (£m)	Contracted SME Assists	SME Assists Claimed to Date
Sites and Premises	-	-	-	-
Access to Finance	40	£164	6,400	3,400
SME Competitiveness	73	£123	35,350	27,500
Infrastructure	-	-	-	-
SME Innovation	75	£74	13,550	10,500
Enterprise Formation and Entrepreneurship	3	£4	750	300
Strengthening the R&D Base	25	£27	3,000	1,750
Sector Development	53	£50	9,500	5,100
Resource Efficiency	58	£52	16,550	13,050
Low Carbon Sector Development	24	£33	4,650	2,800
Public Realm	-	-	-	-
Technical Assistance	-	-	-	-
Tourism	-	-	-	-
Access to Employment	-	-	-	-
Social Enterprise	7	£4	950	900
Marketing	-	-	-	-
Community	-	-	-	-
Grand Total	358	£532	90,700	65,300

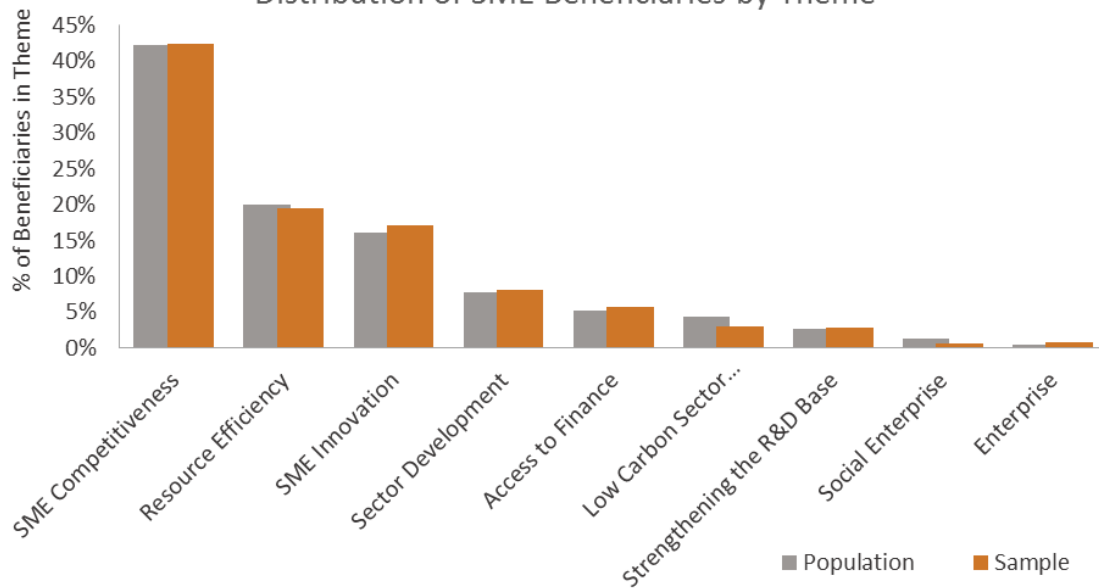
MCIS Data. Accessed January 2013

Beneficiary Data Returns

Table 7.7 Beneficiary Data Returns by Project Type

	Number of Projects Returning Information		Contracted ERDF Covered by Project Returns		Beneficiaries (Based on Claimed Assists)	
	Number	% of Pop	£m	% of Pop	Number	% of Pop
SME Competitiveness	48	66%	£89	73%	16,176	46%
Resource Efficiency	30	52%	£32	62%	7,017	42%
SME Innovation	41	55%	£47	63%	5,749	42%
Sector Development	33	62%	£32	64%	3,105	33%
Access to Finance	27	68%	£92	56%	2,066	32%
Strengthening the R&D Base	15	60%	£16	59%	915	31%
Low Carbon Sector Development	8	33%	£21	62%	830	18%
Enterprise and Entrepreneurship	3	100%	£4	100%	303	40%
Social Enterprise	5	71%	£2	57%	266	28%
Grand Total	210	59%	£335	63%	36,427	0.56

Distribution of SME Beneficiaries by Theme

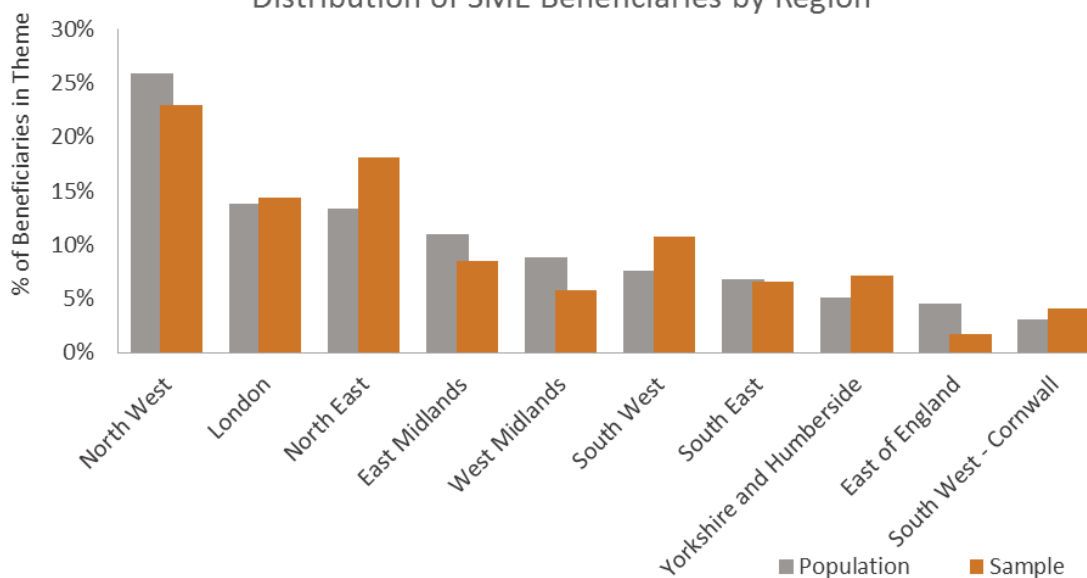


Source: Beneficiary data returns and MCIS data access in January 2013. Base population for analysis is 358 projects which are within scope for the analysis.

Table 7.8 Beneficiary Data Returns by Project Region

	Number of Projects Returning Information		Contracted ERDF Covered by Project Returns		Beneficiaries (Based on Claimed Assists)	
	Number	% of Pop	£m	Number	% of Pop	£m
North East	42	82%	£118	93%	7,550	87%
London	33	69%	£28	76%	6,000	66%
North West	37	77%	£45	92%	5,600	60%
South West	20	83%	£25	84%	4,500	91%
East Midlands	29	54%	£30	61%	3,550	49%
South East	8	47%	£6	58%	2,750	62%
West Midlands	13	50%	£20	37%	2,450	42%
South West - Cornwall	12	80%	£20	80%	1,700	84%
Yorkshire and Humberside	9	82%	£24	95%	1,650	96%
East of England	7	32%	£20	60%	700	24%
Grand Total	210	66%	£335	77%	36,450	65%

