



Department for
Business & Trade

ATI Programme Impact Evaluation 2023-24

Technical Annex

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Summary

This report is a technical annex to the Aerospace Technology Institute (ATI) Programme Impact Evaluation 2023-24. This report details the findings from econometric analysis evaluating the economic impact of the Aerospace Technology Institute (ATI) Programme from its inception in 2013 until the most recent period of data in 2021. The programme has multiple funding streams. However the focus of this evaluation is the Strategic Programme alone, which features developments in systems, aerostructures, power and propulsion and vehicles, and includes capital infrastructure projects such as testing facilities and simulation software which can be used across the programme to de-risk the development of other technologies. The analysis used longitudinal data from the Office for National Statistics (ONS) to observe changes in the following performance measures:

- Turnover and employment, from the Business Structure Database (BSD).
- Capital expenditure, gross value added (GVA), GVA per worker, and UK versus non-UK purchases, from the Annual Business Survey (ABS).
- Hours worked and hourly earnings, from the Annual Survey of Hours and Earnings (ASHE).
- Private research and development (R&D) expenditure, R&D employment, and UK versus non-UK R&D, from the Business Enterprise Research and Development survey (BERD).

The econometric approach used two-way fixed effects and staggered difference-in-difference models to provide robust evidence of the additional performance of ATI funded companies compared to others in the aerospace and manufacturing sectors. A summary of the econometric results is provided below.

Key findings

The findings from this evaluation represent quantitative analysis up to 2020/2021 (the latest available data). As such, the quantitative results represent a limited time span, seven years post the programme start. Estimates from the staggered difference-in-difference pipeline approach (model 5) are reported as the primary result. Results from two-way fixed effects models (1-4) are discussed and explicitly identified in each case.

Evidence from econometric analysis showed that the programme has led to substantial benefits, including additional leveraged R&D activity, jobs created or safeguarded, progression through TRLs, and establishment of new partnerships and relationships. Results showed weaker evidence of benefits for collaborating partners in additional company turnover, employment and employee earnings. Results showed no evidence of benefits for collaborating partners in additional R&D expenditure, R&D employment, capital expenditure, or GVA. Thus, the majority of these quantifiable impacts created by the programme were concentrated within a subset of companies, namely those companies leading ATI Programme funded projects.

However, the commercialisation timelines in the aerospace sector are typically ten or more years. As all completed projects took place within the last 9 years, the full commercial benefits are likely to be long-term, as projects moved beyond technology readiness level 6. Therefore, this evaluation may not capture the ultimate effects of the ATI Programme, such as productivity increases, strengthening of the UK aerospace supply chain, and commercialisation of new technologies. The long-term value of the programme will likely be seen by a persistent increase in productivity of funded companies, an area that should be of key interest to examine within the next quantitative evaluation.

R&D expenditure: The econometric analysis indicated that the programme led to a 24% increase in average annual R&D spending compared to the pipeline counterfactual, using model 5. The estimated impact of the ATI funding on company R&D spending suggested that the programme leveraged £0.39 of additional private R&D spend per £1 of public sector spending by 2023. Over the

lifetime of the programme, the total impact on R&D expenditure was estimated to be £2.7bn, showing that 76% of spending was additional and would not have occurred without the support of grants.

Capital expenditure: Using models 1-4 only, results suggested the programme increased capital expenditure by an additional 5% to 7% per year in companies leading on funded projects. This result was not seen in the preferred model (5). The results found no evidence that capital expenditure had increased for collaborating companies.

Turnover, employment, GVA: The ATI Programme is associated with positive impacts on company performance, increasing the turnover, employment, and GVA of those awarded grants. The total growth in turnover was 14% higher for awarded companies over the programme period compared to control companies. The number of employees in companies receiving grants grew 12% more than control companies. Using the central estimate, this implies the programme had created or safeguarded 59,400 job years by the end of 2023. There was weakly significant evidence suggesting that the ATI Programme increased company GVA by 5% for project leaders only.

Wage growth: Results show that a 3% increase in worker earnings was attributable to the ATI Programme's support, compared with control companies. An increase in earnings per hour can be seen as a signal of productivity gains reflected in an increase in labour productivity. Despite this, there was mixed evidence that the programme had an impact on hours worked, as results from models 4 & 5 show no statistically significant relationship.

Spending inside and outside the UK: The econometric results found no robust evidence that the ATI Programme had altered procurement to focus on UK based suppliers. This suggests that the notion of supporting the UK supply chain cannot be at present supported quantitatively.

Identifying causal linkages and outcome metrics

The metrics used to evaluate the ATI Programme were derived from a robust HMT Magenta book Theory of Change (ToC) development process, shown in Annex A - ToC model. The ToC identified the economic outcomes and impacts that were expected to materialise as part of the programme. For each of these impacts, data sources and metrics were identified to facilitate evaluation. Metrics were taken forward if both of the following criteria were met:

The data available was sufficient to enable robust quantitative evaluation.

There was clear evidence, within academic literature or raised in stakeholder interviews, that the causal mechanism linking the metric to the ATI funding programme was plausible.

The development process identified the following outcome metrics to be explored in this analysis:

- **Private research and development (R&D) expenditure:** Changes in R&D expenditure indicated the leveraging effectiveness of ATI grants.
- **Capital expenditure:** Changes in expenditure on capital investments indicated the extent to which ATI grants have stimulated growth in R&D and production facilities.
- **Turnover, employment, and GVA:** Changes in company growth in turnover, GVA, and jobs created or safeguarded indicated the economic impact of ATI funding.
- **Wages:** Changes in the wages paid to employees indicated the impact on workers and served as a proxy for labour productivity.
- **Spending inside and outside the UK:** Changes in the amount of intermediate goods purchased by companies indicated the effect of ATI in directing spending to within the UK.

Each of the metrics taken forward were linked to the ATI funding programme via one of two causal mechanisms:

Direct impact: Impacts on private R&D expenditure, capital expenditure, jobs created or safeguarded, and GVA arose directly through R&D activity. Grant funding can be used for R&D activities which could lead to investments in new products or processes that improve productivity, promoting economic growth (as noted in Griffith's (2000) study¹).

Indirect impact: Turnover and wages impacts arose indirectly through R&D activity. Greater levels of R&D could lead to increases in employment and turnover as ATI-funded companies sell their new products or intellectual property for manufacturing processes.

However, the following issues arise:

Product development lifecycle: The impact may be muted if the product or service the R&D is intended to produce has not yet reached market. The aerospace sector typically has long product development cycles, around 7 to 10 years, with new products infrequently entering the market. As no wholly new aircraft have been launched since the start of the ATI Programme in 2013, and the programme is almost 11 years old, it may still be too early to assess the full impact of the programme.

Use of subcontractors: In cases where subcontractors are used, the impact will not be measured using the evaluation approaches selected because the analysis used company-level data. As a result, the analysis could be seen as a conservative estimate on the overall (and true) impact of funding activity.

Other funding streams: Companies within the control groups may be recipients of other public/private support funds that cannot be observed. This may lead to an underestimate of the treatment effect.

Deadweight: The aim of the evaluation was to understand the additional effects of the programme over and above those which would have happened without additional funding. A counterfactual scenario was developed to assess what would have happened to treated companies had they not received funding. The development of a suitable counterfactual scenario required the implementation of two control groups made up of companies in the aerospace sector and the wider manufacturing sector. The econometric approach is based on company-level microdata spanning the period from before to after companies received ATI funding and includes relevant control variables so that the model estimates isolate the differences in companies due only to receiving ATI funding.

Displacement and substitution: Displacement is the number or proportion of intervention outputs accounted for by reduced outputs elsewhere. For example, if resources are reallocated to an ATI-funded project within a company or between companies by reducing the scope of a different project or activity, then this would be displacement. Substitution is the effect that arises where a firm substitutes one activity for a similar one to take advantage of public sector assistance. Therefore, this evaluation focusses on measuring additional firm level outputs caused by the ATI Programme.

Selection bias: The allocation of ATI funding is by competitive application, so there could be systematic differences between funded and non-funded companies. Observable characteristics can be controlled for in the econometric analysis such as company size, industry, R&D expenditure, turnover, capital expenditure. Differences in economic outcomes are observed between the two groups in the period leading up to ATI funding and analysed to test parallel path dependency. To account for any unobservable company characteristics, a pipeline approach is used, this compares funded companies to companies yet to be funded by the ATI Programme.

Exogenous shocks: Given that the analysis spans the period between 2012 and 2021, it is likely to have been influenced by the Covid-19 pandemic. The Covid-19 pandemic could have distorted the analysis if there was a differential impact between the treatment and control groups. For example,

¹ [How important is business R&D for economic growth and should the government subsidise it? \(ucl.ac.uk\)](https://www.ucl.ac.uk/ati/evaluation/2023-24/technical-annex)

if Covid-19 impacted companies of different sizes differently, then this could confound the treatment effect if the two groups were not balanced appropriately. The impact of Covid-19 on the analysis has been mitigated by controlling time specific unobserved factors that affect all firms in the econometric approach.

Data

Innovate UK funded projects

Information on ATI funded projects from inception in 2013 to financial year 2024 was available from Innovate UK.² Each listed project is linked to participating organisations and the amount of funding awarded and spend to date. Despite the availability of project information until 2024, the period of data used within econometric analysis is constrained to 2020 by the Business Expenditure on Research and Development Survey database or 2021 by the other ONS databases used.

Business Expenditure on Research and Development Survey (BERD)

The BERD survey provides estimates of businesses' expenditure and employment relating to R&D performed in the UK. It provides data at the company level, including the value of R&D, the source of funding for R&D work, and the number of people working on R&D. It also hosts a range of company-level descriptive data that provides suitable scope to control for differences between the treatment and control group.

This was used to construct an unbalanced longitudinal panel dataset describing the evolution of R&D activity amongst firms applying for ATI funding. The BERD sample contained 108 treated companies a year on average, a coverage of 34%. It provided a sample of 1398 treated observations in total over the period 2010 to 2020, of which 482 were ATI project leads.

Business Structure Database (BSD)

The BSD is a snapshot of the Inter-Departmental Business Register (IDBR), a live register of firms registered for VAT and/or pay as you earn (PAYE) in the UK. The IDBR is estimated to cover approximately 99% of UK economic activity. The snapshot of the IDBR used for the BSD is taken around April annually and contains approximately 2 million observations.

Turnover and employment data were both available through the BSD. Since the BSD provides company level data, it was possible to identify the treatment group and form a robust counterfactual group from the remaining companies.

A balanced panel was created for the BSD by removing businesses that did not survive the analysis period. After this process, 102 beneficiary companies remained in the sample, a coverage rate of 32%. Of the treated companies, 34 were ATI project leads, and 68 were non-leads.

Annual Business Survey (ABS)

The ABS is an annual survey of businesses covering the production, construction, distribution, and service industries, which represents about two-thirds of the UK economy as measured by GVA. The ABS is the largest business survey conducted by the ONS in terms of the combined number of respondents and variables it covers (62,000 questionnaires despatched in Great Britain, with around 600 different questions asked).

The ABS provided annual data for capital expenditure and GVA. On average, 79 treated companies appeared in the dataset per year, a coverage rate of 25%. The data yielded 1102 treatment observations in total, 351 of which were ATI project leads. Each control group had substantially more observations each year.

Annual Survey of Hours and Earnings (ASHE)

The ASHE contains information on the wages of treated and untreated companies at the employee level. This means that, in many cases, companies are observed multiple times in each year. The dataset provides information about the levels, distribution and make-up of earnings and hours paid for employees by sex, and mode of employment (full-time or part-time). Estimates are also available

² UKRI (2024). [Innovate UK funded projects since 2004](#).

for various breakdowns including industries, occupations, geographies, and age groups within the UK. ASHE is the official source of estimates for the number of jobs paid below the national minimum wage and is also used to produce estimates of the proportions of jobs within workplace pension categories.

On average there were 76 treated companies in the ASHE sample each year, yielding a treatment coverage of 24%. On average, 27 ATI project leads appeared each year.

ATI funded companies

Information on ATI funded projects was available up until financial year 2024 from Innovate UK.³ Each listed project is linked to participating organisations and the amount of funding awarded and spent to date. £1.9bn was awarded in grants, totalling £3.5bn when matched investment from industry was included. This analysis focuses on the performance funded companies, using company registration numbers to match with other datasets. Academic, catapult, and PSRE organisations are excluded from our analysis, as are withdrawn projects that did not incur expenditure. Therefore, £1.2bn of awarded grants and £2.7bn in total investment is included in this analysis.

312 companies were awarded grants, 11 of which received 78% of the total funding. The remaining companies were awarded less than 1% each. Companies receiving ATI grants cover 81 industry sectors (by 5-digit SIC code). Table 1 shows the total award, (matched) total cost and the proportion of funding by industry sector, for the sectors that received the majority (85%) of funding. Of these sectors, companies in the *Manufacture of engines and turbines, except aircraft, vehicle and cycle engines* and *Manufacture of air and spacecraft and related machinery* sectors received 74% of total ATI funding.

Table 1: ATI grant funding by UK industry sector

| SIC | Award (£m) | Proportion of award | Proportion of awarded companies |
|---|------------|---------------------|---------------------------------|
| 28110 - Manufacture of engines and turbines, except aircraft, vehicle and cycle engines | 507 | 41% | 1% |
| 30300 - Manufacture of air and spacecraft and related machinery | 404 | 33% | 7% |
| 72190 - Other research and experimental development on natural sciences and engineering | 50 | 4% | 6% |
| 32990 - Other manufacturing | 42 | 3% | 6% |
| 26110 - Manufacture of electronic components | 40 | 3% | 3% |
| 71200 - Technical testing and analysis | 14 | 1% | 2% |
| 26512 - Manufacture of electronic industrial process control equipment | 13 | 1% | 1% |

Approximately 7% of awarded companies were within the *Manufacture of air and spacecraft and related machinery* (SIC Code 30300) sector. This is the main sector of activity for ATI funded companies, as other sectors contained fewer companies.

³ UKRI (2024). [Innovate UK funded projects since 2004](#).

The pattern of company activities across the UK industry sectors forms the basis of selecting control companies to form the counterfactual analysis.

Counterfactual selection

A counterfactual scenario is used to help understand the additional effect of the ATI Programme. The counterfactual in this case describes what would have happened to companies awarded ATI funding had they not received it. To do so, the analysis uses two control groups that represent companies with as similar characteristics to those awarded grants as possible, except they did not receive funding. The control groups used are non-ATI funded companies based on the industry sectors of funded companies:

- I. **Manufacturing sector:** Within the wider manufacturing sector identified by all 2-digit SICs between 30 through to 33. Typically, this control group contained around five hundred observations each year.
- II. **Same sectors:** Within the same industry sectors as the funded companies. These sectors were identified by the 5-digit SICs presented in Table 1. This control group typically contained one to two hundred observations each year.
- III. **Pipeline:** Companies funded later in the programme as a counterfactual to companies funded in the early years. This approach eliminated possible bias in estimates caused by unobserved differences between funded and non-funded companies. It relied on the assumption that the effects of ATI grants were visible amongst the earlier funded companies first. This control group was the smallest, with tens of observations each year.

A set of control variables, described in the econometric approach section, helped to ensure that systematic differences between organisations in the treatment and counterfactual groups were minimised as far as possible. The approaches, which are discussed in the econometric approach section, produced unbiased estimates if the differences between firms awarded funding and the control groups were constant over time: this was the parallel trend assumption.

Econometric approach

To evaluate the ATI Programme's impact, the analysis uses a combination of two-way fixed effects and staggered difference-in-difference estimations using data from 2010 to 2020/2021. Four models are used to estimate the impact on each of the key outcome variables, to provide robustness in the estimated results:

Model 1: A two-way fixed effects estimation, firm level fixed effects, using the manufacturing control group.

Model 2: A two-way fixed effects estimation (as model 1), with the inclusion of time fixed effects in addition to the firm level fixed effects, using the manufacturing control group. Time fixed effects are added to account for time specific unobserved effects such as the Covid-19 pandemic or significant macroeconomic shocks such as a change in the base rate of interest.

Model 3: A two-way fixed effects estimation, including time fixed effects in addition to the firm level fixed effects, using non-funded same sector companies as the control group. The advantage of this specification is that companies within the same industry sector are more likely to face a similar market environment and therefore more likely to present similar performance measures.

Model 4: A two-way fixed effects estimation, including time fixed effects in addition to the firm level fixed effects, with not yet treated (pipeline) companies as the control group. Firms receiving grants later are compared to firms receiving grants earlier. This removes unobserved differences between the control and treatment group as, by the end of the analysis period, all firms are treated.

Model 5: A staggered difference in difference estimation, using not yet treated (pipeline) companies as the control group. This approach is used to balance model 4 considering possible shortcoming of two-way fixed effects, noted below. This model is preferred as the approach best eliminates possible bias in estimates caused by unobserved differences between funded and non-funded companies. When results from other models are referred to, they are explicitly indicated.

The key performance outcomes that are used as dependent variables are:

- R&D expenditure and R&D employment.
- Capital expenditure, GVA, and GVA per worker.
- Turnover, employment, location of intermediate purchases (UK and non-UK split).
- Hourly wages, hours worked.

Two-way fixed effects (TWFE)

The two-way fixed effects model estimates the impact ATI grants had on performance outcomes, whilst controlling for company characteristics and unobserved differences between companies (Wooldridge, 2021).⁴ Following similar notation, the TWFE estimator is presented in the following form:

$$y_{it} = \beta_1 X_{it} \cdot Post_t + \beta_2 Z_{it} + c_i + f_t + u_{it}$$

y_{it} is the performance outcome of interest (R&D expenditure, capital expenditure, etc.) for firm i in period t . $X_{it} \cdot Post_t$ is the cumulative count of grants awarded at the end of period t . The coefficient β_1 provides the estimated causal effect of the ATI grants on the outcomes of interest. Z_{it} is a vector

⁴ Wooldridge, J. M. (2021). Two-way fixed effects, the two-way mundlak regression, and difference-in-differences estimators. Available at SSRN 3906345.

of observed firm characteristics which include firm size, region, and industry sector. The c_i are firm-specific effects and f_t time-specific fixed effects controlling for unobserved heterogeneity.

There are potential shortcomings of the TWFE estimator that may bias the coefficient estimate results as estimates rely on the assumption of linear additive effects (Imai and Kim, 2021).⁵ Results can also be difficult to interpret as the estimates are an amalgamation of variation in the over-time and cross-sectional effects. Therefore, a staggered difference in difference estimator is used and is the preferred model for reporting central results. This approach is explained below.

Staggered difference in difference

The staggered difference-in-difference (DiD) estimator was used to compare outcomes across different firms and time, accounting for the varying timing for firms being awarded ATI grants. This estimator is particularly useful for capturing variations in treatment timing, as it can provide more precise estimates of the treatment effect compared to other estimators.

The Callaway and Sant'Anna (2021)⁶ approach for staggered DiD estimation is focused on identifying the average treatment effect on the treated (ATT) over time and across units with varying treatment timings. Using the same notation, the general form estimator is expressed as follows:

$$ATT_{gt} = \frac{1}{N_g} \sum_{i \in G_g} (Y_{it} - (\hat{\alpha}_{gt} + \hat{\gamma}_i + \hat{\delta}_t + X'_{it}\hat{\beta}))$$

Where ATT_{gt} is the average treatment effect on the treated for firms that were awarded ATI grants in period g and observed in period t . N_g is the number of treated firms in period g . G_g is the set of treated firms in period g . Y_{it} is the outcome for firm i at time t (either the cumulative value of ATI grants awarded number of the cumulative count of grants awarded at the end of period). $\hat{\alpha}_{gt}$ is the estimated effect of being treated in period g and observed in period t (this term captures the direct treatment effect if it is time-varying). $\hat{\gamma}_i$ is the estimated unit fixed effect for firm i , capturing unobserved time-invariant characteristics of firm i . $\hat{\delta}_t$ is the estimated time fixed effect for period t , capturing time-specific effects common to all firms. X'_{it} is the term representing control variables of observed firm characteristics which include firm size, region, and industry sector.

