Department for Business & Trade

Evaluation of the Exceptional Regional Growth Fund Investments

Report to the Department for Business and Trade by Belmana, RSM UK and IFF Research

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This work was undertaken in the Office for National Statistics Secure Research Service using data from ONS and other owners and does not imply the endorsement of the ONS or other data owners.

Executive Summary

The Exceptional Regional Growth Fund (eRGF) – which was part of the wider Regional Growth Fund (RGF) – provides support for projects in large, usually manufacturing, businesses with significant potential for generating economic growth and that create or sustain additional private sector employment. While the rest of the RGF ceased taking applications in 2017, eRGF continued as a funding stream. It is most like the Regional Projects strand of RGF that also invested in large businesses and was open to applications 2011-15.

Different to other RGF funding, eRGF provided discretionary support reacting quickly to avoid any consequences of a significant economic shock or to secure internationally mobile investment. Funding was on a case-by-case basis. Projects were similar in scale and type of beneficiary to the Regional Projects, but eRGF funding was more often to secure business investment and continue or begin a business' operation in the UK. In practice, the eRGF has then often centred on altering the decisions by multinational businesses about whether or not to locate, expand, continue or reduce activities in the UK.

For many projects, the business would be considering locating their activities in other countries. The non-UK options for the business would normally be more attractive due to lower overall costs or better/faster returns on investment and, where this was the case, the level of eRGF support was determined to be sufficient to secure the UK option meeting the funding gap between the UK and non-UK alternative. The additional impacts expected were primarily that the employment generated or safeguarded would be of high value, in that the jobs would be higher paying than alternatives in the local area. Projects also predicted other additional impacts, such as R&D would have wider benefits through spillovers.

The overall approach of the study is to test the eRGF logic model. This is undertaken qualitatively, asking whether those involved in the projects link the funding provided to decisions to locate significant investments in the UK, and that associated impacts were borne out. The quantitative evidence then explores two dimensions: whether projects are associated with expansions at businesses and fewer closures of operations; and whether the employment associated with these expansions are high value.

Overall, there is evidence that the benefits expected are being realised. The investments made are found to affect location decisions towards siting major manufacturing and research capabilities in the UK. This is indicated in both the qualitative case studies and in analysis of data about restructurings. Also, the timing and shape of the investments made, particularly the employment generated, is consistent with the forecasts made in business cases. Many projects were quite recently completed, so the full impacts are yet to occur, and the evaluation approach has assessed whether – at this stage – intermediate effects are confirmed.

Findings

This study evaluates the 10 live investments, which were provided £101m of grant support complemented by a further £555m of co-investment from the businesses. For quantitative analysis, the evaluation includes the wider RGF Regional Projects which were similar in their intentions. Adding these incidences of support greatly enhances analytical robustness.

Case studies confirmed that the location decisions were a competition between sites across different countries within the multinational parent and indicated benefits for the UK:

- **Businesses could identify at least one alternative non-UK plant to which their investments could be made.** These alternatives were crucial to the overall case for the investments which would continue operation in the UK. Interviewees at UK plants foresaw

closure without assistance primarily as operations in establishments reached a stage where investments were needed. Investments by the businesses were significant, as much as 20 times the grant provided. They were viewed as long-term commitments, securing product lines with lengthy production life or locating innovation in the UK by investment in R&D facilities.

- **Innovation was a feature of many projects.** Investments are associated with locating future generations of electric vehicles in the UK, described as step changes in technologies. Projects highlighted the concentration of innovativeness in ecosystems that the investment would contribute to. There was also evidence of skills investments as new manufacturing processes required investments in people.

- **eRGF influenced corporate strategic decisions.** Support occurred as the businesses looked at alternative sites and countries. Alternative non-UK sites had strengths: many had cost advantages, or comparable R&D systems. Case studies highlighted that businesses' own options analysis included the UK support which was sometimes in the context of incentives provided by the governments of the non-UK alternative countries.

- **There are examples of innovation and skills benefits.** A project had already developed innovations that meant a stronger position for the UK plant within the wider multinational. The interviews validated the skilled employment, ranging from projects tapping into UK strengths in its technical workforce to the companies viewing the long-term projects justifying investing in skills development.

- **The supplier picture was complex.** There are anticipated benefits to UK suppliers, with many business models procuring from the UK. Supplier lists were analysed to show how R&D supply chains involved universities, research businesses and many of these were in the UK. Businesses however also noted how competitions to contract for suppliers did not constrain geographically, sourcing in global marketplaces for components or services.

For the qualitative evidence gathering, the study has focused on the relatively recent and continuing projects. These project level case studies benefit from the key stakeholders still being identifiable and contactable. Also, interviewees can recall events. However, the scale of the projects' impacts can then be harder to describe, as many are in early stages of delivering outcomes.

The quantitative analysis focused on the decisions made by large businesses about location for the period after 2010 for around 8,000 manufacturing and health science businesses, including 100 that are supported by RGF or eRGF Regional Projects. Pooling the eRGF projects with the RGF Regional Projects provided a larger sample over a longer period and effects could be expected to be common across eRGF and RGF projects. The quantitative analysis also separately used ONS data about the employment in the businesses.

- **Supported plants are more likely to expand than other plants.** The first analysis looks at the proxy measure for business expansion at a plant: the businesses announcing an expansion. Data from the European Restructuring Monitor contains all major restructuring events sourced from data about public announcements and government notifications. The restructuring dataset contains 116 expansion events in the businesses in eRGF sectors for the period since 2010. Of these six can be correlated with the support provided through RGF. A portion of these announcements are estimates as additional, in that they occur even after controlling for the underlying chance of making such announcements. Of the six announcements, RGF support would explain up to 3 more expansion announcements. These results are consistent with assumptions made when eRGF projects were appraised: the likelihood of expanding increases but around half of that would have occurred without support.

- **Supported plants are less likely to announce a closure than other plants.** A second analysis uses the announcements of businesses closing a plant or reducing employment in a plant. The dataset has comprehensively recorded significant UK restructurings 2002-21 and contains 117 events relevant to this study where businesses announced a closure or offshoring of their activities. None of these events took place in the plants benefitting from RGF support, and this is tested and found to be significantly lower than would have been expected. Based on the characteristics of the RGF plants, the number of businesses that might announce closure/relocation is estimated and the change in this attributable to RGF estimated. There are 0.2 fewer announcements attributable to RGF support.

- **Jobs at RGF supported plants attract a wage premium.** Analysing an ONS database of jobs at UK businesses, the value of the additional employment effect is estimated using a wage premium analysis. When an individual changes job moving to an unsupported business, on average, their pay rises by 11.9%. This is about half the improvement in pay seen when individuals move to the RGF supported businesses, which is 20.2%, suggesting the premium at eRGF businesses is around 10%.

- **Evidence consistent with assumptions made when projects were approved.** Using the wages paid, the premium in weekly wages is £125, a figure that is comparable to the average £155 assumed in the original appraisal. The appraisal estimate is necessarily higher, as it includes a factor to take account of long-term effects on wages, skills and labour quality in a counterfactual of a relative lack of good employment opportunities.

Investments made are long-term, and the evaluation takes place as projects are reaching conclusion with impacts yet to fully occur. The evaluation highlights risks, and risk analysis was central to both government decision making over funding and the overall business decisions. On the government side, projects were shaped to allow for rescoping at interim stages with further funding contingent on early outcomes. However, across projects, the outcomes in future years were also affected by the wider regulatory and policy context. Key issues noted included the availability of similar incentives in competitor economies, and the paths taken on regulatory and wider policy as the UK took control of industrial policies after leaving the European Union.

This study has some caveats. Analysis has relied on a relatively small set of investments and so statistical analysis has had to look across both eRGF and comparable investments made through the earlier RGF Regional Projects. It is not possible to clarify any difference. A concern would be that the eRGF projects would differ from the wider RGF both in terms of the logic of the intervention and the selection processes used in the eRGF.

The discussion about this limitation of the analysis draws out two aspects of the RGF support that suggest a quantitative analysis pooling RGF Regional Projects and eRGF projects is not too indirect a route to evaluate the eRGF specifically. Firstly, in pooling analysis, the results highlight that the Regional Projects had the location effects desired in supporting business expansions in the UK and reducing events associated with job losses.

The logic across the eRGF and the Regional Projects of the RGF does have that common purpose of supporting businesses at the plant-level to expand or safeguard the existing employment. The decisions over locating significant production or R&D capabilities are not made frequently and the government intervention measures to encourage decisions develop over time. Secondly, the quantitative analysis benefits from analysis looking across a decade of decisions and arguably the eRGF reflects a maturing over the RGF Regional projects in approach rather than changing radically.

This maturing of the approach is most marked in the application processes employed for eRGF projects, and the scrutiny of the proposed projects. These have more explicitly considered the location decision in a multinational, with businesses articulating much more of the internal factors as they consider the placing of key investments. The application process is a departure from the

original RGF process, but more in its focus on the drivers for the long-term impacts expected and decisions about where investments occur. Both interventions' projects are long-term, and pooling across RGF and eRGF projects has allowed analysis to explore and test the underlying assumptions of the drivers for the changes, outcomes and impacts, something likely to be common for the RGF and the eRGF version of support.

1. Introduction

1.1 Background and context

The Exceptional Regional Growth Fund (eRGF) – which was part of the wider Regional Growth Fund (RGF) – provided support for projects in large, usually manufacturing, businesses. Projects had significant potential for generating economic growth and created or sustained additional private sector employment. The eRGF funded:

- Bids that present an opportunity to secure internationally mobile investment; or
- Projects that respond quickly to significant economic shocks should a business relocate activities from a UK establishment.

The projects were substantial investments in UK locations with considerable co-investment by the business providing sustained high-quality employment, associated with R&D and wider supply chain impacts. A key characteristic of the funding was it seeking to alter the strategic decision of businesses as they consider options to invest in the UK against alternatives outside the UK. The aim was to incentivise maintaining or developing a UK presence, using the eRGF grant to switch the decision to favour the UK. Processes were in place to set the level of support so that this incentive would be the amount needed and no more, by assessing the non-UK options and the extent to which they might be more attractive to a business due to lower overall costs or better/faster returns on investment.

eRGF was exceptional to the wider RGF interventions. eRGF has paralleled this as a discretionary support to react quickly to opportunities outside of the RGF rounds and has continued for the period since RGF funding ended. RGF generally operated within specific rounds, involving formal application with specific timings. In the RGF, the Regional Projects[1] strand was most similar to the exceptional RGF in supporting larger businesses with major investments in plants or facilities; other RGF strands focused on small businesses and investments into place.

The eRGF grant recipients are typically large manufacturers and large employers. Most are also driving innovation in their respective industries through R&D in the UK. The beneficiaries generally have also had a long presence in the UK; many of the businesses have operated in the supported plants for several decades. The government investments met a minimum application for funding of £1m, ranging up to £36m. The projects typically involved capital investment by a business (e.g., upgrade/ expansion of premises), or investment in new often research and development facilities. These would secure new or safeguard existing employment.

This study evaluates the 10 live investments made, which provided £101m of grant support complemented by a further £555m of co-investment from the businesses. Overall, the eRGF projects forecast in their initial applications 31,300 years of safeguarded employment and 8,700 years of new employment. The evaluation uses a mix of qualitative and quantitative analysis. As there are relatively few projects, the quantitative analysis also draws evidence from the wider RGF projects, which supported a further 90 businesses.

1.2 Evaluation Approach

The evaluation approach is to test the logic model of the eRGF support. This is undertaken using interviews with those involved in eRGF providing qualitative evidence that links the funding provided to the locating by a multinational business of significant investments in the UK, and that

[1] RGF Regional Projects closed to applications in 2015.

this is borne out in the various steps in that decision. Qualitative evidence also then is used to explore the impacts expected after the investments.

For the quantitative analysis, the analysis covers both eRGF and RGF Regional Projects as the eRGF projects alone provide too small a sample. The quantitative analysis then tests whether location decisions do differ for RGF beneficiaries to the decisions made in comparable businesses about restructurings. For this, the analysis uses the European Restructuring Monitor[2] (ERM) database of restructuring events, listing UK announcements after decisions of manufacturers and life science businesses about closures, expansions and other restructurings. Statistical modelling estimates whether eRGF support increases the chance of expansion or decreases the chance of plant closure taking account of the characteristics of the plants.

As the main effect of locating activity in the UK is employment, a second strand to the quantitative analysis looks at whether assumed benefits from this decision are valid. It looks at evidence of the benefits of any additional employment and checking they are high value jobs. This uses a business survey of employee wages. Both the location decision and earning analyses use both eRGF projects and RGF projects to increase the power of the statistical analysis.

1.3 Summary of Evaluation Findings

Case studies confirmed that the location decisions were a competition between sites across different countries within the multinational parent and indicated benefits for the UK. The logic of the eRGF intervention was checked: the timing, scale and delivery of the eRGF support did have the desired effect of influencing the decision about where businesses located their next investment. The studies indicated that the projects were delivering impacts, primarily the employment associated with the new investments and innovation was highlighted.

A question is whether this would have happened without support and quantitative analysis focuses on the restructuring decisions of supported businesses modelling what would have happened without support. The chance of announcing a business expansion is increased for businesses supported by RGF projects; and the chance of announcing closures of job losses reduced. DBT appraised the likely effect on business decisions of eRGF when approving projects. The appraisals used an assumption that around half the benefits are additional, or that business location decisions would favour the UK to that extent. The evaluation results are consistent with these deadweight assumptions that DBT made when appraising projects.

A second key component was the quality of the employment that investments would drive. The earnings analysis then indicates the employment generated in the supported businesses attracts a wage premium and this is similar in scale to the assumptions made in the appraisal of projects. These two findings validate the assumptions made as benefits were estimated during the appraisal of business cases as projects were approved. It indicates that at this stage the supported projects are delivering the value for money expected.

There are constraints to analysing a relatively small number of projects and quite soon after they have been initiated. To some extent the analysis has had to focus on confirming that the expectations of future impacts is well-grounded, as there is insufficient evidence of the actual effects at this stage. This has the potential to understate the risks to the forecasts and assumptions. This has also meant that the exceptional nature of this support has only been investigated partially, as findings often must generalise from evidence across the exceptional RGF and the wider Fund.

[2] https://www.eurofound.europa.eu/en/european-restructuring-monitor

Findings from report chapters

Chapter 2 summarises the eRGF and outlines the evaluation approach.

- By September 2023, there are 10 live projects with the first initiated in financial year 2016/17 and four further projects yet to be initiated. The planned investments into the businesses are £101m of grant support. There is then a further £555m of co-investment from the businesses.
- The projects forecast 31,300 years of safeguarded employment and 8,700 years of new employment. Safeguarded employment peaks in 2021 at 4,500 safeguarded jobs and, for the new jobs, the highest level is in 2019 at 1,100. The projects also have estimates of the supply chain employment dependent on the plants, estimated using ONS multipliers at 5,600 further jobs.
- eRGF projects were identified for eRGF funding through the wider interactions government had with large businesses, where there was potential for a suitable project meeting eRGF criteria.
- eRGF project business cases are subjected to in-depth appraisal (including a due diligence process) ahead of award. The case for assistance sets the grant awarded to a business to be the cost gap between locating investment in the UK versus a counterfactual, non-UK option. The alternative was normally more attractive to businesses due to lower overall costs or better/faster returns on investment.
- Projects secured large co-investment into the UK from the businesses, sometimes 20 times the grant funding provided. Businesses provided estimates of the employment and other effects of the projects, with DBT's contemporary assessed additionality rates yielding more than half these as additional, so that less than half would have occurred without support.
- Employment benefits were the only monetised benefits in the case for support in all but a few projects, with a few projects having R&D spillovers also. This implies that evaluating the employment effects, and the extent to which they are materialising, would be a crucial validation of the quantitative elements of the business cases for the project.
- The employment effects are also monetised. The value of the additional jobs safeguarded or created by the projects has been valued by their wage premium. The premium over comparable jobs paid was assessed by DBT to be £155 per week for the supported businesses' job creation/safeguarding. The appraisal estimate is necessarily higher, as it includes a factor to take account of long-term effects on wages, skills and labour quality in a counterfactual of a relative lack of good employment opportunities.

Chapter 3 presents findings from seven project-level case studies. The evaluation's case studies combine interviews with project leads, project document review and other desk research. Triangulating evidence from different sources allows the analysis to capture impacts and corroborate this through the combination of sources.

- Case studies confirmed that the location decision in the multinationals was a competition between sites across different countries within the parent. The global decision making would be based on cost differentials, and the advantages and disadvantages of alternative sites.
- Case studies also highlighted that the business' option analysis would be influenced by incentives provided by the governments of the other countries with many also providing publicly funded financial incentives to locate. An observation was that, unlike the eRGF, these were funds accessible to businesses in more formal application processes than the routes through which eRGF was secured, which were viewed as informal referrals.
- There was across all projects an acknowledgement that the eRGF was important in securing the investment in the UK. Some projects viewed the support as needed merely to continue any operation in the UK, with the UK plant expected to close without assistance. Investments were

viewed as long-term commitments, securing product lines with lengthy production life or locating innovation in the UK by investment in R&D facilities.

- Innovation was highlighted. Investments are associated with locating future generations of electric vehicles in the UK, described as step changes in technologies. Projects highlighted the concentration of innovativeness in ecosystems that the investment would contribute to. A project had already developed innovations that meant a stronger position for the UK plant within the wider multinational.

- The strengths of the cases of the alternative non-UK sites were highlighted: many had cost advantages, or comparable R&D systems.

- The interviews validated the skilled employment, ranging from projects tapping into UK strengths in its technical workforce to the companies viewing the long-term projects justifying investing in skills development.

- The supplier picture was complex. There are anticipated benefits to UK suppliers, with many business models procuring from the UK. Supplier lists were analysed to show how R&D supply chains involved universities, research businesses and many of these were in the UK. Businesses however also noted how competitions to contract for suppliers did not constrain geographically, sourcing in global marketplaces for components or services.

The quantitative analysis – in chapters 4 and 5 – widen the scope of the evidence to all RGF projects, combining the direct investments into large businesses funded through eRGF with the wider large-scale investments (called Regional Projects) that the RGF funded. The RGF projects were evaluated in BEIS (2022) and the quantitative analysis builds on approaches taken there.

In chapter 4, the decision about whether to invest in the UK made by large corporations is analysed using datasets about location decisions of UK businesses for the last decade. Using this evidence about decisions across numerous businesses in manufacturing and life sciences, the scale of any RGF effect could be calibrated. The data centres on restructuring events, the occasions where businesses implement a strategic decision that involves plant closure, job losses, relocations, as well as announcements of expansion.

- Analysis focuses on the period after 2010 for around 8,000 manufacturing and health science businesses, including 100 that are supported by RGF or eRGF projects. The first analysis looks at whether RGF support drives businesses making announcements of expansions in employment. The restructuring dataset contains 116 events where businesses announce expansions. Of these six can be correlated with the support provided through RGF. A portion of the announcements are additional, in that they occur even after controlling for the underlying chance of making such announcement. Of the six announcements, RGF support would explain up to 3 more expansion announcements.

- A second analysis looks at the announcements of businesses deciding to close a plant or reduce employment in a plant. The dataset contains 117 events where businesses announced a closure or offshoring of their activities. None of these events took place in the plants benefitting from RGF support, though three restructurings did occur in the supported enterprises affecting plants not benefitting from RGF but owned by the parent company.

- Based on the characteristics of the RGF plants, the number of businesses that might announce closure/relocation is estimated and the change in this attributable to RGF estimated. There are 0.2 fewer announcements attributable to RGF support.

Chapter 5 builds on analysis of businesses' decision to locate their investments in the UK, exploring the employment then created in the businesses. It looks at survey data about the individuals working in supported businesses. Analysis establishes whether the employment is more remunerative than the comparable employment available for the individuals. If so, this is strong evidence that the jobs have a productivity premium.

- The value of the additional employment effect is estimated using a wage premium analysis. When an individual changes job, on average, their pay rises by 11.9%. This is about the half the improvement in pay seen when individuals move to the RGF supported businesses, which is 20.2%, suggesting the premium is around 10%.
- Using the wages paid, the premium in weekly wages is £125, a figure that is comparable to the average £155 assumed in the appraisals of eRGF projects though a little lower.

2. Evaluating the Exceptional RGF delivery

This chapter describes the eRGF projects and the processes for businesses to secure eRGF support. It then maps out how impacts can be evaluated tailoring the approach to the challenges of assessing effects. A case-by-case approach was taken by the Department for Business and Trade as it identified and progressed applications for eRGF support, and this drives the impact evaluation approach. This reflects the nature of the eRGF, where eRGF projects were identified through the wider interactions government had with large businesses rather than the formal RGF application and selection processes.

Qualitative, case study evidence evaluates processes, recognising that the business cases for support were highly differentiated. There is also potential to look at whether eRGF support will lead to the long-term impacts expected as projects were appraised. This would be less direct testing the key assumptions about how impacts arise. It focuses on quantifying whether business decisions are being influenced as expected and whether the employment eRGF projects create or safeguard are high value.

2.1 Exceptional Support from the Regional Growth Fund

The eRGF investments were a relatively small number of individual projects supporting large businesses, with the projects spread over a number of years. This section provides an overview of the eRGF interventions and describes the way the support was delivered, especially the way projects were identified and appraised. It then highlights some of the challenges of evaluating the impacts of the eRGF.

Overview of the eRGF Projects

The eRGF investments were individual projects, meeting a minimum application for funding of £1m, ranging up to £36m. These were grants to businesses directly from the Fund with projects consisting of capital investment by a business (e.g., upgrade/ expansion of premises or the installation of new plant and machinery), or investment in skills or research and development (R&D). The supported businesses are large, often global players in their sector.

By September 2023, there were 10 live projects with the first initiated in financial year 2016/17. Four further projects were yet to be initiated and being considered; a further ten projects have not been progressed, and their applications were closed. The initiated projects were expected to last between 3 and 10 years and, as with the wider RGF, a focus was the creation and safeguarding of jobs. The employment in the supported businesses is just under 21,500 aggregating the employment numbers of the supported companies in their annual accounts. Using the ONS geographical database NOMIS and the industry and postcodes for the supported plants within the businesses, the plant level employment is lower as some businesses have multiple plants. Employment in the supported plants was approximately 17,000.

The businesses received £101m of grant support. There was then a further £555m of co-investment from the businesses, so that the projects are £656m. Applicants forecasted 31,300 years of safeguarded employment and 8,700 years of new employment. Safeguarded employment peaked in 2021 at 4,500 safeguarded jobs and, for the new jobs, the highest level was in 2019 at 1,100. The projects also have estimates of the supply chain employment dependent on the projects, estimated using ONS multipliers at 5,600 further jobs.

Applications process and selection

The application to DBT for RGF funding differed somewhat for eRGF from the wider Regional Growth Fund. Unlike the RGF, the eRGF did not have a formal application process. Each application for eRGF was taken on a case-by-case basis. There was no call for applicants, timings associated with submissions and decisions, and there was no formal marketing of the exceptional

funding. Rather, as part of wider interactions government had with large businesses, where the potential for a suitable project was identified, the business was directed to the RGF team for eRGF funding (though no ring fenced DBT budget existed for eRGF). The circumstances were usually where the business was known to be considering a decision over the location of a significant investment in the UK or were planning to disinvest from the UK. Through eRGF, Ministers had an option to respond quickly, funding projects to avoid any consequent significant economic shock or to secure internationally mobile investment.

There were criteria for the funding. Applications had to be associated with a significant opportunity related to an investment; that is the creation of a substantial amount of jobs in the local area by funding a project. Alternatively, the need for eRGF support might avoid the effects of significant shocks in local labour markets; that is investments related to the safeguarding of a substantial number of jobs in a local area. These criteria aligned with the wider RGF, but some conditions of the RGF, such as the requirement for projects to be in areas where employment was highly dependent on the public sector, were relaxed for eRGF.

eRGF applications involved a business case expressing how any funding met requirements, such as the award resulting in significant private sector leverage; sustainable job creation/safeguarding; value for money; state aid compliance; clear wider benefits or unique strategic importance to the UK economy; and that Government involvement must be small in relation to the overall private investment.

Alongside DBT acting as the sponsor Department for a project, Department for Energy Security and Net Zero (DESNZ) and the Department for Science, Innovation and Technology (DSIT) also acted as sponsors, though application and selection was conducted by DBT (and its predecessor departments). Applications had a case officer associated with each from the sponsor department. The sectoral focus of these departments may have determined which businesses were referred to eRGF. There is a focus on the automotive sector, in part reflecting DBT relations with the sector but also driven by that sector's importance to the UK regions, reliant on highly globalised companies. A second feature of the sectoral focus would be areas of the economy where there were technology-driven restructurings, such as that associated with electrification of vehicles.

All eRGF awards were subjected to in-depth appraisal (including a due diligence process) and scrutiny within the Department, under the DBT Industrial Development Advisory Board (IDAB) and DBT Ministers and then would be considered by HM Treasury. Cases were built on three pillars: the case for assistance, subsidy control and value for money. These pillars looked at the case through different lenses.

Pillar 1: Case for assistance. Applicants needed to demonstrate the case for assistance using a credible counterfactual argument (i.e. what would happen in the absence of public support), and that this outcome was likely to happen where grant support was not forthcoming, The second aspect to be demonstrated – that the minimum amount of grant necessary is requested – was based on the cost or financial gap between delivering the project in the UK and the non-UK option (which could be do nothing). Applicants provided detailed financial information for both the scenarios and there were external accountants' scrutiny of the cost models, looking critically at the cost assumptions made comparing the UK and counterfactual locations.

Pillar 2: Value for money. Value for money (VFM) assessment was a key aspect of the eRGF appraisal process and a requirement for every eRGF bid as part of obligations in reporting to HM Treasury, IDAB, the National Audit Office, etc. The VfM assessment was closely linked to the case for assistance, used the counterfactual proposed in the application and the external scrutiny. Government economists assessed economic benefits arising. Although these vary from case to case, the main sources of economic benefits were high-value jobs, training and upskilling of the UK workforce, and knowledge spillover from research and development (R&D) activity.