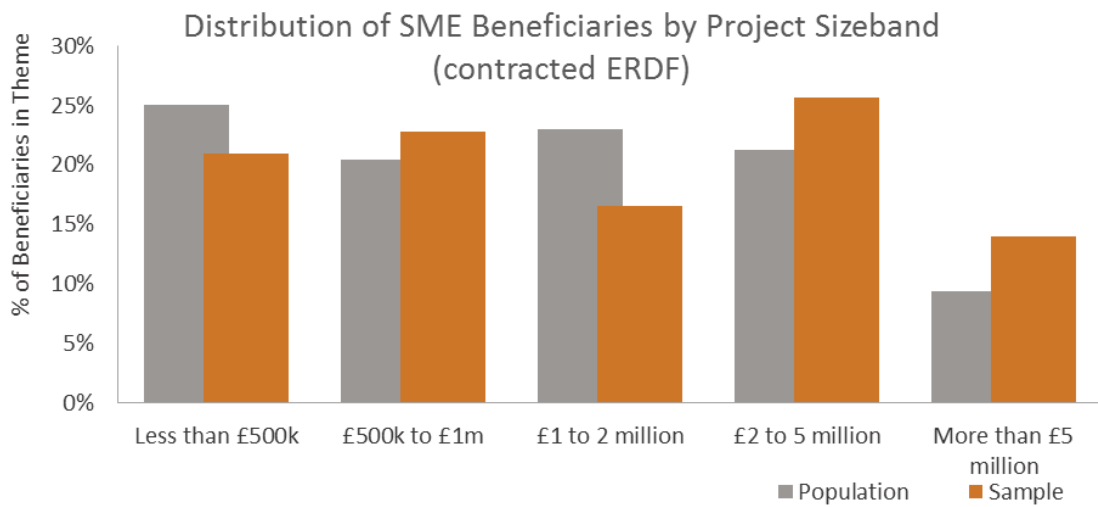
Distribution of SME Beneficiaries by Region



Source: Beneficiary data returns and MCIS data access in January 2013. Base population for analysis is 358 projects which are within scope for the analysis.

Table 7.9 Beneficiary Data Returns by Project Size-band

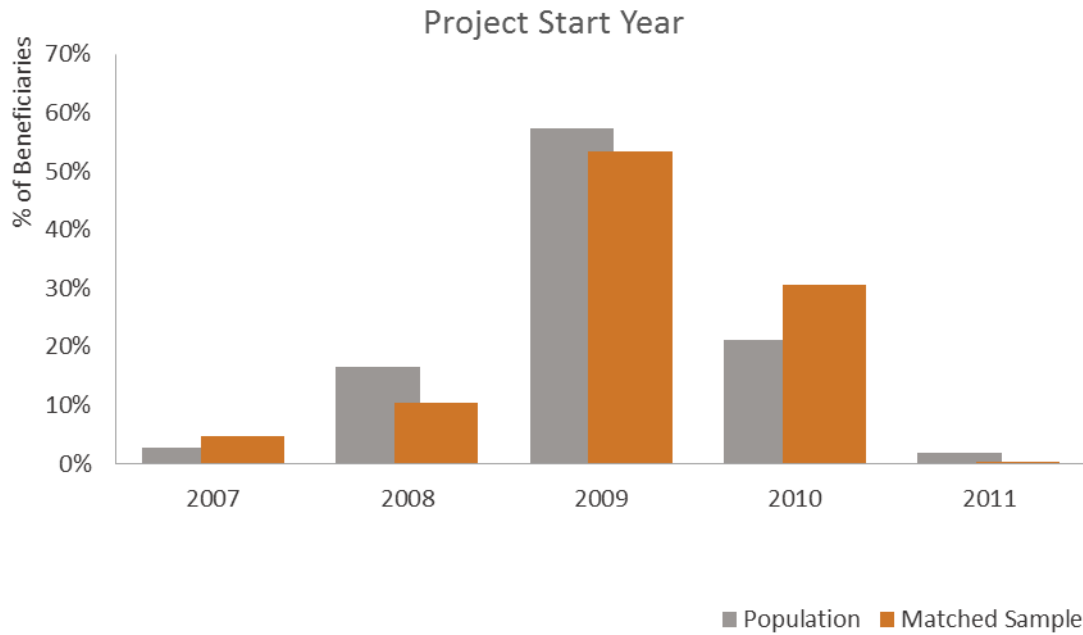
	Number of Projects Returning Information		Contracted ERDF Covered by Project Returns		Beneficiaries (Based on Claimed Assists)	
	Number	% of Pop	£m	Number	% of Pop	£m
Less than £500k	80	61%	£21.99	60%	8,400	52%
£500k to £1m	59	70%	£43	70%	8,250	71%
£1 to 2 million	33	66%	£47	68%	5,600	49%
£2 to 5 million	28	74%	£93	75%	8,350	76%
More than £5 million	10	83%	£131	89%	5,800	99%
Grand Total	210	66%	£335	77%	36,450	65%



Source: Beneficiary data returns and MCIS data access in January 2013. Base population for analysis is 358 projects which are within scope for the analysis.

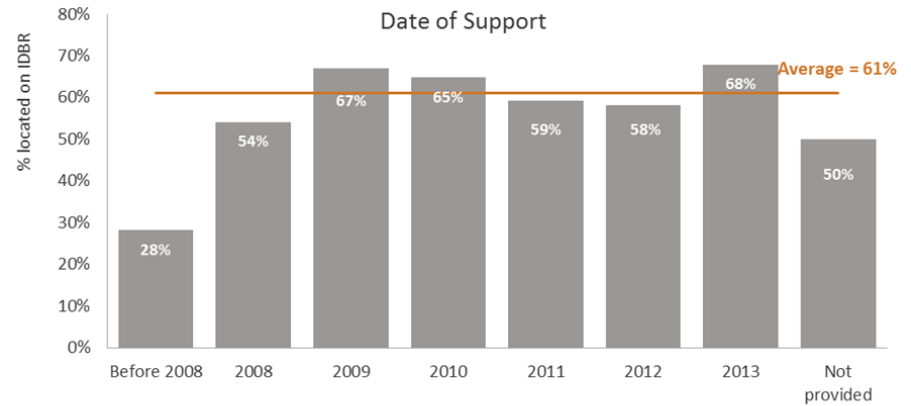
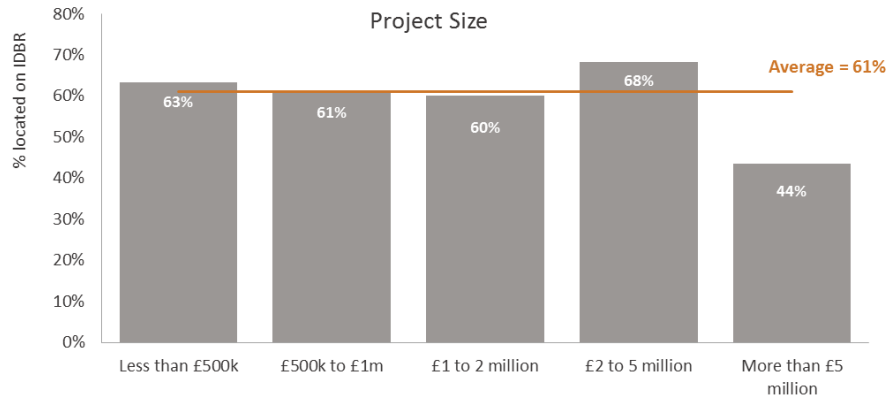
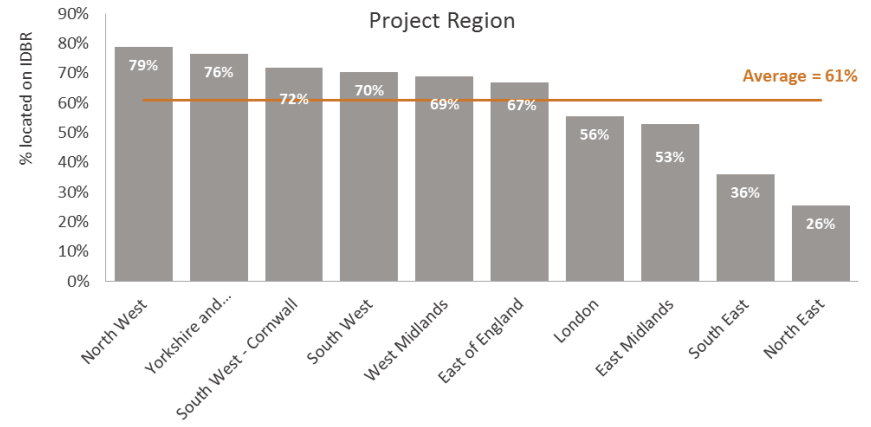
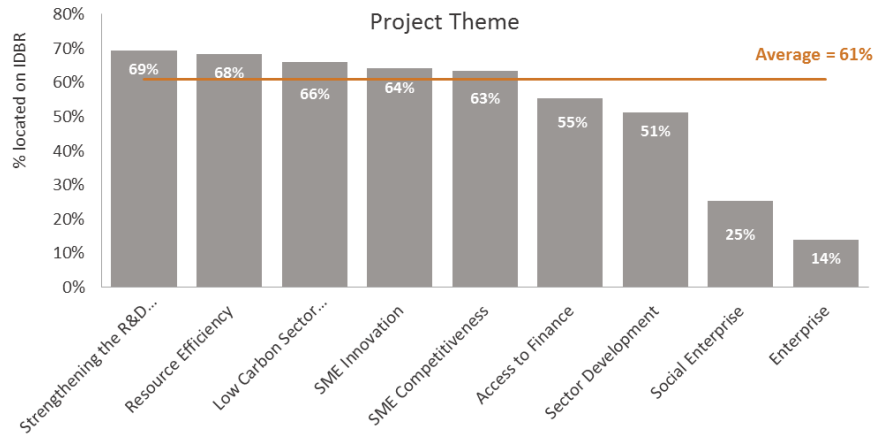
Table 7.10 Beneficiary Data Returns by Project Start-Year