Parallel trends

Difference-in-difference analysis relied on the assumption that funded and non-funded companies would have followed similar trends in the absence of the ATI Programme. Whilst this cannot be observed directly, it is possible to support this assertion by evidencing the presence of a parallel trend, before the programme started. Figure 1 and Figure 2 presents the estimated effect of the ATI Programme on R&D expenditure and employment of funded companies compared to yet to be funded companies over time. These effects control for observed heterogeneity across companies, therefore, uncontrolled visualisations of output variables (such as R&D expenditure) overtime, as shown later in Figures 3 and 4, may depict variation between treatment and control groups prior to treatment. This does not impact the parallel trends assumption. From six years before the programme started (T-6) until the programme start (0), there was no statistically significant differences in the patterns of R&D expenditure and employment between funded and non-funded companies. This provides evidence to suggest that funded and non-funded companies were following a similar path of performance, a parallel trend, before the programme started.

⁵ Imai, K., & Kim, I. S. (2021). On the use of two-way fixed effects regression models for causal inference with panel data. *Political Analysis*, 29(3), 405-415.

⁶ Callaway, B., & Sant'Anna, P. H. (2021). Difference-in-differences with multiple time periods. *Journal of econometrics*, 225(2), 200-230.

Figure 1 Pre-trend effects on R&D expenditure

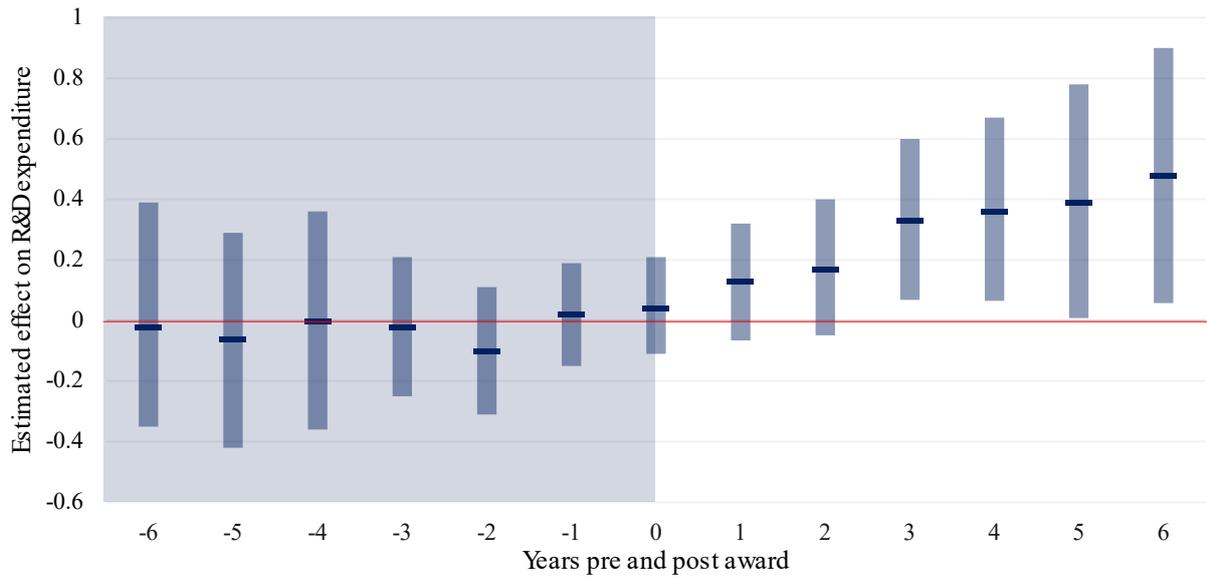
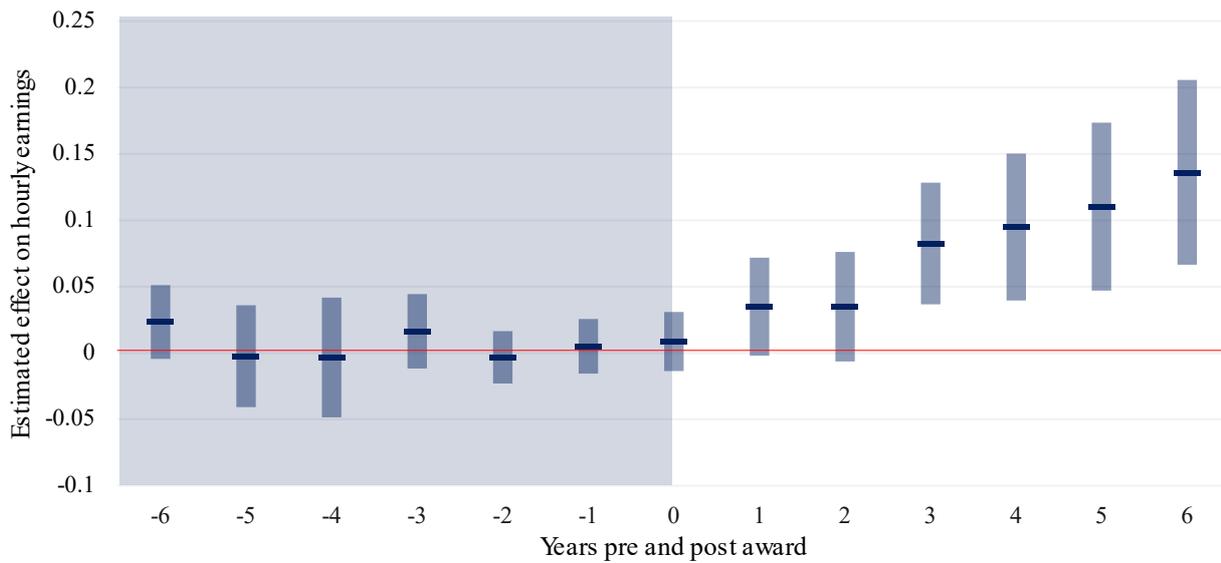


Figure 2 Persistence of effects on R&D employment of project leaders



Difference-in-difference analysis was performed within the ONS Secure Research Service using STATA and the 'xthdidregress' command. This programme contains a parallel-trends test (pretreatment period). The null hypothesis (H0) is that the treatment effects in all the pretreatment periods are zero. Results from this test show that for all outcomes it was not possible to reject the null hypothesis (with p-values being greater than 5%), indicating that the parallel trends assumption holds and estimates were considered valid.

Results

This section details the results of econometric analysis estimating the impact of ATI grant funding on the following key performance outcomes using the ABS, BERD, BSD and ASHE databases:

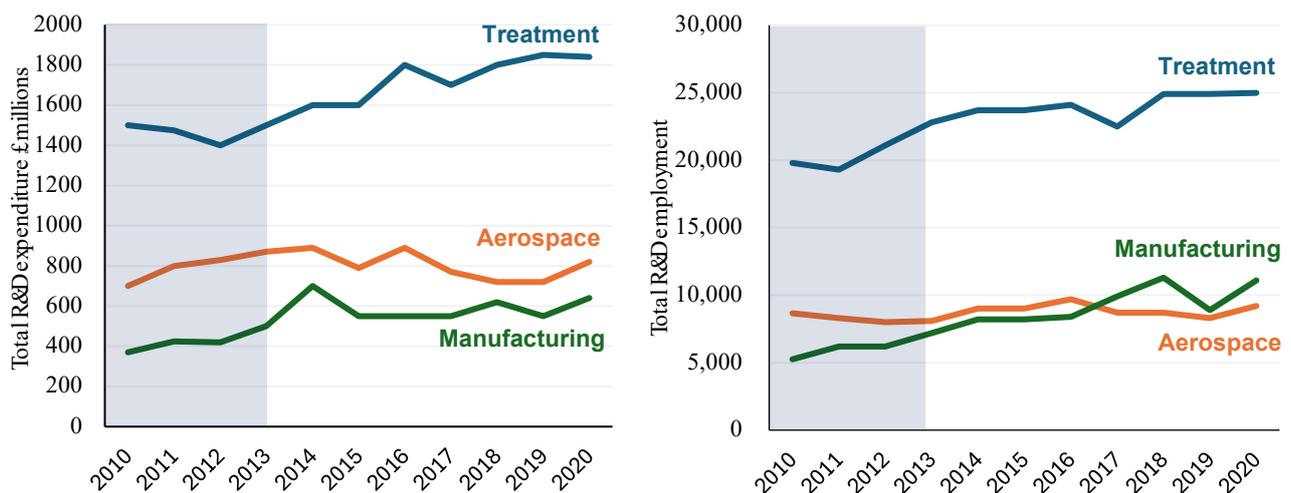
- R&D expenditure and R&D employment.
- Capital expenditure.
- Turnover, GVA, productivity, and location of intermediate purchases (UK and non-UK split).
- Employment.
- Hourly wages and hours worked.

In each case, the analysis used a combination of TWFE and staggered difference in difference estimations using data from 2010 to 2021 (the latest available data). As such, the quantitative results represent a limited time span, seven years post the programme start. Estimates from the staggered difference in difference pipeline approach (model 5) are reported as the primary result. Results from other models are discussed and explicitly identified in each case.

R&D expenditure and employment

Visualisation of R&D activity over time shows that beneficiary firms, those who secured at least one ATI grant, saw their R&D expenditure and employment increase. Figure 3 shows the annual R&D expenditure and employment across sample firms that were and were not awarded ATI grants. This indicates that R&D expenditure and employment of beneficiaries was greater than seen in the wider sectors, perhaps as these companies were already more active in R&D. Expenditure and employment of funded companies expanded after the programme was launched in 2013, while stagnating amongst companies within the aerospace and wider manufacturing sectors, though an increase in R&D employment was observed in the manufacturing sector.

Figure 3 R&D expenditure and employment over time



Source: Business Expenditure on Research and Development Survey, adapted by authors. Note: Shaded area is pre-ATI Programme funding.

Results from econometric estimations are shown in Table 2. These results suggest that the ATI grants had an impact on R&D expenditure at the overall level with strongly significant effects (alpha significance level of 1-5%) identified across all model specifications (models 1-5). In the models using the aerospace sector or the pipeline approach (model 3 & 4), the impact on R&D expenditure

was estimated at between roughly 7 and 9%. Estimates from the staggered difference-in-difference model using the pipeline counterfactual (model 5) show that the average annual treatment effect of ATI funding was 24% over and above the private R&D expenditure found in untreated businesses. The impact on R&D employment was not statistically significant in the preferred model (model 5) but estimates from the other specifications (models 1-4) show a strongly significant increase of 6% to 8%, showing that these estimates are sensitive to modelling approach. However, these results imply a degree of additionality associated with the ATI funding.

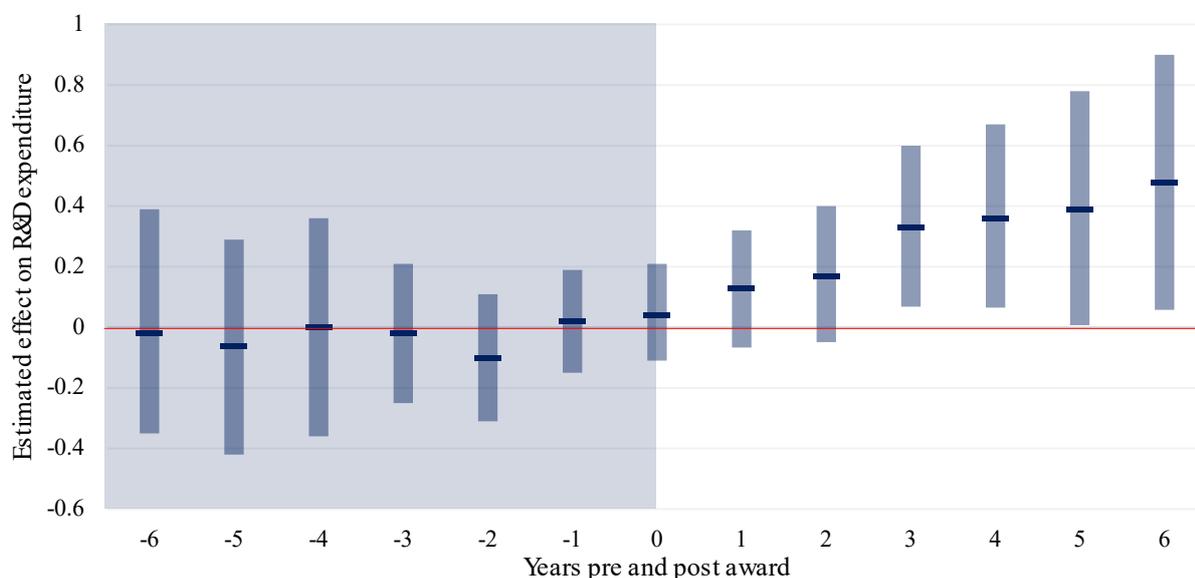
Table 2. Estimated effects of ATI grants on R&D spending and employment by 2021 – overall findings

| Model | Comparison Group | Time Effects | Coeff. | Std. Error | Observations | Adjusted R ² |
|--|----------------------|--------------|-----------|------------|--------------|-------------------------|
| Estimated % impact on R&D expenditure | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0949*** | 0.0262 | 13,954 | 0.67 |
| 2) TWFE | Manufacturing sector | Yes | 0.0955*** | 0.0257 | 13,954 | 0.76 |
| 3) TWFE | Aerospace sector | Yes | 0.0914*** | 0.0207 | 6,980 | 0.77 |
| 4) TWFE | Pipeline | Yes | 0.0685*** | 0.0142 | 1,247 | 0.75 |
| 5) DiD | Pipeline | Yes | 0.236** | 0.1050 | 1,247 | - |
| Estimated % impact on R&D employment | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0816*** | 0.0184 | 13,562 | 0.67 |
| 2) TWFE | Manufacturing sector | Yes | 0.0788*** | 0.0168 | 13,562 | 0.76 |
| 3) TWFE | Aerospace sector | Yes | 0.0803*** | 0.0138 | 6,764 | 0.77 |
| 4) TWFE | Pipeline | Yes | 0.0625*** | 0.0089 | 1,232 | 0.75 |
| 5) DiD | Pipeline | Yes | 0.0137 | 0.0161 | 1,232 | - |

Source: Business Expenditure on R&D survey, ONS, Frazer Nash Consultancy analysis. Note: ‘***’, ‘**’ and ‘*’ indicate alpha levels of 0.01, 0.05 and 0.1 respectively. P-values present in full regression tables at the end of this report.

Using the regression results from the staggered DiD models (model 5), Figure 4 shows the persistence of impacts on R&D spending from the point of being awarded an ATI grant. These effects appeared to accumulate three to four years after the grant award was made, indicating that that benefits start to be realised towards the end of projects (the average project lasting approximately three years). The effects also appear to persist up to six years after receiving funding, substantially longer than the average project period. This suggests that the programme has led to additional R&D expenditure beyond the initial ATI project.

Figure 4. Persistence of effects on R&D expenditure, estimates from model 5



Isolating companies who led ATI projects and those who collaborated shows that the impacts on R&D expenditure and employment were only observed in companies leading projects, Table 3. Notably, only project leads were found to increase R&D expenditure. These businesses experienced a 36% increase in R&D expenditure (model 5). There was no evidence to suggest that collaborators saw additional increases in R&D expenditure or employment, indicating that the benefits of the programme were concentrated within a subset of companies (Table 4).

Table 3. Estimated effects of ATI grants on R&D spending and employment by 2021 – project leaders

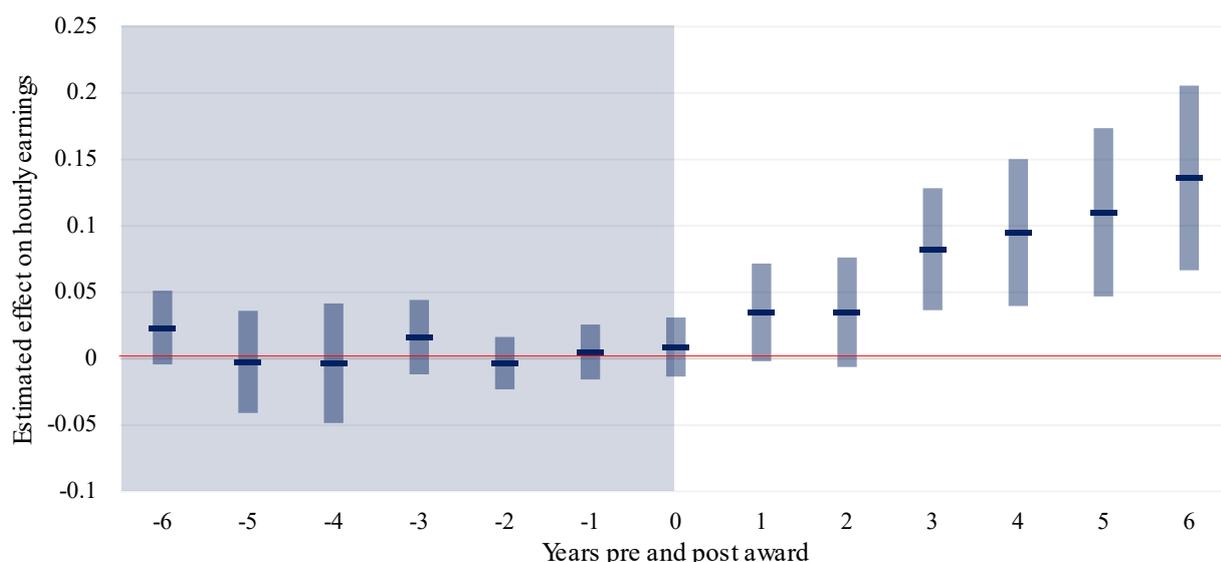
| Model | Comparison Group | Time Effects | Coeff. | Std. Error | Observations | Adjusted R ² |
|--|----------------------|--------------|-----------|------------|--------------|-------------------------|
| Estimated % impact on R&D expenditure | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.1000*** | 0.0265 | 13,047 | 0.64 |
| 2) TWFE | Manufacturing sector | Yes | 0.0987*** | 0.0259 | 13,047 | 0.74 |
| 3) TWFE | Aerospace sector | Yes | 0.0907*** | 0.0206 | 6,073 | 0.77 |
| 4) TWFE | Pipeline | Yes | 0.0488*** | 0.0092 | 340 | 0.87 |
| 5) DiD | Pipeline | Yes | 0.3610*** | 0.1830 | 340 | - |
| Estimated % impact on R&D employment | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0869*** | 0.0194 | 12,664 | 0.65 |
| 2) TWFE | Manufacturing sector | Yes | 0.0833*** | 0.0182 | 12,664 | 0.75 |
| 3) TWFE | Aerospace sector | Yes | 0.0807*** | 0.0143 | 5,866 | 0.78 |
| 4) TWFE | Pipeline | Yes | 0.0489*** | 0.0078 | 334 | 0.86 |
| 5) DiD | Pipeline | Yes | 0.0562** | 0.0169 | 334 | - |

Table 4. Estimated effects of ATI grants on R&D spending and employment by 2021 – project collaborators

| Model | Comparison Group | Time Effects | Coeff. | Std. Error | Observations | Adjusted R ² |
|--|----------------------|--------------|---------|------------|--------------|-------------------------|
| Estimated % impact on R&D expenditure | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0653 | 0.0800 | 13,614 | 0.64 |
| 2) TWFE | Manufacturing sector | Yes | 0.1071 | 0.0794 | 13,614 | 0.75 |
| 3) TWFE | Aerospace sector | Yes | 0.1660* | 0.0854 | 6,640 | 0.76 |
| 4) TWFE | Pipeline | Yes | -0.0230 | 0.1020 | 907 | 0.74 |
| 5) DiD | Pipeline | Yes | -0.1140 | 0.1670 | 907 | - |
| Estimated % impact on R&D employment | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0063 | 0.0693 | 13,228 | 0.65 |
| 2) TWFE | Manufacturing sector | Yes | -0.0447 | 0.0666 | 13,228 | 0.75 |
| 3) TWFE | Aerospace sector | Yes | 0.1320 | 0.0939 | 6,430 | 0.76 |
| 4) TWFE | Pipeline | Yes | -0.1270 | 0.1030 | 898 | 0.73 |
| 5) DiD | Pipeline | Yes | -0.0240 | 0.0173 | 898 | - |

This approach to modelling identified a statistically significant impact on R&D employment, seen only in project leaders, an increase in employment of 6% (table 3, model 5). Using the regression results from the staggered DiD model (5) focussing on lead companies, Figure 5 shows the persistence of impacts on R&D employment from the point of being awarded an ATI grant. These effects appeared to follow a similar pattern to the effects on R&D expenditure, accumulating three to four years after the grant award was made and appear to persist up to six years after receiving funding. This suggests that the programme has led to additional R&D activity beyond the initial ATI project, but only for project leaders.