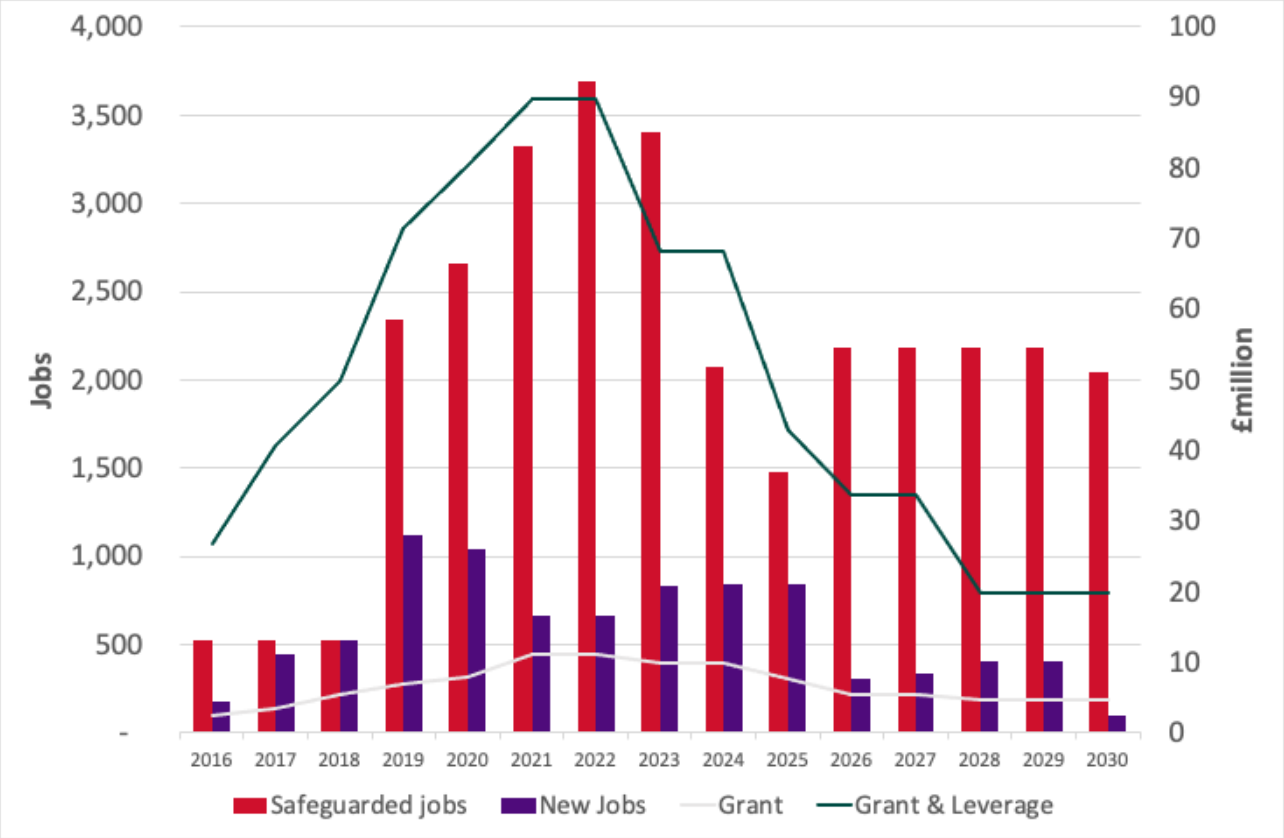
Pillar 3: Subsidy Control. All eRGF cases were subject to the Subsidy Control Act 2022. Sector policy teams were responsible for completing the subsidy control assessment and referring cases to the Competition and Markets Authority as appropriate. Application processes involved a State Aid test and, as the eRGF would not fund any projects that would be identified as State Aid grants, offers included provisions to claw back funding should the European Commission determine the project State Aid.

Timings of the expenditures and employment outcomes

eRGF was monitored using the wider RGF processes. Department monitoring officers were in place that collected data from each project about outcomes. Each award was monitored quarterly, for a period varying by projects but typically starting when the grant offer was accepted and then extending for around five years after the final instalment of grant payment. The monitoring period varied for projects, extending beyond five years after the end of funding if this was needed to cover the entire period when impacts were forecast.

Figure 2.1 plots out the grant levels, leverage and jobs for each year across the eight live projects. This has been modelled for some projects by apportioning over time using start and end dates for the projects as expenditures for each year were complicated by being a mixture of applications, plans and forecasts. On this basis, the grant level then peaked at around £10m in 2021 and averages about half that for the rest of the period. The grant then leverages investment from companies, and this is plotted. It provides about £7 per pound of grant.

Figure 2.1: eRGF Expenditure, Co-investment and Employment



The employment estimates are based on returns made to DBT by projects for the jobs created and safeguarded. The main employment outcome was safeguarded jobs as the eRGF projects were primarily supporting the continued operation of existing UK plants. Employment safeguarded peaked in the 2021-23 period at over 3,000 jobs safeguarded annually then forecast to maintain 2,000 jobs during the rest of the 2020s. The safeguarded jobs represented about a third of the

current employment in the supported plants, and this was higher in some projects where plants faced closure in the alternative options for the businesses.

Challenges of evaluating the Exceptional RGF support

This evaluation seeks to answer two main research questions:

- RQ1: whether the eRGF support materially changed the location decision for the supported businesses in favour of the UK and the implications of the location decision.
- RQ2: whether there is additional employment due to the eRGF support and whether it attracts a (local) wage premium (underpinned by inherently high GVA/productivity driving activities).

eRGF was business support that targeted large, complex businesses, seeking to incentivise a business' strategic decision. It delivered interventions on a case-by-case basis. While many of the processes associated with the eRGF were standardised and based on the wider RGF programme, eRGF interventions were necessarily quite tailored, spread over a long period and involved relatively few projects. As the business decisions being influenced were over investments into plants, economic outcomes would also be over a long timeframe and preceded by periods when facilities or plants were being built or refurbished.

This means there are some challenges in evaluating impacts. Robust impact evaluation quantifies the additional effects of an intervention comparing outcomes in the supported businesses with a suitable comparator called the counterfactual. The research questions both focus on effects attributable to eRGF. For this to be estimated, the number of supported businesses must be relatively high for the more statistical approaches; for qualitative approaches, interventions would need to be relatively recent so that it is possible to identify interviewees, and they can recall impacts and outcomes. A further concern for this evaluation is that the investments that follow a location decision will be long-term in nature and the effects of support – such as additional R&D with spillovers or supply chain impacts – are hard to measure directly.

Figure 2.2: Evaluation approach

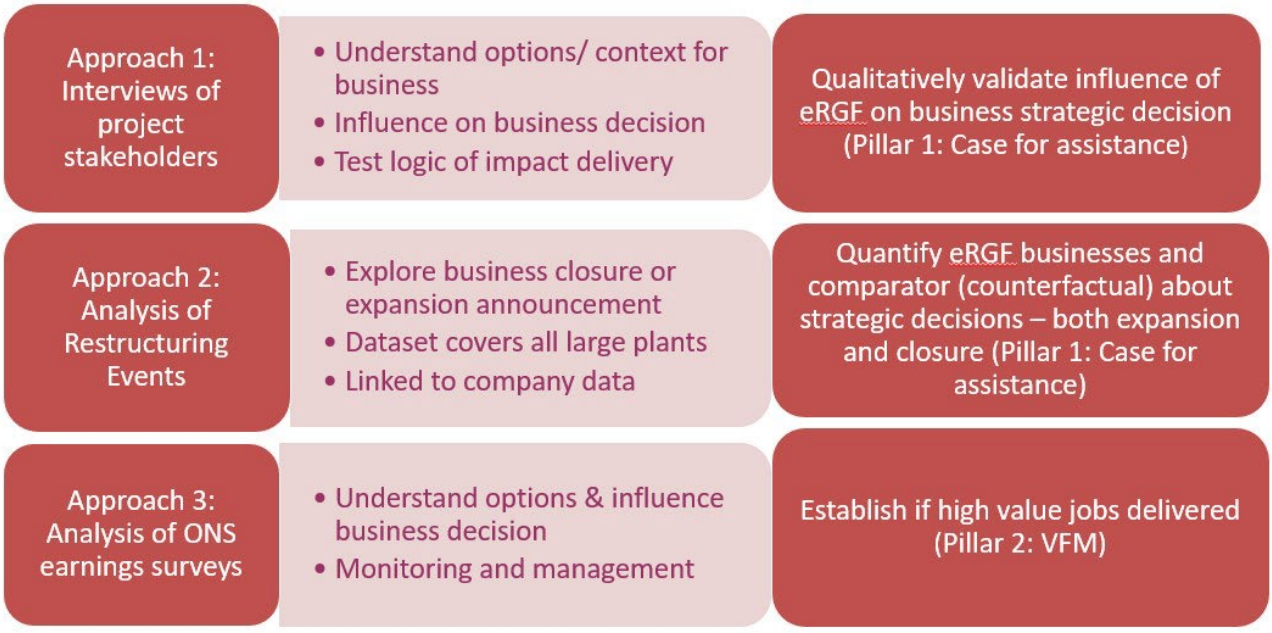


Figure 2.2 summarises the approach taken to evaluate eRGF impacts, with the next sections detailing this and how research questions are answered through it. The approach mixes qualitative cases studies and quantitative analysis of data covering the businesses supported by eRGF and RGF Regional Projects, and a wider set of comparable businesses. The approach centres on validating assumptions made about how the eRGF delivers impact (the logic model). There is a

mix of behavioural, process and timing assumptions about how, where and when businesses make decision about their investments. Approach 1 in the figure, using case studies based on interviews, explores the context of business decisions and the how behaviours in businesses are affected by eRGF support.

Evaluations can benefit from integrating evidence of businesses that considered eRGF support. There were ten businesses that were referred to eRGF but then did not progress to a funded project by the time of the evaluation. The information about these projects (including those still under consideration) has not been used in the evaluation. Because eRGF did not have a formal application process, the evidence about these projects was highly variable and the reason for not progressing not explicitly determined. Few had submitted a full bid, withdrawing in the discussions and scrutiny prior to this. For those with documents about what the project entailed, the commercial sensitivity of the cases being made, especially as the business was likely to be considering alternative options, was very high. This limited the potential to collect qualitative evidence through interviews. For the older potential projects, identifying interviewees would be difficult and their ability to recall events would be hard.

Approach 2 focuses on one of the assumptions crucial in the appraisal. This is that the support influences the businesses to maintain or locate activity in the UK that otherwise would have been moved to an alternative non-UK location. This can be tested quantitatively as there is data about the restructuring and location decisions that covers eRGF, RGF and other large businesses. Both approaches 1 and 2 evaluate the first pillar, the Case for assistance. To enhance robustness through having a larger number of cases, the analysis uses both eRGF projects and the RGF Regional Projects.

A concern would be that the eRGF projects would differ from the wider RGF both in terms of the logic of the intervention and the selection processes used in the eRGF. The logic across the eRGF and the Regional Projects of the RGF does have that common purpose of supporting businesses at the plant-level to expand or safeguard the existing employment. The decisions over locating significant production or R&D capabilities are not made frequently and the government intervention measures to encourage decisions develop over time. The quantitative analysis benefits from analysis looking across a decade of decisions and the arguably the eRGF reflects a maturing over the RGF Regional projects in approach rather than changed radically.

Pillar 2 is evaluated by focusing on the key long-term impact as investments complete: the delivery or high value employment. In appraising the projects, DBT identified other impacts (such as R&D spillovers), but the most significant impact was employment. Further, for quantitative analysis, this is well measured and there are methods to assess the quality of employment in supported businesses.

2.2 Evaluating outcomes and impacts in the supported business

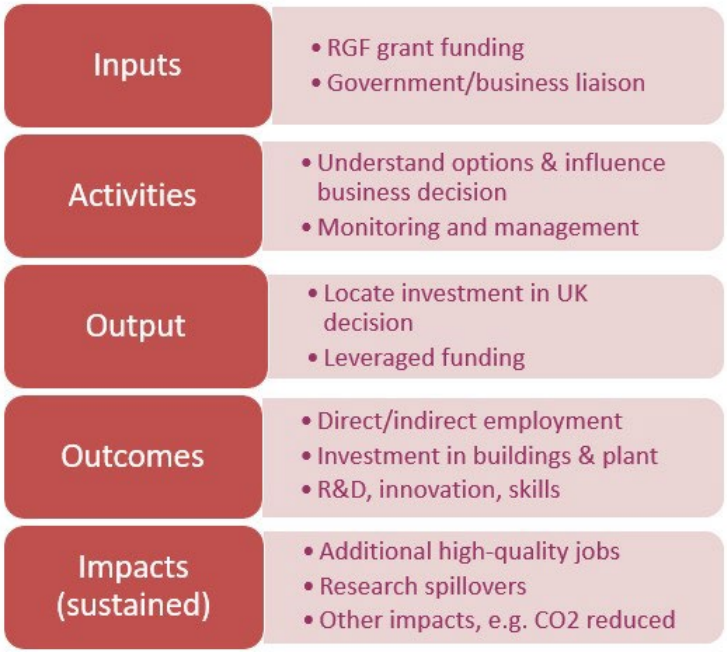
The last section sets out the evaluation challenges to attribute effects to support, even some years after eRGF interventions. For the appraisal at the time support, modelled forecasts were used to provide a counterfactual. The study focuses on validating the underlying logic and quantitative assumptions underpinning the effects that were forecast at appraisal. This section explains how this is a viable evaluation strategy and then maps out where qualitative and quantitative evidence may be used. It finally lists the quantitative assumptions that will be tested.

Logic of exceptional RGF support

Evaluation evidence is often linked to the intervention logic, starting with the problem that the government action seeks to solve. The logic model tracks how the intervention then results in changes in different outputs, outcomes and impacts, and this modelling provides a useful framework on which to hang the measurable aspects of the support measure.

A key output of the eRGF support was to contract the business to maintain or expand its UK operations. The figure indicates this central part of the eRGF logic, with inputs and activities undertaken to provide the minimum grant meeting the additional costs to the businesses associated with this decision.

Figure 2.3: e-RGF Logic Model



As the eRGF intervention was targeting the business location decision, interventions were timed around when these decisions would be made and to intervene with the support into the processes for decision making. An assumption was that multinationals make their location decisions at global board level looking across options in multiple countries. The role of the support would be to incentivise these decisions towards the UK.

This logic follows from recent research highlighting (e.g., Lampón, González-Benito and García-Vázquez, 2015) how business relocation outcomes are the consequences of competitions internal within a multinational. Rivalry over the efficiency of the UK plant compared with other plants within the same multinational is a more important reason than competition across different businesses in locating production.

The application process resulted in considerable information relevant to how the eRGF activities could influence the case being made within a multinational over the location of their production. As well as applications describing the investment that the company might locate in the UK, eRGF applicants described the internal competition process, set out the alternative location being considered, the ultimate decision maker (usually the global board of the multinational), the company's decision-making process, including the appraisals, feasibility studies, precedents supporting the applicant company's location decisions. Evidence would also cover how this economic activity related to a project is associated with R&D, skills developed, wider spillovers and indirect employment in the supply chain.

Evaluating outcomes and impacts by testing the logic of the eRGF

A qualitative approach has been used to test the logic of the eRGF intervention in Figure 2.3 and then explore the early outcomes and impacts related to the support. The analysis uses case studies of seven beneficiaries of the eRGF. It explores the logic of the development and implementation of the projects in each business through reviewing documents associated with the investments and interviews of those involved in the project and leading project delivery.

The analysis is used to explore some specific research questions, primarily the extent to which eRGF influenced location decisions and the implications of this (RQ1). It secondly also explores the impacts of the eRGF support, in terms of the employment generated in supported plants and the longevity of that effect (RQ2). This is assessed qualitatively, considering how businesses have put in place physical infrastructure and skills investments that correlate with long-term economic activity being in the UK.

Evaluating the location decision using data

There are many thousands of jobs created and safeguarded following the eRGF support. A crucial first stage in these effects is the location decision. The first research question, whether the eRGF support materially changed the location decision for the supported businesses in favour of the UK and the implications of the location decision (RQ1), recognises this.

This justifies a different approach to that used in the evaluation of the full RGF, where additional employment effects are evaluated using a quasi-experimental approach at firm level. It models how RGF applicants were selected for support and then identifies comparable non-beneficiaries using statistical matching techniques to find businesses that appear as if they would have been selected given their observable business characteristics. The increase in the outcome of interest (employment, turnover, and labour productivity, investment etc.) seen in the beneficiary businesses can then be adjusted for any change seen in the control group.

Evaluating the eRGF builds on this. The approach pools the eRGF and RGF supported plants and then links these businesses to a dataset about plant-level restructuring decisions. The European Restructuring Monitor records restructuring events in private and public sector entities and across sectors. A restructuring covers a range of events, including expansion, relocation, and closure, that a business initiates. For large businesses, these are often announced to the media or reported to government and other stakeholders such as trades unions. The events have been compiled recording the organisation, the site affected, as well as type, scale and timing of the event. The database is available about these covering the last few decades. The evaluation uses this events database to quantify whether eRGF affects business decision making about expansions and closures.

Evaluating Employment Impacts

Additional employment is not in itself always an impact, as the Green Book increasingly views the UK labour market as at full employment and so able to provide employment. For any job to provide benefits, the additional jobs should either be associated with some wage premium, reflecting it being a high-quality job, or in an area where full employment is demonstrably not present. The evaluation then seeks to answer the second question quantitatively, does the employment attract a wage premium?

In appraising the projects, when DBT decided to support a project, the central estimate of direct jobs for each year of the project is valued using the wage premium over a counterfactual job. The ONS Annual Survey of Hours and Earnings (ASHE) is used. ASHE is an employer-employee survey where – each year – the wages, hours worked and occupation of 1% of employees is requested from businesses. The survey includes the location of the jobs, and the sample size is sufficient to model the wage distribution of jobs in a local area.

While during the appraisal, wage modelling was undertaken establishing the pay distribution at industry and occupation level to provide the counterfactual for the jobs of this kind in the applicant projects, to evaluate the actual jobs in the business a relatively simple analysis is undertaken checking the actual outturn in the supported businesses. ASHE survey responses can be analysed at firm level in the ONS Secure Research Service (SRS). The SRS is a secure setting in which, under anonymised conditions non-disclosive analysis can be undertaken for publication. The analysis can test if the premiums expected at application are materialising.

One aspect to note is that the logic of RGF support does not expect support to cause a change in the wage premium (though arguably under some circumstance this may occur). This is helpful for analysis, as it means the timing of support does not need to be integrated into the analysis. Had this been needed, it would motivate a before/after support analysis considerably increasing the number of observations of wages needed. The analysis only explores whether working in the business is associated with a wage premium (i.e. the same person working in a supported business gets paid more than if the same person were working at an unsupported business). This tests the intervention logic that support is safeguarding/creating high quality jobs, and the benefits are from this incremental improvement in the quality of jobs rather than having the jobs only.

Expected impacts of the eRGF projects: Assumptions made

The eRGF's decision to support a business was based on a value for money assessment to estimate whether a projects benefits merited the costs to public purse. Benefit cost ratios were calculated based on estimates of the monetised benefits, with the benefits valued primarily being the employment effects and, where projects focused on R&D, the spillovers of the innovation investments. The approach to the modelling was standardised: applicants worked with DBT to provide forecasts of outputs, such as the employment safeguarded, in an agreed form, and then assumptions were applied on how these would translate into impacts. A sample of projects have been reviewed and the key assumptions drawn out.

Table 2.1: Summary of VFM assumptions for sample of projects

Assumption	Description	Values taken	
		Median	Range
Deadweight	Share of effects that would have happened anyway, without support. Scales benefits proportionately down	50%	35%-75%
Wage premium in 2022	Weekly wage benefit associated with additional jobs, include value of scarring effects of Covid Pandemic	£155	£52-£259
R&D Spillovers	Valuation of the wider benefits through assumption applied to change in stock of R&D	None	n.a

Table 2.1 indicates the three main assumptions used in the assessment of VFM and then estimates the median level of the assumptions across the projects. The assumptions differed across projects, and the table indicates the range of values that were made in different projects. A first assumption is around the chance that the project effects would have arisen without support. DBT's analysis as project applications were assessed looked critically at the potential for the businesses to either entirely cancel their investments or scale these back should government support not occur. This suggested different ranges of deadweight with the central estimate across the projects, i.e. the median, being 50%.

The second assumption was the wage premium used to assess the employment effects. Applicants were asked to provide details of the jobs that they expected to be created and safeguarded both directly in the supported plant and indirectly in supply chains or contracted in jobs. The wages to be paid to the employees as well the skill level was considered. The analysis then progressed using survey data from ASHE to find comparable employment in the same labour market as the location of the investment. For the most recent projects, the analysis also adjusted the wages for the effects of the Pandemic, which was viewed as scarring the labour market due to the periods of furlough or reduced working. More generally, appraisals sought to take into account the long-term effects on skills and labour quality due to a lack of good employment opportunities.

The analysis to estimate the wage premium and then the value of the additional employment was therefore quite complex. The table summarises this in an overall measure, dividing the estimated value of the employment benefits by the number of weeks of employment in the assessment to estimate the weekly wage premium assumed. The jobs were assumed to last five years across the

study and so employment effects valued 260 weeks of employment. Each week of additional employment would be associated with a wage premium of £155 in the central estimate.

In most of the projects, the employment benefits were the only monetised impacts and provided most benefits for all but one of the surveyed projects. Hence, the median project had no R&D spillovers, as indicated in the table. However, around one in five projects had some R&D spillovers in their business case and in about half these the benefits were very high, as the project supported a plant that focused on R&D. Given the small number of projects in this category, the modelling assumptions could not be collapsed into a single measure that could then be tested in the evaluation quantitatively.

2.3 Concluding remarks

eRGF cases were subjected to in-depth appraisal ahead of award, compiling evidence about the alternative location options, the cost differences of operations in the UK/non-UK options and the expected outcomes of the projects. There was independent review of the evidence base, such as the cost modelling undertaken by businesses as they look at the funding gap that would emerge if a UK location was more expensive than the alternative. The body of evidence provided the gross effects of the project, such as the scale of investment when co-investment is included and the jobs associated with the new investment. The logic of the funding and how it incentivises location decisions can be tested qualitatively, confirming the various steps taken both at DBT and in the businesses as they consider options and the eRGF.

Appraisal then has focused on VFM and the additional impacts, calculating the additional benefits. This is underpinned by assumptions about what effects are additional and how to value these. This chapter outlines an evaluation approach for the quantitative dimension. The analysis proposed tests the assumptions used in the forecasted benefits, asking if these prove valid. At appraisal, projects forecast the jobs they would safeguard or create and the R&D investments they would make. DBT assessed that half these were additional, 50% would have occurred without support. The evaluation approach tests this happened.

The value of these additional effects was forecast to be the retention or creation of high value jobs. VFM would not be associated with the level of additional employment however, more in these additional jobs paying better. The premium over comparable jobs paid was assessed by DBT to be wages higher by £155 per week for the supported businesses' job creation/safeguarding. It is possible to check whether this is valid looking at wages paid in the supported businesses.

Employment benefits were the only benefits in the case for support in all but a few projects. This implies that evaluating the employment effects, and the extent to which this are materialising would be a crucial validation of the quantitative elements of the business cases for the project. However, R&D spillovers, the logic of why RGF support alters the location decision of a multinational decision to stay or move into the UK are also important to evaluate. A mix of qualitative methods with more quantitative is used, therefore, in this study.

3. Case Study Evidence about eRGF Investments

The Exceptional Regional Growth Fund (eRGF) supports projects that make significant investments into key employers and research-oriented businesses in regions across England. The projects are of a scale that, once co-investment by the businesses is considered, implies locating significant industrial capability in the UK. As the businesses are multinational, there is competition across different countries for the investments. The businesses make strategic decisions about their global footprint, and the RGF incentivises this to the UK.

This chapter complements the quantitative economic analysis with case studies of seven beneficiaries of the eRGF. It explores the logic of the development and implementation of the projects in each business through reviewing documents associated with the investments and interviews of those involved in the project and leading project delivery.

The chapter briefly outlines the methodology and summarises the project, reasons for providing the grant and expected outcomes at the time of application. Realised impacts and insights from project leads are also discussed to reflect on policy implications.

3.1 Case studies of eRGF investments

The evaluation's case studies combine interviews with project leads, project document review and other desk research. Triangulating evidence from different sources allows the analysis to capture impacts and corroborate this through the combination of sources. Figure 3.1 links the evidence gathered to the logic model, with the documents about projects and interviews with stakeholders combining to provide evidence across the logic.

Figure 3.1: eRGF logic model and case study approach

Table 3.1 provides an overview of eRGF beneficiaries that are the focus of case studies. Out of the seven projects considered, four are automotive manufacturers, one pharmaceutical manufacturer, one rail manufacturer and a quantum computing business. There is a diversity of projects, and they are progressing in different parts of England. The three main sources of evidence are:

- eRGF documents: Beneficiary applications for the eRGF grant and other supporting documents have been provided by the Department for Business and Trade (DBT). These documents have been analysed to understand details of the grant, context for seeking and approving the grant, and anticipated impacts at the time of application.
- Interviews: Qualitative interviews have been conducted with project leads. The interviews were used to collect evidence on impacts and the experience of the delivery process. Such

evidence is largely dependent on the knowledge and views of interviewees, particularly where the outcomes or impacts are of a more qualitative, intangible nature. The interviews lasted for about 45 mins and were conducted online.