	Number of Projects		Contracted ERDF		Beneficiaries (Based on Claimed Assists)	
	Number	% of Pop	£m	Number	% of Pop	£m
2007	7	70%	£6.45	48%	1,000	90%
2008	22	51%	£36	60%	5,550	51%
2009	118	64%	£218	79%	19,550	64%
2010	53	78%	£67	83%	9,350	77%
2011	8	89%	£7	93%	750	65%
Unknown	2	100%	£1	100%	200	100%
Grand Total	210	66%	£335	77%	36,450	65%



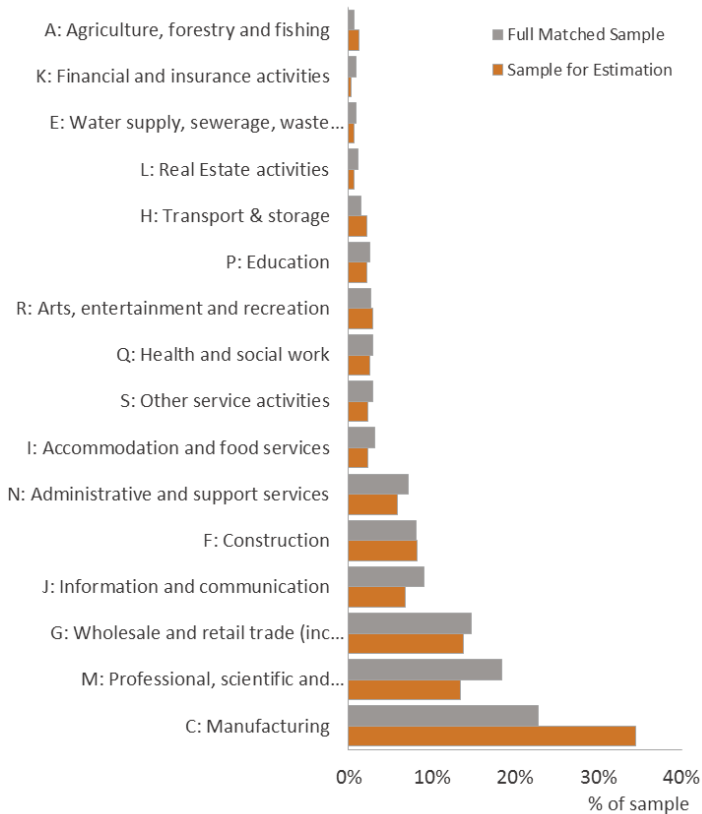
Source: Beneficiary data returns and MCIS data access in January 2013. Base population for analysis is 358 projects which are within scope for the analysis.

Figure 7.1 IDBR Matching Rate by Project Characteristics



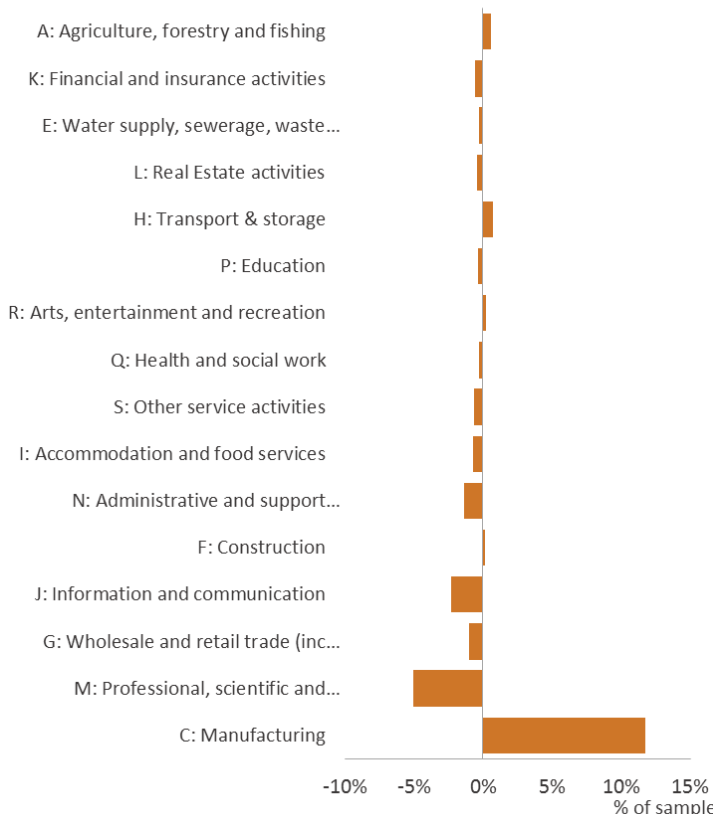
Sample Structure: Matched Dataset vs Sample for Estimation