Figure 5 Persistence of effects on R&D employment of project leaders



Total impact on R&D expenditure and employment

Estimates from model 5 indicated the average impact on R&D expenditure and employment, the total impact until 2023 was estimated by:

1) Taking the average annual R&D expenditure of companies. The distribution of R&D expenditure within the sample of companies that received ATI funding is highly skewed: A small number of companies spend a large amount of money on R&D each year, whereas most companies spend a much smaller amount. As a result, the annual mean private R&D expenditure is not representative of the sample companies R&D expenditure. Therefore, three approaches to calculating an average R&D expenditure are used to offer transparency of this sensitivity. Whilst the weighted mean approach (i) likely offers a more sophisticated results, the more conservative result is used based on the simple mean (ii).

- I. A weighted mean that differentiates between large and non-large companies. This metric uses the prevalence of large and non-large companies in the population to scale the values in the sample. This metric was designed to account for the differences between sampling in the ONS datasets and show the mean annual R&D expenditure was £38m.
- II. A simple mean, showing the annual R&D expenditure was £37m.
- III. A 50% trimmed mean that restricts the sample to the observations within the middle two quartiles before calculating the average. This metric is not appropriate as a headline figure for expenditure values, but it does provide a comparison to better understand how the effect of the programme was distributed across sample companies. Showing the annual R&D expenditure was £1.5m.

2) Using the estimated impact from model 5 and grossing the estimates over the firms awarded grants, produces an estimated total impact of £2,670 million in additional private R&D expenditure by 2023 (using the simple mean). Table 5 presents the results of each mean calculation.

Table 5. Three measures of the mean for R&D expenditure, and associated total impact

| Approach | Mean value 2010– 2021 (£2023 millions) | Total impact (£2023 millions) |
|----------------------|--|-------------------------------|
| (1) Weighted mean | 37.6 | 2,790 |
| (2) Mean | 37.0 | 2,670 |
| (3) 50% trimmed mean | 1.5 | 109 |

The estimated £2,670 million in additional private R&D expenditure was leveraged through £1,910 million of public spending. These estimates suggested that the programme leveraged £0.39 of additional private R&D spend per £1 of public sector spending by 2023.

Monitoring data indicated that the total project cost including government and industry spending, was £3.5bn. Therefore, over the lifetime of projects, 76% (£2.7bn/£3.5bn) of R&D spending would not have occurred in the absence of the programme (implying deadweight of 24%).

The 50% trimmed means for R&D employment were used to reduce the effect of skewness. The TWFE estimates imply an increase in R&D employment of 0.2 jobs per treated firm per year. To calculate the number of job years, the effect was assumed to be evenly distributed across the lifetime of the programme. The effect was found to be equivalent to 2,180 R&D job years across the duration of the programme.

Capital expenditure

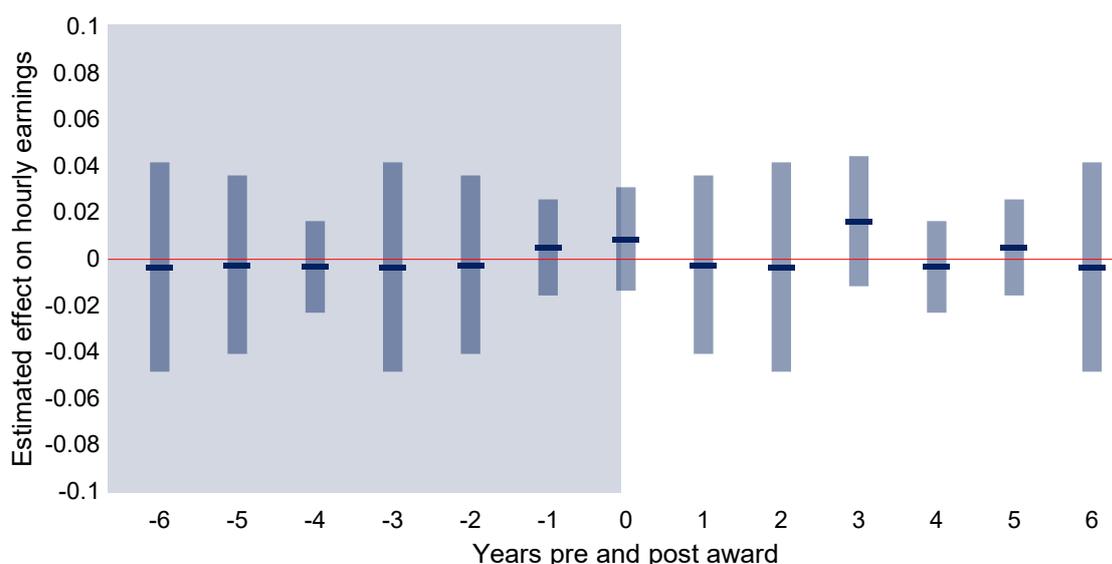
This section discusses the quantitative results for analysing the impact on capital expenditure using data from the Annual Business Survey.

Table 6 presents the estimated effect of ATI funding on net capital expenditure. The primary results, from model 5, found no statistically significant evidence that the ATI Programme had an effect on capital expenditure. However, the TWFE results, model 1-4, suggested the programme increased capital expenditure by between 6% and 9%, significant at the 1% level. These effects were only seen in companies leading ATI projects.

Table 6. Estimated effects of ATI grants on net capital expenditure by 2021

| Model | Comparison Group | Time Effects | Coeff. | Std. Error | Observations | Adjusted R ² |
|---|----------------------|--------------|-----------|------------|--------------|-------------------------|
| Estimated % impact on net capital expenditure – overall findings | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0940*** | 0.0155 | 14,326 | 0.57 |
| 2) TWFE | Manufacturing sector | Yes | 0.0923*** | 0.0173 | 14,326 | 0.57 |
| 3) TWFE | Aerospace sector | Yes | 0.0731*** | 0.0081 | 8,367 | 0.58 |
| 4) TWFE | Pipeline | Yes | 0.0587*** | 0.0173 | 960 | 0.50 |
| 5) DiD | Pipeline | Yes | 0.1200 | 0.3260 | 960 | - |
| Estimated % impact on net capital expenditure – project leaders | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0929*** | 0.0178 | 13,671 | 0.57 |
| 2) TWFE | Manufacturing sector | Yes | 0.0913*** | 0.0191 | 13,671 | 0.60 |
| 3) TWFE | Aerospace sector | Yes | 0.0761*** | 0.0090 | 7,646 | 0.59 |
| 4) TWFE | Pipeline | Yes | 0.0695*** | 0.0191 | 239 | 0.72 |
| 5) DiD | Pipeline | Yes | 0.6700 | 0.3350 | 239 | - |
| Estimated % impact on net capital expenditure – collaborators | | | | | | |
| 1) TWFE | Manufacturing sector | No | -0.1570 | 0.1100 | 14,021 | 0.56 |
| 2) TWFE | Manufacturing sector | Yes | -0.0481 | 0.1420 | 14,021 | 0.56 |
| 3) TWFE | Aerospace sector | Yes | -0.0610 | 0.1350 | 8,128 | 0.58 |
| 4) TWFE | Pipeline | Yes | -0.0480 | 0.1420 | 721 | 0.44 |
| 5) DiD | Pipeline | Yes | -0.2371 | 0.3570 | 721 | - |

Using the regression results from the staggered DiD model (5), Figure 6. Persistence of effects on capital expenditure - not statistically significant. Figure 6 shows the no statistical significance of the persistence of impacts on capital expenditure from the point of being awarded an ATI grant.

Figure 6. Persistence of effects on capital expenditure - not statistically significant

Total impact on net capital expenditure

Table 7 presents the calculation of the total effect of the ATI Programme on net capital expenditure, following the approach used to calculate total impact on R&D expenditure. The total impact was calculated as the product of the mean and the average of the estimates from models 1 to 4.

Table 7. Three measures of the mean for net capital expenditure, and associated total impact

| Approach | Mean value 2010 – 2021 (£2023 millions) | Total impact (£2023 millions) |
|------------------|---|-------------------------------|
| Mean | 22.7 | 431 |
| Weighted mean | 12.4 | 237 |
| 50% trimmed mean | 4.21 | 80.1 |

The weighted average is substantially less than the mean, suggesting that large companies are substantially overrepresented in the ABS sample compared to the population of ATI beneficiaries. Using the weighted mean, the results imply the ATI Programme caused the capital expenditure of the average beneficiary company to increase by £0.761m over the 2013-21 period. Scaling this up to the number of treated businesses, this implies a total additional capital expenditure of £237m.

Turnover, GVA, and productivity

Turnover

Econometric results from model 5 show that ATI funding had a statistically significant impact on increasing turnover of treated companies but show no robust evidence of increases in GVA or productivity.

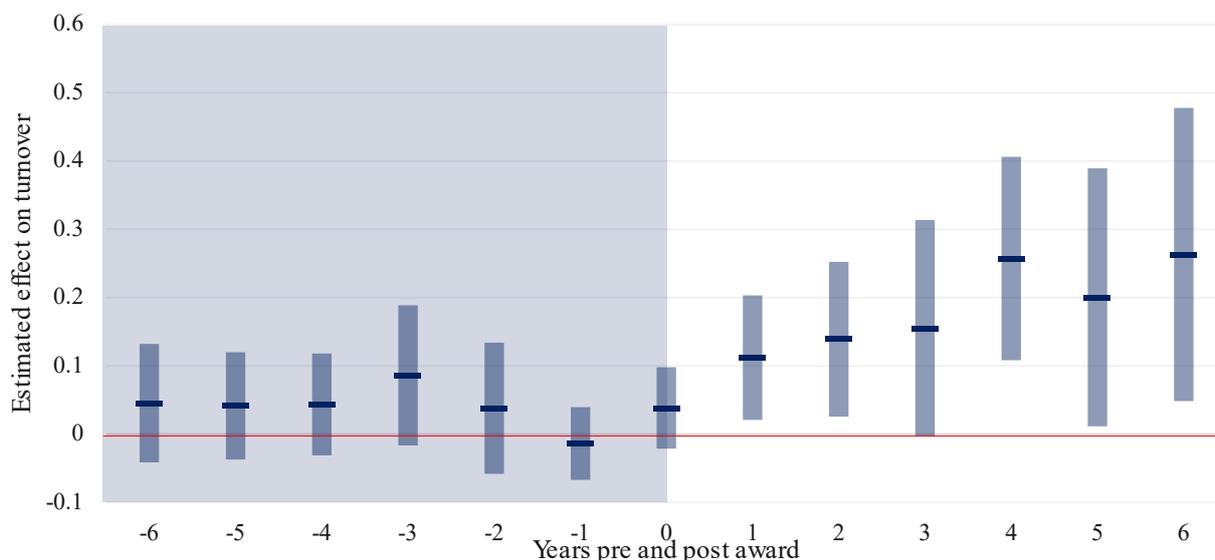
The ATI Programme was found to increase turnover by 14% across all treated companies, statistically significant at the 1% level, Table 8 (model 5). The preferred model specification (model 5) showed no evidence of an increase in productivity, measured by turnover per worker. Estimates from the other specifications (model 1-4) show a strongly significant increase of 1 to 3%, showing that estimates of the impact on turnover per worker are sensitive to modelling approach.

Table 8. Estimated effects of ATI grants on turnover and turnover per worker by 2021 – overall findings

| Model | Comparison Group | Time Effects | Coeff. | Std. Error | Observations | Adjusted R ² |
|--|----------------------|--------------|-----------|------------|--------------|-------------------------|
| Estimated % impact on turnover | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0920*** | 0.0195 | 103,487 | 0.61 |
| 2) TWFE | Manufacturing sector | Yes | 0.0919*** | 0.0195 | 103,487 | 0.61 |
| 3) TWFE | Aerospace sector | Yes | 0.0917*** | 0.0209 | 54,043 | 0.61 |
| 4) TWFE | Pipeline | Yes | 0.0579*** | 0.0151 | 1,224 | 0.81 |
| 5) DiD | Pipeline | Yes | 0.137*** | 0.0520 | 1,224 | - |
| Estimated % impact on turnover per worker | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0256*** | 0.0081 | 103,487 | 0.05 |
| 2) TWFE | Manufacturing sector | Yes | 0.0253*** | 0.0080 | 103,487 | 0.05 |
| 3) TWFE | Aerospace sector | Yes | 0.0278*** | 0.0098 | 54,043 | 0.04 |
| 4) TWFE | Pipeline | Yes | 0.0141** | 0.0062 | 1,224 | 0.34 |
| 5) DiD | Pipeline | Yes | 0.0182 | 0.0462 | 1,224 | - |

Using the regression results from the staggered DiD models (5), Figure 7 shows the persistence of impacts on turnover from the point of being awarded an ATI grant. It is expected that increases in turnover would be seen only once the technology was commercialised, perhaps several years beyond completion of the project. However, Figure 7 indicates that increases in turnover accrue shortly after receiving ATI awards. Speculatively, this perhaps indicates that the programme has encouraged lead companies to internalise some revenue generating R&D activities, transferring output from collaborators to leads, and in doing so impacting company turnover.

Figure 7 Persistence of effects on turnover



The effect was seen only in companies leading ATI projects, results from the preferred model (5) suggest turnover increased by 18%, Table 9. While there was less robust evidence to suggest an effect for project collaborators, Table 10, showing statistical significance for models 1-3, weak significance for model 4 and no significance for model 5.

Table 9. Estimated effects of ATI grants on turnover and turnover per worker by 2021 – project leaders

| Model | Comparison Group | Time Effects | Coeff. | Std. Error | Observations | Adjusted R ² |
|--|----------------------|--------------|-----------|------------|--------------|-------------------------|
| Estimated % impact on Turnover | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.171** | 0.0846 | 103,181 | 0.60 |
| 2) TWFE | Manufacturing sector | Yes | 0.171** | 0.0847 | 103,181 | 0.60 |
| 3) TWFE | Aerospace sector | Yes | 0.337*** | 0.0902 | 53,737 | 0.59 |
| 4) TWFE | Pipeline | Yes | 0.155*** | 0.0034 | 918 | 0.80 |
| 5) DiD | Pipeline | Yes | 0.181** | 0.0713 | 306 | - |
| Estimated % impact on turnover per worker | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0254*** | 0.0080 | 102,671 | 0.05 |
| 2) TWFE | Manufacturing sector | Yes | 0.0252*** | 0.0079 | 102,671 | 0.05 |
| 3) TWFE | Aerospace sector | Yes | 0.0275*** | 0.0095 | 53,227 | 0.04 |
| 4) TWFE | Pipeline | Yes | 0.0083 | 0.0071 | 408 | 0.35 |
| 5) DiD | Pipeline | Yes | 0.0293 | 0.0603 | 408 | - |

Table 10. Estimated effects of ATI grants on turnover and turnover per worker by 2021 – collaborators

| Model | Comparison Group | Time Effects | Coeff. | Std. Error | Observations | Adjusted R ² |
|--|----------------------|--------------|-----------|------------|--------------|-------------------------|
| Estimated % impact on Turnover | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0939*** | 0.0198 | 102,569 | 0.59 |
| 2) TWFE | Manufacturing sector | Yes | 0.0938*** | 0.0198 | 102,569 | 0.59 |
| 3) TWFE | Aerospace sector | Yes | 0.0939*** | 0.0210 | 53,125 | 0.57 |
| 4) TWFE | Pipeline | Yes | 0.0477* | 0.0265 | 306 | 0.86 |
| 5) DiD | Pipeline | Yes | 0.0630 | 0.0680 | 306 | - |
| Estimated % impact on turnover per worker | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0083 | 0.0071 | 103,079 | 0.05 |
| 2) TWFE | Manufacturing sector | Yes | 0.0457 | 0.0458 | 103,079 | 0.05 |
| 3) TWFE | Aerospace sector | Yes | 0.0401 | 0.0461 | 53,635 | 0.04 |
| 4) TWFE | Pipeline | Yes | 0.1560 | 0.0592 | 816 | 0.04 |
| 5) DiD | Pipeline | Yes | 0.0002 | 0.0706 | 816 | - |

Total impact on turnover

Estimates from model 5 indicated the average impact on turnover, the total impact until 2023 was estimated following the approach used to calculate the total impact on R&D expenditure. Table 11 presents the mean, weighted mean, and trimmed mean for turnover. It shows that the mean exceeds the weighted mean, indicating that large businesses are overrepresented in the BSD sample.

Table 11. Three measures of the mean for turnover, and associated total impact

| Approach | Mean value 2010 – 2021 (£2023 millions) | Total impact (£2023 millions) |
|------------------|---|-------------------------------|
| Mean | 496 | 21,200 |
| Weighted mean | 399 | 17,100 |
| 50% trimmed mean | 55.0 | 2,350 |

As the median value, the weighted mean was used to calculate total impact. The total effect—17.1 billion over the 2013 to 2021 period—implies each beneficiary company increased turnover by £55 million more than control companies. Assuming the effect was distributed evenly across the analysed period, this implies an effect of £6 million per business per year.

GVA and GVA per worker results

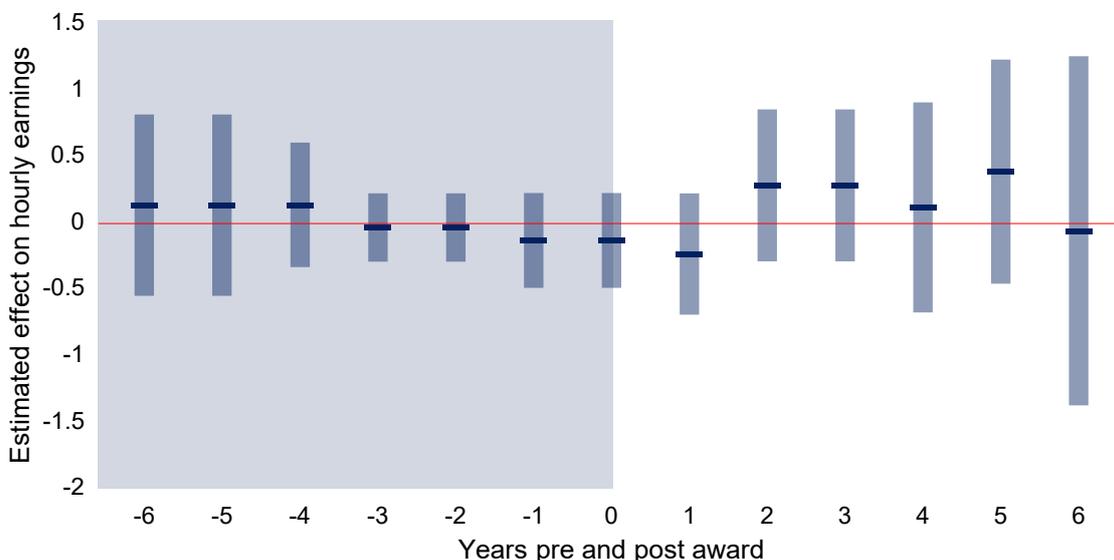
Table 12 presents the econometric estimates for the impact on company GVA and productivity, measured by GVA per worker. The staggered difference in difference specification, model 5, found no statistically significant evidence that the ATI Programme increased GVA or GVA per worker for treated companies. Estimates from the other specifications (model 1-3) show a strongly significant increase in GVA of 6% to 8% and a weakly significant increase for model 4 of 4%. Similarly, specifications (model 1-3) show a strongly significant increase in GVA per worker of 2%. This shows that estimates of the impact on GVA and GVA per worker are sensitive to modelling approach.