- Supply Chain Research: Beneficiaries shared a list of suppliers. For each supplier on the list, firm-level data on its location, employment, turnover, and sector and segment classification was collected. Some qualitative evidence about the product or service offered, its location and evidence of engagement with the beneficiary was also collected.

Characterising Supported Businesses

The eRGF grant recipients are typically large manufacturers and large employers. Most are also driving innovation in their respective industries through R&D in the UK. For example, a pharma company is investing around a quarter of its UK revenue back into research and some of its popular drugs in the global market have been discovered at their UK facility and influenced the direction of British life sciences. The beneficiaries generally have also had a long presence in the UK; many of the businesses have operated in the supported plants for several decades. In one project, this is not the case, involving the locating of a significant investment which would be the multinational's first in the UK.

The table also indicates context for the location of future activities. As eRGF applications were being progressed, beneficiaries were considering whether to locate or remain in the UK, against opportunities to locate in other countries. The case studies each consider the decisions on location, taken at each business's board level, with UK presences being compared with options in other countries. These alternative plans had a fair level of specification at the time of application, and the "counterfactual" location also formed part of the evidence used by DBT in appraising the eRGF support. Table 3.1 summarises the reasons for considering moving to other countries, the areas being considered and the comparative advantage of a UK location over the identified other options. Generally, alternative locations are in advanced economies rather than shifts to low-wage economies, though many alternatives do have lower wage rates than the UK.

The mix of case studies also is broadly similar to the wider eRGF set of projects. There are four projects supporting the automotive sector and one where a rail manufacturing plant is supported. These investments involve R&D and innovation, but also then further significant investing in manufacturing capacity to translate new products and processes into production. These are made into existing UK plants. The other two projects are investments in R&D facilities, with one then leading to a new UK manufacturing presence for the business.

Table 3.1: Exceptional Regional Growth Fund projects used in case studies

Sector	Project Details		Grant Details					
	About the company	Project Period	Relocation options	UK advantage	Purpose of Grant	eRGF Grant	Leverage multiple	Jobs Secured & Other Benefits
Health sciences	Large pharma R&D presence in the UK.	2020-2025	EU at parent and US	Extant research; Track record	Build new research facility.	£10-25m	x 20	541 direct jobs and 187 contractor jobs. £2m support of PhD students.
Computing	New UK-based R&D facility into quantum computing	2022-2025	US at parent	Leading academic work in sector	Invest in a high-tech R&D facility.	£5-10m	x 2.5	24 direct jobs. Future phases to create 300 high value jobs.
Automotive	Manufacturer of components for passenger cars.	2016-2020	EU at established presence	Strong R&D	Support R&D to develop innovative products.	£1-5m	x 4	Secure 526.5 and deliver 10 new jobs. 263 safeguarded jobs in supply chain.
Automotive	Large car manufacturer.	2017-2020	Multiple established presences	Extant site	Support new and more automated manufacturing.	£10-25m	x 15	2,190 jobs and an additional 1,497 in supply chain.
Automotive	Electric vehicle production by OEM	2022-2025	EU	Extant site	Support more efficient EV production.	£25-50m	x 2	594 direct and 576 indirect jobs.
Automotive	Large car manufacturer.	2018-2022	EU	Good location	Support production of new line of vehicles.	£5-10m	x 20	174 jobs created; 1,271 jobs safeguarded
Rail	Rail manufacturing plant, part of industrial manufacturing group	2019-2023	EU at established presence	Extant site and low currency risk	Building manufacturing facility.	£5-10m	x 10	Create 232 direct and 348 indirect jobs.

Typically, remaining in the UK entailed upgrading facilities, and this formed the substance of the eRGF project. Funding this involved the co-investment by the business, which was usually of substantial scale, so that the share of the grant funding to overall funding is less than a quarter in all but two projects. The investment would upgrade plants either for new R&D capabilities or in the case of the transport vehicle sector manufacturers, producing a new line of vehicles or components.

Across the projects, the counterfactual option was to reduce or shut down UK operations and locate the activity to a different country. Other European countries such as France, Spain, Belgium, Vienna and Hungary were the common counterfactuals. The decision to relocate to a non-UK location was generally on the basis that this offered higher cost effectiveness or more efficient manufacturing at newer facilities. In some cases, market opportunities and ease of business was perceived to be better than the UK. The choice of relocation was partly also driven by where the parent company was located or where the company had manufacturing plants.

The purpose of the project can broadly be fitted into three categories. In two projects, the location of R&D investment was the focus. One project maintains the UK presence of a foreign-owned health science company. With a long history of R&D investment, the business is highly research-intensive and recruits skilled workers for its permanent staff. The computing project also has an R&D focus investing in novel technologies. The business was without an established presence in the UK when it applied for the eRGF. Support allows the business to build an extensive manufacturing facility in the UK.

Five of the projects give a long-term future for UK plants, with the projects enabling the starting of whole product lines in the UK, including next generation electric vehicles, and/or enhancing the processes employed in manufacturing processes. To enhance competitiveness with a multinational's alternative manufacturing locations, projects would deliver a comprehensive upgrade to plants, viewed as key to maintaining competitiveness against alternative production locations for the new products lines. There were three such projects in automotive, viewed as "a paradigm shift in automotive design and engineering". Similarly, the eRGF fund was granted to a rail manufacturing company to build a plant and support the company in delivering rails to the British transportation system under an existing contract.

A third type of project also focused on manufacturing but introducing an enhancement to production processes. The development of the bids for funding were in the context of relatively long-standing UK presences for all the businesses.

Across the case studies, the cost-benefit ratio was found to be positive. Four out of the seven projects were low or medium risk whereas out of the three high risk projects, two supported the automotive industry. Overall, despite varying levels of risk and deadweight, the plausible risk of moving investments abroad was seen as a loss to British industries. One of the companies provided letters of support from local government and local enterprise partnerships (LEPs) to highlight its value to the local economy and community.

eRGF and business outcomes

The documents associated with eRGF application highlight how public support would affect location decisions of the beneficiaries who were looking to relocate overseas. Robust evidence backed up the costings provided by companies and the counterfactuals were found to be credible alternative locations. After an in-depth appraisal, the different impacts expected through the government support was valued and the benefit-cost ratio calculated driven by deadweight, market displacement and number of jobs to be safeguarded in relation to the amount of grant requested. Spillover benefit from research was also a consideration to calculate benefits.

The next section focusses on analysing interviews with project leads, to look at how – during the lifetime of the projects – the support leads to impacts:

- Influencing the location decision: In explaining the decision to leave or stay in the UK, the report also draws out how the eRGF was part of the decision-making process.
- eRGF grant: The process of applying for the grant as well as negotiating and finalising the terms of the grant are summarised across the projects. The section focuses on the difference in grant size, matching investments by beneficiaries and experience of the project leads.
- Impact: The anticipated benefits at the time of application as well as some of the realised impacts are discussed. A case study is conducted on impact of a company on its supply chain.
- Lessons and Challenges: Based on the delivery milestones and experience of interviewees, the main challenges and lessons for the future of the eRGF grant and business support policy in the UK are highlighted.

3.2 Changing the location decision in favour of the UK

eRGF sought to alter the location decision of businesses as they considered options outside the UK. The aim was to incentivise maintaining a UK presence, using the eRGF grant to just switch the decision to favour the UK. The interviews about individual projects generally confirmed that the influence of the eRGF in this.

"In terms of the aims of the project, I understand that there was, as there is every couple of years, a question on footprint. This eRGF was important to sway the decision in favour of the UK".

The section describes how businesses made decision about their UK presences, in terms of alternative locations. It highlights that the decisions are outcomes of internal competitions between the plants of these global businesses across different countries and regions.

Location options and the eRGF businesses

The application to eRGF paralleled the internal business processes about locating in the UK versus alternative locations. This was the context for the eRGF support, influencing the global businesses' as they used internal competitions over where investments would be made. All the businesses could identify at least one alternative non-UK plant to which their investments could be made. These alternatives were crucial to the overall case for the investments. As projects were scoped, discussions with the UK government were characterised in these terms.

"We could either maintain, build or acquire a new facility in the UK or we could somewhat disband UK operations and move our research and development back to [an existing location] or build our presence further in [an existing location]"

An automotive eRGF project's focus was attracting to the UK a new-to-market car's future production, replacing the cessation of the production at the plant of a vehicle where sales were to cease. The new car would involve a new vehicle architecture, i.e. a step-change for the UK plant's capability, but this aspect was attractive to other plants who would also be competing for this future production.

"It's basically a competition where you're competing with other [company] plants."

The investment involved in locating production was considerable. The company was rolling out a new vehicle platform as a programme across other plants of the company.

"We were looking to attract investment in our plant to introduce the [new platform]. This was a large programme across many sites… to upgrade facilities to introduce things like aluminium, lightweight aluminium parts or plastic, changes

to the body structure. Our bid was aimed at getting sufficient funding to make it attractive … to invest in the plant so it could install on [the new] platform."

The drive to locate at a UK plant the next generation of automotive platforms was a feature of a second eRGF auto project, motivated by the transition to electric vehicles

"The sole focus and application of the grant was to turn us into the first electrical battery electric vehicle producing plants within the whole of [the] group and the ultimate goal was to upgrade the facility to be able to produce an all-electric."

Again, the UK plant is competing with other plants in operation. The alternative EU site in this project proved more cost-effective and efficient because the UK plant was not equipped for the next generation of electric vehicles. The eRGF project then was an investment into an upgrade to bridge that efficiency gap.

On the question of where to relocate, "each of the geographies had their own pros and cons". The pharma eRGF project chose between the UK and two other locations. Compared to the UK, other countries offered better business location incentives with wider public funding opportunities for a big company, there was also considerations of the wider R&D ecosystem, important for the collaborative environment. But the drawback was noted that investment in an innovative ecosystem involved paying premiums to recruit and retain talent.

"*[The non-UK location] is attractive because it is in a super concentrated area of highly innovative institutions and organizations... It is clearly a place where everyone wants to be to capture the value potential that is being generated there... The cons are that it is a super competitive geography with high turnover of talent…The talent is there but it is expensive."*

Across studies, the competition between countries to attract investments within multinationals was mediated by options analysis using investment appraisal approaches. To secure approval from global headquarters, projects would have to meet stringent internal criteria, including profitability forecasts over the entire lifecycle of any investment. The eRGF projects aim to strengthen the UK investment case and demonstrate its long-term viability.

Influencing location decisions

Facing decisions about relocating operations, the eRGF support was designed to help tip the scales in favour of the UK. The applications were generally made while businesses were considering whether to retain activities in the UK. There were discussions with the UK government about the incentives for companies in maintaining activities in the UK, as well as the decisions about long-term investments. During these high-level discussions eRGF was pointed out as an opportunity to one of the companies.

One business viewed how "decision to go for the funding happened organically". There were early discussions between the company and the government explaining that the business was considering options for locating future investment. The entry into the eRGF process was not a formal application process, but more an avenue suggested to the company in the light of the discussions.

"The eRGF is not a yearly scheme … visible to all. I don't think we found this. The government told us that this is there, and we can apply for it."

Others confirmed the informal process: one of the beneficiaries needed to decide where to undertake expansion and they were directed to the Department for Business and Trade, with this then leading to the eRGF. The lead on the project related how the support of the government tipped the internal decision towards carrying out the activities in the UK as an indicator of broad

government support. Being aware that the company itself had the support of the UK was deemed to be a significant tipping point to be able to go ahead to carry out the R&D activities in the UK.

"The main rationale [for applying for the eRGF funding] was trying to fly the flag for the UK as being part of the global automotive company."

Without the eRGF grant funding, the activities would have been conducted outside of the UK at another plant ("*This eRGF was important to sway the decision in favour of the UK").*

Across projects, the extent of government grant and co-finance from the supported business was important. The incentives that might be needed could be quantified. Costs of locating in the UK were often higher than competing locations. The level of eRGF funding was set to bridge the cost between the UK and shifting overseas, make necessary upgrades to increase cost-effectiveness or build research capabilities and future-proof their facilities in the UK. Typically, a cost analysis would quantify this funding gap, a sum of money that would meet the lower costs associated with a move out of the UK.

Some projects interested in the eRGF funding operated in a manner consistent with the DBT funding gap modelling approach, seeing the government funding bridging the financial gap associated with locating in the UK, and then the business's own funding co-investing to the full amount needed. They cited their experience of other countries' public support programmes, common across Western Europe and North America (citing the US Inflation Reduction Act support), that had built a capability in the business to develop the financials for an application to support such as eRGF. One of the interviewees explained the use of their own in-house tool to estimate the gap required to be competitive and ensure profitability:

"Simply put, it was a requirement to close the finance gap. We have a tool with intelligent cost planning where we have a certain level of the cost, we have to hit to make the whole (production) profitable. When we stacked up our costs there was the gap. So how much was that gap then we equated that to an absolute amount and that was the amount we went to go to the eRGF support with. Unless you can hit that target, you can't apply to build that model. You need to be competitive. You need to ensure that there's profitability within there."

The government then did negotiate from this estimate during the discussions. Businesses provided estimates of the cost gap, but the DBT processes also estimated this, though the government assumptions may not always have been shared with the eRGF applicants.

"I do not know how the government came up with [the lower estimate] and personally, it seems a little random to me. The point is that there was a discussion with the government."

Co-investment from other public bodies was possible. In one case, a funding gap was identified in comparison to the alternative option. The amount needed was only partially funded by eRGF, with the remaining gap met from the local authority where the plant was be located, which also owned the local transport provision. The local authority viewed the economic consequences of the plant closure:

"The plant would have either closed or it would have been successful in obtaining production. Whether the (local authority) would have tried to look for something else for the site, I don't know, but given where it's located, it's right next to [a transport hub] makes it quite an attractive place to have."

Negotiations also determined the structure of projects. In one case, initial discussion with the government focused on the ambition to establish an extensive manufacturing facility in the UK, but then further discussions resulted in the project being broken down into key phases of activity. The first phase of the investment involves establishing an R&D and this was what was funded,

providing an initial step. Co-investment was also provided by the company, with the grant amount representing about a third of the overall costs.

The pathway taken by businesses in making decisions about location usually centred on the board of the global parent providing final approval. The discussions between the project leads at companies and the UK government were in terms of broad parameters of what the board would approve. Case study interviewees highlighted that the projects met Board priorities, both in choosing to continue to locate operations in the UK and undertake programmes in the UK of R&D to develop products. Businesses viewed the funding as also meeting wider strategic priorities, such as the move to electrification in the auto sector.

There were observations made about the RGF as a policy instrument for the government's aims, comparing with similar incentives to locate to other countries. The most cites was the US Inflation Reduction Act and associated incentives. An interviewee recollected that production within the wider corporate group has been moved to the US because of inadequate financial support from the original country:

> *"Due to the Inflation Reduction Act, [this move is] more incentivized… a classic example of our management saying, 'we'll get more support … we will move our manufacturing [facility]'."*

This was paralleled with references to similar incentives in EU countries. A feature of these alternative schemes was their relative transparency when compared to the eRGF. The IRA and EU options were formal processes, whereby the offer available and the timings of the opportunities was clearly set out. Transparency was viewed positively in terms of allowing the business's in-country team to be able to articulate the UK offer to their board in terms of a settled policy. Interviewees explained that formal support schemes often factored into the strategic plans for a plant, with the potential for a future bid as an investment develops being a further feature for the location decision.

Businesses receiving the eRGF support receive public innovation funding. Table 3.2 presents the results of linking the published Innovate UK grants, which record the beneficiary and the value of projects. It focuses on the five years before the start of the eRGF projects and any grants received in the year of and years after support (which was a maximum of six years). Three of the seven companies in Table 3.1 are Innovate UK beneficiaries receiving just over £20m in the five years before their eRGF support.

Table 3.2: Research grants provided by Innovate UK to eRGF businesses

	Before e-RGF support			After RGF support		
	Beneficiaries	Grants	Value	Beneficiaries	Grants	Value
Innovate UK project funding	3	13	£20.2m	2	17	£33.6m

Source: eRGF beneficiaries linked to Innovate UK public data on funded projects five years before and all years after.

The table indicates continued use of this form of innovation support. Innovate UK grants are a specific form of support, and other research awards from UK funders may have been made. However, the size of the grants is substantial and may reflect both a continuation of past similar support, and the eRGF investments occurring associated with more innovation projects.

This aspect of the eRGF project investments – that businesses were plotting out many years forward and integrating future potential support measures into this – included a further dimension regarding innovation projects. Interviewees viewed the regulatory and policy environment developed by the government or government agencies as important. An example offered by a pharma project was that key to their innovation would be the environment to test and trial new

products, and this touched various parts of government (regulators, NHS bodies etc) over the duration of the project and the years afterwards.

Implications of the location decision

Project leads regard the eRGF funding as influential on the location decision; they have then also discussed the implications of locating in the UK. Across the case studies, the key impact was the investment securing the future of the activities at the UK plant, that otherwise would not have been operating.

In the automotive industry, an interviewee perceived that without the eRGF capital investment to enable manufacturing using enhanced technology would have been unlikely, and without this capacity, the competitiveness and long-term sustainability of the plant would have been in doubt:

"If it hadn't been successful, we wouldn't be here now... This plant would have closed because of that."

For one of the companies, the eRGF was essential in retaining business in the face of competition from not only the EU but also lower wage cost countries. The project lead explained that their business has hundreds of separate manufacturing sites and different countries were interested in the R&D activities taking place at their UK plant highlighting where wages were lower. In this context, it was hard for the UK to compete with the lower cost countries, particularly when assessing the total project cost over 3-4 years. The project lead said that without the eRGF grant funding, the activities would have been conducted outside of the UK at another plant. The support of the UK, indicated by the eRGF, was deemed to be a significant tipping point to be able to go ahead to carry out the R&D activities in the UK.

“In the absence of the RGF funding, essentially the project would have happened elsewhere.”

The decisions to locate in the UK implied a long-term commitment. Given the scale of investment from the British government and the large co-investment from partners, the businesses are likely to stay in the UK beyond the duration of the eRGF support. In some cases, investing in fixed assets also binds companies to the UK for the foreseeable future. One of the businesses has bought land to build a new facility instead of leasing reducing the likelihood of relocation. However, one of the businesses developing an innovative product for automotives claimed that while ideally, they will continue manufacturing the product in the UK, if they change to being manufactured elsewhere, there will be reputational benefits that the product was designed in the UK.

“To be clear, the decision to move was due in significant part to the eRGF. This is supporting [the company] in the UK for several decades. There is no way that after this someone will decide to pick up and leave in five years. There needs to be a major global event for that to happen.”

“This decision to stay in the UK is a 20-year commitment or longer. You do not spend that kind of money and then decide that you will move to America next year. It is a big and important financial and strategic decision.”

For four projects in the automotive sector, the implementation of the new technologies and processes, with the associated skills investment, have supported the long-term sustainability of the automotive plants and enabled future proofing in the sector. The project impacted one of the car manufacturers’ operating models by enabling the development of new business ventures. The high performance and sustainability of the production processes opened opportunities in previously untapped markets, producing vehicles with new specifications and new versions of the existing vehicle models. This diversification of business activities contributed to the plant’s competitiveness and resilience.

"I think the fact that we have this very sustainable long-term model has allowed us to go into this kind of new business… So, there have been side benefits also we should be we should be positive for us."

Having acquired a much bigger facility than their previous one, one of the businesses now has the potential to expand at their new site in the future. Unlike the old site, employees will be able to conduct novel research under the same roof allowing more innovation through collaboration.

"After we move, there is still space on the site which will allow for expansion in the future. We do not need to find something new. In the future, this will make the decision for the UK for more activities easier compared to other geographies"

3.3 Impacts due to the eRGF support

A key aim of the eRGF was to provide sustained high-quality employment, with a focus on a continued location of the businesses in the UK driving this. Beyond these safeguarded jobs, the impacts should extend into new jobs, with businesses increasing activities, and the indirect employment, in the suppliers of the eRGF businesses and in collaborators. There is also consideration of the location and quality of the employment generated. A plant closure can be associated with significant shocks in local labour markets; that is investments related to the safeguarding of a substantial number of jobs in a local area.

The eRGF incentivised companies to retain a base in the UK. Using the fund, the businesses are introducing new research pipelines to the health science industry, manufacturing new models of cars including EVs and building cutting edge computing. Other notable activities include technology adoption to enhance efficiency.

Safeguarding and creating jobs at supported plants

At the core of eRGF projects was the safeguarding of the existing jobs. All projects have delivered on the outcome. Across five projects which had existing plants in the UK and the project has run its full course, between 500-2,200 direct jobs were saved. In addition, between 180-1,500 indirect jobs were also secured. There have also been some new jobs created. One of the automotive companies created 10 new jobs. A project which built a new manufacturing unit in the UK created more than 500 direct and indirect jobs.

Interviews highlighted how the focus of many projects was the safeguarding of existing employment:

"One of the key things with this is safeguarding of jobs as opposed to creation of jobs. It was really based around safeguard, not creation."

Businesses articulated their focus on safeguarding the viability of the plant, and the associated jobs at the site, had a local dimension.

"We have examples of generational, sort of families, where you have nan, mom, dad, child coming in and working in the plant because it's one of the largest employers in the borough."

The logic for projects was then how eRGF investments gave the existing employment a solid future and the sustainability of the employment generated. Projects articulated the various ways in which the eRGF project could be associated with safe-guarded jobs with a key driver being the eRGF investment placing new facilities, plant and associated capital in the UK. Project investment leads to locating significant economic activities in the UK and the R&D focused projects both highlighted the pipeline of research that would be associated with the investments in facilities. A project lead highlights that:

"This decision to stay in the UK is a 20-year commitment or longer. You do not spend that kind of money and then decide that you will move." … "From a strategic perspective, we will truly be the owner of the site now. This binds us in a more permanent way."

New facilities are crucial for R&D activities. The new building is a state-of-the-art facility which will enable more research. Architecturally, it is a well-designed building and can be selling point to attract more talent. The move has also brought staff from three separate buildings together under one roof, therefore facilitating innovation and collaboration.

A further reasoning for the jobs being long-term was around the investments being associated with product innovation. Two of the automotive projects located the production of vehicle production lines in the UK, investments with long life-lengths. A project focusing on an automotive component was also confident of a lengthy securing of employment. The project lead explained that, in the automotive industry, the UK is seen as being a high-cost labour country compared to the likes of Asia or Eastern Europe, but with comparative advantage in innovation and product design. So, the business uses the eRGF project to extend beyond manufacture and assemble, with the project incorporating significant product innovation (the "next step" in the product).

"Our overarching goal was to develop a next generation … system for the automotive industry, to help safeguard the plant."

The project was phased to include design, incorporating new engineering solutions and then introducing new materials into manufacturing at the plant. The business was confident that the product developed had met expectations, noting that "not only was it a success, but it was also actually a commercial success as well", with its deployment on vehicles being higher than expected. It was noted that there were also exports of the product to low-cost economies, countering the terms of trade through the product's use of advanced engineering solutions. The product has received awards acknowledging this success and led to follow-up R&D investment. Due to the success of the project, when the project was ongoing, they set up a global R&D function for the group within the UK.

"Because you've had that success in the UK and demonstrated to the group, you're at the top of the list of anything to do with our R&D activities internally."

The project lead observed how recognition that their plant is making the next generation of a product, which were designed and engineered their plant, would be viewed positively by the plant's employees.

Paralleling product innovation, two eRGF projects highlighted significant process innovation. For their sector, the recent period is one with global shifts in manufacturing technologies and changing demands for vehicle types, and cost-efficiency concerns in the UK compared to other countries.

"The project not only secures jobs and employment but also allows [the company] to develop its capabilities in new production technologies… enhancing the plant's long-term viability."

A substantial perceived benefit to the plant in terms of operation was seen as the advances in two technologies, where the investments represented a generational move in production.

"The biggest single element for us was bringing in the new … technology. It's delivered the savings from an environmental perspective… It enabled us to save cost as well which is obviously the double win-win for both of us, it secured the jobs that we said it would secure"

These cost improvements were attributed to eRGF, in that the company had been seeking to make efficiencies prior to the fundings, and saw progress only since receiving funding:

"So, at that time, at the volumes we were expecting to build, a key KPI was to build the car for €xxx a vehicle, and we didn't get there, but we have improved considerably over the last few years, and we wouldn't have had the chance to do that without it (eRGF funding).

A second project highlighted a similar outcome noting that the project *"enabled us to save some cost as well which is obviously the double win-win for both of us, it secured the jobs that we said it would secure."*

While safeguarding jobs provided a key outcome for the projects, businesses could see how the support might lead to expansion of activity in the UK. In the automotive sector, the success of one of the projects validated the credibility of the British plant and improved competitiveness of the plant amongst other units within the multinational: the plant would *"be a more cost competitive plant and be able to compete competitors within the group."* Due to the success of the eRGF project, the parent company of a different plant set up a global R&D function for the group within the UK while the project was ongoing.

"Because you've had that success in the UK and demonstrated to the group [that] you're at the top of the list of anything to do with our R&D activities internally"."

Other projects have also indicated that the locating in the UK of the manufacturing of new product lines, the capability for using improved production processes and the R&D pipeline associated with pharma and computing technologies can enable capturing future growth opportunities for the UK. This aspect was often tied into the projects being embedded into the wider manufacturing and research of the UK.

Wider effects on the Supply Chain and Innovation Ecosystems

Projects identified spillover effects. The investment in the plant involves contracting substantial works, awarded through a tender process to primes and subcontractors in the region. For a project in the northwest, these works were considered a major investment.

"I can give you many contractors within the northwest that we've been using as part of the major investments, I think the major point to focus on is the commitment from [the company] that they would invest." (PC)

While local contractors have been used, however, some UK business have not been able to be as

Pharma suppliers and collaboration

The suppliers to an eRGF pharma project were analysed. In health science projects, around 50 businesses were found in the supply chain. UK suppliers made up 44%, with the chain beyond this being in the EU and US. There was no correlation with the location of the business' suppliers and the location of the parent company's headquarters. Around half the suppliers are SMEs, and the country distribution was similar across size categories.