Figure 7.2 Sample Structure of Matched Dataset and Estimation Sample



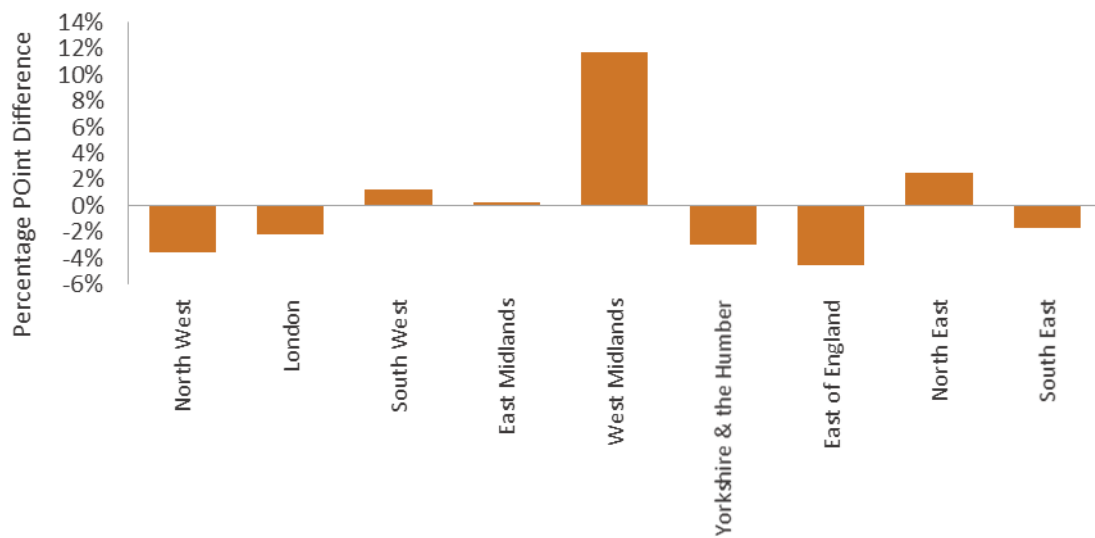
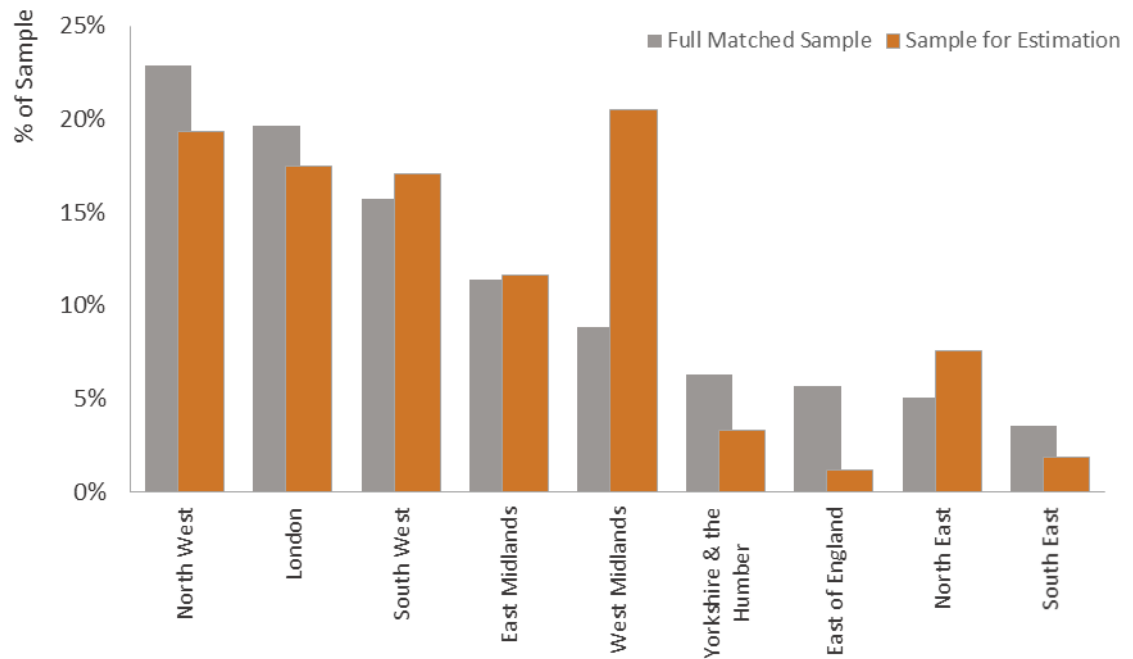
Source: Matched beneficiary dataset. Note: This is an illustrative analysis based on the sample used for equation 1(a) and using 2012 beneficiary characteristics.

Figure 7.3 Difference Between Matched Dataset and Estimation Sample



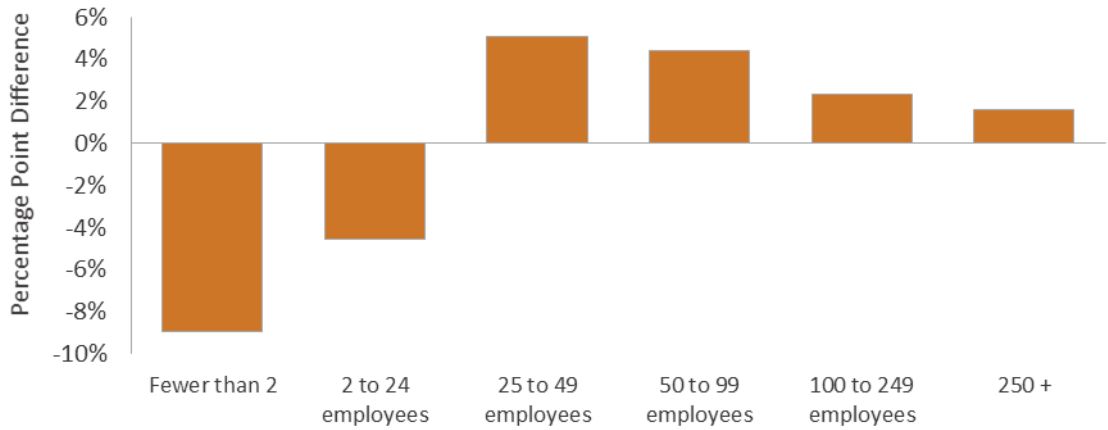
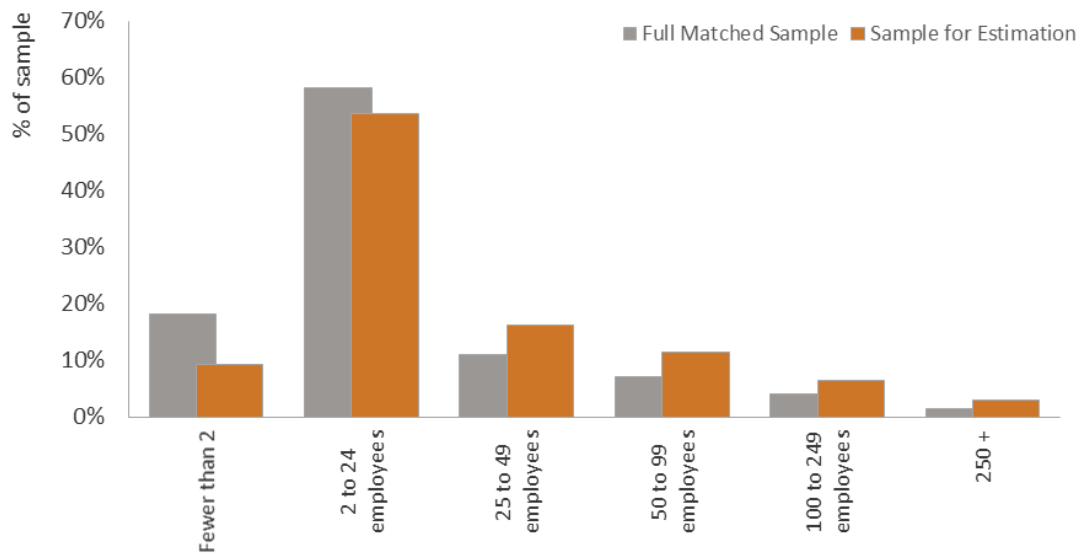
Source: Matched beneficiary dataset. Note: This is an illustrative analysis based on the sample used for equation 1(a) and using 2012 beneficiary characteristics.