Table 12. Estimated effects of ATI grants on GVA and GVA per worker by 2021 – overall findings

| Model | Comparison Group | Time Effects | Coeff. | Std. Error | Observations | Adjusted R ² |
|---|----------------------|--------------|-----------|------------|--------------|-------------------------|
| Estimated % impact on GVA | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0762*** | 0.0236 | 16,422 | 0.74 |
| 2) TWFE | Manufacturing sector | Yes | 0.0742*** | 0.025 | 16,422 | 0.75 |
| 3) TWFE | Aerospace sector | Yes | 0.0554*** | 0.0215 | 8,681 | 0.81 |
| 4) TWFE | Pipeline | Yes | 0.0439* | 0.025 | 937 | 0.75 |
| 5) DiD | Pipeline | Yes | -0.0289 | 0.251 | 937 | - |
| Estimated % impact on GVA per worker | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0232*** | 0.00816 | 16,365 | 0.56 |
| 2) TWFE | Manufacturing sector | Yes | 0.0204*** | 0.00835 | 16,365 | 0.56 |
| 3) TWFE | Aerospace sector | Yes | 0.0166*** | 0.00407 | 8,672 | 0.53 |
| 4) TWFE | Pipeline | Yes | 0.0134 | 0.00835 | 939 | 0.66 |
| 5) DiD | Pipeline | Yes | -0.0302 | 0.20101 | 939 | - |

Using the regression results from the staggered DiD model (5), Figure 8 shows no statistically significant persistence of impacts on GVA from the point of being awarded an ATI grant.

Figure 8. Persistence of effects on GVA - not statistically significant



The econometric analysis found no robust evidence of increases in GVA for collaborating partners, showing statistical significance in only models 1 and 2. However, focusing on project leaders only, results from the preferred model, model 5, show a weakly significant impact. This impact is estimated to be an increase in GVA of 5%, associated with ATI grants (Table 13 and 14).

Table 13. Estimated effects of ATI grants on GVA and GVA per worker by 2021 – project leaders

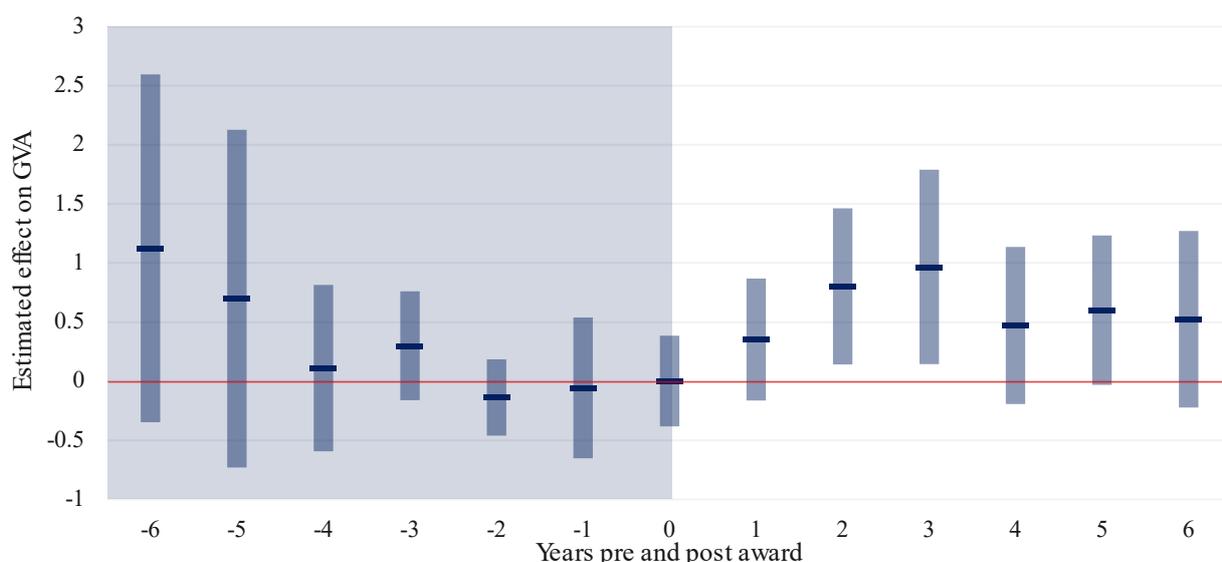
| Model | Comparison Group | Time Effects | Coeff. | Std. Error | Observations | Adjusted R ² |
|---|----------------------|--------------|-----------|------------|--------------|-------------------------|
| Estimated % impact on GVA | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0741*** | 0.0176 | 15,775 | 0.82 |
| 2) TWFE | Manufacturing sector | Yes | 0.0724*** | 0.0187 | 15,775 | 0.83 |
| 3) TWFE | Aerospace sector | Yes | 0.0597*** | 0.0221 | 7,969 | 0.81 |
| 4) TWFE | Pipeline | Yes | 0.0439*** | 0.0187 | 225 | 0.83 |
| 5) DiD | Pipeline | Yes | 0.0492* | 0.0271 | 225 | - |
| Estimated % impact on GVA per worker | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0227*** | 0.0094 | 15,721 | 0.55 |
| 2) TWFE | Manufacturing sector | Yes | 0.0240*** | 0.0100 | 15,721 | 0.56 |
| 3) TWFE | Aerospace sector | Yes | 0.0176*** | 0.0042 | 7,963 | 0.52 |
| 4) TWFE | Pipeline | Yes | 0.0118 | 0.0100 | 230 | 0.56 |
| 5) DiD | Pipeline | Yes | 0.0477 | 0.0262 | 230 | - |

Table 14. Estimated effects of ATI grants on GVA and GVA per worker by 2021 – collaborators

| Model | Comparison Group | Time Effects | Coeff. | Std. Error | Observations | Adjusted R ² |
|---|----------------------|--------------|----------|------------|--------------|-------------------------|
| Estimated % impact on GVA | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.341*** | 0.0598 | 16,132 | 0.76 |
| 2) TWFE | Manufacturing sector | Yes | 0.314*** | 0.0607 | 16,132 | 0.77 |
| 3) TWFE | Aerospace sector | Yes | 0.0861 | 0.0622 | 8,456 | 0.71 |
| 4) TWFE | Pipeline | Yes | 0.0388 | 0.0763 | 712 | 0.76 |
| 5) DiD | Pipeline | Yes | -0.066 | 0.2410 | 712 | - |
| Estimated % impact on GVA per worker | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.108* | 0.0077 | 16,070 | 0.56 |
| 2) TWFE | Manufacturing sector | Yes | 0.0104 | 0.0877 | 16,070 | 0.68 |
| 3) TWFE | Aerospace sector | Yes | -0.055 | 0.0642 | 8,442 | 0.52 |
| 4) TWFE | Pipeline | Yes | 0.0104 | 0.0877 | 709 | 0.67 |
| 5) DiD | Pipeline | Yes | -0.265 | 0.188 | 709 | - |

Figure 9 shows that this impact arises two to three years after a company has been awarded an ATI grant but is not persistent over time, fading after four years. This evidence suggests that the ATI Programme has had some impact on the GVA of companies leading ATI projects.

Figure 9. Persistence of effects on GVA - project leaders



Total impact on GVA

Estimates from model 1-4 indicated the average impact on GVA, the total impact until 2023 was estimated following the approach used to calculate the total impact on R&D expenditure. As Table 15 presents, the average value of GVA exceeds the weighted average, suggesting that large businesses are slightly overrepresented in the ABS sample. The effect of the ATI Programme on GVA was taken as the mean of the significant coefficients (models 1-4), 0.062.

Table 15. Three measures of the mean for GVA, and associated total impact

| Approach | Mean value 2010 – 2021 (£2023 millions) | Total impact (£2023 millions) |
|------------------|---|-------------------------------|
| Mean | 233 | 4,500 |
| Weighted mean | 104 | 2,000 |
| 50% trimmed mean | 46.5 | 899 |

Using the median value, the total effect of the ATI Programme on GVA was calculated as £2 billion over the programme period until 2023. The results suggest that the average beneficiary company increased its GVA by £6.4 million over and above the change experienced by control companies. Assuming the effect was distributed evenly across the analysed period, this implies an effect of £0.71 million per business per year.

Location of intermediate goods and services (inside / outside UK)

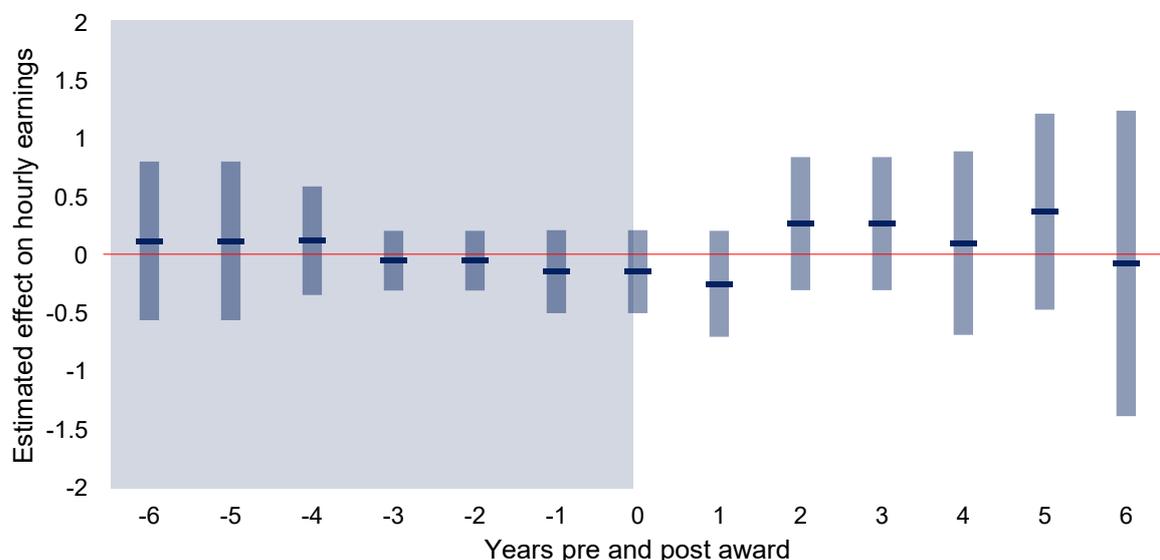
The ABS database is used to identify the impact of ATI grants on the choice of beneficiary companies to support the UK supply chain or make intermediate purchases outside of the UK. Table 16 presents econometric estimates using the value of intermediate purchases inside and outside the UK. Results show no evidence to suggest a substitution towards the UK supply chain. The estimates found no robust evidence that intermediate purchases were greater for grant beneficiaries compared to the aerospace and manufacturing sector, showing statistical significance only in models 1-3. This suggests that the notion of supporting the UK supply chain cannot at present be supported quantitatively.

Table 16. Estimated effects of ATI grants on location of intermediate purchases by 2021

| Model | Comparison Group | Time Effects | Coeff. | Std. Error | Observations | Adjusted R ² |
|--|----------------------|--------------|-----------|------------|--------------|-------------------------|
| Estimated % impact on intermediate purchases inside the UK | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0559* | 0.0165 | 3,545 | 0.38 |
| 2) TWFE | Manufacturing sector | Yes | 0.0560*** | 0.0170 | 3,545 | 0.38 |
| 3) TWFE | Aerospace sector | Yes | 0.0418*** | 0.0118 | 3,293 | 0.37 |
| 4) TWFE | Pipeline | Yes | 0.0231 | 0.0170 | 484 | 0.56 |
| 5) DiD | Pipeline | Yes | -0.592 | 0.550 | 484 | - |
| Estimated % impact on intermediate purchases outside the UK | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0733*** | 0.0245 | 3,152 | 0.33 |
| 2) TWFE | Manufacturing sector | Yes | 0.0721*** | 0.0247 | 3,152 | 0.33 |
| 3) TWFE | Aerospace sector | Yes | 0.0538*** | 0.0162 | 3,311 | 0.35 |
| 4) TWFE | Pipeline | Yes | 0.0276 | 0.0247 | 452 | 0.57 |
| 5) DiD | Pipeline | Yes | 0.230 | 0.580 | 452 | - |

Using the regression results from the staggered DiD model (5), Figure 10 shows the no statistical significance of the persistence of impacts on intermediate purchases inside the UK from the point of being awarded an ATI grant.

Figure 10. Persistence of effects on intermediate purchases inside the UK - not statistically significant



Employment

Econometric results using information from the Business Structure Database show that ATI-funded companies were estimated to have created or safeguarded 12% more jobs than control companies on average between 2013 and 2021 (model 5 and Table 17).

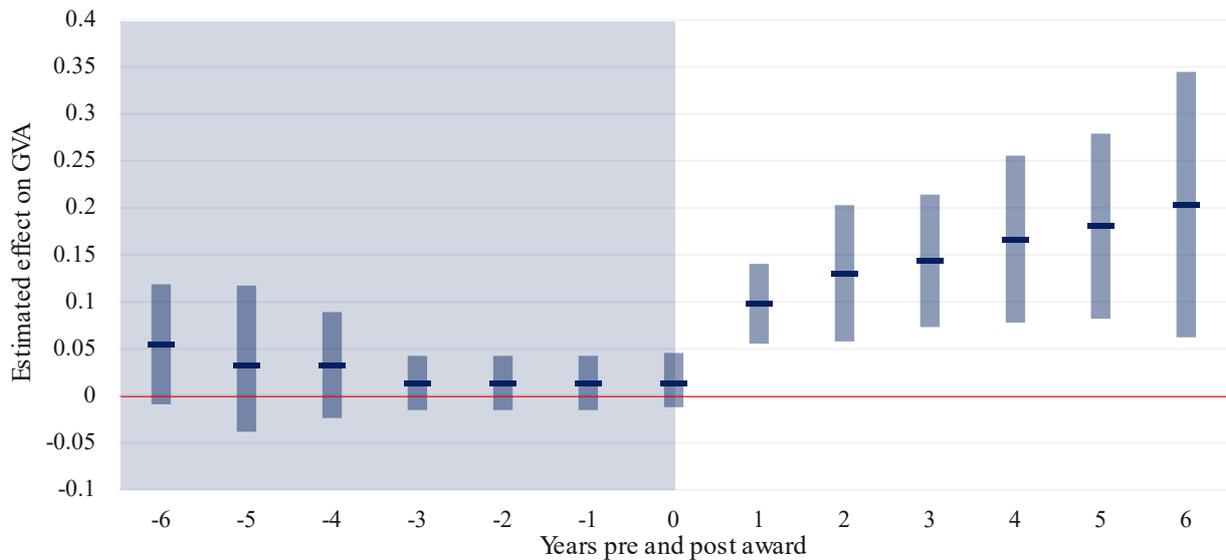
A stronger effect was seen in companies leading ATI projects, results from the preferred model (5) suggest employment increased by 15%. There was less robust evidence to suggest an effect for project collaborators of 4% to 7%, showing strong statistical significance for models 1-3, weak significance for model 4 and no significance for model 5.

Table 17. Estimated effects of ATI grants on employment by 2021

| Model | Comparison Group | Time Effects | Coeff. | Std. Error | Observations | Adjusted R ² |
|--|----------------------|--------------|-----------|------------|--------------|-------------------------|
| Estimated % impact on employment – overall findings | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0664*** | 0.0116 | 103,488 | 0.78 |
| 2) TWFE | Manufacturing sector | Yes | 0.0666*** | 0.0117 | 103,488 | 0.78 |
| 3) TWFE | Aerospace sector | Yes | 0.0638*** | 0.0114 | 54,068 | 0.81 |
| 4) TWFE | Pipeline | Yes | 0.0438*** | 0.0094 | 1,224 | 0.86 |
| 5) DiD | Pipeline | Yes | 0.118*** | 0.0278 | 1,224 | - |
| Estimated % impact on employment – project leaders | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.148*** | 0.0537 | 103,182 | 0.78 |
| 2) TWFE | Manufacturing sector | Yes | 0.153*** | 0.0537 | 103,182 | 0.78 |
| 3) TWFE | Aerospace sector | Yes | 0.187*** | 0.0558 | 53,762 | 0.80 |
| 4) TWFE | Pipeline | Yes | 0.147** | 0.0725 | 918 | 0.86 |
| 5) DiD | Pipeline | Yes | 0.152*** | 0.0349 | 918 | - |
| Estimated % impact on employment – collaborators | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0681*** | 0.0119 | 102,570 | 0.77 |
| 2) TWFE | Manufacturing sector | Yes | 0.0682*** | 0.0120 | 102,570 | 0.77 |
| 3) TWFE | Aerospace sector | Yes | 0.0659*** | 0.0117 | 53,150 | 0.79 |
| 4) TWFE | Pipeline | Yes | 0.0394* | 0.0200 | 306 | 0.90 |
| 5) DiD | Pipeline | Yes | 0.0632 | 0.0414 | 306 | - |

Using the regression results from the staggered DiD models (model 5), Figure 11 shows the persistence of impacts on employment from the point of being awarded an ATI grant. These effects appeared to accumulate from one year after the grant award was made, indicating that that increases in jobs created or safeguarded start take place from the beginning of the projects. The effects also appear to persist up to six years after receiving funding, substantially longer than the average project period. This suggests that the programme has led to additional employment beyond the initial ATI project.

Figure 11. Persistence of effects on employment, overall estimates



Total impact on employment

The average employment (calculated using the average 50% trimmed mean) in ATI-funded companies from 2010 to 2021 was 260 jobs per company. Using the estimated impact from model 5 implies that 29 jobs were created or safeguarded per company because of the ATI Programme. This, in turn, suggests that the programme created or safeguarded 59,400 additional job years up to 2023, assuming that the impact was spread evenly across time. The primary results suggest the effect is larger for ATI project leads. For these businesses, employment increased by 15.2% on average, while for non-leads, there was found to be no statistically significant effect.

The estimated average change in jobs per firm between 2013 and 2021 was found to 30 jobs per firm. Net jobs created or safeguarded was calculated as 312 (the number of benefitting companies) multiplied by the 30 additional jobs created, which equates to 9,550 additional jobs.

This estimated effect on jobs created or safeguarded is comparable to a similar international funding scheme, PERTE,⁷ based in Spain (also highlighted in the main report). Here, the €4.5bn investment in PERTE should result in 14,079 new jobs. This includes 1,900 high quality R&D jobs.

Wages

The ASHE database was used to assess the impact of ATI grants on worker earnings and hours worked. Estimates from the preferred model (5) suggest that the programme had led to a 3% increase in the wages of workers employed by beneficiaries (Table 18). However, the overall results from model 4 and 5 showed no evidence to support changes in hours worked. It could be argued, perhaps, that an increase in employee wages represents an increase in productivity.