The suppliers were analysed by their activities. Goods supplies come from abroad, while services are more likely to be provided by UK businesses. There was high number of suppliers involved in contract research and R&D, with these somewhat less likely to be UK-located; the suppliers that provided general business services were more likely to be UK based. All the businesses providing medical technology goods were non-UK.

There are collaborations between the business and UK academia (grants are recorded in public data). A wide range of UK universities have received research grants where the company is noted as a collaborator. The business highlights their collaboration at a university with a research hospital. The biotech hub provides a setting for clinical trials and expertise. Progressing drugs through assessments has involved working with research charities:

"They obviously have a fantastic network of experts and sites and facilities which hopefully allows those drugs to go forward and prove their worth in cancer."

Funding for doctoral programmes are tied in with the company:

"We like the way UK PhD students are funded. It is through UKRI's funding, and [we] co-invest with them, sort of 50-50 and sometime 75% us and 25% UKRI. Over 20 years, we have supported over 120 students…."

competitive as their foreign counterparts, thus resulting in losing to foreign competition.

"Obviously, in terms of the upgrade to the plant, we have been using as many local contractors as we can. ... But on the bigger scale of things, some UK businesses have lost out to foreign competition because they've just not been able to be competitive."

The evidence is complex on the question of eRGF's impact on the supply networks associated with each plant in the UK as it goes into operational mode. The approaches used by multinational businesses in securing suppliers differ and outcomes then can depend on the approach used.

For one auto project, the eRGF impact in the UK extended beyond the plant to its extensive network of suppliers, many of whom also benefit from the increased business opportunities generated by the investments. The project lead highlights significant impact on its supply chain, facilitating innovation, skill development, and job creation across the region. The project has also been attributed to impact the supply chain by enabling the companies to scale up and adopt new technologies.

"We have a very long supply chain of 45 supplies in the UK, about 70% of our parts by volume come from the UK. So that's important, that's the main impact"

There was a contrast with companies that build their supply chain network on a global basis. Procurement of components would then be through international competitions so the suppliers could then be in the UK and abroad. Such procurement/partnering approaches mean that the winning suppliers are those with the best skills and capabilities, not dependent on geographic location.

"So, I think it will just be wrong just to identify that it is local or even foreign contractors that are winning business. It's it all depends on the key skills."

The car manufacturer explained how such procurement models operated. There were other plants of the parent company for the model being produced in the UK. These were in the EU, and all the plants shared a supply chain. The other plants are larger than the UK plant and, overall, less than 10% of parts for the UK plant's production comes from the UK, with almost three quarters coming from the EU. The eRGF project's effects on the supply chain can then be limited as the supplier footprint was modest and, perhaps more importantly, the way procurement took place de-linked the location of suppliers from that of the car manufacturer in the UK.

This approach was now maturing further focusing on the procurement of key inputs into car making, such as batteries for EVs. Project leads explained how in a matter of a few months, the landscape had changed. The difficulties in developing a UK supplier were very much in the media, and there remained a strong dependency on supplies from a few countries ("*obviously China has a massive intellectual property on the batteries that go into all these electric vehicles"*). The expectation was that the next years would see carmakers seek to bring more supply under control. For key inputs into production, a single supplier plant for many production plants would remain, retaining the globalised model, but these may be subsidiaries of the carmaker.

"There's been a complete 180-degree turn, and the focus now is on more in-sourcing and that's what we are focusing on at [the UK plant] is in sourcing as much as we can and doing it with our own people under the Stalinist T-shirt instead of some third party doing it on our behalf."

The needs of internationalisation of the supply chain have led to co-investments in the infrastructure to import and export goods. A large eRGF plant investment would necessitate new supply routes, and the local port had been approached. The plant was to be some distance from Dover, and the discussions mean an alternative route.

"So instead of bringing in trucks through the continent and through Dover and up the motorway… we approach [the freighting company who] have done their own investments."

One of the companies building a research facility emphasised its presence in the UK enabling and maintaining partnerships. The company's UK presence has existing contacts and suppliers. The business did not view supply chains as stopping relocation, but that building a network takes time and any relocation would inevitably place a different dynamic on this:

"I think it would be very difficult to maintain the same level of connectivity if we were to remove our UK footprint. If the decision to move was made .. to move the activities to a different geography, I am sure that we would have lost 80% of those relationships. Although we are in a global world, a lot of these things are driven by proximity.

The project lead emphasised that their R&D tapped into established and specialised ecosystems. The business works with significant numbers of R&D contract staff as well as UK universities, charities, and companies on numerous R&D projects. A range of activities along the health science R&D pipeline are delivered, ranging from research and development of products through to the trials required for commercialisation. A separate analysis explores this in detail, but overall, the UK facility benefitted its global operations through its specialisation in particular pharma products.

Upskilling workers to improve efficiency

A final dimension to impacts of the project builds on the safeguarded employment, as eRGF projects reported investments into skills.

An automotive business felt the benefit to the plant was seen in technology adoption leading to cost and job savings, However, the project had a significant upskilling strand, empowering the workforce through training, enabling them to adapt to new manufacturing processes and technology. The upskilling of the workforce was well-received by trade unions, as well as providing a model for the wider upskilling being sought after in the auto-manufacturing industry:

"Across industries, the training was well received by the trade union partners and other stakeholders. Upskilling in the team, which … is ongoing, … was a really good building block."

Another automotive company had plans to reopen their apprenticeship training programme to attract new staff and talent. With the funding keeping the plant open, they felt more confident to continue the scheme as they would not lose the workforce they train. Moreover, the plant has an ageing workforce, and the company has capitalised on the highly skilled staff by launching an apprentice programme which allows young talent to work with a senior workforce.

"It [eRGF] enabled us to re-energise the Apprentice Scheme… the company was more confident at that time to restart the training programmes for new apprentices and technical apprentices.

The benefits to this were also viewed as long-term with the business regarding a renewed confidence to compete for early career staff, being able to highlight the longevity of jobs as the investments in the plan were visibly long-term.

Risks and Opportunities as Projects Delivered

Delivering impacts through eRGF projects was viewed from the outset in terms of potential risks. The original applications were assessed in terms of this, and the design of project recast to address the identified risks. As the projects have progressed, the nature and effects of the risks has become more grounded in experience, with effects on impacts beginning to be designed.

Interviews highlighted how political uncertainties in the UK at the time of application have then been handled during projects. After the UK left the EU, there was uncertainty about the UK's future relations with Europe. Clinical research was often conducted in the UK prior to 2016, but the shift of the European Medical Agency from London to Amsterdam

has increased the attractiveness of conducting clinical assessments outside the UK in the EU. It was not only a reason to consider relocating from the UK but also a further concern for their supply chain.

"… participation in the project aligns with the broader goals of ensuring the plant's sustainability and competitiveness amidst uncertainties such as Brexit."

A car manufacturer explained how they faced increased delivery costs for components and took steps to reduce these. A lengthy road freighting route through the continent was replaced with a shipping, which involved leasing of land near to the plant and a port.

The investments made into the UK did mean commitments that were long-term and policy changes being made by government were noted as a risk. The move funded by eRGF to electric vehicles in one project has been in the context of securing battery supplies and ensuring the local content of manufacturing meets necessary levels to avoid high tariffs. A further comment was

"At the moment, I don't think our government has helped by delaying the introduction of electric vehicles by the original commitment -2030. I think it was the Prime Minister [that] announced this in September of last year that he's moving the goal posts basically to 2035." (PC)

More generally on supply chain disruptions in the global market, one of the companies explained the challenge of meeting the cost target. During Covid, there was a period when the manufacturing units did not run at all and although they gradually ramped up, there was a considerable lag as supply chains normalised.

"It's very difficult just to look at the cost number because within the period of the grant we had the COVID interruption had a massive impact on everyone. There was a considerable lag on that with the impacts thereafter of semiconductors availability in the industry, not just for vehicle manufacture, but it was particularly hard hit and in terms of where all the shipping was and it took a long time and a lot of costs for that shipping position to unwind itself probably not longer than three months, but the unwinding of it was huge. So that meant that we adjusted our shift patterns to fit that demand."

Most of the companies have adhered to the timeline by achieving key milestones in line with expectations. One of the companies reported a significant delay which might impact final expenditure, while a second is experiencing a minor delay by a few months. A company felt that they were a bit optimistic in hiring new people for the project and would have adopted a more phased approach to hire the right people at the right cost. Despite this, they were able to deploy them quickly.

Financial commitments of the grant have also been met. All the projects in the transport sector have concluded without major issues in delivery. One of them reported underspending. Although the project delivered the key outcomes, including exceeding the targeted jobs safeguarded, they delivered less than planned on some of the objectives. One of the companies co-invested more than the initial agreement.

3.4 Conclusions

This chapter presents the findings from seven project-level case studies. The mix of case studies is broadly similar to the wider eRGF set of projects. There are four projects supporting the automotive sector and one where a rail manufacturing plant is supported. These investments involve R&D and innovation in these projects, but the other two projects focus on investments in R&D facilities, with one then leading to a new UK manufacturing presence for the business.

Facing decisions about relocating operations, the eRGF support was designed to help tip the scales in favour of the UK. The pathway taken by businesses in making decisions about location usually centred on the board of the global parent providing final approval. All the businesses could identify at least one alternative non-UK plant to which their investments could be made, and some interviews highlighted that alternatives were more cost-effective. The eRGF project then was an investment into an upgrade to bridge that efficiency gap.

Interviews highlighted how the focus of many projects was the safeguarding of existing employment, and the decisions to locate in the UK implied a long-term commitment. Interviews highlighted how product lines, such as specific vehicle platforms, would be produced in the UK, investments with long life-lengths. There were complementary investments in skills and apprentices, further evidence of long-term commitment. For R&D investments, a project's new facilities are state-of-the-art, a selling point to attract talent. A further reasoning for the jobs being long-term was around the investments being associated with product innovation.

The evidence is complex on the question of eRGF's impact on the supply networks associated with each plant in the UK. The approaches used by multinational businesses in securing suppliers differ and outcomes then can depend on the approach used. For one project, the eRGF impact in the UK extended beyond the plant to its extensive network of suppliers, many of whom also benefit from the increased business opportunities generated by the investments. There was a contrast with companies that build their supply chain network on a global basis. Procurement of components would then be through international competitions so the suppliers could then be in the UK and abroad.

4. Impacts on Location Decisions in Manufacturing

The decision about whether to invest in the UK made by large corporations is analysed using datasets about individual business location decisions in UK manufacturing businesses for the last decade. The data centres on restructuring events, the occasions where businesses implement a strategic decision that involves organisational changes that locate or relocate significant levels of activities. Analysing such decisions involves collating different sources of evidence around the restructuring events, about the business involved and wider context as businesses decide about their location.

The chapter follows recent studies that have modelled business location decisions, particularly Lampon et al (2015) and more recent work. The dataset about the location decisions of UK manufacturing plants is described, with the core being a panel of data about UK manufacturing plants covering the period 2011-2021. Individual restructuring events have been linked into this, covering the business making a large-scale location decision, its timing and nature, as well as the direct effects if the decision on employment. These include many decisions that were influenced by the eRGF and RGF project investments.

4.1 Business expansion, closure, reorganisation and relocation

An aim of the eRGF was to retain in or locate to the UK the significant manufacturing presences and research capability, that would – due to either economic shocks or an expectation of future competitiveness pressures – relocate or close in the UK. This section explores the approaches that are used for this evaluation to model location decisions. The section then considers the restructuring events in the recent period. A focus is the manufacturing sector as RGF has generally involved businesses in the sector[3].

RGF support and the decision to locate investment in the UK

The RGF's projects were aimed to encourage businesses to locate significant economic activity in the UK and the grant fundings, plus the supported businesses' own investments, would drive expansions and reduce the chance of plant closures. This chapter explores restructuring events in businesses using a database of announcements made by UK businesses. The European Restructuring Monitor (ERM) reports the announcements made either of their expansions or closure plans (such as the media releases businesses make).

These announcements will correlate with the decision by a business to locate investment in the UK. Figure 4.1 draws out that this is an output of RGF funding, then leading to outcomes and impacts. The figure then summarises the evaluation approach, which determines what drives a business to make an announcement, as a proxy for the drivers for the original decision. The analysis then assesses what contribution the RGF support has had.

The counterfactual of what would have happened anyway is analysed here using data about a wider set of businesses, allowing expansion and closure events to be contextualised using businesses that do and do not make announcements, and those that did or did not benefit from RGF support. Overall, the study approach focuses on two sets of restructurings:

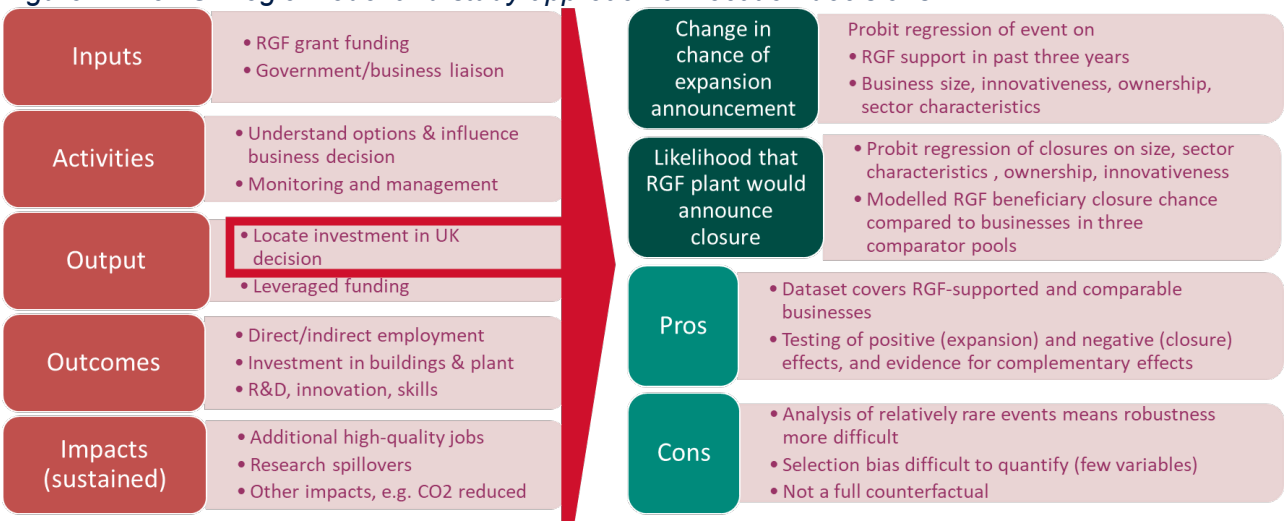
- The **chance of an expansion announcement due to RGF** is estimated by regressing the announcement occurring (variable takes the value one in a year of announcement and zero otherwise) on various business variables. The regression includes whether the business

[3] Beyond manufacturing, investments were made into transport infrastructure and digital companies, and businesses that classified to research and development services.

benefited from RGF support in any of the three years before, allowing an estimate of the change in the chance of an announcement due to receiving RGF support.

- For the likelihood of an RGF **plant announcing a closure**, as there are no announcements in the three years after RGF support, the regression analysis does not include whether or not RGF support occurs and focuses on the business level variables. The characteristics of the RGF businesses are then plugged into these models to estimate a chance of these businesses making an announcement given their characteristics, and this is tested for a significant chance.

Figure 4.1: eRGF logic model and study approach on location decisions



The approach – through its uses of a data about plants across manufacturing and health sciences – can test the RGF correlation with restructuring events announcements However, the events are rare, and so sample sizes are modest. Robustness issues are also complicated by the fact that RGF support may be correlated, in some unobservable way, with the business being inherently more likely to expand and less likely to close. Also, the announcement variable is a proxy for the location decision making and cannot cover the full extent of the decision. The dataset does not include the parallel decision made about the scale of co-investment.

Robustness of the modelling is investigated, and the chapter reports tests of the quality of the data compiled, how sensitive results are to different models, including ones that seek to tackle selection bias effects.

Modelling business restructuring

The literature on business location is diverse and mixes analysis of drivers for firm location and relocation to more qualitative understanding of location choice. This chapter's approach looks at the outcomes of the business decision making process and then seeks to explain these using data that would correlate with the influences on this decision. Analysis contrasts the baseline decision not to move, with the choices away from this using data that incorporates restructuring events.

There has been research on this. A first set of studies look quantitatively at the relocation of whole multinational enterprises (Sleiwaegen and Pennings, 2006). In Sleiwaegen and Pennings, the main drivers in the decision to relocate to another country were the firm characteristics, such as profitability, the labour intensity of firms, the scale of the multinational group. The choice variable is whether the firm chooses to relocate or not, and conditional upon relocation, the firm determines the location (separated into nearby locations and remote locations). The results show that less profitable firms are more likely to relocate, as well as labour-intensive firms, multinational groups, and firms operating in the manufacturing industry. For regional choice, the findings suggest that market potential is an important determinant for relocation in remote regions, with companies that have a higher added value having a higher probability to move to remote regions. Then, further

factors would drive location to more remote regions, such as the market potential in the new area. This strand of analysis models location decisions from the perspective of the individual plant, assessing the technological, financial and location specific drivers at the plant level.

There is also academic literature highlighting (e.g., Lampón, González-Benito and García-Vázquez, 2015) how business relocation outcomes are the consequences of competitions internal within a multinational. It contrasts other work about the drivers for relocation being external to the company, such as the level of efficiency/productivity of a UK affiliate of a multinational compared with its local competition. This alternative perspective finds that rivalry over efficiency of the UK plant compared with other plants within the same multinational is a more important reason than external rivalry for relocating production. These propositions indicate that government intervention around relocation should focus more on large, globalised businesses' internal factors, perhaps more than on external or macroeconomic factors.

This motivates Lampon et al considering the plants within large businesses and whether or not individual plants relocate. Revealed preferences is used, looking at information on plants that were relocated from Spain during 2001-2008, plants that have maintained their location in Spain during this period, or plants located in Europe that belong to the same multinational as the active and relocated plants. Modelling quantifies plant level characteristics, such as the productivity the plants compared to others in Spanish and in fact you in sector and of the other plants in the same company. Again, the scale of a multinational and its ownership being non-Spanish were viewed as further drivers for relocation out of Spain.

Similarly, Bodenmann & Axhausen (2012) use variables such as local taxes, governmental business friendliness, and accessibilities for different business sectors. They find that distance, local taxes, and cantonal business development strongly influence relocating firms' destination choice. Furthermore, significant differences between sectors can be identified. For instance, residents with graduate degrees have a significant and high impact on business services, but a minimal effect on businesses in wholesale trade and personal services.

Restructuring in UK manufacturing

Underpinning the current analysis is data about the location decisions of businesses. The European Restructuring Monitor[4] (ERM) follows a specific methodology for collecting data related to large-scale restructuring events, with the support of the network of Eurofound correspondents. As this covers EU Member States and Norway, its data covers the UK for the period until the most recent years.

Using a media monitoring tool, correspondents carry out a wide-ranging daily screening of business press and online sources, recording large-scale company restructuring events. An event is included if it entails the announced destruction or creation of (1) at least 100 jobs or (2) implicates at least 10% of the workforce at sites employing more than 250 people. Cross-national restructuring events are also reported to the ERM.

The information gathered about restructuring events is recorded into a standard 'factsheet', detailing the company name and group, the location of affected units, the sector, the number employed in the affected unit prior to restructuring, the announcement date, planned timings for the restructuring and the number of announced job reductions/creation.

The type of restructuring event is also indicated. Business expansion events are covered, where a company extends its business activities, hiring new workforce. Relocation is when the activity stays within the same company but is relocated to another location within the same country. The

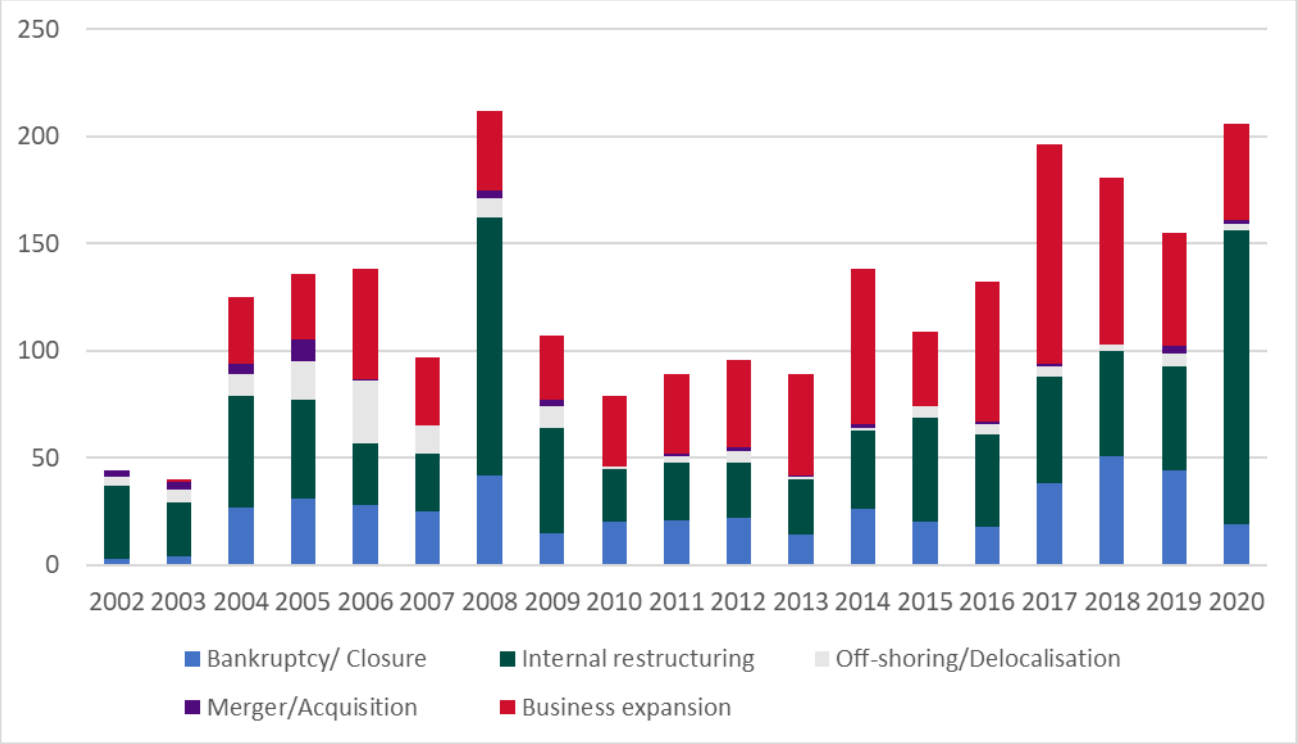
[4] https://www.eurofound.europa.eu/en/european-restructuring-monitor

database differentiates with offshoring/ delocalisation, when the activity is relocated or outsourced outside of the country's borders. Outsourcing events see activity subcontracted to another company within the same country. These events that locate economic activity then contrast with closure where a company or an industrial site ceases operations for economic reasons not directly connected to relocation or outsourcing including bankruptcy, which is separately recorded.

The database also captures merger/acquisition, and more general internal restructuring. Both can involve a company undertaking a job-cutting plan, which is not linked to another type of restructuring defined above.

For the UK, the database records 4,905 restructuring events, of which 2,371 could be linked to Companies House registration numbers. Many of the unmatched were restructurings in the non-corporate sectors, such as public bodies, universities etc., so that matching to a business identifier was not undertaken.

Figure 4.2: Restructurings in the UK, 2002-2020



Source: European Restructuring Monitor

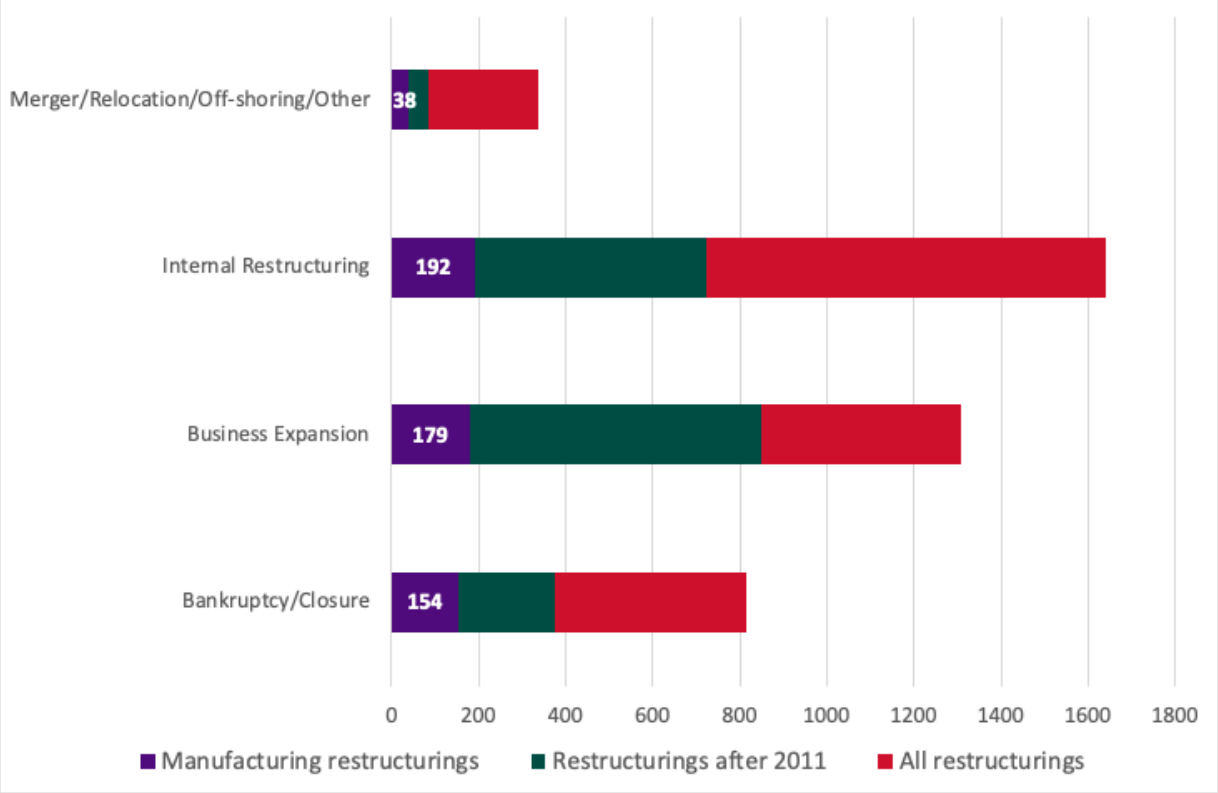
Figure 4.2 presents the number of restructurings events by the five main categories. The red portions show that there are many expansionary events throughout the period. Businesses announce the expansion of their activities and the ERM records these business expansions, with any associated detail about the number of jobs created. These would also include some of the events arising after RGF support.