Figure 7.4 Sample Structure of Matched Dataset and Estimation Sample: Company Region



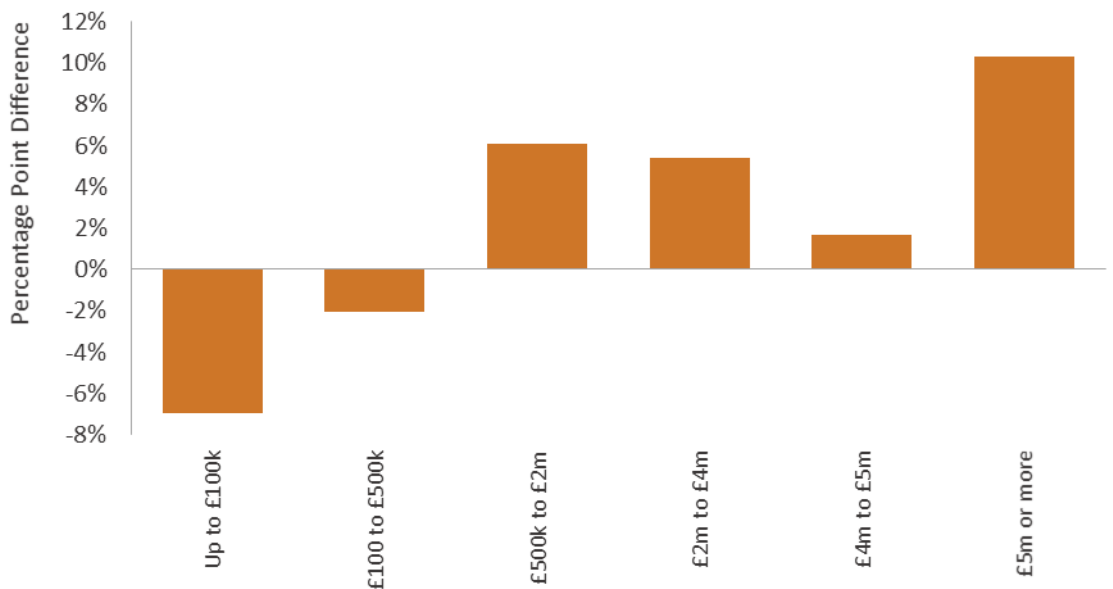
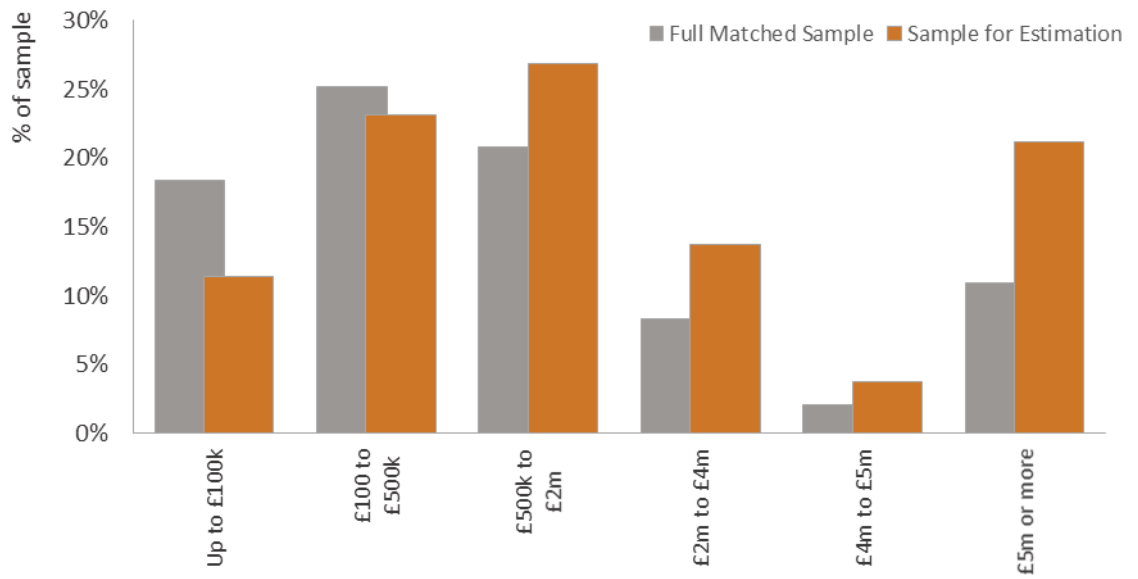
Source: Matched beneficiary dataset. Note: This is an illustrative analysis based on the sample used for equation 1(a) and using 2012 beneficiary characteristics.

Figure 7.5 Sample Structure of Matched Dataset and Estimation Sample: Employment



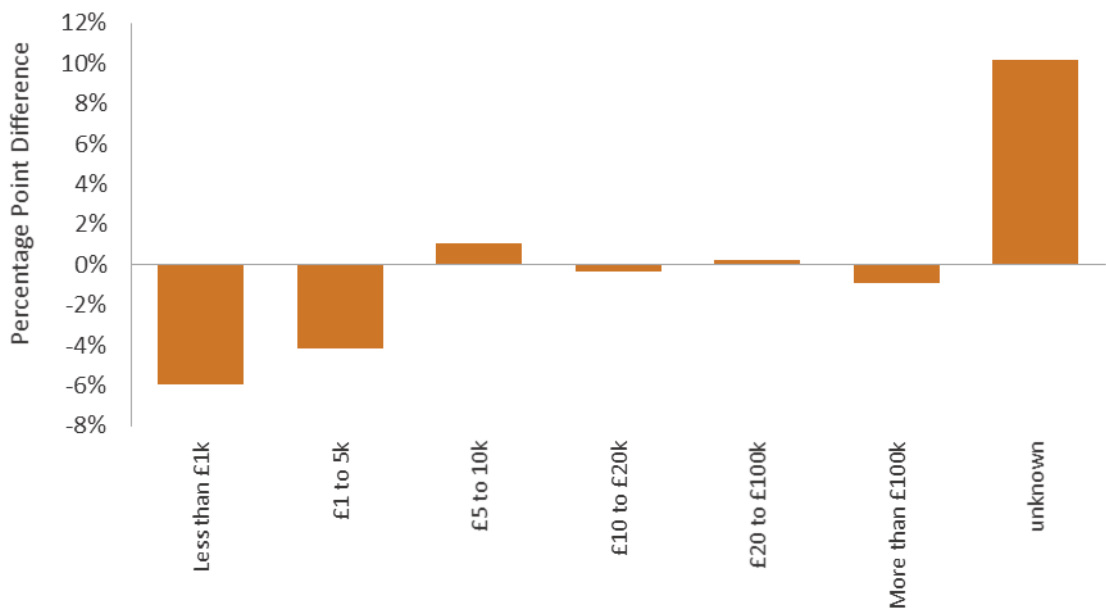
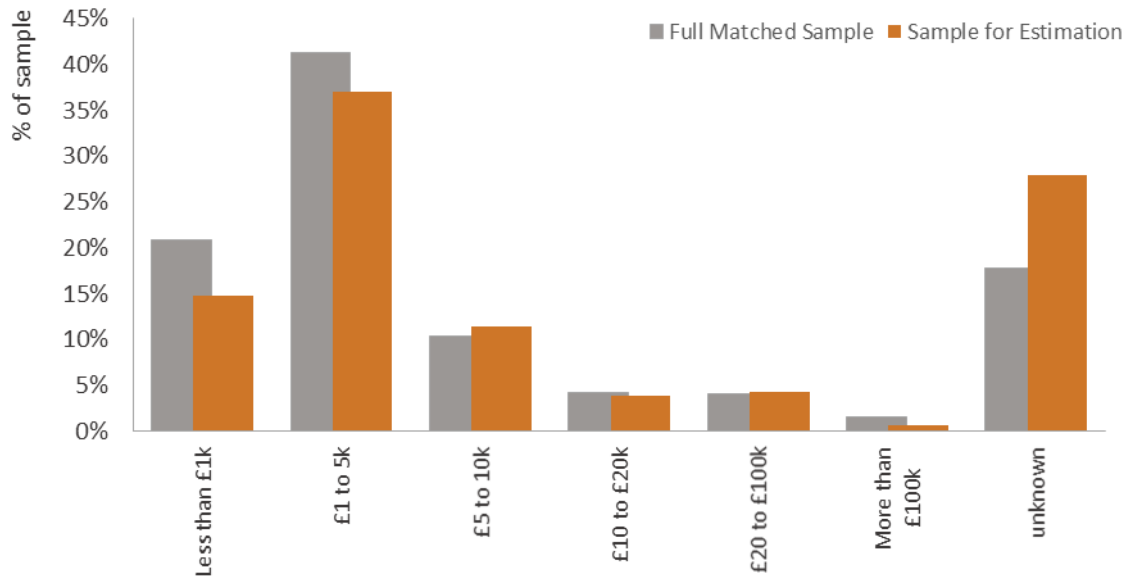
Source: Matched beneficiary dataset. Note: This is an illustrative analysis based on the sample used for equation 1(a) and using 2012 beneficiary characteristics.