Table 18. Estimated effects of ATI grants on hourly earnings and hours work by 2021 - overall results

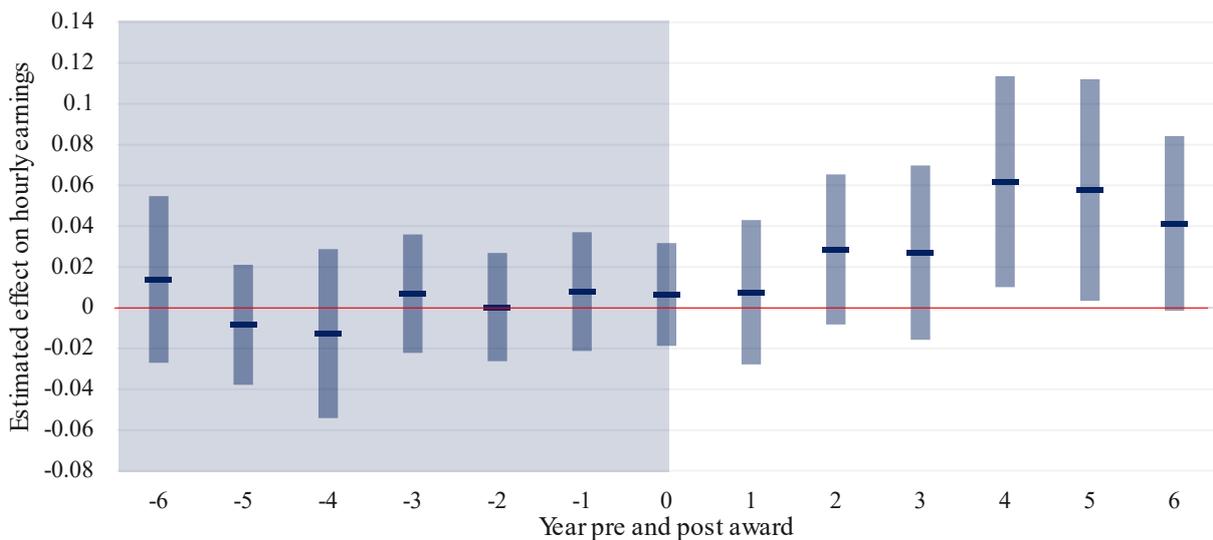
| Model | Comparison Group | Time Effects | Coeff. | Std. Error | Observations | Adjusted R ² |
|---|----------------------|--------------|-----------|------------|--------------|-------------------------|
| Estimated % impact on hourly earnings of workers | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0095*** | 0.0008 | 12,679 | 0.34 |
| 2) TWFE | Manufacturing sector | Yes | 0.0072*** | 0.0008 | 12,679 | 0.37 |

⁷ PERTE: Strategic Projects for Economic Recovery and Transformation | España Digital 2026 (espanadigital.gob.es)

| 3) TWFE | Aerospace sector | Yes | 0.0068*** | 0.0006 | 7,546 | 0.40 |
|---|----------------------|-----|------------|--------|--------|------|
| 4) TWFE | Pipeline | Yes | 0.0026*** | 0.0005 | 940 | 0.50 |
| 5) DiD | Pipeline | Yes | 0.0300** | 0.0150 | 940 | - |
| Estimated % impact on employee hours worked | | | | | | |
| 1) TWFE | Manufacturing sector | No | -0.0013*** | 0.0003 | 12,679 | 0.62 |
| 2) TWFE | Manufacturing sector | Yes | -0.0010*** | 0.0003 | 12,679 | 0.62 |
| 3) TWFE | Aerospace sector | Yes | -0.0008** | 0.0004 | 7,547 | 0.60 |
| 4) TWFE | Pipeline | Yes | -0.0002 | 0.0002 | 940 | 0.42 |
| 5) DiD | Pipeline | Yes | 0.0061 | 0.0061 | 940 | - |

Using the regression results from the staggered DiD models (5), Figure 11 shows the persistence of impacts on employment from the point of being awarded an ATI grant. These effects appeared to accumulate four to five years after the grant award was made, indicating that increased wages start to be realised towards the end of projects (the average project lasting approximately three years). The effects also appear to persist for a short period of time, albeit after the average project length, appearing four to five years after receiving funding. This suggests that the programme has led to increases in wage growth activity beyond the initial ATI project.

Figure 12. Persistence of effects on hourly earnings



When isolating companies leading ATI projects and collaborators, the effect was seen more strongly in companies leading ATI projects. Results from the preferred model (5) suggest hourly earnings increased by 5%, Table 19 and 20. Results using model 5 show an increase in hours worked in companies leading ATI projects by 1%, showing some weak evidence that the programme has increased the volume of hours worked. While the results from models 1-3 imply a reduction in hours work, the estimates from models 2 and 3 are significant only at the 10% level. This conflict in direction of impact shows that the results is sensitive to model choice.

For collaborating companies, there were statistically significant results from models 1-4, showing an estimated impact in hourly earnings of 0.4 to 0.9%. There appeared again evidence from models 1-3 of a reduction in hours worked of 0.1 to 0.8% but this result was not significant using models 4 and 5.

Collectively, these results indicated an increase in hourly earnings and a possible change in hours worked, which varied in direction depending on model used. Estimates from model 5 showed an increase in hours worked (in lead companies only), while estimates from models 1-3 represented a decrease in hours worked. An increase in earnings combined with a reduction in hours worked may

suggest an increase in productivity. As the results evidence here can be considered potentially ambiguous, this presents an opportunity to further investigate the impact of the programme on hourly earnings and hours worked in future evaluations.

Table 19. Estimated effects of ATI grants on hourly earnings and hours work by 2021 - project leaders

| Model | Comparison Group | Time Effects | Coeff. | Std. Error | Observations | Adjusted R ² |
|---|----------------------|--------------|------------|------------|--------------|-------------------------|
| Estimated % impact on hourly earnings of workers | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.1250*** | 0.0132 | 12,002 | 0.32 |
| 2) TWFE | Manufacturing sector | Yes | 0.0682*** | 0.0126 | 12,002 | 0.35 |
| 3) TWFE | Aerospace sector | Yes | 0.0653** | 0.0152 | 6,869 | 0.40 |
| 4) TWFE | Pipeline | Yes | 0.0434*** | 0.0168 | 335 | 0.55 |
| 5) DiD | Pipeline | Yes | 0.0473** | 0.0080 | 335 | - |
| Estimated % impact on employee hours worked | | | | | | |
| 1) TWFE | Manufacturing sector | No | -0.0236*** | 0.0088 | 12,416 | 0.62 |
| 2) TWFE | Manufacturing sector | Yes | -0.0164* | 0.0087 | 12,416 | 0.62 |
| 3) TWFE | Aerospace sector | Yes | -0.0143* | 0.0075 | 7,284 | 0.60 |
| 4) TWFE | Pipeline | Yes | -0.0097 | 0.0106 | 605 | 0.38 |
| 5) DiD | Pipeline | Yes | 0.0091** | 0.0044 | 605 | - |

Table 20. Estimated effects of ATI grants on hourly earnings and hours work by 2021 - collaborators

| Model | Comparison Group | Time Effects | Coeff. | Std. Error | Observations | Adjusted R ² |
|---|----------------------|--------------|------------|------------|--------------|-------------------------|
| Estimated % impact on hourly earnings of workers | | | | | | |
| 1) TWFE | Manufacturing sector | No | 0.0089*** | 0.0012 | 12,416 | 0.33 |
| 2) TWFE | Manufacturing sector | Yes | 0.0073*** | 0.0010 | 12,416 | 0.36 |
| 3) TWFE | Aerospace sector | Yes | 0.0069*** | 0.0011 | 7,283 | 0.4 |
| 4) TWFE | Pipeline | Yes | 0.0043** | 0.0005 | 605 | 0.54 |
| 5) DiD | Pipeline | Yes | 0.0174 | 0.0115 | 605 | - |
| Estimated % impact on employee hours worked | | | | | | |
| 1) TWFE | Manufacturing sector | No | -0.0012*** | 0.0002 | 12,002 | 0.63 |
| 2) TWFE | Manufacturing sector | Yes | -0.0010*** | 0.0002 | 12,002 | 0.63 |
| 3) TWFE | Aerospace sector | Yes | -0.0082*** | 0.0003 | 6,870 | 0.61 |
| 4) TWFE | Pipeline | Yes | 0.0003 | 0.0003 | 335 | 0.85 |
| 5) DiD | Pipeline | Yes | -0.0120 | 0.0079 | 335 | - |

Full regression tables for main results

Table A.1 Estimated effects of ATI grants on R&D expenditure

| Model | R&D expenditure | | | | | | | | | | | |
|------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|------------------------|-----------------------|----------------------|---------------------|---------------------|
| | Overall results | | | | Project leaders | | | | Project collaborators | | | |
| | Manufacturing No | Manufacturing Yes | Aerospace Yes | Pipeline Yes | Manufacturing No | Manufacturing Yes | Aerospace Yes | Pipeline Yes | Manufacturing No | Manufacturing Yes | Aerospace Yes | Pipeline Yes |
| N_Projects | 0.0949*** (0.0262) | 0.0955*** (0.0257) | 0.0914*** (0.0207) | 0.0685*** (0.0142) | 0.100*** (0.0265) | 0.0987*** (0.0259) | 0.0907*** (0.0206) | 0.0488*** (0.00922) | 0.0653 (0.0800) | 0.107 (0.0794) | 0.166* (0.0854) | -0.0226 (0.102) |
| Region_2 | 0.547*** (0.0869) | 0.462*** (0.0839) | 0.746*** (0.171) | 0.557** (0.261) | 0.503*** (0.0980) | 0.427*** (0.0964) | 0.763*** (0.206) | 0.824 (0.644) | 0.456*** (0.0901) | 0.366*** (0.0853) | 0.671*** (0.187) | 0.420 (0.296) |
| Region_3 | 0.492*** (0.0925) | 0.452*** (0.0887) | 0.468*** (0.147) | 0.549** (0.250) | 0.438*** (0.104) | 0.405*** (0.102) | 0.436** (0.177) | 0.166 (0.421) | 0.412*** (0.0930) | 0.367*** (0.0868) | 0.419*** (0.155) | 0.547** (0.274) |
| Region_4 | 0.592*** (0.102) | 0.541*** (0.0994) | 0.667*** (0.142) | 0.345 (0.362) | 0.541*** (0.108) | 0.504*** (0.107) | 0.673*** (0.155) | 0.238 (0.336) | 0.547*** (0.106) | 0.490*** (0.103) | 0.662*** (0.154) | 0.556 (0.403) |
| Region_5 | 0.613*** (0.0960) | 0.565*** (0.0937) | 0.629*** (0.164) | 0.308 (0.235) | 0.591*** (0.106) | 0.552*** (0.105) | 0.712*** (0.194) | 0.702 (0.530) | 0.529*** (0.0942) | 0.475*** (0.0897) | 0.552*** (0.173) | 0.253 (0.228) |
| Region_6 | 0.589*** (0.102) | 0.553*** (0.0972) | 0.642*** (0.137) | 0.509** (0.226) | 0.534*** (0.110) | 0.516*** (0.107) | 0.659*** (0.169) | 1.085** (0.410) | 0.490*** (0.0991) | 0.446*** (0.0918) | 0.516*** (0.144) | 0.394* (0.223) |
| Region_7 | 0.589*** (0.0933) | 0.562*** (0.0887) | 0.720*** (0.147) | 0.771*** (0.212) | 0.499*** (0.101) | 0.483*** (0.0987) | 0.682*** (0.188) | 0.575 (0.496) | 0.509*** (0.0987) | 0.478*** (0.0924) | 0.678*** (0.165) | 0.886*** (0.244) |
| Region_8 | 0.431*** (0.106) | 0.463*** (0.0952) | 0.538*** (0.178) | 0.397 (0.422) | 0.378*** (0.112) | 0.418*** (0.103) | 0.565*** (0.201) | 1.256*** (0.407) | 0.345*** (0.109) | 0.375*** (0.0951) | 0.490** (0.191) | 0.318 (0.442) |
| Region_9 | 0.619*** (0.0915) | 0.599*** (0.0876) | 0.743*** (0.121) | 0.676*** (0.178) | 0.564*** (0.105) | 0.556*** (0.102) | 0.774*** (0.155) | 1.240*** (0.321) | 0.514*** (0.0978) | 0.487*** (0.0922) | 0.618*** (0.131) | 0.448** (0.198) |
| Region_10 | 0.414*** (0.106) | 0.435*** (0.101) | 0.634*** (0.133) | 0.871*** (0.274) | 0.329*** (0.113) | 0.368*** (0.110) | 0.610*** (0.162) | 0.354 (0.442) | 0.321*** (0.110) | 0.337*** (0.103) | 0.574*** (0.145) | 0.846*** (0.318) |
| Region_11 | 0.599*** (0.108) | 0.556*** (0.104) | 0.685*** (0.126) | 0.930*** (0.269) | 0.535*** (0.119) | 0.498*** (0.117) | 0.700*** (0.159) | 1.518*** (0.386) | 0.495*** (0.106) | 0.447*** (0.101) | 0.593*** (0.134) | 0.688*** (0.256) |

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|-------------|-----------------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|-----------------------|----------------------|
| SIC_2 | 0.682*** (0.232) | 0.552** (0.221) | 0.667** (0.261) | 0.149 (0.300) | 0.886*** (0.284) | 0.818*** (0.292) | 0.817*** (0.298) | 0.323 (0.397) | 0.691*** (0.216) | 0.519*** (0.195) | 0.674** (0.288) | 0.112 (0.303) |
| SIC_3 | 0.271 (0.220) | 0.259 (0.208) | 0.339 (0.257) | 0.815** (0.340) | 0.324 (0.289) | 0.290 (0.291) | 0.399 (0.297) | 1.207*** (0.438) | 0.236 (0.213) | 0.226 (0.189) | 0.304 (0.282) | 0.530* (0.303) |
| SIC_4 | -0.932*** (0.353) | -0.945*** (0.337) | -0.376 (0.647) | -1.019** (0.413) | -0.578 (0.508) | -0.679 (0.483) | 0.359 (0.931) | -0.543 (0.700) | -1.105*** (0.249) | -1.142*** (0.203) | -0.257 (0.869) | -1.238*** (0.288) |
| SIC_5 | -2.035*** (0.626) | -1.886*** (0.696) | -2.762*** (0.578) | -2.752*** (0.883) | -1.944*** (0.637) | -1.880** (0.732) | -3.236*** (0.670) | -3.138** (1.241) | -0.762 (0.510) | -0.317 (0.475) | -2.575** (1.006) | |
| SIC_6 | 1.493*** (0.323) | 1.343*** (0.314) | 1.220*** (0.377) | 0.924** (0.390) | 1.119*** (0.368) | 1.130*** (0.343) | 1.204*** (0.401) | 0.815 (0.708) | 1.669*** (0.318) | 1.481*** (0.299) | 1.278*** (0.402) | 1.035*** (0.387) |
| SIC_7 | 1.595*** (0.263) | 1.491*** (0.247) | 0.111 (0.246) | 1.242*** (0.307) | 1.229*** (0.317) | 1.204*** (0.321) | 0.0693 (0.278) | 0.789** (0.371) | 1.801*** (0.300) | 1.624*** (0.273) | 0.0608 (0.274) | 1.304*** (0.353) |
| SIC_8 | -0.130 (0.296) | -0.296 (0.297) | -0.112 (0.381) | -0.181 (0.438) | -0.332 (0.354) | -0.434 (0.327) | -0.263 (0.489) | -0.248 (0.472) | -0.172 (0.374) | -0.362 (0.385) | -0.244 (0.559) | -0.455 (0.710) |
| SIC_9 | 2.372 (1.464) | 2.205 (1.387) | 2.116 (1.295) | 1.850 (1.213) | 0.0646 (0.294) | 0.169 (0.297) | 0.259 (0.302) | 0.472 (0.471) | 3.594*** (0.932) | 3.255*** (0.969) | 3.119*** (0.913) | 2.773*** (0.969) |
| Size_Medium | -1.550*** (0.0791) | -1.608*** (0.0788) | -1.962*** (0.125) | -2.135*** (0.230) | -1.465*** (0.0836) | -1.515*** (0.0832) | -1.877*** (0.140) | -2.267*** (0.675) | -1.462*** (0.0772) | -1.525*** (0.0768) | -1.877*** (0.127) | -2.049*** (0.236) |
| Size_Micro | -4.427*** (0.0875) | -5.065*** (0.0833) | -5.415*** (0.131) | -5.451*** (0.362) | -4.364*** (0.0908) | -4.979*** (0.0870) | -5.307*** (0.142) | -5.156*** (0.657) | -4.343*** (0.0858) | -4.989*** (0.0816) | -5.314*** (0.133) | -5.582*** (0.387) |
| Size_Small | -2.914*** (0.0775) | -3.004*** (0.0762) | -3.350*** (0.125) | -3.474*** (0.255) | -2.835*** (0.0807) | -2.918*** (0.0798) | -3.286*** (0.138) | -3.371*** (0.661) | -2.827*** (0.0751) | -2.925*** (0.0739) | -3.278*** (0.126) | -3.343*** (0.265) |
| 2011.year | | -2.408*** (0.0584) | -2.215*** (0.0844) | -2.269*** (0.239) | | -2.426*** (0.0607) | -2.164*** (0.0922) | | | -2.402*** (0.0582) | -2.188*** (0.0839) | -2.345*** (0.242) |
| 2012.year | | -2.458*** (0.0553) | -2.071*** (0.0785) | -2.164*** (0.211) | | -2.490*** (0.0577) | -2.015*** (0.0852) | | | -2.450*** (0.0551) | -2.044*** (0.0779) | -2.233*** (0.217) |
| 2013.year | | -2.052*** (0.0593) | -1.953*** (0.0815) | -2.193*** (0.218) | | -2.016*** (0.0619) | -1.808*** (0.0886) | | | -2.064*** (0.0597) | -1.991*** (0.0824) | -2.511*** (0.235) |
| 2014.year | | -2.868*** (0.0552) | -2.222*** (0.0756) | -2.187*** (0.201) | | -2.889*** (0.0578) | -2.129*** (0.0836) | -0.271 (0.185) | | -2.893*** (0.0557) | -2.257*** (0.0763) | -2.316*** (0.231) |
| 2015.year | | -2.365*** | -2.077*** | -2.247*** | | -2.352*** | -1.962*** | -0.359* | | -2.366*** | -2.094*** | -2.320*** |