The largest share of restructuring events is job reducing according to the database. There are peaks in internal restructuring events at the times when the UK suffered recessions. They rise both in 2008 and in 2020, with the global financial crisis occurring in 2008 and the COVID Pandemic affecting 2020. Bankruptcies rise somewhat in the years after the UK leaves the European Union, with a decline in 2020. This latter fall occurs as the government intervened to support employment during the Pandemic.

The analysis hereafter focuses on the manufacturing restructurings after 2011. Figure 4.3 indicates how this focus targets the analysis on 563 events. Firstly, the red portions of each bar indicate how around half the restructurings take place in the decade before 2011. The purple and green bars

then show how most restructurings fall outside of the manufacturing sector, with business services, retail and public sector services combined having the highest share. Of the 2,032 restructurings after 2011, 563 are events associated with businesses in the manufacturing sector.

Figure 4.3: Restructurings in manufacturing, 2012-2020



Source: European Restructuring Monitor

The restructuring database includes the employment changes associated with restructuring events. Figure 4.4 presents the changes in employment associated with the four categories of events, focusing on manufacturing after 2011.

There are almost 150,000 jobs created or lost due to the events. Arguably, there is a relatively complete picture of the significant restructuring events that reduce the number of jobs. Companies must report falls in employment as they consult on significant redundancies and the legal obligations involve companies quantifying the number of jobs at risk. The consultative processes lead to media coverage and the events then being recorded in ERM with estimates of the employment changes. Just over 114,000 jobs have been lost in these.

The employment increases associated with business expansion meanwhile may be less complete in the database. Over 33,000 jobs are recorded over the period, but in the ERM dataset, where events are recorded, there are gaps with many expansions having blank records for the number of jobs created. Business expansions may not be publicised quite to the scale as would occur for employment losses, as they do not involve consultations or other formal processes that announce the restructuring event in a manner that would be captured by ERM.

Figure 4.4: Restructurings in the UK, 2002-2020

Source: European Restructuring Monitor

Each record in the database includes the location of affected business units. These are usually in terms of the town or city in which a business's unit is based and, for manufacturing restructuring events, identifies an affected plant for most records. For some records, there are multiple affected units listed reflecting job losses or job creation across a business's establishments. The individual manufacturing plants were linked to a postcode using online data sources and databases, but the matching was partial.

4.2 Analysing Business Restructuring Events

This section describes the RGF supported plants using the dataset about restructuring events, testing for any effects of Regional Growth Fund support on business decisions to locate significant economic activity in the UK. This section then considers three dimensions to the restructuring events. It firstly looks at expansionary events between 2012-22 in the sectors and businesses that RGF support focused. The analysis looks at the likelihood of businesses announcing an expansion as recorded in the ERM and then whether this could be attributed to RGF. Some – but by no means all – RGF support interventions are associated with the business then announcing an expansion, and this section quantifies the contribution support had on this.

For the second dimension, the attention turns to the announcements of business closures and relocations out of the UK. For this type of event, there are no events recorded for the RGF-supported plants. The approach taken is to estimate the chance of businesses announcing such decisions and then using the modelling to establish a baseline chance of an RGF business being one that announces a closure event and see if this differs for RGF-supported plants over other businesses.

A final analysis looks at employment changes in the periods after RGF support and the restructuring events. It correlates and contrasts the employment changes seen in the RGF plants (due in part to support) with that associated with restructuring events.

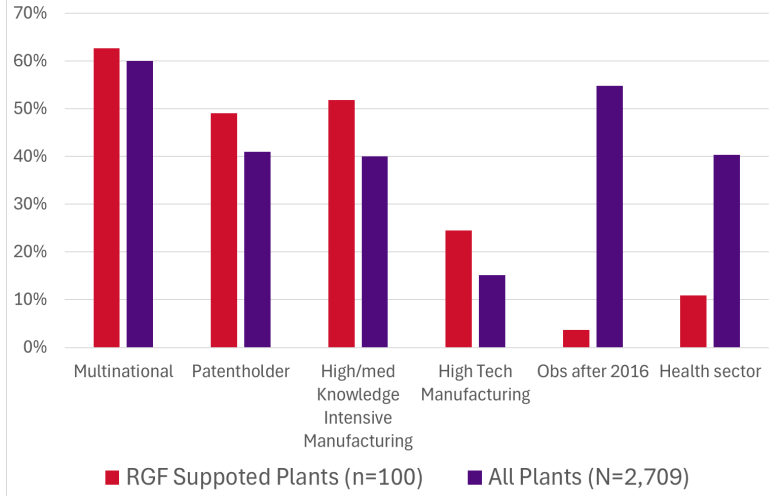
Characterising the RGF plants

The dataset underpinning this analysis covers around 2,700 plants, of which 100 are supported by the RGF. These businesses are tracked over the 2012-22 period and the data includes the restructuring events that businesses announce, both expansions and plant closures.

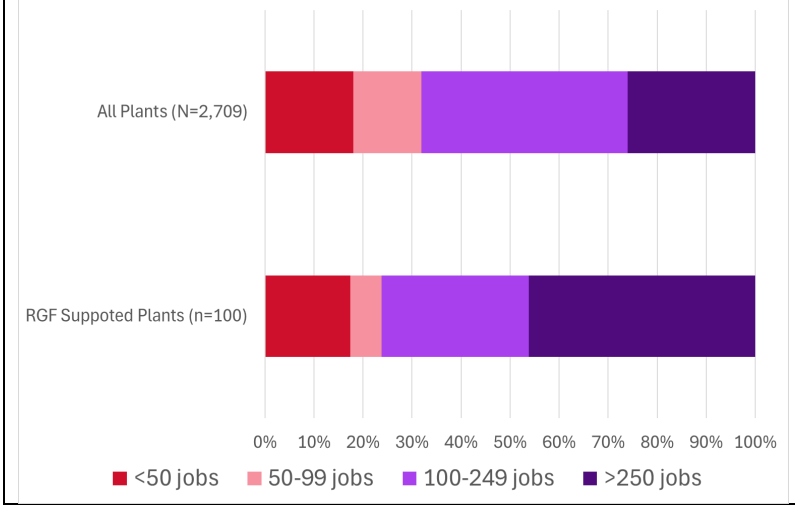
Figure 4.5 indicates some of the characteristics of the RGF supported plants and wider dataset. Efforts have been taken to construct a dataset that is similar to the beneficiaries of Regional Growth Fund beneficiaries, and this is indicated by the similarities in many characteristics. Broadly around 60% of the owners of the plants operate globally. In other characteristics, the shares differ due to the RGF supported plants generally being in advanced manufacturing, with this being most marked by the share of businesses in the healthcare sector being almost 40% in the dataset but nearer 10% amongst the RGF beneficiaries. This then potentially explains the somewhat higher share of knowledge intensive manufacturing businesses in the RGF support group.

Data has been compiled across a decade for the plants. However, RGF support was over two phases in the decade with the first half having a distinctly higher share under the main RGF funding. The figure indicates that the eRGF share of later projects is around 5%, indicated by the share of observations centred on the period after 2015 with centring being on the year of support. For the wider datasets, the annual data is balanced, so around half of the panel is centred on the period after 2015 and half before.

Figure 4.5: Characterising businesses



A panel of level data for around 2,700 plants has been constructed. The data covers the period 2012-22 with individual units opening and closing in that period. The industry coding is as reported in the Companies House register plus plant-level sources. This has then be linked to industry lookups to code to knowledge intensity, technology and sector. The multinational and patentholder variables are derived from FAME and IPO data.



Employment has been compiled using multiple sources as there is no single source for the jobs at indvidual site. Accounting data has been used for the single-plant businesses as reporting in Beauhurst. The multiplant businesses have been linked to LSOA employment data published by ONS. Data has been assured by random checks to ensure linking is broadly correct.

Source: Study dataset

Figure 4.5 has a lower panel looking at the size of the plants in terms of employment, categorising to four size groups. RGF plants are somewhat larger than the wider set of businesses, with almost half having more than 250 jobs in the plant. The shares of the businesses in the two lowest size categories for RGF is around 10% less that the wider dataset.

The differences that can be seen in the businesses is perhaps most marked in two dimensions: the timings for the RGF projects and the focus in RGF investments on businesses in advanced manufacturing compared relative to a high number of health sector businesses in the dataset. This latter feature also correlates with the size of the RGF businesses, with the health sector firms being markedly smaller.

Whether a plant has a restructuring event needs to consider that the RGF supported businesses have the characteristics displayed in Figure 4.5. This is called controlling for characteristics of the supported business. A first stage of modelling leads to – alongside the analysis using all the businesses in the dataset – using the characteristics of businesses to select sub-samples which, on average, looked like the RGF project beneficiaries.

Propensity score matching was used to score the chance of being an RGF beneficiary given their characteristics. This used a probit regression of a dummy of RGF support on the characteristics of all available businesses. The dataset is a panel, having observations for the same business in different points in time. The estimation was stratified to be representative in terms of the year of support. Then, the scoring is applied to the non-beneficiaries, so that plants with similar scores to

the RGF plants could be identified. Stratification meant plants were chosen in the same year as the supported.

The first stage results in three pools of businesses created for the modelling of events, with the matching providing the second pool:

- All businesses: Restructuring events were modelled looking across all the businesses in the dataset.
- Similar businesses in terms of the propensity score selecting around half the observations statistically that were close to the RGF-supported businesses in terms of the score on characteristics.
- All businesses before 2016: As the RGF sample is predominantly supported in this period, a final pool restricted analysis to the first half of the decade

A second stage to the analysis is the focus of the next section: the chance that the businesses announce a restructuring and what effect the RGF support has on this. For the expansionary events, the RGF supported businesses do appear in the ERM, i.e. there are RGF plants announcing expansions in the first three years of the project. So, the analysis asks whether the fact of the support is associated with an increased chance of expanding, compared to businesses that are similar. For the closure announcements, as plants supported by RGF do not appear in the events dataset, the analysis looks at whether there is a correlation between RGF support and the businesses' estimated chance of announcing a closure event.

For both these analyses, the chance of making an announcement is modelled statistically. A binary variable is modelled on business characteristics. There are three models used, described in the later section looking at analytical robustness. However, in presenting results, the nine sets of estimates – based on three models applied to three pools – are summarised to give some flavour of the range of results.

Restructuring events where the decision is to expand

The dataset contains 116 events where businesses announce expansions. Of these six can be correlated with the support provided through RGF, with the remaining RGF projects leading to expansions that did not prompt an announcement and so were not captured in the ERM. This will result because the nature of the RGF project would either mean it was not publicised, or its scale of new job creation – with many projects highlighting jobs saved rather than new jobs – below the threshold of 100 jobs needed to be included in the ERM.

Low coverage of RGF projects is not a problem, as the analysis focuses whether RGF support has made it more likely that an event is announced relative to firms with similar characteristics and where they restructurings are of similar scale or nature. The approach to understanding the drivers for plant expansion events has been to model the occurrence of the event in a general way and then estimate if the RGF projects are associated with an increased chance of an announcement. A variable takes a value one for a plant that makes an announcement, in the year that the announcement takes place, with zero in other years. This dependent variable is regressed (using a probit model) to determine what features about the businesses correlates with an expansion announcement, with the fact of RGF support entering into this.

Table 4.1 indicates the results, with the first row indicating the positive, additional and significant effect that being a beneficiary of RGF has on the chance of making an announcement. The variable used in modelling is whether the plant receives RGF support in the three years around an event, and the table indicates the significance of this factor is high. This implies that the business units that have received a grant are more likely to appear in the restructuring database announcing an expansion event than other businesses controlling for a range of characteristics.

Table 4.1: Drivers for firms to announce expansions

	Announcements			RGF's Significance		
	Total	RGF Projects	Attributable to RGF beneficiary	Median	Range	Sig Models
Parameter	116	6	1-3	0.42**	0.34 – 0.59***	6 of 9 models

Source: Analysis of study dataset; Significance levels are 1% (***), 5% (**) and 10% (*).

On the right-hand side of the table, the parameter estimate associated with RGF are summarised. Across the nine estimates, based on three models applied to the three pools, the parameter is positive, and in 6 of the nine models is significant at confidence levels of 5%. The estimate of the effect of RGF can then be used to compute how many of the announcements that occur are due to the RGF support variable, in that the chance of an announcement can be computed with and without the RGF support. The is the chance of an announcement being made by the average business, then considering how this increases when the estimate of RGF's positive effect is then added. The proportion of the businesses that would make an announcement rises, and the table indicates that the different models then would lead to between 1 and 3 more announcements.

To some extent, this is expected and correlates with RGF support leading to business expansions. Put another way, the nature of RGF support is that it ought to lead to more announcements of expansion, and the estimation suggests that up to half of the announcements made by the supported businesses which would not have occurred given the characteristics of the businesses.

Table 4.1 does indicate that results vary by the model used. The three models where results are insignificant are where the modelling is restricted to the pool of businesses identified using propensity score matching to find businesses comparable to the RGF supported businesses. This modelling does make the pool analysed look more like the RGF supported businesses but reduces the number of businesses that make announcements considerably (as the announcements are not very frequent). Estimates remain similar in levels terms, but their statistical significance then becomes lower.

Restructuring events where the decision is to close or offshore

To some extent the results about the correlation of expansionary restructuring events with RGF support is unsurprising. RGF and eRGF projects supported business expansions and the announcements in the media about these, while not covering all projects, are shown to be higher. This suggests that the ERM data captures the primary purpose of RGF projects.

This section looks at restructuring events that are associated with job losses. The dataset contains 117 events where businesses announced a closure or offshoring of their activities. None of these events took place in the plants benefitting from RGF support, though three restructurings did occur in the supported enterprises affecting plants not benefitting from RGF but owned by the parent company. Analysis similar to that for expansion events can check, given the characteristics of the RGF businesses, whether a closure or offshoring event was likely,

Coverage of closure events is likely to be more complete that expansions in ERM. Employers are obliged to consult on any restructuring event that leads to over 20 job losses, and the process of consultation involves notifying the government (through the HR1 form) and then there are requirements for periods of consultation. While the notification itself is not public data, its use by key stakeholders and processes around the consultation means the event is likely to be widely publicised with coverage of the events in local and national media captured in ERM.

The plant-level dataset has been linked to ERM closure events, focusing on manufacturing businesses. As with the expansion announcements, whether a plant closure event occurs is regressed on a set of drivers using a probit model. This is again undertaken using the three pools of plants for further analysis to establishes the determinants of the event. Differing to the earlier analysis, none of the RGF supported plants are in the events dataset. So, the chance that they

would have made such an announcement is estimated using the regression results about what characteristics are associated with announcements. Such estimated probabilities can be produced for all the plants, including the RGF supported plants. This provides a baseline chance for these plants to announce a job loss. A simple statistical test can check whether these probabilities are different for the plants that were supported by RGF.

Table 4.2: Drivers for firms to announce closures/relocations

	Announcements			RGF's Significance		
	Total	Estimated RGF Events	Attributable to RGF beneficiary	Median	Range	Sig Models
Parameter	117	0.4%-0.6%	0.1%-0.3%	0.16%***	0.1% - 0.25%***	6 of 9 models

Source: Analysis of study dataset; Significance levels are 1% (***), 5% (**) and 10% (*).

The results are summarised in Table 4.2. The table indicates the estimated chance of a plant announcing a closure, given its characteristics, as 0.4-0.6% across the ten-year period. Overall, the chance of a plant closure is quite small, with this occurring in only 0.3% of the plants.

There is evidence that the plants supported by RGF have a higher chance of announcing a closure than the wider set of plants given their characteristics. On the right-hand side is the results of testing whether, having estimated the chance of business closure for all businesses, the probability is higher or lower for the RGF plants. As with expansion events, nine different estimates are made, combining three models on three pools. These are used to estimate the probability of announcing a closure for each business, a measure of how likely individual businesses are to announce a closure based on their characteristics. This constructed variable is then tested to see if it is higher for the businesses that benefitted from an RGF project, and this difference is significant in comparison to other plants in the analysis in all but three estimates.

The estimated probability of announcing a closure is higher for RGF supported businesses. These plants do not announce such an event in the three years after support and the table indicates that based on the characteristics there would be 0.4-0.6% chance of announcing a closure for an RGF business, and this would be higher than the other businesses by 0.16% in the median model. Seeing no closure effects indicates some effect of RGF support. Having estimated the chance of business closure for all businesses, the RGF support correlate with a lower than expected rate of closure events.

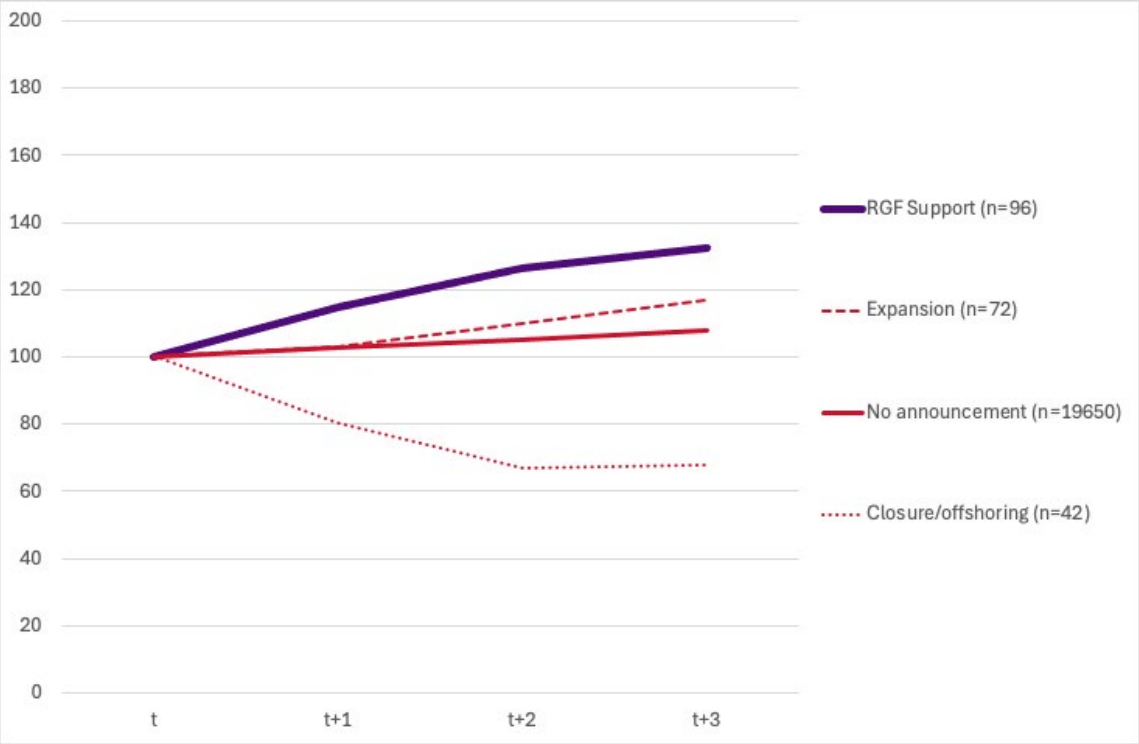
Employment after events

Previous sections have explored the chance that a business expands or closes, and the extent to which RGF support contributes to this. In this section, the results on the employment in businesses after such events, including the investment made for RGF, is characterised.

Figure 4.6 presents the employment changes seen in businesses after events. The figure indexes employment at the start of the event and then tracks the growth for the three years afterwards. Growth is measured in terms of logs, reducing the effects of any outliers. The employment evidence comes from business accounts and estimates of plant level employment compiled using various sources. These are detailed later, and at this stage used primarily to indicate immediate effects of the various events that are analysed.

The figure highlights that after closure events, employment falls as expected. It also indicates that for the majority of plants, there is a modest growth in employment in the three-year period. The data indicates that expansion events have a somewhat higher growth in employment, as would be expected. However, the RGF projects see the most significant employment growth.

Figure 4.6: Employment after expansion and closure events and RGF support



The figure indicates how coverage is quite partial, reflecting the fact that employment data is not always reported for all three years after an event, with counts reflecting the final year's data points. However, the evidence suggests that a third effect of the RGF support – alongside the effects seen on expansion and closure announcements – is that the support correlates with significant job growth.

4.3 Estimation challenges and understanding robustness

This section describes the challenges of assessing the effects off RGF support on business location. A key challenge has been the relatively small number of eRGF projects and then the addition of RGF projects has considerably helped. The results indicate that this provides some basis for analysis thought numbers still remain small. This section briefly considers three challenges.

Linking data about businesses in manufacturing and health sciences

A plant level data set has been constructed for this study, using public data and focusing on manufacturing businesses. This has required extensive data linking, both at a business level and then at location level. Business data usually focuses on enterprise level data, such as the accounts for a business group. As a significant portion of manufacturing businesses, and a particularly high share of the businesses receiving RGF support, are multi-plant, the challenge for analysis is the limited sources of plant level information available.

A first challenge has been establishing a population of plants for the manufacturing sector. A focus has been the health sciences and automotive sectors, and the approach to compile plant level data centres on some specific datasets:

- Office for Life Sciences (OLS) Health Science Business Lists: For the life sciences sector, the Department for Science, Innovation and Technology's OLS publishes a list of 6,585 individual establishments in the sector. The list includes company registration numbers (CRN) and postcodes for 6,193 plants plus some details of the activities that take place in the plant and the size of the plant.

- HMRC Businesses Exporting Automotive Products: For the automotive sector, an iterative process was used to identify businesses, as no single source could be identified. Businesses were identified using the HMRC publication of commodity exports, where the bulk data includes the names of the individual businesses that have exported goods and the commodity code for the export. Commodities classified to the automotive sector were identified iteratively, with a seed set of automotive businesses (identified using industry classifications) used to identify products exported by these companies.
- European Restructuring Monitor: As indicated in figure 4.3, there are 563 events at manufacturing businesses for the period from 2011 onwards. Of these 321 events recorded where restructurings took place, and the organisation could be linked to a Companies House number. Most events took place at one plant, but many covered several plants. Overall, 376 events occurred at individual plants where a CRN and location could be identified.
- Beauhurst and FAME Databases: These sources provide financial and ownership data as well as the postcodes of the main establishments of each business. This was linked to the business lists emerging from all sources using CRNs.
- Ad hoc lists of plants: A document review found some publications by sector bodies about the key UK plants in the automotive industry and advanced manufacturing. This was used to check coverage of other more comprehensive sources.

The dataset compiled for the study has 2,819 business units, with annual data about business performance, for each covering 2012-22. Company accounts provided some variables, with all records having balance sheet data such as total assets and most having employment. However, these data covered the entirety of a company and not the individual plants. For the 1,576 businesses that had a single business unit, the company level data aligned with the plant level, but for other businesses the data needed further adjustment to be used in the analysis. There were two strategies taken:

- Business Register Employment Survey (BRES): The location and industry of the plant was linked to this source, also known as NOMIS, which provides a timeseries of all employment at lower super output area (LSOA) by industry using rounding to ensure such data would not be disclosive. For large plants companies, with large plants, the assumption is that this small area geography would provide an accurate estimate of the employment at plant level.
- Company level data: For some variables such as total assets and R&D investments, the source data was at company level only, and for both the single and multi-plant businesses, variables were created that would not be overly affected by the unit level not aligning to plant. So, proportionate change was used for total assets, and a dummy variable about whether a company reported R&D investment was used.