Figure 7.6 Sample Structure of Matched Dataset and Estimation Sample: Turnover



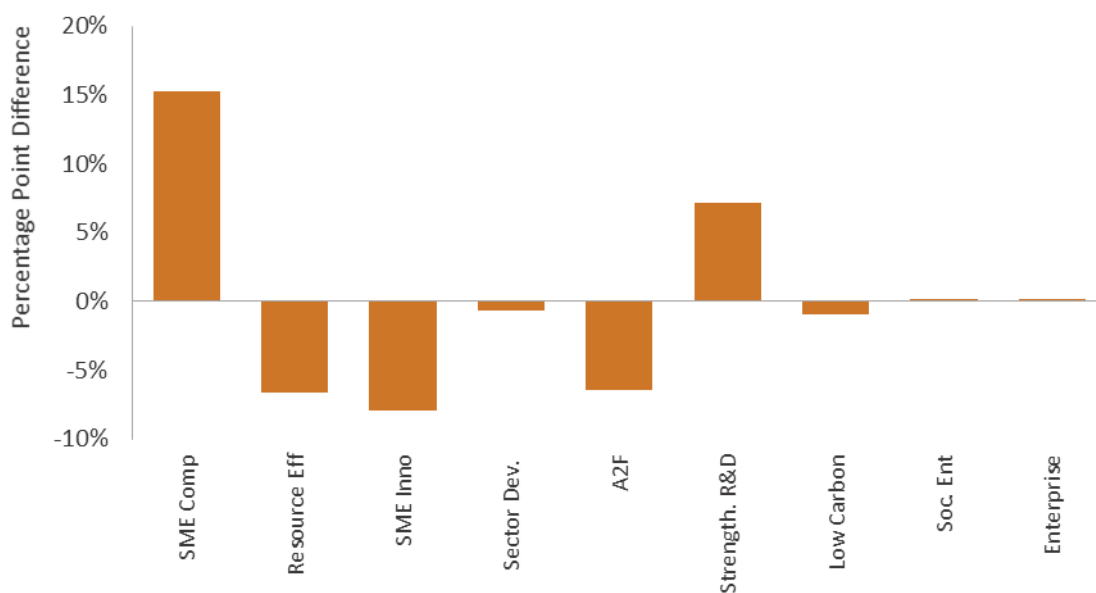
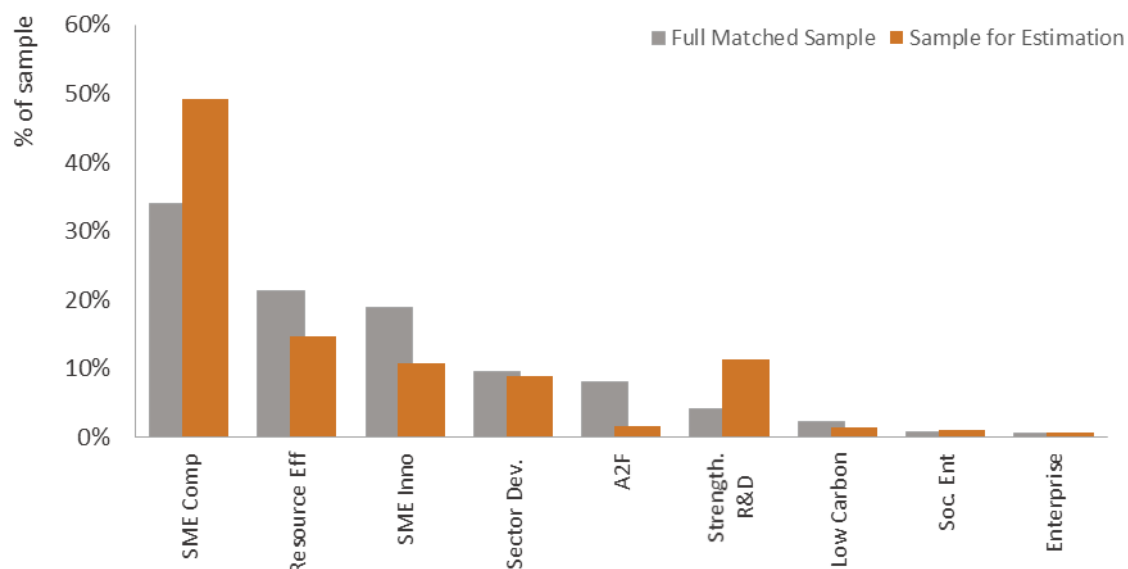
Source: Matched beneficiary dataset. Note: This is an illustrative analysis based on the sample used for equation 1(a) and using 2012 beneficiary characteristics.