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|--------------|-----------|-----------|-----------|----------|-----------|-----------|----------|----------|-----------|-----------|-----------|----------|
| | (0.0598) | (0.0817) | (0.214) | | (0.0625) | (0.0890) | (0.201) | | (0.0601) | (0.0820) | (0.229) | |
| 2016.year | -2.412*** | -2.054*** | -2.154*** | | -2.407*** | -1.944*** | -0.139 | | -2.423*** | -2.083*** | -2.287*** | |
| | (0.0584) | (0.0796) | (0.215) | | (0.0607) | (0.0860) | (0.204) | | (0.0584) | (0.0791) | (0.244) | |
| 2017.year | -2.244*** | -2.071*** | -2.222*** | | -2.225*** | -1.945*** | -0.249 | | -2.244*** | -2.096*** | -2.285*** | |
| | (0.0582) | (0.0805) | (0.203) | | (0.0605) | (0.0859) | (0.194) | | (0.0583) | (0.0803) | (0.232) | |
| 2018.year | -2.334*** | -2.045*** | -2.175*** | | -2.330*** | -1.928*** | -0.201 | | -2.342*** | -2.066*** | -2.235*** | |
| | (0.0564) | (0.0794) | (0.209) | | (0.0585) | (0.0843) | (0.207) | | (0.0563) | (0.0788) | (0.238) | |
| 2019.year | -2.603*** | -1.946*** | -2.052*** | | -2.621*** | -1.832*** | -0.0911 | | -2.620*** | -1.967*** | -2.072*** | |
| | (0.0577) | (0.0826) | (0.203) | | (0.0599) | (0.0876) | (0.201) | | (0.0577) | (0.0823) | (0.237) | |
| 2020.year | -1.659*** | -1.707*** | -2.059*** | | -1.628*** | -1.574*** | -0.219 | | -1.643*** | -1.707*** | -1.975*** | |
| | (0.0592) | (0.0838) | (0.216) | | (0.0611) | (0.0876) | (0.232) | | (0.0591) | (0.0831) | (0.276) | |
| SIC_5 | | | | | | | | | | | - | |
| Constant | 5.972*** | 8.396*** | 8.242*** | 8.886*** | 5.898*** | 8.321*** | 7.966*** | 6.561*** | 6.007*** | 8.445*** | 8.255*** | 9.066*** |
| | (0.217) | (0.218) | (0.290) | (0.415) | (0.278) | (0.291) | (0.353) | (0.715) | (0.219) | (0.209) | (0.307) | (0.416) |
| Observations | 13,954 | 13,954 | 6,980 | 1,247 | 13,047 | 13,047 | 6,073 | 340 | 13,614 | 13,614 | 6,640 | 907 |
| R-squared | 0.660 | 0.753 | 0.771 | 0.764 | 0.638 | 0.741 | 0.773 | 0.868 | 0.643 | 0.745 | 0.762 | 0.737 |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A.2 Estimated effects of ATI grants on R&D employment

| Model | R&D employment | | | | | | | | | | | |
|------------|-----------------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|------------------------|----------------------|----------------------|---------------------|---------------------|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | All/Lead/Not Lead | All | All | All | All | Lead | Lead | Lead | Lead | Not Lead | Not Lead | Not Lead |
| N_Projects | 0.0816*** (0.0184) | 0.0788*** (0.0168) | 0.0803*** (0.0138) | 0.0625*** (0.00890) | 0.0869*** (0.0194) | 0.0833*** (0.0182) | 0.0807*** (0.0143) | 0.0489*** (0.00780) | 0.00633 (0.0693) | -0.0447 (0.0666) | 0.132 (0.0939) | -0.127 (0.103) |
| Region_2 | 0.555*** (0.0907) | 0.493*** (0.0862) | 0.736*** (0.154) | 0.448* (0.231) | 0.520*** (0.0994) | 0.464*** (0.0964) | 0.768*** (0.183) | 1.047** (0.455) | 0.463*** (0.0879) | 0.397*** (0.0812) | 0.653*** (0.159) | 0.188 (0.232) |
| Region_3 | 0.464*** (0.0921) | 0.435*** (0.0876) | 0.440*** (0.136) | 0.455* (0.232) | 0.418*** (0.102) | 0.396*** (0.0986) | 0.421*** (0.157) | 0.582 (0.351) | 0.379*** (0.0839) | 0.350*** (0.0767) | 0.382*** (0.131) | 0.378 (0.253) |
| Region_4 | 0.577*** (0.0934) | 0.541*** (0.0895) | 0.615*** (0.128) | 0.199 (0.304) | 0.548*** (0.0996) | 0.523*** (0.0966) | 0.650*** (0.140) | 0.425 (0.336) | 0.519*** (0.0893) | 0.479*** (0.0838) | 0.586*** (0.127) | 0.184 (0.328) |
| Region_5 | 0.584*** (0.0998) | 0.543*** (0.0969) | 0.609*** (0.170) | 0.338 (0.294) | 0.567*** (0.108) | 0.535*** (0.106) | 0.677*** (0.193) | 1.050 (0.641) | 0.491*** (0.0841) | 0.450*** (0.0785) | 0.514*** (0.148) | 0.183 (0.235) |
| Region_6 | 0.549*** (0.104) | 0.523*** (0.0996) | 0.657*** (0.142) | 0.591** (0.248) | 0.484*** (0.109) | 0.475*** (0.106) | 0.645*** (0.167) | 1.128*** (0.397) | 0.446*** (0.0908) | 0.417*** (0.0831) | 0.527*** (0.124) | 0.445** (0.217) |
| Region_7 | 0.540*** (0.0926) | 0.523*** (0.0878) | 0.696*** (0.142) | 0.646** (0.271) | 0.457*** (0.0955) | 0.449*** (0.0928) | 0.661*** (0.170) | 0.405 (0.403) | 0.467*** (0.0927) | 0.450*** (0.0859) | 0.666*** (0.152) | 0.799** (0.309) |
| Region_8 | 0.468*** (0.103) | 0.498*** (0.0933) | 0.541*** (0.184) | 0.434 (0.487) | 0.399*** (0.103) | 0.437*** (0.0957) | 0.511*** (0.184) | 0.738 (0.581) | 0.397*** (0.102) | 0.428*** (0.0888) | 0.520*** (0.190) | 0.659 (0.578) |
| Region_9 | 0.581*** (0.0923) | 0.574*** (0.0874) | 0.726*** (0.125) | 0.701*** (0.211) | 0.520*** (0.100) | 0.525*** (0.0962) | 0.730*** (0.149) | 1.245*** (0.343) | 0.478*** (0.0891) | 0.471*** (0.0819) | 0.601*** (0.115) | 0.462** (0.210) |
| Region_10 | 0.374*** (0.102) | 0.373*** (0.0978) | 0.638*** (0.124) | 0.856*** (0.261) | 0.288*** (0.108) | 0.299*** (0.105) | 0.602*** (0.147) | 0.413 (0.474) | 0.280*** (0.0989) | 0.276*** (0.0920) | 0.580*** (0.122) | 0.832*** (0.267) |
| Region_11 | 0.534*** (0.105) | 0.521*** (0.101) | 0.612*** (0.121) | 0.813*** (0.285) | 0.469*** (0.113) | 0.464*** (0.109) | 0.611*** (0.143) | 1.247*** (0.389) | 0.434*** (0.0970) | 0.421*** (0.0895) | 0.529*** (0.116) | 0.589* (0.309) |
| SIC_2 | 0.581*** (0.213) | 0.489** (0.205) | 0.525** (0.240) | 0.180 (0.287) | 0.706*** (0.268) | 0.657** (0.270) | 0.684** (0.270) | 0.252 (0.379) | 0.593*** (0.188) | 0.468*** (0.173) | 0.498** (0.238) | 0.126 (0.311) |
| SIC_3 | 0.203 (0.209) | 0.212 (0.202) | 0.269 (0.241) | 0.496 (0.326) | 0.284 (0.291) | 0.325 (0.294) | 0.385 (0.273) | 0.822* (0.460) | 0.135 (0.197) | 0.0937 (0.181) | 0.213 (0.236) | 0.196 (0.325) |

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| | | | | | | | | | | | | |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| SIC_4 | -0.864** | -0.883*** | -0.540 | -0.906** | -0.481 | -0.543 | 0.0206 | -0.598 | -1.013*** | -1.040*** | -0.481 | -1.108*** |
| | (0.337) | (0.322) | (0.485) | (0.432) | (0.473) | (0.443) | (0.667) | (0.694) | (0.202) | (0.174) | (0.610) | (0.297) |
| SIC_5 | -1.968*** | -1.781** | -2.472*** | -2.748*** | -1.872** | -1.743** | -2.759*** | -3.253*** | -0.567 | -0.145 | -1.946** | |
| | (0.710) | (0.791) | (0.667) | (0.967) | (0.730) | (0.815) | (0.725) | (1.024) | (0.427) | (0.402) | (0.786) | |
| SIC_6 | 1.229*** | 1.131*** | 1.005*** | 0.828** | 0.944*** | 0.962*** | 0.890** | 0.823 | 1.382*** | 1.266*** | 1.036*** | 0.905** |
| | (0.298) | (0.295) | (0.332) | (0.340) | (0.349) | (0.338) | (0.358) | (0.623) | (0.294) | (0.289) | (0.336) | (0.393) |
| SIC_7 | 1.498*** | 1.429*** | 0.0661 | 1.270*** | 1.326*** | 1.313*** | 0.0722 | 0.914*** | 1.588*** | 1.469*** | -0.0275 | 1.221*** |
| | (0.250) | (0.241) | (0.220) | (0.253) | (0.345) | (0.353) | (0.245) | (0.270) | (0.288) | (0.268) | (0.225) | (0.350) |
| SIC_8 | -0.0899 | -0.233 | -0.327 | -0.312 | 0.175 | 0.0737 | -0.158 | -0.0842 | -0.184 | -0.345 | -0.695** | -1.061** |
| | (0.227) | (0.237) | (0.305) | (0.339) | (0.291) | (0.318) | (0.466) | (0.433) | (0.255) | (0.298) | (0.312) | (0.501) |
| SIC_9 | 1.717 | 1.614 | 1.537 | 1.340 | -0.123 | 0.0268 | 0.0844 | 0.167 | 2.545*** | 2.316*** | 2.183*** | 1.852** |
| | (1.225) | (1.151) | (1.073) | (0.917) | (0.291) | (0.294) | (0.266) | (0.456) | (0.885) | (0.887) | (0.833) | (0.812) |
| Size_Medium | -1.245*** | -1.277*** | -1.580*** | -1.829*** | -1.161*** | -1.175*** | -1.464*** | -1.711*** | -1.183*** | -1.221*** | -1.527*** | -1.815*** |
| | (0.0680) | (0.0683) | (0.112) | (0.234) | (0.0693) | (0.0698) | (0.119) | (0.592) | (0.0672) | (0.0675) | (0.114) | (0.238) |
| Size_Micro | -4.117*** | -4.700*** | -4.980*** | -5.066*** | -4.058*** | -4.608*** | -4.843*** | -4.307*** | -4.060*** | -4.653*** | -4.923*** | -5.305*** |
| | (0.0767) | (0.0727) | (0.117) | (0.341) | (0.0778) | (0.0747) | (0.122) | (0.614) | (0.0760) | (0.0723) | (0.119) | (0.382) |
| Size_Small | -2.547*** | -2.618*** | -2.872*** | -3.079*** | -2.474*** | -2.529*** | -2.775*** | -2.770*** | -2.488*** | -2.568*** | -2.837*** | -3.087*** |
| | (0.0670) | (0.0660) | (0.112) | (0.254) | (0.0682) | (0.0678) | (0.117) | (0.586) | (0.0656) | (0.0648) | (0.113) | (0.257) |
| 2011.year | | -2.325*** | -2.000*** | -2.102*** | | -2.350*** | -1.937*** | | | -2.326*** | -1.987*** | -2.229*** |
| | | (0.0544) | (0.0765) | (0.193) | | (0.0571) | (0.0850) | | | (0.0543) | (0.0765) | (0.208) |
| 2012.year | | -2.480*** | -1.952*** | -1.939*** | | -2.535*** | -1.915*** | | | -2.479*** | -1.937*** | -2.061*** |
| | | (0.0520) | (0.0723) | (0.167) | | (0.0549) | (0.0812) | | | (0.0519) | (0.0722) | (0.187) |
| 2013.year | | -1.952*** | -1.763*** | -1.971*** | | -1.925*** | -1.623*** | | | -1.970*** | -1.812*** | -2.340*** |
| | | (0.0557) | (0.0759) | (0.182) | | (0.0586) | (0.0843) | | | (0.0560) | (0.0767) | (0.204) |
| 2014.year | | -2.441*** | -1.934*** | -1.897*** | | -2.452*** | -1.840*** | -0.165 | | -2.463*** | -1.982*** | -2.065*** |
| | | (0.0527) | (0.0707) | (0.163) | | (0.0557) | (0.0799) | (0.165) | | (0.0530) | (0.0714) | (0.202) |
| 2015.year | | -1.850*** | -1.705*** | -1.943*** | | -1.809*** | -1.569*** | -0.173 | | -1.852*** | -1.750*** | -2.116*** |
| | | (0.0604) | (0.0782) | (0.181) | | (0.0637) | (0.0870) | (0.196) | | (0.0606) | (0.0783) | (0.208) |
| 2016.year | | -2.203*** | -1.843*** | -1.960*** | | -2.194*** | -1.727*** | -0.145 | | -2.214*** | -1.885*** | -2.128*** |
| | | (0.0567) | (0.0750) | (0.186) | | (0.0596) | (0.0824) | (0.208) | | (0.0567) | (0.0747) | (0.226) |
| 2017.year | | -1.804*** | -1.756*** | -2.007*** | | -1.772*** | -1.620*** | -0.311 | | -1.794*** | -1.779*** | -2.030*** |

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|---------------------------------------|-----------|-----------|-----------|----------|-----------|-----------|----------|----------|-----------|-----------|-----------|----------|
| | (0.0558) | (0.0766) | (0.164) | | (0.0587) | (0.0838) | (0.205) | | (0.0560) | (0.0771) | (0.211) | |
| 2018.year | -1.868*** | -1.682*** | -1.889*** | | -1.857*** | -1.561*** | -0.261 | | -1.864*** | -1.701*** | -1.872*** | |
| | (0.0541) | (0.0733) | (0.165) | | (0.0569) | (0.0805) | (0.198) | | (0.0542) | (0.0737) | (0.220) | |
| 2019.year | -2.287*** | -1.701*** | -1.851*** | | -2.301*** | -1.590*** | -0.261 | | -2.292*** | -1.720*** | -1.774*** | |
| | (0.0539) | (0.0766) | (0.164) | | (0.0567) | (0.0838) | (0.181) | | (0.0542) | (0.0774) | (0.232) | |
| 2020.year | -1.402*** | -1.486*** | -1.872*** | | -1.366*** | -1.349*** | -0.253 | | -1.376*** | -1.493*** | -1.727*** | |
| | (0.0573) | (0.0786) | (0.175) | | (0.0601) | (0.0853) | (0.203) | | (0.0575) | (0.0795) | (0.263) | |
| SIC_5 | | | | | | | | | | | - | |
| Constant | 2.031*** | 4.113*** | 3.927*** | 4.565*** | 1.933*** | 3.950*** | 3.590*** | 2.284*** | 2.127*** | 4.269*** | 4.020*** | 4.950*** |
| | (0.200) | (0.204) | (0.261) | (0.402) | (0.264) | (0.278) | (0.304) | (0.662) | (0.200) | (0.196) | (0.263) | (0.441) |
| Observations | 13,562 | 13,562 | 6,764 | 1,232 | 12,664 | 12,664 | 5,866 | 334 | 13,228 | 13,228 | 6,430 | 898 |
| R-squared | 0.665 | 0.758 | 0.771 | 0.753 | 0.646 | 0.750 | 0.776 | 0.858 | 0.649 | 0.751 | 0.764 | 0.728 |
| Robust standard errors in parentheses | | | | | | | | | | | | |
| *** p<0.01, ** p<0.05, * p<0.1 | | | | | | | | | | | | |

Table A.3 Estimated effects of ATI grants on capital expenditure

| Model | Cap expenditure | | | | | | | | | | | |
|------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|------------------------|-----------------------|---------------------|---------------------|----------------------|---------------------|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | All/Lead/Not Lead | All | All | All | All | Lead | Lead | Lead | Lead | Not Lead | Not Lead | Not Lead |
| N_Projects | 0.0940*** (0.0155) | 0.0923*** (0.0173) | 0.0731*** (0.00807) | 0.0587*** (0.0173) | 0.0929*** (0.0178) | 0.0913*** (0.0191) | 0.0761*** (0.00903) | 0.0585*** (0.0191) | -0.157 (0.110) | -0.0476 (0.142) | -0.0610 (0.135) | -0.0476 (0.142) |
| Region_2 | -0.0708 (0.312) | -0.0341 (0.322) | -0.162 (0.142) | -0.0341 (0.322) | -1.067** (0.443) | -1.188** (0.441) | -0.206 (0.150) | -1.188** (0.441) | 0.0515 (0.360) | 0.0725 (0.366) | -0.141 (0.145) | 0.0725 (0.366) |
| Region_3 | 0.278 (0.336) | 0.309 (0.339) | 0.0254 (0.126) | 0.309 (0.339) | 0.299 (0.421) | 0.441 (0.427) | -0.0132 (0.134) | 0.441 (0.427) | 0.0918 (0.396) | 0.121 (0.402) | -0.00823 (0.129) | 0.121 (0.402) |
| Region_4 | 0.100 (0.403) | 0.126 (0.404) | 0.376*** (0.138) | 0.126 (0.404) | 0.627 (0.613) | 0.671 (0.612) | 0.439*** (0.144) | 0.671 (0.612) | 0.00872 (0.433) | 0.0270 (0.445) | 0.382*** (0.140) | 0.0270 (0.445) |
| Region_5 | -0.114 (0.269) | -0.115 (0.265) | -0.000539 (0.0840) | -0.115 (0.265) | 0.0737 (0.419) | 0.0921 (0.407) | -0.00942 (0.0872) | 0.0921 (0.407) | -0.0662 (0.277) | -0.0563 (0.273) | 0.00142 (0.0848) | -0.0563 (0.273) |
| Region_6 | 0.251 (0.331) | 0.283 (0.333) | 0.292** (0.116) | 0.283 (0.333) | 0.795* (0.395) | 0.773* (0.411) | 0.275** (0.122) | 0.773* (0.411) | 0.139 (0.372) | 0.148 (0.375) | 0.267** (0.119) | 0.148 (0.375) |
| Region_7 | -0.0211 (0.271) | -0.0303 (0.273) | -0.171 (0.116) | -0.0303 (0.273) | 0.787 (0.472) | 0.719 (0.490) | -0.201 (0.126) | 0.719 (0.490) | -0.0359 (0.289) | -0.0229 (0.300) | -0.177 (0.118) | -0.0229 (0.300) |
| Region_8 | 0.314 (0.293) | 0.294 (0.295) | 0.0970 (0.127) | 0.294 (0.295) | 0.620* (0.329) | 0.508 (0.352) | 0.0848 (0.135) | 0.508 (0.352) | 0.190 (0.359) | 0.195 (0.355) | 0.0832 (0.130) | 0.195 (0.355) |
| Region_9 | 0.863*** (0.300) | 0.844*** (0.294) | 0.0514 (0.157) | 0.844*** (0.294) | 1.257*** (0.322) | 1.220*** (0.282) | -0.0663 (0.168) | 1.220*** (0.282) | 0.707** (0.331) | 0.691** (0.324) | 0.0187 (0.162) | 0.691** (0.324) |
| Region_10 | -0.327 (0.534) | -0.355 (0.535) | 0.0988 (0.116) | -0.355 (0.535) | 0.991** (0.435) | 1.054** (0.425) | 0.115 (0.117) | 1.054** (0.425) | -0.303 (0.610) | -0.349 (0.620) | 0.0954 (0.118) | -0.349 (0.620) |
| Region_11 | - | - | - | - | - | - | - | - | - | - | - | - |
| SIC_2 | 0.0811 (0.0502) | 0.0770 (0.0490) | 0.0229** (0.0115) | 0.0770 (0.0490) | -0.0311 (0.0469) | -0.0247 (0.0470) | 0.0196** (0.00872) | -0.0247 (0.0470) | 0.108** (0.0524) | 0.107** (0.0505) | 0.0229** (0.0113) | 0.107** (0.0505) |
| SIC_3 | - | - | - | - | - | - | - | - | - | - | - | - |
| SIC_4 | 0.0203 (0.0302) | 0.0200 (0.0292) | 0.00410 (0.00368) | 0.0200 (0.0292) | 0.713** (0.346) | 0.825** (0.321) | 0.00453 (0.00367) | 0.825** (0.321) | 0.0266 (0.0329) | 0.0261 (0.0316) | 0.00472 (0.00371) | 0.0261 (0.0316) |
| SIC_5 | 0.451* (0.232) | 0.424* (0.223) | 0.117*** (0.0368) | 0.424* (0.223) | 0.144 (0.386) | -0.0541 (0.405) | 0.119*** (0.0372) | -0.0541 (0.405) | 0.456* (0.258) | 0.457* (0.260) | 0.117*** (0.0370) | 0.457* (0.260) |
| SIC_6 | 0.0337 | 0.0317 | 0.00576 | 0.0317 | 0.115 | 0.108 | 0.00376 | 0.108 | 0.0480 | 0.0420 | 0.00710 | 0.0420 |