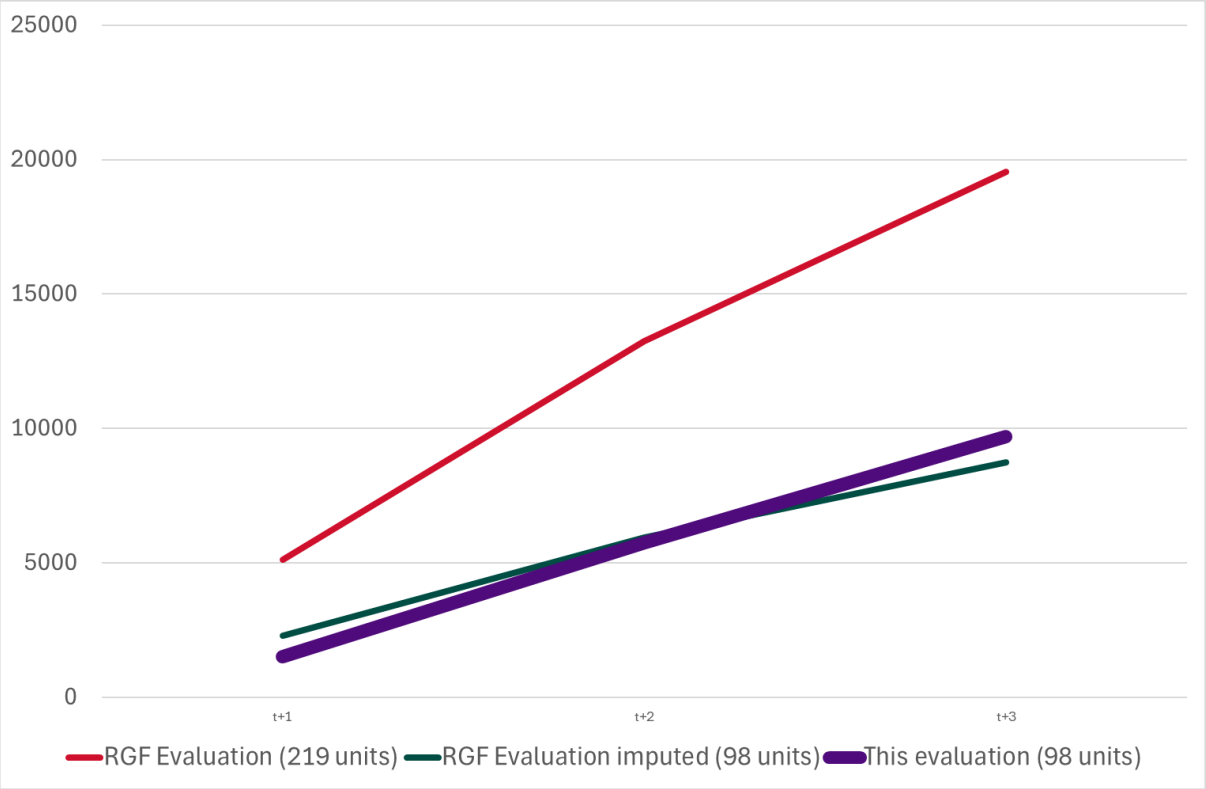
Overall, the strategies meant plant-level employment was estimated for 92% of businesses. For other key variables, such as the change in assets, the approach created variables that were comprehensive but accepting that these variables were not plant specific but could be compiled in a manner that made the variables useable for the analysis.

Assessing the plant level dataset

Restructuring events are usually characterised in terms of their effects on employment. In the ERM dataset, the jobs affected by a restructuring is the most complete outcome recorded. This is unsurprisingly the main effect reported as events are consulted on or publicised. This section indicates the robustness of the plant-level dataset that has been compiled for this study.

Figure 4.7 assesses the extent to which the approach taken to find plant level employment data has achieved its aim. It compares the data with the ONS data at plant level, focusing on the businesses that participated in RGF. BEIS (2022) evaluated the RGF and estimates the total employment for all the supported plants using the ONS survey data about jobs at the individual units of businesses.

Figure 4.7: Employment growth in RGF supported plants, this evaluation versus previous



Source: Study dataset and RGF Evaluation (BEIS, 2022)

The figure – in a thick blue line – plots employment for businesses supported by either the Regional Growth Fund or the exceptional Regional Growth Fund estimated using the compiled data. It can be contrasted with employment from the earlier separate evaluation of the 2022 RGF undertaken. Figure 4.7 indicates that the estimates align, with employment in the 98 plants growing by 1,509 jobs in the first year after support and 5,757 and 9,695 jobs in the second and third year after support. The red line indicates the estimates from the RGF evaluation, which covers more of businesses that were supported. However, when the numbers are rescaled to be more comparable, the numbers are nearly identical.

The original RGF evaluation accessed ONS plant level data. The analysis linked to location of the individual plants in the businesses to the local unit level data accessed at ONS. These datasets underpin the public dataset about employment at in small areas, BRES, that have been compiled for the study.

Selection bias, characterising businesses and restructuring drivers

Key to analysing the effect of support is to be able to determine what would have happened without the intervention. Data that has been compiled about manufacturing businesses at plant level, to link to both the ERM data about restructuring events and to the details of RGF beneficiaries. This provides data for three sets of businesses and their plants: about the RGF beneficiaries, those that undergo restructuring and crucially provide a picture of a wider set of manufacturing businesses. For these set of businesses, analysis then shifts to controlling for the differences in businesses so that any estimation can focus on restructuring decision but in a manner that controls for the size, type and context for each plant.

The drivers towards these decisions have been modelled in recent work, such as Lampon et al. (2015), where individual plants within businesses have been characterised in terms of the parent organisation and production plant variables to then explain the location and restructuring choices made. In such studies, often focusing on businesses within specific sectors, drivers have been a mix of the technologies used, the skills of the workforce, as well as the relative performance of a

plant within a wider conglomerate. The studies have compiled the data about the context a business finds itself in, for example Lampon et al's focus on the automobile sector looks at plants located in Spain but then enriches the data with evidence about the global footprint for the individual companies.

Table 4.3: Outcome and independent variables used in analysis

Variable	Definition	Source
Restructuring outcomes		
Closure or offshoring	Announcement of bankruptcy or plant closure, or relocation overseas	ERM
Expansion	Announcement of expansion of employment at business	ERM
Restructure	Taking value one for expansion, minus one for closure and zero otherwise	ERM
Employment	Plant level employment estimated for multi-plant businesses using BRES	Beauhurst, BRES
Company variables		
Multinational	Whether foreign owned or, if UK owned, has foreign subsidiaries	FAME
Reported R&D	Accounts report research and development expenditure	Beauhurst
Patentholder	Whether a business has a UK registered patent	IPO
Total asset change (%)	Annual accounts balance sheet data	Beauhurst
Skills proxy	Dummies categorising industries assessed as knowledge intensive	ONS
Technology proxy	Dummies categorising industries using high tech processes	BEIS (2022)

Table 4.3 indicates the categories of variables constructed for the current study, splitting between the outcomes considered and the company level variables. For the outcomes, the restructuring events compiled for the ERM are the main focus, as well as the employment changes seen in businesses. For the events, these have been simplified to the generally positive restructuring events as businesses announce expansions, and the generally negative ones as businesses close plants, go bankrupt or propose relocations of their activities to a foreign country.

The company variables compiled from the data sources have generally mixed information from business accounts, with various proxies about the plant. Using data about the parents of each business, a multinational dummy has been constructed. The foreign owned plants are all considered multinationals, with UK businesses that have subsidiaries outside the UK also classed as such.

In modelling of both the chance of receiving RGF support and of undertaking a restructuring event, modelling used three permutations of the variables. A first two both used employment in size

categories, then the variables about the companies (whether a company owns a patent, is a multinational, has more than 3 plants) with some differences in the technology proxies (whether the sector of the business is highly knowledge intensive, in life sciences, classified as high technology). A third model replaced the employment categories with the log employment.

Analysis pooling RGF and exceptional RGF projects

Analysis has relied on a relatively small set of eRGF investments and so statistical analysis has had to look across both eRGF and comparable investments made through the earlier RGF Regional Projects. It is not possible to clarify statistically any difference between these two forms of investment. A concern would be that the eRGF projects would differ from the wider RGF both in terms of the logic of the intervention and the selection processes used in the eRGF.

The discussion about this limitation of the analysis draws out two aspects of the RGF support that suggest a quantitative analysis pooling RGF Regional Projects and eRGF projects is not too indirect a route to evaluate the eRGF specifically. Firstly, in pooling analysis, the results highlight that the Regional Projects and eRGF projects had the location effects desired in supporting business expansions in the UK and reducing events associated with job losses.

The logic across the two forms of support do have that common purpose of supporting businesses at the plant-level to expand or safeguard the existing employment. The decisions over locating significant production or R&D capabilities are not made frequently and the government measures to encourage decisions favouring locating in the UK are necessarily developments over time. The quantitative analysis benefits from analysis looking across a decade of decisions and the effect of a government support measure that has matured rather than changed radically.

That links to the selection methods employed for eRGF project. These have more explicitly considered the location decision in terms of the governance and analysis undertaken by parent companies. Applying to the ERGF involved businesses articulating much more of the internal factors as they considered the placing of key investments. The application processes matured the original RGF process, focusing on evidence needed to validate support. As these supports measures are long-term, with impacts over many years into the future, an approach that tests underlying assumptions is a compromise, but one that is consistent with the drivers for the changes from the RGF model to the eRGF version of support.

4.4 Conclusions

An aim of the eRGF was to retain in or locate to the UK the significant manufacturing presences and research capability, that would – due to either economic shocks or an expectation of future competitiveness pressures – relocate or close in the UK. This analysis models business relocation outcomes. Underpinning the analysis is data about the location decisions of businesses. The European Restructuring Monitor records large-scale company restructuring events and, for the UK, the database records 4,905 restructuring events. The analysis focuses on the manufacturing and life sciences restructurings after 2011 analysing 563 events.

The RGF projects drive expansions and reduce the chance of plant closures. Any analysis has then to determine what might have happened without the RGF support, to be able to attribute any additional effect to the support. The counterfactual of what would have happened anyway is analysed here using data about a wider set of businesses, allowing individual events to be contextualised. The events database has been combined with a manufacturing/life sciences plant level dataset constructed using public data about 2,819 business units, with annual company accounts covering 2012-22 providing total assets, industry, reported R&D, patent holding, whether multination, etc.

The dataset contains 116 events where businesses announce expansions. Of these six can be correlated with the support provided through RGF, with the remaining RGF projects not captured in

the ERM. The approach to understanding the drivers for plant expansion events has been to model the occurrence of the event. A variable takes a value one for a plant that makes an announcement, in the year that the announcement takes place, with zero in other years. This dependent variable is regressed (using a probit model) to determine what features about the businesses correlates with an expansion announcement including a variable about RGF support.

The estimate of the effect of RGF can then be used to compute how many of the announcements that occur are due to the RGF support variable, in that the chance of an announcement can be computed with and without the RGF support. The is the chance of an announcement being made by the average business, then considering how this increases when the estimate of RGF's positive effect is then added. The proportion of the businesses that would make an announcement rises, and RGF support would lead to up to 3 more expansion announcements.

The dataset contains 117 events where businesses announced a closure or offshoring of their activities. Coverage of closure events is likely to be more complete that expansions in ERM, but none of these events took place in the plants benefitting from RGF support, though three restructurings did occur in the supported enterprises affecting plants not benefitting from RGF but owned by the parent company. The estimated chance of a plant announcing a closure, given its characteristics, is modelled for the RGF supported plants and the chance that no plants do announce a closure then tested. Overall, the RGF supported plants would have been expected to make less than one announcement across the ten-year period, consistent with there being no events recorded in the ERM for RGF plants.

There is also evidence that the plants supported by RGF have a higher chance of announcing a closure than the wider set of plants given their characteristics. Having estimated the chance of business closure for all businesses, the RGF support correlate with a lower rate of closure events.

5. Analysing the Employment Created in Supported Businesses

A focus for the Exceptional Regional Growth Fund (eRGF) was attracting or retaining high quality employment in the UK. Through influencing the decision made by large corporations to locate in the UK, significant investments of a long-term nature would be made. These would introduce employment opportunities into an area. As the projects associate jobs with high levels of capital investment or with the R&D funded with RGF support, this would mean employment would be higher productivity, with this reflected in wage premiums.

The last chapter considered evidence that businesses' decision to locate their investments in the UK are affected by eRGF support. This chapters builds on this, exploring the employment then created in the businesses, looking at survey data about the individuals working in supported businesses. Analysis is undertaken in multiple ways to establish whether the employment is more remunerative than the comparable employment available for the individuals. If so, this is strong evidence that the jobs have a productivity premium also.

The chapter firstly explains the concept of a wage premium associated with a job, then quantifying the wage premium of the jobs in the RGF supported plants. A key general point is that analysis is not seeking to say the wage premium is caused by support. Rather, the chapter seeks to confirm that each additional job generated in the businesses that were supported – and the last chapter provides evidence that employment is attributable to the RGF support – provides better employment for the individual than they otherwise would have found. Benefit is less about raising the firm's productivity, and more about reallocating workers from less productive roles to the productive roles in the supported businesses.

5.1 Wage premiums and their link to job quality

The chapter uses the Annual Survey of Hours and Earnings (ASHE), a longitudinal linked employee-employer payroll survey. The survey asks employers about the jobs held by individuals they employ that fall within the remit of the survey, asking about the individual (age, gender) and the job (occupation, whether part-time) alongside the wages paid and hours worked. As the survey is a business survey, it can be linked to other business level data including whether a business has secured RGF support, or any restructuring event recorded in the Enterprise Restructuring Monitor used in the previous chapter.

Assessing the quality of jobs resulting from RGF support

Alongside businesses deciding to locate their investments in the UK, the RGF projects are expected to create sustainable high quality employment opportunities. The approach to verify the quality of the jobs is to look at whether employment in the supported businesses attract a premium, a wage level higher than would otherwise be expected. The analytical challenge is then that any measure must disentangle the skills, experience and motivation of the employee from the effects of working in a particular supported business.

Figure 5.1 highlights the focus of this chapter: the evidence that there is additional high-quality employment in the supported businesses. The approach taken has two strands, both using an employer-employee survey that the study has accessed. The survey asks employers about the wages paid, sampling 1% of UK employees. The design of the annual survey means the same employees are surveyed each year, and the ONS identifies where these individuals work sending the survey to the right employer even an individual has changed job or has multiple appointments.

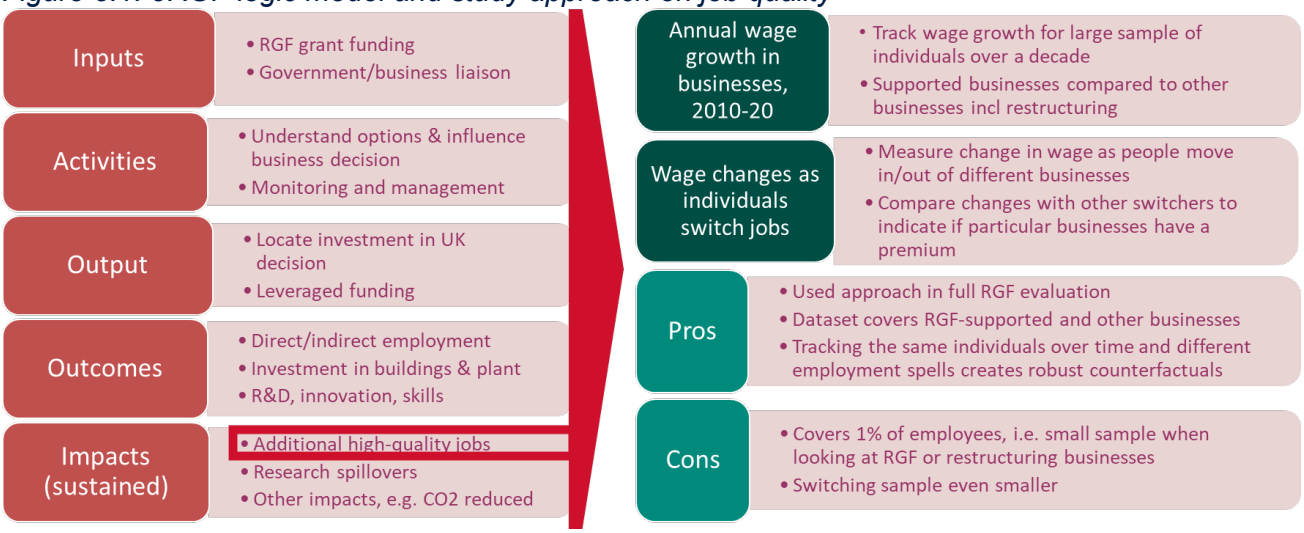
This property of the dataset means that the changes in wages each year are about the same people. Wage levels, or at least the changes in wage rates, will only reflect the additional year of

an individual's career, as the skills, experience and other features of the individual are unchanged. The approach taken to estimate the wage premium proxy for job quality is then:

- The **annual wage growth** looking at individuals in RGF businesses, other businesses involved in restructurings and the wider business population provides a fuser indication. It can show whether the wage growth differs for the supported plants.
- The **change in wages as individuals switch jobs**, focusing on entry into the supported businesses illuminates how any jobs created have a premium. Generally, individuals that move job see a wage rise, but if the rises are higher for a particular employer, then this is evidence that the business's jobs are higher quality, able to offer better remuneration to the employee than would be expected in other businesses given the individual's characteristics.

The analysis is underpinned by the Annual Survey of Hours and Earnings, which has been compiled into an individual level panel for the 2010-22 period. Statistical analysis looks across the entire period and does not differentiate at business level between the periods before and after the RGF support was provided. This is primarily because the logic of the RGF did not anticipate that support would improve the quality of the jobs in the business. This would justify a before/after type analysis. Rather, the logic is that the supported businesses provide high quality jobs, and that the effect of RGF is more to move people from other employers with less productive jobs into employment at the establishments where their skills would be better used.

Figure 5.1: eRGF logic model and study approach on job quality



The pros and cons of the approach are explored in the figure. The wage premium analysis mirrors that used in the full RGF evaluation, and the current analysis can then confirm the earlier findings. As with that analysis, a benefit of using ASHE is its coverage across all businesses, including the previous employers of those that switch jobs. However, with a 1% sample, the number of observations can be quite low. This becomes more pronounced when looking at the relatively few individuals that change jobs. However, as businesses involved in RGF or making announcements about restructurings tend to be large, the analysis has enough observations for the quality of jobs to be assessed.

Wage premiums and quality of jobs

Workers are said to earn a "wage premium" if their wage is higher than it would be in a different business or occupation, given their ability, skills and experience. A premium may arise if the worker is more productive, and the higher wage reflects this. However, it is challenging to robustly assess the wage premium of working in one business over another. The underlying idea is that workers that look similar on paper earn significantly different wages depending on the firm they work for (Song et al., 2015). However, it is difficult to find the circumstances to measure this.

As RGF investments were considered for funding by the Department for Business and Trade (DBT), the wage premium was a crucial factor in the decision making. It was estimated by asking the businesses applying about the jobs they expected to create or safeguard stating the skills and wages of the jobs. DBT then used the results of the ONS survey of wages, the Annual Survey of Hours and Earnings (ASHE), to model the wages of similarly skilled individuals in the same job market as the RGF project. The quality of the jobs that supported businesses intended to create was valued by the difference, the wage premium.

In the recent evaluation of the Regional Growth Fund, BEIS (2022) quantified the wage premium by using a particular feature of the ASHE survey. ONS contacts HMRC each year about which organisations individuals are employed in, focusing only on those whose National Insurance number end in two specific digits. They then survey employment in a particular week of the year. The digits have remained unchanged each year, and so once a person is in ASHE they will remain in the survey in future years.

Analysing the location of jobs

Each year the Annual Survey of Hours and Earnings (ASHE) begins by sampling the businesses to be surveyed using whether any of its employees have NI numbers that end in two specific digits. The businesses are asked to complete a survey about hours and earnings of that employee alongside other characteristics of the employment. A question asks for the postcode of the employee's usual site or office, thus providing insight about the location of a job.

While for single-site businesses, this can be implied by the data ONS holds about location at a business level, for the larger businesses, this can help to identify in which plant or establishment a job is located. As RGF funding is primarily an investment into a site and the restructuring announcements made by businesses are site-specific, the location of an ASHE employee can be used to link a job to the site within a multi-plant business.

For plant-level analysis, as well as the enterprise identifier for businesses receiving RGF support or announcing a restructuring, the Census output area for a site was included in the data linking. This meant that the ASHE employees in the same small area as a restructuring event or RGF investment could be identified within a business.

There has been some analysis of the quality of the location data. ASHE will generally be sent to the business' payroll team and a concern is that the location registered for the PAYE system could be used. Whittard et al (2022) have identified some biases in the location data towards the head office consequently. Most returns made for multi-plant businesses do appear to record location in a manner consistent with other survey data about plant-level employment but there is miss-reporting, and this would affect location level analysis.

The employers that employ the 1% of employees within scope are contacted to complete the survey about the employee. The box indicates how the survey is conducted. Individuals in the sample that hold multiple jobs would lead to them being in multiple surveys. Also, as HMRC updates ONS of the changes in a person's employer individuals are followed as they switch between employers.

In BEIS (2022), analysis looked at the switching of employment by individuals and whether, as individuals moved to RGF supported businesses, they received a pay rise. On average, a job change attracts a pay rise, but as ASHE records many other job switches, analysis can determine comparable changes and whether the change from switching to an RGF business was higher than other moves.

This type of analysis provides estimates of wage premium that are business specific and that robustly offer evidence about what might be happening as employment is created or safeguarded in RGF supported businesses. Job switchers in ASHE have some analytically useful properties. As it can be assumed that the skills, experience, motivation etc of the individual remain largely unchanged in successive years when a job change occurs, any change in wages can be attributed to the change in employer. Examples that use this approach include Disney and Gosling (1998, 2003), Girma and Gorg (2006).

BEIS (2022) observed that the job switches into the RGF supported businesses had a larger pay rise than other switches, where the funding was for a project in a large company. This indicated how the additional employment created by the project – which was measured in a separate analysis – was creating jobs where those taking up the positions with a wage premium over their previous positions. Analysis focusing on the RGF support provided to smaller businesses did not involve as large a pay premium, though additional new jobs were created.

That employment created in large businesses improves the productivity of individuals – an implication of the wage premium – is consistent with the RGF projects supporting businesses investing in new plant and buildings and the associated research and development. Aghion et al. (2018) point to a significant wage premium that grows with the R&D intensity of a business. They use ASHE combined with the Business Enterprise Research and Development Survey (BERD) to estimate the wage premium of R&D intensity, defined as log research spending divided by employment[5].

Earnings data for RGF and comparable business

ASHE surveys the wages and hours of employees in a week in April of each year and uses data on about 200,000 full-time employees drawn (ONS, 2021). The data also includes who the employer is, and this can then be linked to the RGF beneficiaries and the businesses that appear in the restructuring events database. Wage premium analysis focuses on the transition of an individual through phases of employment in different employers. By tracking the same individuals over time, the change in wages can be analysed and this would include the cases where individual change jobs as ASHE would be completed for both the old and new employers in successive years.

In the earlier evaluation, the benchmark for the RGF supported businesses wage premiums was the wider business population. Here, the analysis differs, looking at RGF and eRGF projects and then exploring wage premiums in relation to other similar businesses. The similar businesses are selected by whether they made restructuring announcements, identified in the previous chapters. In addition, a set of businesses have been identified from the ONS data that are similar in statistical terms to the RGF supported businesses. The approach taken – propensity score matching – is the same as that used in the previous chapter. However, here the underlying business data is different as it uses the ONS data about employment, sales, etc rather than the accounting data of the previous section.

[5] The study also focuses on large business, as most data is available for larger businesses. They only include businesses with more than 400 employees. They find a clear positive relationship between R&D intensity and average wages. When looking at different skill levels, the relationship actually becomes stronger when looking at the low-skilled. Moreover, these findings hold when controlling for an individual's age, tenure, and full-time/part-time status, as well as firm size.

Table 5.1 provides the number of jobs that ASHE samples each year. There are over 157,000 jobs surveyed each year. The table then shows that 392 of these are in the businesses that received RGF support at the supported plants. Many of the businesses have multiple plants and there are 1,209 jobs surveyed each year in the enterprises that own the RGF plants. Given about 1% of the employees are in the ASHE survey, the number of surveyed jobs is consistent with the levels of employments in the supported plants (which are around 39k in plants and 120k in enterprises).

Table 5.1: Average number of jobs surveyed annually

	All	RGF	Businesses announcing			Matched plants	
		Supported	Expansions	Closure	Job Losses	Model 1	Model 2
Enterprise-level	157k	1,209	960	393	1,602		
Plant-level	157K	392	324	57	434	361	113
2009-2016	*167k*	*387*	*319*	*74*	*435*	*359*	*123*
2016-2023	*147k*	*397*	*329*	*37*	*434*	*362*	*102*

Source: Average of ASHE cases across surveys 2009-23

Analysing the wage effects of being employed in RGF supported businesses would benefit from a comparative analysis, and the table presents the jobs found in ASHE for comparable businesses. The middle columns count the jobs at the businesses used in the analysis of the previous chapters. These are the businesses that:

- **Announced expansions.** In the businesses that announced an expansion in the restructuring database described in the last chapter, there were 960 surveyed jobs in ASHE each year at enterprise level of which 324 were in the plants where expansions were to take place.

- **Announced closure and job losses.** The table averages the number of jobs over a fourteen-year period and, while the businesses announcing job losses have 434 jobs on average in ASHE, those announcing closures have 57 individuals covered.

A first observation is the businesses announcing closures report a quite small number of jobs to ASHE and, unlike the other datasets, the numbers fall over time. This probably reflects the substantial loss in employment as plants close and the removal of the employer from the survey altogether. In analysis, job closures are combined with the plants announcing job losses when looking at wage premium.

The final two columns cover a set of plants that have been statistically matched to the RGF plants drawing from the ONS datasets. PSM matches the RGF plants to ones that are comparable in terms of plant level employment, turnover, industry (whether in manufacturing, high tech or low paying sector). The first model also includes the growth in employment of the businesses in the year before support. Matching uses propensity score matching. Model 1 provides businesses that have 361 records in ASHE; model 2 has fewer records primarily because the matching is on employment categories rather than levels and so the PSM has not selected as many very large plants as the RGF recipients.

Table 5.2: Number of records where employee switches job

	RGF	Businesses announcing		Matched plants	
Switch to ...	Supported	Expansions	Closure & Job Losses	Model 1	Model 2
Enterprise-level	123	137	309		
Plant-level	83	126	134	85	44
Switch from ...	Supported	Expansions	Closure & Job Losses	Model 1	Model 2
Enterprise-level	181	139	364		
Plant-level	47	75	130	66	53

Source: Average of ASHE cases across surveys 2009-23

Table 5.1 gives the number of jobs annually recorded. Crucial to wage premium analysis is to look at the subset of these records where there are transitions of employees in the plants and enterprises over the 2009-23 period. In the 1,209 jobs tracked in ASHE in RGF supported enterprises, there are 123 transitions where an employee of the plant in the period was not present in the period before. This would mean a person has switched employment into an RGF business. There were 181 transitions the other way, with an employee that was working in the enterprise in the period before moving to another enterprise in the following year.