Figure 7.7 Sample Structure of Matched Dataset and Estimation Sample: Intensity of Support



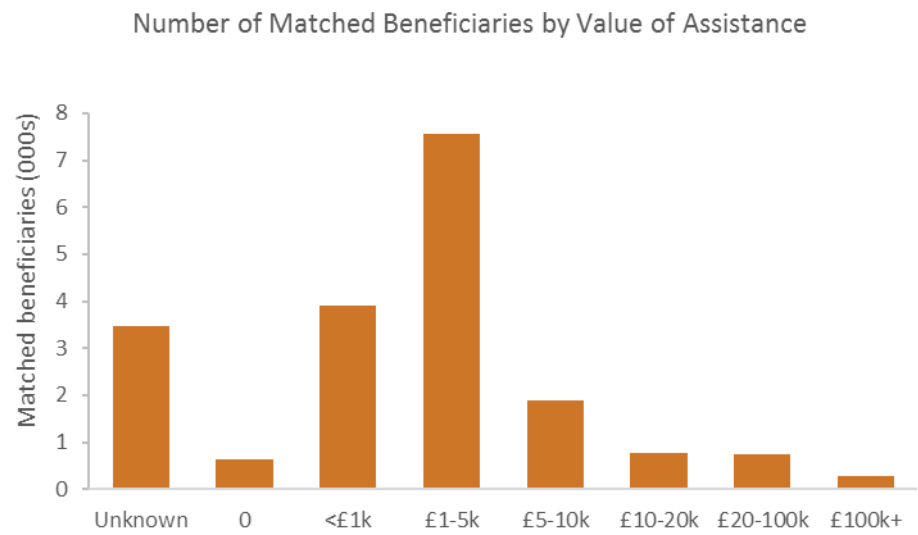
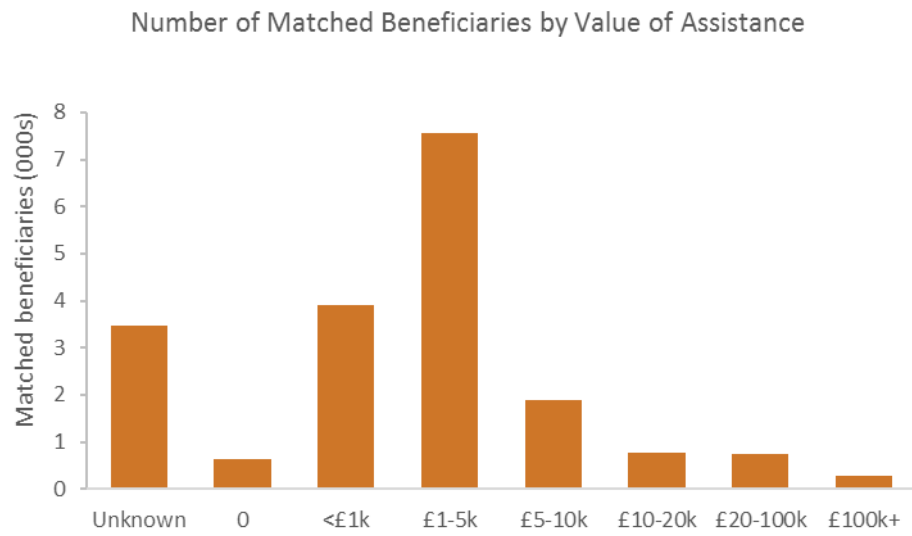
Source: Matched beneficiary dataset. Note: This is an illustrative analysis based on the sample used for equation 1(a) and using 2012 beneficiary characteristics.

Figure 7.8 Sample Structure of Matched Dataset and Estimation Sample: Project Theme



Source: Matched beneficiary dataset. Note: This is an illustrative analysis based on the sample used for equation 1(a) and using 2012 beneficiary characteristics.

Figure 7.9 Intensity of Support



Source: Matched beneficiary dataset

Appendix B - The Econometric Analysis

The research questions and appropriate estimation framework

- 7.27 The principle question is
- Q1: Did the programme under investigation have a positive impact on the performance of those firms participating?
- 7.28 Secondary questions that the quantitative analysis can seek to answer are:
- Q2: Did those firms participating grow faster than non-participants after being in the scheme?
 - Q3: What sort of intervention provides the biggest return?
- 7.29 To answer these questions requires analysis of firm-level data, covering both participants and non-participants and the period before and after participation in the programme. The analysis needs to isolate the effect of participating in the programme from the wide variety of other factors that influence company performance, such as the general economic context, the sector the firm operates, the size of the company.
- 7.30 The common approach to addressing the question of impact of the programme is difference-in-differences (double-difference) analysis.
- 7.31 The general situation is set out in Equation 1. The value of the target indicator for firm i (e.g. growth in turnover, g) in period t is influenced by the period in question, whether the firms participated in the programme before the period, the underlying economic environment facing the firms and specific characteristic of the firm. Underlying economic factors could include the sector the firm operates in and where it is located (growth prospects will differ by sector and by region) while firm specific characteristics would include factors including its size, its quality of management, its age etc.).

$$EQ(1): g_{i,t} = a + bP_{i,t} + d_tEconState_i + k_iFirmChar_i + \dots + error_{i,t}$$

- 7.32 When estimated on pooled data for pre (period 0) and post (period 1) engagement periods, a positive value for the b coefficient indicates that participation in the scheme in question produced an improved performance relative to non-participating firms when other contributing influences are controlled for. This is the 'difference-in-difference' effect.
- 7.33 An issue with this type of analysis is that the firm-level characteristics that can influence performance are often not observed, at least not without carrying out a survey. This is the situation with this study; the IDBR does not provide much information on factors we describe here as firm-level characteristics. If firm characteristics are important influences on performance but not observed, then there is the chance that the estimates for the remaining coefficients, including the key coefficient b , are biased (the estimation 'compensates' for the omitted variable(s) by possibly over- or underestimating the effect of one of the other factors) meaning that our understanding of the influence of the programme itself on influencing growth is inaccurate.
- 7.34 Equation (2) restates equation (1) in terms of differences in growth between the two periods. If the firm-specific characteristics are assumed to have the same influence in

both periods (e.g. contributes, say, 2 pp to growth), then their influence is removed from the equation to be estimated. This is an important consideration when potential firm-specific influences are unobserved and could lead to potential bias in the estimates.

$$EQ(2): \Delta g_i = \alpha + \beta P_i + \gamma EconStates_i + \varepsilon_i$$

Where

$$\Delta g_i = g_{i,1} - g_{i,0}$$

$P_i = 1$ if firm i participated, else 0

7.35 It is therefore preferable to estimate equation 2 rather than equation 1 when there are observations for both periods of interest and there are potential explanatory factors that remain unobserved.

Analysis of post-funding performance

7.36 Equation 1, estimated on firm data for the post impact period (ie $t = 1$) provides the analysis of post funding performance. In this case a significant positive coefficient for b indicates that participants have achieved stronger growth than non-participants controlling for other factors. However, again, if some factors are not observed, then the value of b will not be a reliable estimate of the impact of the programme itself on growth, but rather the differential in growth that is correlated with the decision to participate or not.

7.37 The evaluation of Regional Selective Assistance⁴² involved analysis of post-funding performance. The study carried out a large survey of beneficiaries and non-beneficiaries, which gave valuable information of the characteristics of the firms sampled as well as sample responses for firm performance over a period of time following the funding. Firms were not asked about performance over a period of time prior to the funding being available. Therefore, a double-difference approach was not possible with this data set. However, the additional information gathered through the survey was important in testing the reliability of the econometric results.

Data and related issues for the econometric analysis

Data

7.38 Data on the performance of firms over time is sourced from the Inter Departmental Business Register (IDBR). Specifically, the IDBR provides information for individual firms on the following:

- Performance indicators
 - Turnover, employment, employees
- Firm characteristics
 - Sector, geographical location

7.39 Annual data are available for 2001-2012 inclusive.

⁴² Evaluation of Regional Selective Assistance (RSA) and its successor, Selective Finance for Investment in England (SFIE), BERR Occasional Paper No 2, March 2008.

- 7.40 Using the IDBR provides a substantial benefit in terms of timeseries of data, consistency of data and being a single source of information on participating and non-participating firms. However, it has the principle limitation that it provides information on few firm-level characteristics.

Identifying the control group

- 7.41 The control group of non-participating firms was drawn from the IDBR to best match the characteristics of the participating firm. This was achieved as follows:
- Participating firms were grouped according to their sector [SIC 3-digit], size and region.
 - For each aggregate group up to 10 non-participating firms with the same characteristics were identified in the IDBR for each participating firm. Importantly, the method did not explicitly identify any one firm in the control sample with a particular participating firm.