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|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | (0.0427) | (0.0424) | (0.0106) | (0.0424) | (0.0804) | (0.0893) | (0.0108) | (0.0893) | (0.0454) | (0.0461) | (0.0106) | (0.0461) |
| SIC_7 | 0.0183 | 0.0175 | 0.00405 | 0.0175 | -0.048*** | -0.048*** | 0.00611 | -0.048*** | 0.00931 | 0.00868 | 0.00243 | 0.00868 |
| | (0.0250) | (0.0257) | (0.0101) | (0.0257) | (0.0168) | (0.0173) | (0.0102) | (0.0173) | (0.0369) | (0.0360) | (0.00997) | (0.0360) |
| SIC_8 | 0.297 | 0.306 | -0.00505 | 0.306 | -0.441 | -0.449 | -0.00404 | -0.449 | 0.524 | 0.556 | -0.00467 | 0.556 |
| | (0.298) | (0.298) | (0.00736) | (0.298) | (0.284) | (0.276) | (0.00732) | (0.276) | (0.431) | (0.436) | (0.00738) | (0.436) |
| SIC_9 | 0.0353 | 0.0528 | 0.0194 | 0.0528 | -0.595*** | -0.631*** | 0.0180 | -0.631*** | 0.327 | 0.329 | 0.0194 | 0.329 |
| | (0.226) | (0.230) | (0.0228) | (0.230) | (0.206) | (0.198) | (0.0224) | (0.198) | (0.364) | (0.382) | (0.0231) | (0.382) |
| Size_Medium | -1.871*** | -1.794*** | -2.270*** | -1.794*** | -1.232 | -1.056 | -2.310*** | -1.056 | -1.751*** | -1.690*** | -2.275*** | -1.690*** |
| | (0.323) | (0.344) | (0.112) | (0.344) | (0.762) | (0.774) | (0.117) | (0.774) | (0.365) | (0.398) | (0.115) | (0.398) |
| Size_Micro | -2.845*** | -2.951*** | -6.276*** | -2.951*** | -2.734*** | -2.756*** | -6.294*** | -2.756*** | | | -6.286*** | |
| | (0.416) | (0.489) | (0.134) | (0.489) | (0.668) | (0.645) | (0.139) | (0.645) | | | (0.137) | |
| Size_Small | -3.300*** | -3.230*** | -4.295*** | -3.230*** | -2.710*** | -2.640*** | -4.354*** | -2.640*** | -3.239*** | -3.090*** | -4.314*** | -3.090*** |
| | (0.414) | (0.433) | (0.125) | (0.433) | (0.867) | (0.864) | (0.130) | (0.864) | (0.497) | (0.548) | (0.128) | (0.548) |
| 2011.year | | 0.194 | -0.104 | 0.194 | | | -0.132 | | | 0.229* | -0.103 | 0.229* |
| | | (0.132) | (0.0818) | (0.132) | | | (0.0902) | | | (0.138) | (0.0818) | (0.138) |
| 2012.year | | 0.145 | -0.233** | 0.145 | | | -0.276*** | | | 0.157 | -0.232** | 0.157 |
| | | (0.174) | (0.0930) | (0.174) | | | (0.102) | | | (0.183) | (0.0929) | (0.183) |
| 2013.year | | -0.0362 | -0.189** | -0.0362 | | | -0.161 | | | -0.281 | -0.229** | -0.281 |
| | | (0.183) | (0.0944) | (0.183) | | | (0.103) | | | (0.231) | (0.0968) | (0.231) |
| 2014.year | | -0.282 | 0.0478 | -0.282 | | -0.0371 | 0.117 | -0.0371 | | -0.621* | 0.0206 | -0.621* |
| | | (0.258) | (0.0966) | (0.258) | | (0.284) | (0.102) | (0.284) | | (0.363) | (0.0987) | (0.363) |
| 2015.year | | 0.0600 | 0.0667 | 0.0600 | | 0.314 | 0.108 | 0.314 | | -0.233 | 0.0293 | -0.233 |
| | | (0.246) | (0.0967) | (0.246) | | (0.297) | (0.103) | (0.297) | | (0.336) | (0.0992) | (0.336) |
| 2016.year | | -0.189 | 0.127 | -0.189 | | -0.0570 | 0.185* | -0.0570 | | -0.370 | 0.112 | -0.370 |
| | | (0.256) | (0.0916) | (0.256) | | (0.399) | (0.0977) | (0.399) | | (0.341) | (0.0933) | (0.341) |
| 2017.year | | -0.0941 | 0.0621 | -0.0941 | | -0.225 | 0.104 | -0.225 | | -0.182 | 0.0523 | -0.182 |
| | | (0.248) | (0.0908) | (0.248) | | (0.475) | (0.0973) | (0.475) | | (0.335) | (0.0922) | (0.335) |
| 2018.year | | -0.271 | 0.206** | -0.271 | | -0.298 | 0.275*** | -0.298 | | -0.339 | 0.209** | -0.339 |
| | | (0.278) | (0.0939) | (0.278) | | (0.456) | (0.0993) | (0.456) | | (0.394) | (0.0953) | (0.394) |
| 2019.year | | -0.0108 | 0.181* | -0.0108 | | -0.175 | 0.221** | -0.175 | | -0.0141 | 0.175* | -0.0141 |
| | | (0.277) | (0.0995) | (0.277) | | (0.454) | (0.105) | (0.454) | | (0.408) | (0.102) | (0.408) |
| 2020.year | | -0.523* | 0.00628 | -0.523* | | -0.832* | 0.0766 | -0.832* | | -0.491 | 0.0220 | -0.491 |
| | | (0.266) | (0.100) | (0.266) | | (0.473) | (0.107) | (0.473) | | (0.406) | (0.103) | (0.406) |
| 2021.year | | -0.410* | 0.239** | -0.410* | | -0.557 | 0.332*** | -0.557 | | -0.397 | 0.259*** | -0.397 |
| | | (0.238) | (0.0972) | (0.238) | | (0.483) | (0.104) | (0.483) | | (0.371) | (0.100) | (0.371) |
| Constant | 7.546*** | 7.662*** | 7.765*** | 7.662*** | 7.161*** | 7.336*** | 7.762*** | 7.336*** | 7.545*** | 7.651*** | 7.789*** | 7.651*** |

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| | (0.311) | (0.314) | (0.138) | (0.314) | (0.410) | (0.512) | (0.148) | (0.512) | (0.359) | (0.333) | (0.140) | (0.333) |
|---------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Observations | 14,326 | 14,326 | 8,367 | 960 | 13,671 | 13,671 | 7,646 | 239 | 14,021 | 14,021 | 8,128 | 721 |
| R-squared | 0.566 | 0.568 | 0.582 | 0.500 | 0.565 | 0.602 | 0.589 | 0.723 | 0.556 | 0.558 | 0.575 | 0.444 |
| Robust standard errors in parentheses | | | | | | | | | | | | |
| *** p<0.01, ** p<0.05, * p<0.1 | | | | | | | | | | | | |

Table A.4 Estimated effects of ATI grants on turnover

| Model | Turnover | | | | | | | | | | | |
|------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|---------------------|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | All/Lead/Not Lead | All | All | All | All | Lead | Lead | Lead | Lead | Not Lead | Not Lead | Not Lead |
| N_Projects | 0.0920*** (0.0195) | 0.0919*** (0.0195) | 0.0917*** (0.0209) | 0.0579*** (0.0151) | 0.171** (0.0846) | 0.171** (0.0847) | 0.337*** (0.0902) | 0.155*** (0.003) | 0.0939*** (0.0198) | 0.0938*** (0.0198) | 0.0939*** (0.0210) | 0.0477* (0.0265) |
| Region_2 | 0.139*** (0.0517) | 0.139*** (0.0517) | 0.00864 (0.0872) | 0.0637 (0.296) | 0.141*** (0.0518) | 0.141*** (0.0518) | 0.0136 (0.0878) | 0.568 (0.367) | 0.138*** (0.0519) | 0.138*** (0.0519) | 0.00514 (0.0879) | -0.692** (0.260) |
| Region_3 | 0.128** (0.0516) | 0.128** (0.0516) | 0.00579 (0.0889) | -1.244 (1.032) | 0.130** (0.0516) | 0.130** (0.0516) | 0.00909 (0.0893) | -0.957 (0.969) | 0.132** (0.0516) | 0.132** (0.0516) | 0.0113 (0.0892) | |
| Region_4 | 0.0612 (0.0535) | 0.0614 (0.0535) | 0.0143 (0.0873) | 0.135 (0.455) | 0.0640 (0.0535) | 0.0642 (0.0535) | 0.0224 (0.0877) | 0.538 (0.500) | 0.0576 (0.0535) | 0.0579 (0.0535) | 0.00794 (0.0876) | 0.158 (1.342) |
| Region_5 | 0.0986* (0.0513) | 0.0988* (0.0513) | 0.00904 (0.0883) | -0.851*** (0.309) | 0.100* (0.0513) | 0.100* (0.0513) | 0.0117 (0.0888) | -0.634* (0.357) | 0.105** (0.0515) | 0.106** (0.0515) | 0.0194 (0.0892) | -0.846 (0.516) |
| Region_6 | 0.122** (0.0507) | 0.122** (0.0508) | 0.0679 (0.0850) | -0.0689 (0.275) | 0.123** (0.0508) | 0.124** (0.0508) | 0.0710 (0.0855) | 0.202 (0.333) | 0.117** (0.0509) | 0.117** (0.0509) | 0.0593 (0.0857) | -0.465 (0.472) |
| Region_7 | 0.194*** (0.0583) | 0.194*** (0.0583) | 0.000633 (0.0976) | -0.0977 (0.407) | 0.196*** (0.0583) | 0.196*** (0.0583) | 0.00306 (0.0981) | 0.149 (0.463) | 0.195*** (0.0584) | 0.195*** (0.0584) | -0.00124 (0.0982) | 1.189** (0.513) |
| Region_8 | 0.172*** (0.0477) | 0.172*** (0.0477) | 0.0430 (0.0821) | 0.116 (0.269) | 0.170*** (0.0476) | 0.170*** (0.0477) | 0.0358 (0.0825) | 0.120 (0.284) | 0.171*** (0.0478) | 0.171*** (0.0478) | 0.0366 (0.0828) | 0.255 (0.419) |
| Region_9 | -0.0317 (0.0513) | -0.0314 (0.0513) | -0.123 (0.0879) | -0.538** (0.216) | -0.0305 (0.0513) | -0.0303 (0.0513) | -0.123 (0.0885) | -0.378 (0.262) | -0.0278 (0.0515) | -0.0275 (0.0515) | -0.125 (0.0890) | -0.686* (0.359) |
| Region_10 | 0.0191 (0.0671) | 0.0193 (0.0671) | -0.0980 (0.108) | 0.835 (0.525) | 0.0140 (0.0669) | 0.0142 (0.0669) | -0.112 (0.107) | 0.883 (0.642) | 0.00420 (0.0668) | 0.00443 (0.0668) | -0.136 (0.107) | 1.393*** (0.496) |
| Region_11 | 0.0763 (0.0598) | 0.0763 (0.0598) | -0.0302 (0.0903) | 0.188 (0.277) | 0.0788 (0.0598) | 0.0789 (0.0598) | -0.0288 (0.0906) | 0.491 (0.348) | 0.0752 (0.0600) | 0.0752 (0.0600) | -0.0393 (0.0909) | -0.428 (0.317) |
| SIC_2 | -1.655*** (0.143) | -1.684*** (0.144) | -1.955*** (0.118) | -1.290*** (0.307) | -1.688*** (0.160) | -1.717*** (0.160) | -1.860*** (0.139) | -1.520*** (0.298) | | 0.0243 (0.451) | 0.389*** (0.0519) | -0.194 (0.566) |
| SIC_3 | -2.192*** | -2.221*** | -2.143*** | -0.856** | -2.207*** | -2.237*** | -2.047*** | -1.249*** | -0.630** | -0.607* | 0.221*** | 0.563 |

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|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|
| | (0.0867) | (0.0869) | (0.116) | (0.363) | (0.118) | (0.118) | (0.139) | (0.306) | (0.283) | (0.360) | (0.0356) | (0.725) |
| SIC_4 | - | - | - | - | - | - | - | - | - | - | - | - |
| SIC_5 | - | - | - | - | - | - | - | - | - | - | - | - |
| SIC_6 | - | - | - | - | - | - | - | - | - | - | - | - |
| SIC_7 | -2.103*** | -2.132*** | -2.374*** | -1.795*** | -2.380*** | -2.411*** | -2.270*** | -2.306*** | -0.0228 | | | |
| | (0.281) | (0.281) | (0.116) | (0.415) | (0.313) | (0.313) | (0.139) | (0.454) | (0.451) | | | |
| SIC_8 | -2.341*** | -2.341*** | -2.112*** | -1.743*** | -2.436*** | -2.436*** | -2.254*** | -1.799*** | | | | |
| | (0.0966) | (0.0966) | (0.131) | (0.648) | (0.0904) | (0.0904) | (0.127) | (0.589) | | | | |
| SIC_9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Size_Medium | -2.201*** | -2.200*** | -2.353*** | -2.778*** | -2.110*** | -2.109*** | -2.239*** | -2.771*** | -2.068*** | -2.067*** | -2.192*** | 2.761*** |
| | (0.0900) | (0.0900) | (0.120) | (0.252) | (0.0840) | (0.0840) | (0.116) | (0.270) | (0.0867) | (0.0867) | (0.126) | (0.531) |
| Size_Micro | -6.263*** | -6.263*** | -6.529*** | -6.411*** | -6.172*** | -6.171*** | -6.394*** | -6.511*** | -6.144*** | -6.143*** | -6.365*** | 6.111*** |
| | (0.0849) | (0.0849) | (0.111) | (0.553) | (0.0785) | (0.0785) | (0.108) | (0.500) | (0.0816) | (0.0816) | (0.117) | (0.633) |
| Size_Small | -4.050*** | -4.049*** | -4.230*** | -4.311*** | -3.958*** | -3.957*** | -4.099*** | -4.144*** | -3.933*** | -3.932*** | -4.076*** | 4.967*** |
| | (0.0851) | (0.0851) | (0.114) | (0.250) | (0.0788) | (0.0788) | (0.110) | (0.251) | (0.0820) | (0.0820) | (0.119) | (0.596) |
| 2011.year | | 0.0620*** | 0.0650*** | -0.0670 | | 0.0620*** | 0.0648*** | -0.0737 | | 0.0621*** | 0.0651*** | |
| | | (0.00645) | (0.0107) | (0.0567) | | (0.00644) | (0.0107) | (0.0584) | | (0.00648) | (0.0108) | |
| 2012.year | | 0.0463*** | 0.0410*** | 0.00481 | | 0.0463*** | 0.0406*** | -0.00459 | | 0.0468*** | 0.0414*** | |
| | | (0.00771) | (0.0132) | (0.0883) | | (0.00771) | (0.0132) | (0.0863) | | (0.00773) | (0.0133) | |
| 2013.year | | 0.0533*** | -0.0308** | -0.0634 | | 0.0573*** | 0.0384*** | -0.269** | | 0.0499*** | -0.0204 | |
| | | (0.00861) | (0.0145) | (0.0861) | | (0.00871) | (0.0147) | (0.127) | | (0.00870) | (0.0147) | |
| 2014.year | | 0.0635*** | -0.0281* | -0.124 | | 0.0671*** | -0.0360** | -0.358*** | | 0.0596*** | -0.0170 | -0.0394 |
| | | (0.00920) | (0.0155) | (0.0856) | | (0.00928) | (0.0157) | (0.129) | | (0.00927) | (0.0158) | (0.0831) |

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|---------------------------------------|----------|-----------|-----------|----------|----------|-----------|-----------|----------|----------|-----------|-----------|----------|
| 2015.year | - | 0.0578*** | -0.00692 | -0.00568 | - | 0.0615*** | -0.0150 | -0.211* | - | 0.0549*** | 0.00253 | 0.00488 |
| | | (0.00967) | (0.0164) | (0.0848) | | (0.00974) | (0.0166) | (0.127) | | (0.00974) | (0.0167) | (0.112) |
| 2016.year | | -0.0160 | -0.00463 | -0.0497 | | -0.0189* | -0.0115 | -0.200 | | -0.0131 | 0.00457 | -0.188 |
| | | (0.0101) | (0.0169) | (0.0951) | | (0.0102) | (0.0171) | (0.137) | | (0.0102) | (0.0171) | (0.150) |
| 2017.year | | -0.0137 | -0.0320* | -0.0697 | | -0.0165 | -0.0395** | -0.257* | | -0.0104 | -0.0226 | -0.127 |
| | | (0.0103) | (0.0181) | (0.104) | | (0.0104) | (0.0183) | (0.152) | | (0.0104) | (0.0184) | (0.166) |
| 2018.year | | -0.0241** | 0.0603*** | -0.00536 | | -0.0271** | 0.0684*** | -0.195 | | -0.0214** | 0.0518*** | -0.0407 |
| | | (0.0108) | (0.0192) | (0.108) | | (0.0108) | (0.0194) | (0.165) | | (0.0108) | (0.0194) | (0.189) |
| 2019.year | | -0.0148 | -0.0450** | -0.0195 | | -0.0175 | 0.0525*** | -0.199 | | -0.0121 | -0.0364* | -0.0930 |
| | | (0.0111) | (0.0194) | (0.114) | | (0.0112) | (0.0196) | (0.175) | | (0.0112) | (0.0197) | (0.220) |
| 2020.year | | 0.0388*** | 0.0639*** | -0.112 | | 0.0414*** | 0.0719*** | -0.323 | | 0.0355*** | 0.0541*** | -0.0990 |
| | | (0.0116) | (0.0200) | (0.121) | | (0.0117) | (0.0202) | (0.203) | | (0.0117) | (0.0202) | (0.253) |
| 2021.year | | 0.0672*** | 0.0949*** | -0.119 | | 0.0697*** | -0.103*** | -0.318 | | 0.0641*** | 0.0854*** | -0.163 |
| | | (0.0121) | (0.0210) | (0.133) | | (0.0121) | (0.0212) | (0.216) | | (0.0121) | (0.0212) | (0.253) |
| Constant | 13.43*** | 13.49*** | 13.65*** | 13.64*** | 13.35*** | 13.42*** | 13.42*** | 13.73*** | 11.75*** | 11.76*** | 11.12*** | 12.67*** |
| | (0.0516) | (0.0531) | (0.0872) | (0.284) | (0.0965) | (0.0966) | (0.121) | (0.307) | (0.292) | (0.372) | (0.137) | (0.731) |
| Observations | 103,487 | 103,487 | 54,043 | 1,224 | 103,181 | 103,181 | 53,737 | 918 | 102,569 | 102,569 | 53,125 | 306 |
| R-squared | 0.614 | 0.614 | 0.608 | 0.814 | 0.604 | 0.604 | 0.590 | 0.803 | 0.594 | 0.594 | 0.572 | 0.859 |
| Robust standard errors in parentheses | | | | | | | | | | | | |
| *** p<0.01, ** p<0.05, * p<0.1 | | | | | | | | | | | | |