Table 5.2 indicates that RGF supported and expansionary plants generally have more joiners than leavers. This is what is expected as there is a net inflow of individuals into the plants. For the RGF plants, there were 83 moves into the plants over the period and 47 moves out. For plants announcing closures and job losses, the flows in and out are more similar.

5.2 Changes in earnings and estimating the wage premium

This section analyses the linked dataset compiled to estimate the wage premiums in the different groups of businesses. It explores how the wages paid in the RGF businesses differs in terms of general trends comparing both with the wider ASHE sample and the subgroups created of comparable businesses. The section then looks at the effects on individuals' wages as they transition into working at the businesses and whether switching jobs attracts a rise in pay that is high.

Annual growth in wages

ASHE collects the gross weekly pay of the employees in the scope of the survey. The level of pay in the RGF supported businesses indicates the average job is higher value than the average across ASHE. In 2011, the 312 individuals working in RGF supported enterprises in 2011 and £803 per week; across all respondents, weekly pay was £440.

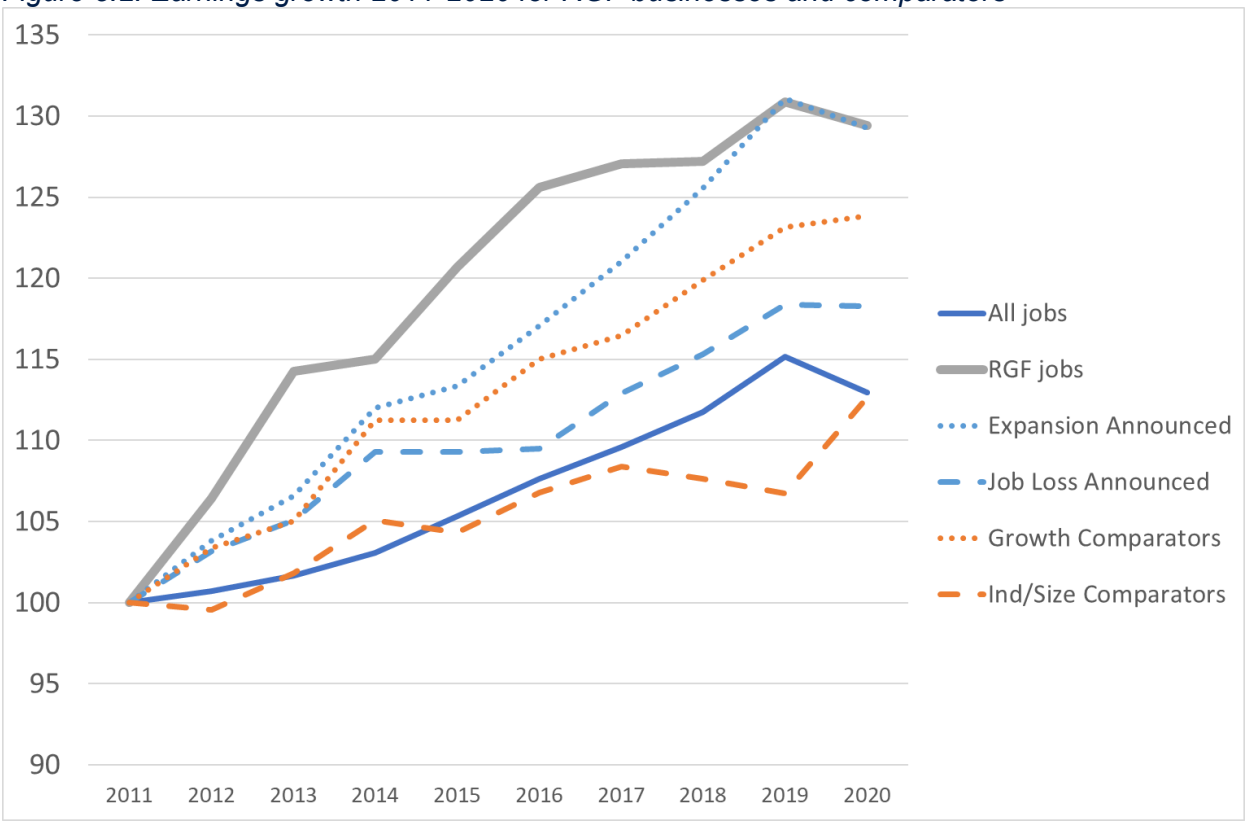
The average weekly pay is closer the RGF level in the businesses used for comparison purposes. In businesses that announced expansion at some point in the period, gross weekly wages in 2011 are £802; the jobs in businesses announcing job losses or closures received £778; and the two statistical matched groups paid £673 and £709.

These averages reflect salaries of employees without considering the age and experience of employees. The averages indicate that the wages paid in the businesses supported by RGF and in the comparable businesses are higher than the national average wage, but this in part will reflect higher levels of skills and ability.

The surveys also follow employees' wage changes, and the growth in wages would be less affected by this. Figure 5.2 plots out the growth in weekly gross wages in these groups of businesses after 2011. The changes in pay seen in the RGF businesses is the highest of the various groups, and higher than the wider ASHE sample. The figure indexes to 100 in 2011 and then shows that wages are 30% higher by 2020 for RGF businesses, double the growth seen across all jobs.

There is some evidence that the comparator groups fall into two sets. The businesses that make an announcement of expanding are also reaching the RGF level of wage growth, and the businesses that are statistically matched to the RGF supported businesses controlling for having similar employment growth to the RGF businesses also have relatively high wage growth over the period.

Figure 5.2: Earnings growth 2011-2020 for RGF businesses and comparators



Source: Analysis of ASHE linked to supported and comparator businesses; sample sizes in Table 5.1.

The other groups of businesses show wage growth after 2011 that is more similar the wider set of ASHE respondents, and so lower. The average across ASHE is 15% wage growth and this is like the changes seen in the businesses that announced job losses. This growth is also similar to the businesses that were matched to the RGF beneficiaries but using a model that did not select on the businesses' growth in employment.

A concern in analysing wage growth is that the average for the different types of businesses may be affected by some unmeasured variable. Wage dynamics may differ due to local labour market effects, or the degree to which businesses are unionised and the agreements under which individual employed. The next section uses an approach which may moderate these concerns, focusing on the subsample of employees that transition between employers and wage growth they see. These moves would tend to be within the same labour market and – while non-wage factors will still be unmeasured – the focus on the same individual in two different businesses in successive years does ameliorate some of these concerns.

Wage changes as individuals transition between jobs

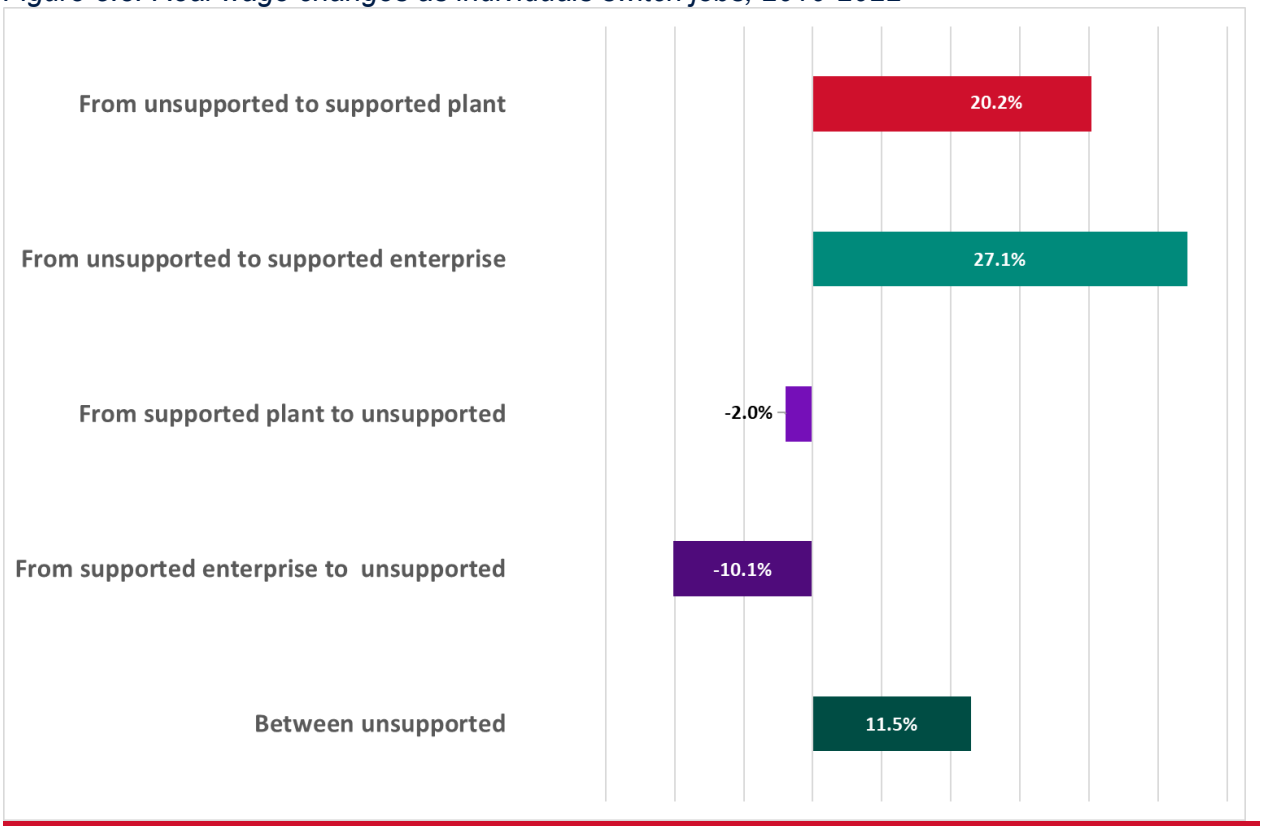
The wage premium is earnt if a worker's wage is higher than it would be in a different business or occupation, given their ability, experience and skills. Transitions between employers can help to shed light on whether such premiums are associated with a business. Exploring the wage changes seen as individual switch between the RGF supported businesses and other businesses can shed light on the incremental value of any employment created in the supported firms.

Figure 5.3 presents the changes in gross weekly pay when workers change jobs. The figure focuses on the RGF businesses, and the changes seen in the wider ASHE survey, covering all transitions over the period. Here, analysis focuses not on the effect of the RGF support, in that analysis does not contrast wage changes before support with that after. Rather, the focus is the measurement of the wage premium from working in the business.

Overall, these results are similar to those estimated for the full RGF evaluation (BEIS, 2022). When an individual changes job, on average, their pay rises by 11.9%. This is the real wage change that is seen in the 85,968 job changes recorded in the businesses not supported by RGF as individuals move jobs. This is about the half the improvement in pay seen when individuals move to the RGF supported businesses, either at enterprise level where there are 123 transitions; or into the plant that RGF supports into which there are 83 new moves.

These results indicate a healthy wage premium to any employment created in the RGF plants. There is corroborating evidence in the moves from the businesses, where real wages drop. The 2% fall seen at plant level is consistent with no change in the nominal pay; the rather larger drop in pay seen by those leaving at enterprise level indicates moves out of the enterprise to plants unsupported by RGF were associated with nominal falls and losing the wage premium.

Figure 5.3: Real wage changes as individuals switch jobs, 2010-2022



	Gross weekly pay		Transitions
Switch ...	Change	Standard Dev	Counts
From unsupported to supported plant	20.2%	0.43	83
From unsupported to supported enterprise	27.1%	0.48	123
From supported plant to unsupported	-2.0%	0.60	47
From supported enterprise to unsupported	-10.1%	0.70	181
Between unsupported	11.5%	0.71	85,968

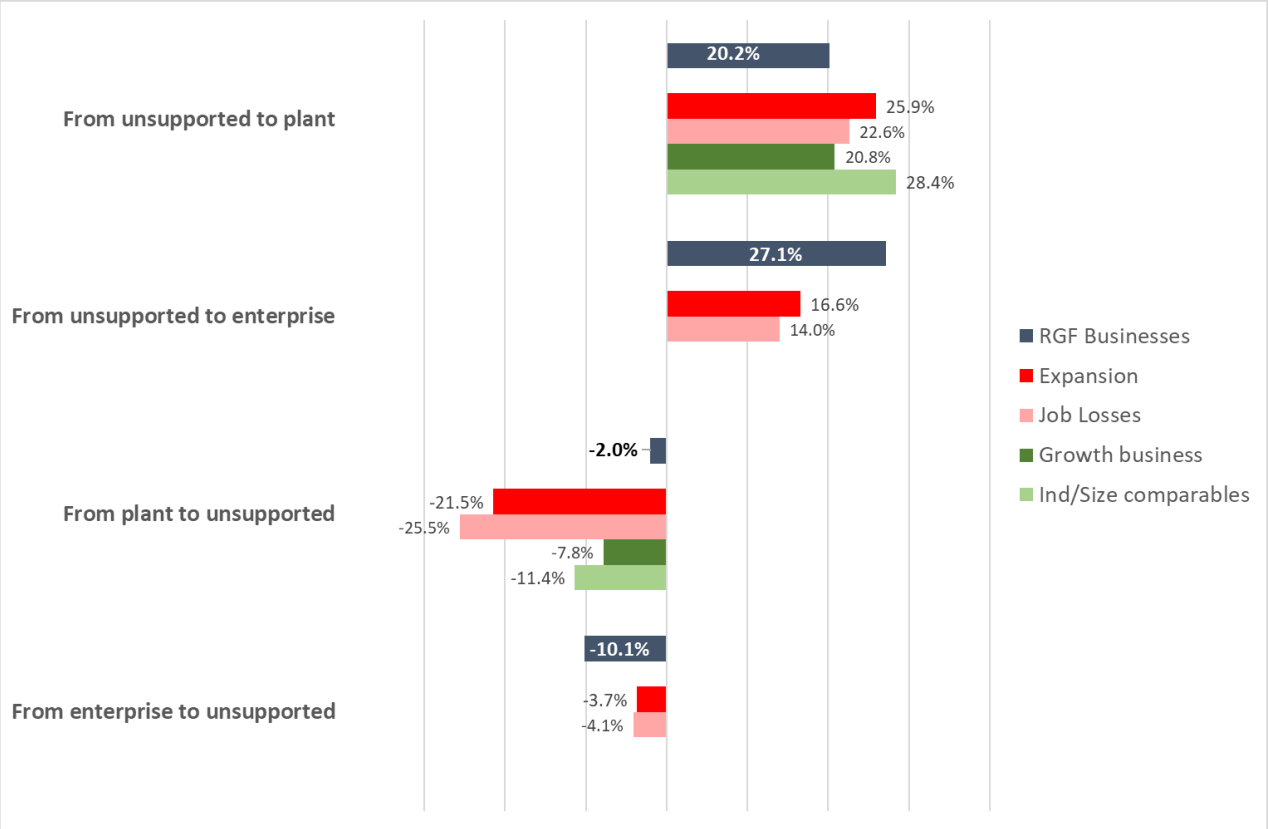
Source: Analysis of ASHE linked to supported and comparator businesses

The wage premium observed as individuals move in and out of the RGF supported businesses and plants can be contrasted with similar transitions in and out of comparable businesses. Figure 5.3 analyses the ASHE data for the transitions relating to the four groups of comparable businesses.

For businesses that have made an announcement of expansion, individuals moving to these businesses see a pay rise of 25.9%. The premium over the average transition across all ASHE moves is nearly 15%, as figure 5.2 indicates how switches in the wider ASHE data is associated with an 11.5% pay rise. The other three groups of businesses display very similar real wage changes as individuals switch into them.

Figure 5.4 also indicates the fall in real wages individual experience as they leave the businesses selected as comparable to RGF ones. Employment found in other businesses is associated with falls in pay. Some of the estimates are similar to those in Figure 5.3, and indicate real wage falls consistent with no change in the nominal wages. However, there are two estimates – for the businesses announcing expansions or job losses in the restructuring database – that indicate very substantial falls in weekly wages as individuals leave their jobs in the businesses making announcements.

Figure 5.4: Restructurings in the UK, 2002-2020



	Gross weekly pay		Transitions
Switch in business announcing expansion ...	**Change**	**Standard Dev**	**Counts**
From unsupported to announcing plant	25.9%	0.51	126
From unsupported to announcing enterprise	16.6%	0.55	137
From announcing plant to other	-21.5%	0.85	75
From announcing enterprise to other	-3.7%	0.70	139
Switch in business announcing job losses ...	**Change**	**Standard Dev**	**Counts**
From unsupported to announcing plant	22.6%	0.50	134
From unsupported to announcing enterprise	14.0%	0.51	309
From announcing plant to other	-25.5%	0.86	130
From announcing enterprise to other	-4.1%	0.68	364
Switch in growth businesses...	**Change**	**Standard Dev**	**Counts**
From unsupported to RGF-comparable plant	20.8%	0.61	85
From RGF-comparable plant to other	-7.8%	0.68	66
Switch in businesses similar in ind/size ...	**Change**	**Standard Dev**	**Counts**
From unsupported to RGF-comparable plant	28.4%	0.42	44
From RGF-comparable plant to other	-11.4%	0.69	53
Between unsupported	11.5%	0.71	85,968

Source: Analysis of ASHE linked to supported and comparator businesses

The table below the figure indicates the count of transitions during the period. While these two falls are not the based on the smallest number of transitions, they are smaller samples that the individuals moving in the other direction. Overall, they do suggest that the wage premium is lost as individuals leave the businesses.

Comparing with appraisal wage premium assumptions

The transitions to the supported businesses are the actual changes in wage rates seen by the employees entering the business and – as the individual's wage is also available for the previous job – provides an estimate of the pay change due to being employed in the business, controlling for the skills, experience and ability of the individual. This differs from the appraisal method which

compared the wages paid by the RGF business with averages matching for the skills level expected in the post. This section explores how comparable the ASHE transitions findings is to the assumed wage premiums used in eRGF appraisals.

In the appraisal, on average, a wage premium of £155 was associated with the employment that eRGF expected to safeguard or create. This is the estimate for 2022 (Table 2.1). The analysis here suggests that – as individuals switch to the supported businesses – their weekly pay would be £746 in 2022, and their pay would have been £621 in the year before moving job, calculated by removing the estimated average wage premium estimated in Figure 5.2. This would result in a wage premium of £125, somewhat lower than the assumed levels in the appraisal, but of a similar order of magnitude. However, the appraisal estimate is necessarily higher, as it includes a factor to take account of long-term effects on wages, skills and labour quality in a counterfactual of a relative lack of good employment opportunities.

Table 5.3: Estimate weekly wage premium, 2022

	RGF	Businesses announcing		Matched plants	
	Supported	Expansions	Closure & Job Losses	Model 1	Model 2
Wage at plant	£746.06	£797.62	£773.08	£864.74	£606.81
Wage before switch	£620.68	£633.53	£630.57	£715.84	£472.59
Premium	£125.38	£164.09	£142.51	£148.90	£134.22

Table 5.3 presents the estimated wage premiums for the comparator businesses. These businesses provide somewhat higher wage premiums, both because their plant level wages prove to be higher and – in some cases – because the wage rise observed in these businesses as new employees enter is higher.

To some extent, Table 5.3 validates the comparable businesses as being comparable. The previous chapter sought to identify suitable comparable businesses so that the additional effects of the RGF support on the chance that a business expands or remains open. There the additional effects identified depended crucially on these businesses being as comparable as possible. In terms of the additional wages that the safeguarded or created employment caused by RGF the premiums being similar or somewhat higher does confirm these five groups of businesses are at similar productivity levels, as well as the other factors that have been used to select the businesses.

5.3 Estimation challenges and understanding robustness

Rather like the challenges of assessing the effects of RGF support on business location, there are steps taken in the analysis of wage premiums to address the issues around a relatively small number of RGF projects.

Building a dataset about wages paid

The ASHE panel constructed for this analysis covers over a decade of observations of employee wages. Generally sample sizes for wages are high because, using employee level data for businesses where employment is high multiples the number of observations surveyed in ASHE. This means analysis of jobs in the businesses uses samples large enough both for statistical analysis of the average employee, but also then exploring the job changes. Total number of surveyed employees is high; then the portion that change their jobs is around a hundred over the period since 2009.

One noticeable feature of the data however is that the sample sizes during 2021-3, a period when many of the exceptional RGF projects reached completion and employment would have been rising, are affected by Covid. The ASHE survey response rates dropped markedly in these years

as businesses closed. Also, the nature of the job market would have been markedly differed in this period.

The approach of pooling across a decade can mitigate this. It helps to determine the wage premiums associated with businesses during a stable period, which arguable may be more representative of the medium- and long-term nature of the jobs safeguarded and created. Also, as the aim of the analysis is not seeking to attributing an effect of RGF support on wage premiums, there is a less of a need to synchronise the dataset to the period of the support.

Wage premiums in RGF and comparable businesses

As the wage premium analysis focuses on the quality of any additional effects, rather than what effects are additional, the use of comparators is somewhat different in this analysis. This chapter establishes whether wage premiums are occurring in other comparable businesses viewing this more about showing that the comparators are robust. The analysis indicates that the comparator businesses used in the previous chapters analysis are similar in terms of wage premiums.

This is a positive result. Both the RGF and comparator businesses can be characterised as being large UK plants predominantly in the manufacturing sector. Various innovation and skills related characteristics are also high, such as the chance of these businesses holding patents or receiving R&D grants. This chapter highlights that, within this class of businesses some further, job quality related findings are:

- ***Wage premiums of over 20%.*** The businesses across four alternative comparators are associated with a wage premium. This is shown by employees seeing pay rises as they join the businesses from outside. For those businesses that announce an expansion and therefore, like the RGF supported businesses, progress investment plans in the UK recruit individuals to posts that are at a higher productivity level than the individuals' previous job.
- ***Premiums extend across to business experiencing job cuts.*** Businesses that announce job losses or whole plant closures also have jobs that attract a wage premium.

The intention of the Exceptional RGF was to avoid plant closures, securing the further investments from companies for future production or R&D to remain in UK operations. The alternatives for the UK presence would be – if funding is not secured having accounted for deadweight – that the business would reduce their UK presences and there would be employment losses. The second finding indicates that the alternative path of comparable unsupported plants reducing employment would lead to job losses and that those losses would be of productive jobs that have a wage premium.

5.4 Conclusions

The RGF aims to sustain or create high quality jobs, and this chapter has analysed the survey data about the individuals working in supported businesses. Analysis establishes whether the employment is more remunerative than the comparable employment available for the individuals. If so, this is strong evidence that the jobs have a productivity premium. This is not saying the wage premium is caused by support. Rather, the chapter seeks to confirm that each additional job generated in the businesses that were supported provides better employment for the individual than they otherwise would have found.

The wage premium is quantified by using a particular feature of a UK earnings survey. The survey contacts each year organisations where individuals are employed focusing always on the same people and so tracking them as they change jobs. This establishes both annual pay changes and any that arise as individuals switch between employers. The analysis looks at the employees RGF supported plants, the plants that announce restructuring identified in chapter 4 and other comparable plants. The pay rises as employees move to these businesses can be contrasted with wider pay changes as people change jobs, and the premium is any difference.

The value of the additional employment effect is estimated using a wage premium analysis. When an individual changes job, on average, their pay rises by 11.9%. This is about the half the improvement in pay seen when individuals move to the RGF supported businesses, which is 20.2%, suggesting the premium is around 10%. Using the wages paid, the premium in weekly wages is £125, a figure that is comparable to the average £155 assumed in the appraisals of eRGF projects though a little lower. The appraisal estimate is necessarily higher, as it includes a factor to take account of long-term effects on wages, skills and labour quality in a counterfactual of a relative lack of good employment opportunities.

6. Conclusions

Exceptional Regional Growth Fund (eRGF) cases are subjected to in-depth appraisal ahead of award, and this evaluation of the eRGF has aimed to validate the forecasts made and assumptions underpinning the decisions to support businesses. This is undertaken qualitatively, asking whether those involved in the projects link the funding provided to the decision to locate significant investments in the UK, and there are associated further employment, innovation and wider impacts. The quantitative evidence then explores two dimensions: whether projects are associated with expansions at businesses and fewer closures of operations; and whether the employment associated with these expansions are high value.

6.1 Findings

Case studies confirmed that the location decisions were a competition between sites across different countries within the multinational parent. There was across all projects an acknowledgement that the eRGF was important in securing the investment in the UK, meeting the funding gap: the cost differences between locating in the UK and a counterfactual alternative credible overseas location.

The investments made are associated with innovation, with project leads highlighting that new technologies were featuring in projects, often interacting with wider innovation ecosystems and building up the skills base. The projects identified new products developed following investments, and some wider impacts such as on suppliers to the supported businesses.

The quantitative analysis then looks at the assumptions made when projects were approved. It uses evidence from the longer list of RGF and eRGF projects, investments made over the period since 2011, to explore whether the investments made secure high value jobs that are additional and the extent to which the RGF investments affect business location decisions. This focus on employment and location is valid as employment benefits due to the siting of the project were the monetised benefits in the business cases for support.

Using data about the wages paid at the supported businesses, the premium in weekly wages – what a job earns in the business over a comparable post outside the business – is £125, a figure that is comparable to the average £155 assumed in the original appraisal (the difference is explained by further appraisal assumptions made that the quantitative analysis could not estimate).

The analysis then explores how the RGF support drives businesses making announcements of expansions in employment. A restructuring dataset compiled for the study contains 116 events where businesses announce expansions and, of these, six can be correlated with the support provided through RGF. A complete match is unlikely as business expansions will not necessarily be announced. Of those that are in the data, econometric analysis finds up to 3, or a half, of these expansion announcements, are additional.