Issues to address

- 7.42 The specific characteristics of the ERDF programme raise a number of issues for the analysis:

How to identify pre and post-participation periods?

- 7.43 The analysis is considering whether engaging in the ERDF programme resulted in an improvement in performance over and above what would be expected if the firm was not involved in the programme. While not explicit in the research question, in our view the interest is in examining the impact on underlying long term performance rather than the performance in any one year.
- 7.44 Given this, the analysis should examine performance over a number of years before and after the engagement with the programme (the period of funding). Ideally the pre and post-engagement periods would cover a minimum of three years, but of course this has implications for the timeliness of the analysis.
- 7.45 The characteristics of firms' engagement with the ERDF programme is very varied, both in terms of the type of activities undertaken as well as the level and duration and timing (start year) of engagement⁴³. The benefits of different programmes are also likely to be realised by participants at different times; both the initial effects being experienced with different lags from the end of the funding, and also remaining with different durations.
- 7.46 Ideally, the approach would take account of the precise timing of funding and the nature of each engagement, calculating pre-and post-funding performance metrics on the basis of, say, 3 years before and after the firm-specific start and end date of its engagement. Therefore, the precise years the performance is calculated over would differ firm by firm. However, to carry out the double-difference estimation on this basis would require each beneficiary be matched to individual firms in the control group. This is not how the control group was identified.
- 7.47 The only practical approach is to calculate pre and post-participation performance using a common timeframe for all beneficiaries and those in the control group.

⁴³ The programme management data collected reports beneficiaries receive funding for different periods from 2001-2013. That some recipients are recorded as receiving funding prior to 2008, the first year of the funding period being studied illustrates questions about the overall reliability of the data the study has been provided with.

- 7.48 The potential limitations of using performance over a common time frame for all firms, regardless of their precise period of funding, are mitigated by testing the robustness of the results to using alternative definitions of the pre and post-participation periods.
- 7.49 Similarly the issue of whether sufficient time has passed between the end of funding and the period selected to measure post-engagement performance for an effect to be realised is addressed by estimating the equations using different periods for pre- and post-participation performance, restricting the sample of beneficiaries as necessary.
- 7.50 The choice of the pre and post-engagement periods and the criteria for selecting the 'relevant' beneficiaries for the estimation has a notable impact on the number of observations available in the analysis. Of the 8,200 firms that commenced participation (funding) in 2009, a third were still receiving ERDF funding after 2011. Almost 12,000 firms started to receive funding in 2010, with more than three quarters receiving funding for more than that year one year. If the impact of participation is not fully felt on firm performance until after participation is complete, and so restrict the beneficiaries used in an analysis to only those that had received all their funding by the start of the post-performance period (which, given the timeseries available will have to commence end 2010 in order to cover a period of more than one year), then the usable sample is greatly reduced.

There is a wide range of actions within the overall programme

- 7.51 The effect participation in the programme has on the performance indicator is likely to depend on the precise type of activity that is funded and the level of funding relative to the size of the company. Nine different types of project are identified (e.g. resource efficiency, enterprise formation etc.) though the administrative information on the level of funding is not complete for all beneficiaries.

Firm-level performance indicators can show high year-on-year volatility

- 7.52 Financial indicators in particular can show high year-on-year volatility around any underlying trend. This can mean that the growth rate calculated between any two year's values can be highly dependent on the particular choice of start and end year. Estimating underlying growth over the period in question (through a time trend) rather than 'point-to-point' growth rate points would be one way to overcome this potential limitation. However, the two periods for the analysis are likely to cover a small number of years (perhaps just two or three) and this limits the rigour of estimating underlying trend. In the event, the analysis uses average growth rates calculated between the start and end year of the periods selected.

Estimation strategy

Time periods for analysis

- 7.53 Given the issues raised above we test the analysis on different time periods, as set out in the table below. The table also states how the specific sample of beneficiaries will be selected in each case.

Table 7.12 Alternative time periods to use in estimations

Option	Pre-participation period	Post-participation period	Sample of beneficiaries	Comment
P1	2005-07	2009-12	All	
P2	2005-07	2009-12	Did not receive	

			funding before 2007	
P3	2005-07	2009-12	Received funding in 2007, 2008 or 2009 (but not before 2007)	
P4	2005-07	2009-12	As (P3) and no funding after 2009	
P5	2002-07	2009-12	As (P1)	
P6	2002-07	2009-12	As (P2)	
P7	n/a	2009-12	All	Post impact analysis only.

Variables

Performance indicators

- 7.54 The equations will be estimated on growth⁴⁴ in each of the following performance indicators:
- turnover
 - employment
 - productivity (turnover per person employed).

Explanatory variables

Spatial classification

- 7.55 The analysis will control for the possible influence that geographical location might have on performance. The IDBR provides the postcode of firms, from which the following two alternative spatial classifications are constructed:
- L1: English regions (9)
 - L2: UAs and counties (152 in England)
 - Firm density
- 7.56 The performance of a firm may be influenced by the presence of other firms around it, through agglomeration effects. These effects can be independent of those that could come from generally fast-growing locations, the type of effects that the spatial indicators will seek to identify).
- 7.57 The potential role of agglomeration effects will be tested through a district-level estimate of firms per capita.

⁴⁴ Average growth will be estimated as average change in log of the variable divided by the number of years covered by the period selected.

Sectoral classification

7.58 The IDBR records a firm's principle industry according to the 5-digit SIC classification. The control sample is identified by matching to beneficiaries at the 2-digit SIC. The estimation will consider two alternative sectoral classifications:

- S1: SIC Section - e.g. manufacturing, construction, accommodation and food service activities)
- S2: SIC Division (2-digit level)

Type/scale of engagement

7.59 Beneficiaries will be grouped as participating in one of the following programme types:

- T1: Resource Efficiency, SME Competitiveness, Access to Finance, Enterprise formation/entrepreneurship, Low carbon sector, sector development, SME Innovation, Social enterprise, Strengthening R&D base.

7.60 The scale of engagement in the programme will be measured by:

- M1: Annual funding as a share of turnover.
- M2: Bands of funding as % of turnover: 0-0.5%, 0.5-1%, 1-5%, 5-10%, 10-50%, +50%

Size of firm

7.61 Firms are grouped into the following sizeband categories based on number of employees

- Z1: 0-49, 50-99, 100-249, 250+

The analysis

7.62 The table below lists the principle variations of the double-difference equation (Eq 2) estimated for each performance indicator and period P1-P6. In addition, alternative specifications were tried that combined controlling for regional spatial effects (L1) and detailed sectoral effects (S2). This combination did not provide results materially different from the spatial/sectoral combinations shown in Table X.

Table 7.13 Alternative Specifications of Difference in Difference Equation

Equation	Participation	Spatial	Sector	Type of engagement	Size-band	Firm density	Scale of involvement	Other comments
2 (a)	✓	L1	S1					
2 (b)	✓	L1	S1	T1	Z1	✓	M1	Sample of beneficiaries are only those where funding levels are known.
2 (c)	✓	L1	S1	T1	Z1	✓	M2	Sample of beneficiaries are only those where funding levels are known.
2 (d)	✓	L2	S2					
2 (e)	✓	L2	S2	T1	Z1	✓	M1	Sample of beneficiaries are only those where funding levels are known.
2 (f)	✓	L2	S2	T1	Z1	✓	M2	Sample of beneficiaries are only those where funding levels are known.