The same dataset also looks at the announcements of businesses deciding to close a plant or reduce employment in a plant. The dataset contains 117 events where businesses announced a closure or offshoring of their activities. None of these events took place in the plants benefitting from RGF support, though three restructurings did occur in the supported enterprises affecting plants not benefitting from RGF but owned by the parent company. Based on the characteristics of the RGF plants, the number of businesses that might announce closure/relocation is estimated and the change in this attributable to RGF estimated. There are 0.2 fewer announcements attributable

to RGF support. These combined expansion and closure announcements results are consistent with the additionality levels found in the previous RGF evaluation of 2022[6].

The value of the additional employment effect is estimated using a wage premium analysis. When an individual changes job, on average, their pay rises by 11.9%. This is about half the improvement in pay seen when individuals move to the RGF supported businesses, which is 20.2%, suggesting the premium is around 10%.

The evaluation has also looked at evidence about the processes used to identify and support beneficiaries. By September 2023, there are 10 live eRGF projects with the first initiated in financial year 2016/17 and four further projects yet to be initiated. These are monitored alongside the other RGF support, including the hundred or so RGF Regional projects. The eRGF are similar to those funded by the wider RGF projects in scale though there are fewer. The planned investments into the businesses are £101m of grant support. There is then a further £555m of co-investment from the businesses.

6.2 Evaluation approach

The study has benefited from interviews with key individuals involved in eRGF; it has also used firm level data across both the eRGF and the earlier RGF projects. The qualitative evidence has some strengths and some weaknesses:

- **Focus on eRGF decision making.** As eRGF projects were recent, interviews and other project qualitative evidence can relate to the investment and location decision made by the supported businesses. Views about the context, drivers and investment decision outcome could be collected.
- **Relatively small sample of businesses.** The eRGF has a modest number of projects so that the ability to look across the scheme is somewhat lessened. In addition, there were no candidates of projects that might be a counterfactual as the entry into the Fund was on an exceptional basis.

For the quantitative analysis, the methods employed replicate those used in the wider evaluation of the Regional Growth Fund. The consistency of the findings across the two studies was a means of testing the robustness of the eRGF approach. Overall, the quantitative analysis has some features:

- **Evidence could use a comparator.** Analysis could look at both supported businesses and comparable unsupported ones, testing on the decisions to expand/close and looking at the employment in the supported businesses. The use of a linked business data that included restructuring events was key to this, and sample sizes – while modest because the events are rare – were sufficient.
- **Selection bias issues.** As the businesses supported were large and complex multinationals, and their location decisions were within a wider global context, the ability to completely represent the business decisions in the available data was difficult. The study has considered robustness by comparing findings with past work on the RGF and by using alternative models, finding consistency of results.
- **Pooling across RGF Regional Projects and eRGF.** The extent to which the quantitative results would differ across the two waves of intervention is impossible to assess given the small number of eRGF projects. Pooling eRGF with RGF Projects has some advantages in this regard, but the two schemes could differ. The main support for this step is that eRGF

[6] https://www.gov.uk/government/publications/regional-growth-fund-evaluation

has matured on the RGF interventions, shaping the selection processes to build on RGF effects. The evaluation in some ways replicates this.

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Annex A: Case Studies Approach

The studies explored the effects of the Department for Business and Trade (DBT) eRGF funded projects, and those funded by other departments, seeking evidence on whether and how projects met their project objectives, the outcomes and impacts seen and any reflections about the projects.

The studies used the documents and monitoring data about the projects as a starting point. These covered the application processes in considerable detail so that the project could be detailed at this scoping stage; the monitoring data then gave an indication of the outputs of the project in the period since the project start. The DBT Regional Growth Fund team, as well as providing project documents, provided a first point of contact for each project, introducing the research team to the projects.

Interviews lasting 45 minutes were arranged firstly with the government officials overseeing a project (case officers or monitoring officers at one of the lead departments). Through them, slots with project leads based in the supported company were contacted. The interview explored the project goals, aims and activities; outputs and impacts; the footprint of the investment such as the skills, R&D and supply chain activity associated with it locally, for the industry and globally; collaboration with industry, universities etc. Discussion also covered reflections of what went well and what might have been done differently. Project leads were then able to introduce others involved in the project for further interviews, such as individuals in the supported unit's parent organisation; significant partner organisations such as key suppliers or collaborators.

Interviews were recorded where agreed, or notes were taken as they were conducted. These were analysed in a structured way, establishing key themes and then compiling the evidence from the different interviews about a particular project. The thematic analysis allowed evidence to be analysed in terms of the overall logic of the intervention, as well as allowing a degree of comparative analysis as different views about a theme were contrasted. The project case study was written covering the qualitative evidence from interviews and also integrating reviews of the project documents. Each project was reported separately and then analysis focused on looking across the projects to provide an overall analysis.

Some projects were also able to assist in providing the widest footprint for the project. This listed key parties indirectly affected by the project, such as in the supply chain, at collaborating research organisations, or at local level. This was then used in the quantitative analysis.

Case study interview framework

The interview framework covered:

- Project goals, aims and activities
- Bid and Project Design
- Outputs and Impacts
- Future plans and concluding questions

A: Project goals, aims and activities

1. What is your role in the project?
2. Since when have you been involved with the project?
3. Could you describe the goals and aims of this project? Have they changed significantly over the course of the project? If changed, probe for details on project inputs, activities, outputs, and long term goals.

4. How did this this project fit with your business' wider goals and interaction with government support for investment?

B: Bid and Project Design

5. What was the rationale behind applying for the eRGF funding?
6. How did the bid to eRGF come about?
7. At the time of applying was there any plans or decisions in-progress about (re-)locating business activity? What were the key influences/pressures on any plans/decisions?
8. A second key part of the RGF was co-investment and high-quality jobs. How did you reason around the amount you were willing to invest yourselves? How did you arrive at the job projections in the business case?
9. What other options were considered to meet your goals and aims? How could you have realised the goals and aims without the RGF funding?

C: Outputs and Impacts

10. Has the project delivered the expected output [plant / refurb / enhancement], or is it on track to deliver this?
11. What are the main benefits to your business, and have they materialised?
12. Has the build impacted your operating model? Has there been a change in your long-term ability to: Attract R&D funding; Develop/manufacture more of the firm's products; Locate business activities in the UK
13. Did the grant help unlock/ leverage other private sector investment?
14. As the project has progressed, do you have any views on how the delivery structure has assisted or prevented outcomes or impacts?
15. Would any other financial instrument, with a different structure, have been more beneficial for your company if available for the investment?
16. Are you aware of any benefits accrued outside your organisation, such as to employees, partners, suppliers, or customers in the UK? If so, what do you think are the wider impacts to UK industry of this project?
17. Understanding the wider impacts of your projects is challenging. For these wider benefits, would you – in broad terms – be able to say more about the businesses or employees that may have benefitted? Do you track this or have suggestions for us about how/where to find evidence about these impacts?

D: Future plans and concluding questions

18. What is the anticipated future for the project?
19. Are there key successes and any issues you would like to highlight, and any lessons from the project?
20. Are there any other issues you would like to talk about that we haven't covered yet?

Annex B: Data analysis

The study used several datasets about UK businesses. These were linked together using business identifiers to provide an analytical data with variables about business type and performance, and the employees within businesses. This annex describes these datasets and the analysis undertaken in two settings. It begins by looking at the data common across both the firm level and employee level data.

RGF Support Data

The econometric analysis centres on cross-sectional data could be linked over time to create panel data. Using business identifiers, the data was linked to the businesses supported in RGF and the Exceptional RGF. RGF projects support individual plants within UK businesses. So, identifying the supported entity mixed business identifiers with the location of a plant, to match to the supported businesses at plant-level.

The source for lists of the supported organisations was the monitoring data collected as RGF has progressed since 2011. The data contains the Companies House number of the business, as well as the postcode of the plant that is the focus of the investment. Some companies had multiple projects. If these were in the same plant, analysis looking at the timing of effects was restricted to the first project. Where companies had multiple projects, but these were in different locations, each incidence was analysed separately focusing on the effects on the business in the different project locations.

While initially the postcode was used for analysis, this was generally replaced by ONS Output Areas, which each cover about 20 postcodes. This allowed the plant linking to be a bit more permissive about businesses that extend across relatively large areas and potentially having multiple postcodes across a site. In some circumstances, the matching was undertaken by the business identifier and the higher ONS Lower Super Output Area, as the output area/postcode layer of geography was not accurately locating the business.

Having identified the plants that received RGF support and linking this to data about the plants and the businesses, the analysis period associated with the RGF investments was defined. Analysis periods differed across the two types of analysis (and from the definitions used in the full RGF support). Figure B1 indicates the way that the focus of analysis was defined.

Business and Employee Datasets

Analysis took place in two distinct settings:

- Chapter 4 uses a dataset compiled for the study from public sources such as the accounts filed by businesses at Companies House linking to business restructuring events, patents etc. For practical reasons, the dataset is a sample of relevant UK businesses.
- Chapter 5 uses the ONS Secure Research Service (SRS) data within the project area provided for analysis by ONS. The setting stores data about all economically significant UK businesses and the employment, industry, location of businesses was linked to a survey of a sample of the businesses' employees.

This section describes the data in each setting, and the analysis undertaken.

Setting 1: Analysis of Restructuring Events using Public Datasets

The statistical modelling in Chapter 4 explored the drivers for a business to make restructuring decisions such as expanding or closing a plant, and whether this correlates with RGF support. The outcome data set was the list of business announcements about their plans to expand or close their business, and this was then linked to further business level data. Difficulties accessing ONS data meant analysis about the restructuring announcements made by businesses was undertaken using public datasets linked to the RGF support data. This had some advantages, particularly as the compilation of data – which was quite complex – could then be checked at various stages for accuracy, something more difficult in the anonymised ONS setting where entities are not identifiable.

Table B1 lists the key variables used in the analysis. Data compilation had challenges:

- **Sectors of interest.** For both practical and methodological reasons, it was appropriate to focus analysis on the subset of businesses in the manufacturing and life sciences sector, and to remove the smaller businesses. Without this scoping, data compilation would be complex and – as much of the analysis focuses on the businesses that are comparable with the large RGF beneficiaries – this focus aligned to the businesses benefitting from support.

- Availability of plant level data. Outside of ONS, there is no readily available public database of the location of individual businesses (and even the ONS local units register is quite complex in how it represents individual business establishments). However, using multiple sources a set of units within large, multi-plant businesses has been established.

- Characterising the businesses. Modelling relied on variables that are relevant to the business decisions about their investments. A full set of business characteristics capturing the complexity of UK manufacturing/health sciences businesses is difficult. The approach taken was to create a set of variables that balanced the need to capture decision drivers, but not stretching the available data, even after linking, so it could be insufficiently robust.

Table B1 variables were derived from a mixture of public data, free data available on request, and the data compiled by commercial business data providers (primarily Beauhurst and Moody's FAME data). The spine of the data in the analysis is the business identifier, the location of the establishment and the year. The business identifier was the Companies House registration number; the location was the postcode. Generally, data linking used these three keys (or some subset depending on the variable).

Defining restructuring outcomes

Eurofound made their European Restructuring Monitoring (ERM) for the UK available to the study. This was the source of the Expansion and Closure variables, that take a value of one when a business announces the restructuring event for a particular plant in a particular year.

There are 4,095 events listed in the Eurofound. The dataset was firstly cut down to just the sectors relevant to RGF, excluding the retail, finance, business services and public sector organisation that reported restructurings. The focus for the analysis has also been the recent decades, looking at the events after 2011. Overall, 508 events are recorded since 2011 in manufacturing (412) and the research and innovation services (96) industries related particularly to health sciences.

The analysis of these events highlighted that there were some types of events that were unequivocally either positive or negative in term of their effects on the activities at identifiable plants. In the positive direction were the events the ERM classifies as expansion announcements. These often had a positive employment change, no job losses and could be linked to plants of the business. Both bankruptcies and closures were events that were negative, with both resulting in

job losses and usually associated with closure at identifiable locations. The two outcomes analysed in the study are then expansion events and closure/bankruptcy announcements.

Table B1: Variables used in analysis using public datasets

Variable	Description	Notes	
		Source	Coverage
RGF beneficiary	Business leading an RGF or eRGF project by year of start	RGF Monitoring	Plant-level
Expansion	Manufacturing and health businesses announcing an expansion in a particular year since 2010	ERM	Plant-level
Closure	Businesses recorded as announcing a closure at a plant or bankruptcy in a particular year	ERM	Plant-level
Asset change	%age change in total assets recorded in accounts	FAME/Beauhurst	Company-level
R&D reported	R&D expenditure recorded in accounts	FAME/Beauhurst	Company-level
Employment	Categorical variables about jobs at plant level	FAME/Beauhurst and BRES	Plant-level
Hi KI manu	Equals 1 if SIC industries classed as highly knowledge intensive manufacturing	Link to CH SIC industry	Company-level
Hi/Med KI Manu	Equals 1 if SIC industries classed as highly or medium knowledge intensive manufacturing	Link to CH SIC industry	Company-level
High Tech Manu	Equals 1 if high technology manufacturing SIC industries	Link to CH SIC industry	Company-level
Multinational	Equals 1 if foreign owned or has a UK parent with non-UK subsidiaries	FAME	Company-level
Health sector	Equals 1 if included in Office for Life Science health science businesses lists	OLS	Company-level
Patentholder	Equals 1 if if business holds a patent at the UK Intellectual Property Office	IPO	Company-level
>3 plants	Equals 1 if if more than three business addresses reporting in OLS list, Beauhurst, ERM	OLS, Beauhurst, ERM	Company-level

Sources: Eurofound Restructuring Monitor (ERM) Database; Business Register Employment Survey (BRES); Office for Life Sciences (OLS); Intellectual Property Office (IPO) patent register linked to Companies House (CH) identifier.

The other events documented in the database – such as reorganisations or mergers and acquisitions – were difficult to allocate to a plant-level effect. Reorganisation events listed multiple units of the business and mixed job losses with employment growth.

The ERM data identified the business to only the name of the company, the location in terms of the town/city of the establishment(s) affected, as well as the nature of the event. It was often necessary to identify Companies House numbers (CRN). For the mainly manufacturing businesses that remained, where a Companies House number was provided, these were checked. Further matching to the Companies House register proceeded where no CRN was present. This used the entity name that was given. The first strategy was to use exact name matching following name standardisation; the second strategy was a fuzzy match but only on an extract of the Companies House register for large businesses in the sectors identified. The two matching strategies maintained a low false match rate. A manual matching of remaining entities completed the process.

Defining drivers for location decisions

Beauhurst is a commercial data provider that compiles the public data reported to Companies House by all UK businesses. For larger businesses, that are the focus of this study, returns include the full company accounts, providing employment, turnover and other expenditure categories, as well as the balance sheets. The annual accounts can be linked over time to provide accounting variables over the period of the study. In addition, the commercial databases detail the structure of

businesses, including ownership, and include the industrial sector of the businesses, using standard industrial classification.

The company level variables in Table B1 are derived from the accounting and Companies House data. Balance sheets provided the change in assets in the year and whether or not a business recorded R&D in their accounts was a variable. The industry classification is mapped to indicators of knowledge intensity and high technology. ONS (2018) provides lookups for knowledge intensive manufacturing industries; it also provides a look up for industries using high technology.

Whether a business was a multinational or not was derived from a series of structured queries of ownership. The queries provided lists of UK Companies House numbers for companies that were either foreign owned or were UK businesses with overseas subsidiaries. Foreign ownership was identified where the global ultimate owner was located outside of the UK, ignoring a few countries that are known to be jurisdictions UK businesses locate in and the businesses not owned by an entity. The UK businesses that had overseas subsidiaries were tagged through the ultimate owners reporting about organisational structure.

Company accounts report on the entirety of the business. Considerable effort was put into determining the employment of the business at individual sites. The approach taken involved data linking that could be broadly split into two phases, with a first focused on compiling lists of the establishments from which a business operated. For businesses in health and life sciences, there is the Office for Life Sciences (OLS) Health Science Business List, a list of 6,585 individual establishments in the sector. The list includes CRNs and postcodes for 6,193 plants plus some details of the activities that take place in the plant and which employment category the plant falls into. This dataset also provided a variable to identify businesses in the life sciences sector.

RGF mainly supported manufacturing businesses. Identifying such businesses using only industrial classification provided a very long list of businesses, with many not relevant for the study (being too small). An initial sift was to focus on the businesses that reported employment, and then an iterative approach was taken to identify further relevant businesses. As well as SIC classification, the study focused on the businesses that HMRC public data reports as exporting automotive products. Businesses were identified using the HMRC publication of commodity exports, where the bulk data includes the names of the individual businesses that have exported goods and the commodity code for the export. Commodities classified to the automotive sector were identified iteratively, with a seed set of automotive businesses (identified using industry classifications) used to identify products exported by these companies.

Employment for the manufacturing businesses was assumed to be plant level if the business had a single establishment. Then the employment was estimated for the multi-plant businesses, focusing on the 198 where the number of known plants in a company were known to exceed three, and the 144 where employment was larger than 250 in the entire entity as reported in company accounts. For the businesses in the life sciences sector, an employment category for the plant was available for 2018 and this was used for the variable. There were 58 plants where the whole entity employment was likely to be higher than at the plant. Here, the location and industry of the plant was linked to the Business Register Employment Survey database to provide a rounded employment estimate of the number of jobs in the business's industry at the Lower Super Output Area of the plant.

The study has also linked UK patents registered by companies. The UK Intellectual Property Office publishes the patent register online and the owner – where a limited entity – can be linked to the Companies House register and then to the ONS business register.

Modelling the drivers to announce expansion and closures

The linked dataset considered the outcome of a business announcing an intention to expand or to close at one of its plants. Table B2 indicates the number of such announcements by year across the datasets. Overall, it can be observed that the dataset is quite modest in terms of the sample making announcements.

Table B2: Announcement made in manufacturing and life sciences businesses, 2012-20

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Expansion	**7**	**9**	**19**	**6**	**16**	**29**	**16**	**14**	**0**
Follows RGF	**1**	**1**	**4**	**0**	**0**	**0**	**0**	**0**	**0**
Closure	**3**	**14**	**6**	**9**	**5**	**16**	**17**	**24**	**5**
Follows RGF	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Linking into the dataset the fact of RGF project support adds a further dimension to which businesses are restructuring. In the three years before an expansion is announced, there are RGF projects in six announcements and the table indicates the years in which this is the case. The RGF support is not associated with closure announcements in a similar way.

Table B3 presents the underlying models for the probit estimates of the expansion decision. The three models used differed in terms of the variables used in modelling whether or not an announcement occurred. All models included whether the plant benefited from RGF support in any of the three years before support, but the models. Models 1 and 2 are similar, with only a few variables differing, and results are similar. Model 3 uses the employment number rather than the categories, using the whole company level employment.

Modelling was then undertaken across three pools of businesses. The first is all the businesses in the sample. A Probit estimator is used to assess the drivers for an expansion announcement. Being an RGF beneficiary in the three years before support proves positive. It indicates that a high number of plants is the main driver combining with the different size categories to then reduce the chance smaller plants announcing. The reduced chance of the life science sector making an announcement was tested, with analysis of the sample focusing only on the businesses outside this sector. The effect of being an RGF beneficiary is maintained.

Table B3: Drivers for firms to announce expansions

Variable	Model 1			Model 2			Model 3		
	All	Matched to 10 obs	Pre-2016 only	All	Matched to 10 obs	Pre-2016 only	All	Matched to 10 obs	Pre-2016 only
RGF beneficiary	**0.42****	**0.35**	**0.38****	**0.42****	**0.34**	**0.39****	**0.59*****	**0.43**	**0.55*****
Asset change, t-1	-0.36	-7.51	0.04	-0.36	-7.15	0.04	-0.42	-18.07**	-1.76
R&D reported, t-1	-0.23***		-0.17	-0.23**		-0.16	-0.13		-0.15
50-99 emp	-0.68***	-0.20	-0.55**	-0.69***	-0.21				
100-249 emp	-0.48***		-0.46***	-0.49***		-0.47***			
250+ emp	-0.16*	-0.36	-0.09	-0.16*	-0.36	-0.08			
Post-2015	0.04			0.04			0.02		
Hi KI manu	0.12		0.08	0.13			0.13		0.14
High Tech Manu	0.05	-0.12	0.19	0.06	-0.04	0.22**	0.07	0.06	0.23*
Life Sci sector	-0.56***		-0.57***	-0.55***		-0.58***	-0.41***		-0.31**
Patentholder, t-1	0.02	0.05	0.17*	0.03	0.05	0.18*	0.07	0.37	0.20*
Multinational	0.08	0.02	0.11	0.07	0.03		0.10	-0.14	0.06
>3 plants	0.85***	0.64**	0.77***	0.85***			0.97***	1.06***	0.98***
Hi/Med KI Manu				-0.02	-0.11	-0.09			
Emp, logged, t-1							0.05	0.09	0.11**
Constant	-2.11***	5.54	-2.65***	-2.11***	5.19	-2.64***	-2.78***	15.06	-1.82
Observations	**28,624**	**1,017**	**13,103**	**29,615**	**1,040**	**13,552**	**27,252**	**1,874**	**12,343**
Adj R-squared	**0.16**	**0.07**	**0.16**	**0.16**	**0.07**	**0.16**	**0.12**	**0.19**	**0.16**

Across the models and pools the RGF driver remain positive though proves insignificant when the pool is restricted to 1,017 businesses including those supported by RGF and a set of businesses matched to these businesses using propensity score modelling. This matching seeks to address the selection bias that may be present in modelling RGF support effects. There may be some unobserved characteristics common to both receiving RGF support and in expanding a business. The lack of significance of the result is however not due to this being the case necessarily. As the matching selects the businesses that look most like the RGF beneficiaries, there is then the issue that the number of announcements made becomes much smaller. Whereas for both the other pools, virtually all 116 announcements are in the modelling, as the sample becomes considerably smaller, the number of incidences of announcements becomes very much smaller and the precision of the modelling becomes weaker.

Table B4 presents the underlying models for the probit estimates of the closure decision. The three models used are similar to that used in the expansion modelling. However, as indicated in Table B2, RGF support was not associated with closure announcements in the same way as was the case for the expansion announcements. This means modelling does not include the RGF variable. Rather the models in Table B3 highlight the general drivers into businesses making closure announcements without policy impacts.

Table B2: Drivers for firms to announce closures

	Model 1	Model 2	Model 3
Variable	**All**	**All**	**All**
Asset change, t-1	0.01	0.01	-0.20
R&D reported, t-1	-0.06	-0.04	-0.01
50-99 employees	-0.68***	-0.69***	
100-249 emp	-0.51***	-0.52***	
250+ employees	-0.28***	-0.29***	
Post-2015	0.11	0.10	0.12
Hi KI manu	-0.52***	-0.28	-0.43**
High Tech Manu	-0.17*	-0.08	-0.10
Health sector	-0.53***	-0.58***	-0.47***
Patentholder, t-1	-0.05	-0.03	0.00
Multinational	-0.11	-0.11	-0.11
>3 plants	0.58***	0.55***	0.70***
Hi/Med KI Manu		-0.30***	
Emp, logged, t-1			0.02
Constant	-2.19***	-2.12***	-2.56***
Observations	**29,455**	**30,478**	**28,042**
Adj R-squared	**0.09**	**0.11**	**0.05**

Broadly, the likelihood of announcing a plant closure is again linked to the number of plants a company has and then the overall size appears to moderate this scale factor. However, the modelling does pick out some types of businesses that are unlikely to announce closures. Highly significant in reducing the chance of making an announcement is the sector, with both life sciences and highly knowledge intensive manufacturing businesses less likely to make these announcements.

Table B4: Modelled additional chance for RGF firms to announce closures

	Model 1			Model 2			Model 3		
	All	Matched to 10 obs	Pre-2016 only	All	Matched to 10 obs	Pre-2016 only	All	Matched to 10 obs	Pre-2016 only
RGF beneficiary	**0.21%*** **	**0.11%**	**0.25%*** **	**0.19%** **	**0.09%**	**0.23%*** **	**0.10%** **	**0.08%**	**0.16%*** **

The RGF beneficiaries do not make announcements of plant closures. However, by plugging into the estimated model the characteristics of the businesses to estimate each plant's chance of making an announcement provides an estimate of how likely RGF beneficiaries are to announce a closure. This likelihood then can be compared to the estimates for different pools of comparators (all businesses in the data, a set of businesses statistically matched to the RGF beneficiaries and the sample of events before 2017).

Table B4 provides the results. Generally, the modelled chance of the businesses making an announcement of closure is a little higher than other businesses, once adjusted for characteristics. Again, there is some difficulty in getting precise measures when the comparison group is restricted to the businesses that have been statistically matched to the RGF beneficiaries. This is likely to

reflect the relatively small number of plants that would announce a closure when the sample is only a thousand observations.

Setting 2: SRS access to the Annual Survey of Hours and Earnings (ASHE)

To analyse the earnings effects of support, the study draws on the Annual Survey of Hours and Earnings (ASHE). Each year, ONS surveys businesses about the pay, hours, occupation, age and gender of one percent of all employees. The ASHE design tracks individuals, as the same one percent are surveyed each year, with individuals that have moved jobs being surveyed in their new employer's return. This allows the quality of jobs to be assessed both in terms of levels of wages and the transitions as individuals move into and out of the supported businesses. This latter feature can proxy for the quality of jobs.

The sample selection is based on the National Insurance identifier, selecting all jobs held by one per cent of all NI numbers. HM Revenue and Customs shares with ONS the employer details for these jobs and ONS then asks the employers to fill out an ASHE record for each person identified. All the largest employers will be surveyed, and about 1% of their employees will be recorded in ASHE. ASHE excludes serving members of the Armed Forces. Outside of that, the main category of employees that would not be included the low-paid employees who fall below National Insurance thresholds. This study uses weekly earnings (including overtime) for employees.

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Any enquiries regarding this publication should be sent to us at

enquiries@businessandtrade.gov.uk.