Table A.5 Estimated effects of ATI grants on GVA

| Model | GVA | | | | | | | | | | | |
|-------------------|-----------------------|-----------------------|-----------------------|---------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|----------------------|-----------------------|----------------------|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| All/Lead/Not Lead | All | All | All | All | Lead | Lead | Lead | Lead | Not Lead | Not Lead | Not Lead | Not Lead |
| N_Projects | 0.0762*** (0.0236) | 0.0742*** (0.0250) | 0.0578*** (0.0215) | 0.0439* (0.0250) | 0.0741*** (0.0176) | 0.0724*** (0.0187) | 0.0597*** (0.0221) | 0.0439*** (0.0187) | 0.341*** (0.0598) | 0.314*** (0.0607) | 0.0861 (0.0622) | 0.0388 (0.0763) |
| Region_2 | 0.0535 (0.211) | 0.0748 (0.209) | -0.0537 (0.0831) | 0.0748 (0.209) | -1.051* (0.583) | -1.054* (0.566) | -0.0758 (0.0865) | -1.054* (0.566) | 0.236 (0.188) | 0.244 (0.182) | -0.0255 (0.0811) | 0.244 (0.182) |
| Region_3 | 0.264 (0.240) | 0.294 (0.239) | 0.147* (0.0800) | 0.294 (0.239) | 0.625*** (0.207) | 0.716*** (0.248) | 0.122 (0.0829) | 0.716*** (0.248) | 0.0117 (0.223) | 0.0496 (0.217) | 0.118 (0.0788) | 0.0496 (0.217) |
| Region_4 | 0.224 (0.199) | 0.239 (0.197) | 0.366*** (0.0843) | 0.239 (0.197) | 0.983*** (0.254) | 1.018*** (0.264) | 0.416*** (0.0896) | 1.018*** (0.264) | 0.109 (0.190) | 0.133 (0.193) | 0.369*** (0.0835) | 0.133 (0.193) |
| Region_5 | 0.442*** (0.168) | 0.447*** (0.165) | 0.430*** (0.0503) | 0.447*** (0.165) | -0.00319 (0.286) | 0.0274 (0.277) | 0.399*** (0.0516) | 0.0274 (0.277) | 0.630*** (0.166) | 0.622*** (0.165) | 0.444*** (0.0499) | 0.622*** (0.165) |
| Region_6 | 0.689*** (0.197) | 0.709*** (0.196) | 0.314*** (0.0689) | 0.709*** (0.196) | 1.430*** (0.298) | 1.421*** (0.289) | 0.272*** (0.0706) | 1.421*** (0.289) | 0.470** (0.184) | 0.483*** (0.180) | 0.268*** (0.0677) | 0.483*** (0.180) |
| Region_7 | 0.0583 (0.184) | 0.0420 (0.183) | -0.0371 (0.0686) | 0.0420 (0.183) | 1.057*** (0.319) | 1.019*** (0.338) | -0.0418 (0.0719) | 1.019*** (0.338) | -0.0712 (0.178) | -0.0701 (0.177) | -0.0477 (0.0668) | -0.0701 (0.177) |
| Region_8 | 0.723*** (0.202) | 0.705*** (0.201) | 0.174** (0.0739) | 0.705*** (0.201) | 1.381*** (0.199) | 1.325*** (0.213) | 0.126 (0.0773) | 1.325*** (0.213) | 0.578*** (0.208) | 0.580*** (0.204) | 0.150** (0.0740) | 0.580*** (0.204) |
| Region_9 | 0.478* (0.277) | 0.460* (0.271) | 0.129 (0.0906) | 0.460* (0.271) | 1.013** (0.416) | 0.981** (0.386) | 0.0712 (0.0904) | 0.981** (0.386) | 0.356 (0.276) | 0.333 (0.276) | 0.0999 (0.0881) | 0.333 (0.276) |
| Region_10 | 0.313* (0.187) | 0.289 (0.190) | 0.213*** (0.0630) | 0.289 (0.190) | 0.687*** (0.242) | 0.700*** (0.249) | 0.189*** (0.0645) | 0.700*** (0.249) | 0.398** (0.187) | 0.356* (0.188) | 0.214*** (0.0625) | 0.356* (0.188) |
| Region_11 | - | - | - | - | - | - | - | - | - | - | - | - |
| SIC_2 | -0.0177 (0.0383) | -0.0203 (0.0374) | 0.0116 (0.00878) | -0.0203 (0.0374) | -0.096*** (0.0322) | -0.095*** (0.0311) | 0.0102 (0.00760) | -0.095*** (0.0311) | -0.00194 (0.0380) | -0.00482 (0.0369) | 0.0124 (0.00880) | -0.00482 (0.0369) |
| SIC_3 | - | - | - | - | - | - | - | - | - | - | - | - |
| SIC_4 | 0.0219 (0.0233) | 0.0227 (0.0224) | 0.00475 (0.00337) | 0.0227 (0.0224) | 1.034* (0.525) | 1.060** (0.502) | 0.00552* (0.00331) | 1.060** (0.502) | 0.0324 (0.0246) | 0.0339 (0.0242) | 0.00542 (0.00332) | 0.0339 (0.0242) |
| SIC_5 | 0.207 (0.172) | 0.187 (0.174) | 0.0647*** (0.0249) | 0.187 (0.174) | -0.418** (0.197) | -0.541** (0.235) | 0.0677*** (0.0255) | -0.541** (0.235) | 0.286 (0.194) | 0.281 (0.199) | 0.0673*** (0.0248) | 0.281 (0.199) |
| SIC_6 | 0.0283 | 0.0274 | 0.0212*** | 0.0274 | 0.0285 | 0.0164 | 0.0175*** | 0.0164 | 0.0339 | 0.0268 | 0.0215*** | 0.0268 |

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|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | (0.0289) | (0.0287) | (0.00622) | (0.0287) | (0.0749) | (0.0793) | (0.00533) | (0.0793) | (0.0273) | (0.0275) | (0.00573) | (0.0275) |
| SIC_7 | -0.0210 | -0.0214 | -0.0114* | -0.0214 | -0.078*** | -0.078*** | -0.00782 | -0.078*** | -0.0268 | -0.0271 | -0.0117** | -0.0271 |
| | (0.0230) | (0.0236) | (0.00645) | (0.0236) | (0.0114) | (0.0128) | (0.00567) | (0.0128) | (0.0332) | (0.0331) | (0.00564) | (0.0331) |
| SIC_8 | 0.0334 | 0.0492 | 0.00284 | 0.0492 | -0.502 | -0.527 | 0.00406 | -0.527 | 0.331 | 0.391* | 0.00338 | 0.391* |
| | (0.227) | (0.233) | (0.00337) | (0.233) | (0.420) | (0.413) | (0.00330) | (0.413) | (0.218) | (0.223) | (0.00332) | (0.223) |
| SIC_9 | -0.0502 | -0.0372 | -0.0136 | -0.0372 | -0.135 | -0.158 | -0.0148 | -0.158 | 0.0237 | 0.0514 | -0.0144 | 0.0514 |
| | (0.0975) | (0.103) | (0.00932) | (0.103) | (0.120) | (0.121) | (0.00922) | (0.121) | (0.152) | (0.161) | (0.00921) | (0.161) |
| Size_Medium | -1.786*** | -1.738*** | -1.835*** | -1.738*** | -1.257*** | -1.145*** | -1.840*** | -1.145*** | -1.706*** | -1.673*** | -1.820*** | -1.673*** |
| | (0.172) | (0.170) | (0.0681) | (0.170) | (0.400) | (0.411) | (0.0721) | (0.411) | (0.177) | (0.177) | (0.0686) | (0.177) |
| Size_Small | -3.341*** | -3.317*** | -3.659*** | -3.317*** | -3.024*** | -2.969*** | -3.684*** | -2.969*** | -3.214*** | -3.154*** | -3.649*** | -3.154*** |
| | (0.227) | (0.221) | (0.0731) | (0.221) | (0.725) | (0.704) | (0.0770) | (0.704) | (0.198) | (0.194) | (0.0734) | (0.194) |
| 2011.year | | 0.180* | 0.0741 | 0.180* | | | 0.0620 | | | 0.204** | 0.0744 | 0.204** |
| | | (0.0971) | (0.0576) | (0.0971) | | | (0.0626) | | | (0.101) | (0.0576) | (0.101) |
| 2012.year | | 0.151 | 0.0283 | 0.151 | | | 0.0172 | | | 0.146 | 0.0289 | 0.146 |
| | | (0.109) | (0.0618) | (0.109) | | | (0.0673) | | | (0.114) | (0.0617) | (0.114) |
| 2013.year | | 0.0678 | 0.0552 | 0.0678 | | | 0.0847 | | | -0.149 | 0.0246 | -0.149 |
| | | (0.133) | (0.0612) | (0.133) | | | (0.0667) | | | (0.162) | (0.0625) | (0.162) |
| 2014.year | | 0.0730 | 0.101 | 0.0730 | | -0.312* | 0.122* | -0.312* | | -0.0800 | 0.0779 | -0.0800 |
| | | (0.139) | (0.0674) | (0.139) | | (0.174) | (0.0727) | (0.174) | | (0.163) | (0.0687) | (0.163) |
| 2015.year | | 0.189 | 0.0603 | 0.189 | | -0.174 | 0.0724 | -0.174 | | 0.0410 | 0.0309 | 0.0410 |
| | | (0.124) | (0.0673) | (0.124) | | (0.300) | (0.0728) | (0.300) | | (0.168) | (0.0691) | (0.168) |
| 2016.year | | 0.0107 | 0.0972 | 0.0107 | | -0.481 | 0.118* | -0.481 | | -0.0407 | 0.0839 | -0.0407 |
| | | (0.136) | (0.0638) | (0.136) | | (0.378) | (0.0693) | (0.378) | | (0.159) | (0.0651) | (0.159) |
| 2017.year | | 0.112 | 0.216*** | 0.112 | | -0.227 | 0.246*** | -0.227 | | -0.0266 | 0.196*** | -0.0266 |
| | | (0.129) | (0.0628) | (0.129) | | (0.303) | (0.0677) | (0.303) | | (0.172) | (0.0643) | (0.172) |
| 2018.year | | 0.118 | 0.225*** | 0.118 | | -0.243 | 0.254*** | -0.243 | | 0.0219 | 0.211*** | 0.0219 |
| | | (0.137) | (0.0628) | (0.137) | | (0.320) | (0.0677) | (0.320) | | (0.172) | (0.0642) | (0.172) |
| 2019.year | | 0.0151 | 0.249*** | 0.0151 | | -0.228 | 0.290*** | -0.228 | | -0.0908 | 0.238*** | -0.0908 |
| | | (0.146) | (0.0629) | (0.146) | | (0.328) | (0.0677) | (0.328) | | (0.185) | (0.0647) | (0.185) |
| 2020.year | | -0.244 | 0.176*** | -0.244 | | -0.606 | 0.228*** | -0.606 | | -0.300 | 0.177** | -0.300 |
| | | (0.156) | (0.0682) | (0.156) | | (0.368) | (0.0728) | (0.368) | | (0.187) | (0.0701) | (0.187) |
| 2021.year | | -0.349** | 0.219*** | -0.349** | | -0.678* | 0.291*** | -0.678* | | -0.437** | 0.221*** | -0.437** |
| | | (0.162) | (0.0674) | (0.162) | | (0.384) | (0.0722) | (0.384) | | (0.196) | (0.0693) | (0.196) |
| Size_Micro | | | -6.357*** | | | | -6.357*** | | | | -6.350*** | |
| | | | (0.0845) | | | | (0.0875) | | | | (0.0846) | |
| Constant | 10.06*** | 10.03*** | 10.13*** | 10.03*** | 9.568*** | 9.866*** | 10.14*** | 9.866*** | 10.08*** | 10.07*** | 10.14*** | 10.07*** |

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| | (0.190) | (0.226) | (0.0882) | (0.226) | (0.230) | (0.360) | (0.0933) | (0.360) | (0.185) | (0.229) | (0.0871) | (0.229) |
|---------------------------------------|---------|---------|----------|---------|---------|---------|----------|---------|---------|---------|----------|---------|
| Observations | 16,422 | 16,422 | 8,681 | 937 | 15,775 | 15,775 | 7,969 | 225 | 16,132 | 16,132 | 8,456 | 712 |
| R-squared | 0.739 | 0.746 | 0.807 | 0.746 | 0.824 | 0.831 | 0.806 | 0.831 | 0.756 | 0.763 | 0.807 | 0.763 |
| Robust standard errors in parentheses | | | | | | | | | | | | |
| *** p<0.01, ** p<0.05, * p<0.1 | | | | | | | | | | | | |

Table A.6 Estimated effects of ATI grants on GVA per worker

| Model All/Lead/Not Lead | GVA per worker | | | | | | | | | | | |
|-------------------------------|------------------------|------------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|------------------------|-----------------------|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | All | All | All | All | Lead | Lead | Lead | Lead | Not Lead | Not Lead | Not Lead | Not Lead |
| N_Projects | 0.0232*** (0.00816) | 0.0204*** (0.00835) | 0.0166*** (0.00407) | 0.0134 (0.00835) | 0.0227*** (0.00943) | 0.0240*** (0.0100) | 0.0176*** (0.00422) | 0.0118 (0.0100) | 0.108* (0.00770) | 0.0104 (0.0877) | -0.0553 (0.0642) | 0.0104 (0.0877) |
| Region_2 | 0.360** (0.171) | 0.357** (0.171) | 0.248*** (0.0729) | 0.357** (0.171) | 0.00411 (0.207) | -0.0411 (0.223) | 0.226*** (0.0777) | -0.0411 (0.223) | 0.491** (0.200) | 0.489** (0.201) | 0.261*** (0.0743) | 0.489** (0.201) |
| Region_3 | 0.406* (0.207) | 0.416** (0.208) | 0.290*** (0.0713) | 0.416** (0.208) | 0.746*** (0.204) | 0.739*** (0.228) | 0.277*** (0.0757) | 0.739*** (0.228) | 0.162 (0.205) | 0.171 (0.208) | 0.261*** (0.0723) | 0.171 (0.208) |
| Region_4 | 0.560*** (0.154) | 0.556*** (0.154) | 0.511*** (0.0783) | 0.556*** (0.154) | 0.997*** (0.266) | 1.022*** (0.260) | 0.529*** (0.0832) | 1.022*** (0.260) | 0.492*** (0.172) | 0.490*** (0.176) | 0.517*** (0.0794) | 0.490*** (0.176) |
| Region_5 | 0.779*** (0.128) | 0.783*** (0.128) | 0.639*** (0.0493) | 0.783*** (0.128) | 0.296 (0.248) | 0.305 (0.248) | 0.611*** (0.0518) | 0.305 (0.248) | 0.919*** (0.140) | 0.908*** (0.139) | 0.641*** (0.0500) | 0.908*** (0.139) |
| Region_6 | 0.697*** (0.143) | 0.699*** (0.143) | 0.357*** (0.0637) | 0.699*** (0.143) | 1.268*** (0.263) | 1.278*** (0.263) | 0.335*** (0.0675) | 1.278*** (0.263) | 0.526*** (0.152) | 0.528*** (0.151) | 0.335*** (0.0648) | 0.528*** (0.151) |
| Region_7 | 0.290** (0.137) | 0.279** (0.136) | 0.191*** (0.0626) | 0.279** (0.136) | 1.207*** (0.349) | 1.212*** (0.360) | 0.213*** (0.0676) | 1.212*** (0.360) | 0.172 (0.132) | 0.161 (0.132) | 0.184*** (0.0632) | 0.161 (0.132) |
| Region_8 | 0.643*** (0.147) | 0.642*** (0.151) | 0.258*** (0.0648) | 0.642*** (0.151) | 1.294*** (0.235) | 1.322*** (0.260) | 0.221*** (0.0696) | 1.322*** (0.260) | 0.541*** (0.148) | 0.545*** (0.149) | 0.238*** (0.0656) | 0.545*** (0.149) |
| Region_9 | 0.516*** (0.195) | 0.517*** (0.196) | 0.175** (0.0742) | 0.517*** (0.196) | 1.131*** (0.175) | 1.152*** (0.191) | 0.139* (0.0765) | 1.152*** (0.191) | 0.395* (0.213) | 0.391* (0.215) | 0.158** (0.0757) | 0.391* (0.215) |
| Region_10 | 0.470*** (0.154) | 0.465*** (0.152) | 0.512*** (0.0625) | 0.465*** (0.152) | 0.413* (0.213) | 0.431* (0.216) | 0.493*** (0.0655) | 0.431* (0.216) | 0.575*** (0.170) | 0.571*** (0.168) | 0.512*** (0.0630) | 0.571*** (0.168) |
| Region_11 | - | - | - | - | - | - | - | - | - | - | - | - |
| SIC_2 | 0.00576 (0.0243) | 0.00539 (0.0242) | 0.0170*** (0.00533) | 0.00539 (0.0242) | -0.095*** (0.0257) | -0.096*** (0.0251) | 0.0176*** (0.00540) | -0.096*** (0.0251) | 0.0306 (0.0294) | 0.0297 (0.0298) | 0.0175*** (0.00538) | 0.0297 (0.0298) |
| SIC_3 | - | - | - | - | - | - | - | - | - | - | - | - |
| SIC_4 | -0.038*** (0.0140) | -0.0366** (0.0142) | 0.0112*** (0.00301) | -0.0366** (0.0142) | 0.00142 (0.199) | 0.00938 (0.204) | 0.0118*** (0.00318) | 0.00938 (0.204) | -0.0445** (0.0196) | -0.0434** (0.0201) | 0.0115*** (0.00303) | -0.0434** (0.0201) |
| SIC_5 | 0.128 (0.101) | 0.125 (0.103) | 0.0528*** (0.0151) | 0.125 (0.103) | 0.245* (0.125) | 0.260* (0.144) | 0.0534*** (0.0150) | 0.260* (0.144) | 0.0131 (0.116) | 0.0121 (0.117) | 0.0523*** (0.0149) | 0.0121 (0.117) |
| SIC_6 | 0.00187 | 0.00150 | 0.00107 | 0.00150 | 0.0521 | 0.0459 | -0.000675 | 0.0459 | -0.00194 | -0.00354 | 0.00169 | -0.00354 |

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| | | | | | | | | | | | | |
|-------------|----------|----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | (0.0307) | (0.0308) | (0.00370) | (0.0308) | (0.0717) | (0.0687) | (0.00387) | (0.0687) | (0.0290) | (0.0287) | (0.00355) | (0.0287) |
| SIC_7 | 0.00400 | 0.00398 | 0.00812** | 0.00398 | 0.0497*** | 0.0510*** | 0.00992** | 0.0510*** | 0.0130 | 0.0135 | 0.00749** | 0.0135 |
| | (0.0103) | (0.0103) | (0.00398) | (0.0103) | (0.0119) | (0.0126) | (0.00414) | (0.0126) | (0.0188) | (0.0196) | (0.00371) | (0.0196) |
| SIC_8 | -0.0183 | -0.0119 | 0.00398 | -0.0119 | -0.352 | -0.358 | 0.00449 | -0.358 | 0.289 | 0.299* | 0.00422 | 0.299* |
| | (0.200) | (0.201) | (0.00317) | (0.201) | (0.360) | (0.350) | (0.00314) | (0.350) | (0.176) | (0.170) | (0.00314) | (0.170) |
| SIC_9 | -0.00156 | 0.00970 | -0.00452 | 0.00970 | 0.0580 | 0.0570 | -0.00541 | 0.0570 | -0.0394 | -0.0137 | -0.00470 | -0.0137 |
| | (0.0625) | (0.0605) | (0.00879) | (0.0605) | (0.0958) | (0.0941) | (0.00870) | (0.0941) | (0.118) | (0.113) | (0.00871) | (0.113) |
| Size_Medium | -0.0926 | -0.0913 | -0.568*** | -0.0913 | 0.647 | 0.666* | -0.607*** | 0.666* | -0.110 | -0.128 | -0.590*** | -0.128 |
| | (0.143) | (0.143) | (0.0680) | (0.143) | (0.388) | (0.375) | (0.0726) | (0.375) | (0.148) | (0.147) | (0.0693) | (0.147) |
| Size_Small | -0.499** | -0.518** | -1.089*** | -0.518** | 0.0386 | 0.0968 | -1.140*** | 0.0968 | -0.499*** | -0.535*** | -1.115*** | -0.535*** |
| | (0.220) | (0.216) | (0.0755) | (0.216) | (0.862) | (0.863) | (0.0801) | (0.863) | (0.182) | (0.182) | (0.0767) | (0.182) |
| 2011.year | | 0.185 | 0.124** | 0.185 | | | 0.115** | | | 0.202 | 0.124** | 0.202 |
| | | (0.134) | (0.0525) | (0.134) | | | (0.0562) | | | (0.136) | (0.0525) | (0.136) |
| 2012.year | | 0.183 | 0.0874 | 0.183 | | | 0.0783 | | | 0.184 | 0.0877 | 0.184 |
| | | (0.120) | (0.0550) | (0.120) | | | (0.0595) | | | (0.123) | (0.0550) | (0.123) |
| 2013.year | | 0.140 | 0.124** | 0.140 | | | 0.120** | | | 0.102 | 0.124** | 0.102 |
| | | (0.138) | (0.0557) | (0.138) | | | (0.0596) | | | (0.144) | (0.0563) | (0.144) |
| 2014.year | | 0.243* | 0.209*** | 0.243* | | -0.145 | 0.197*** | -0.145 | | 0.271* | 0.213*** | 0.271* |
| | | (0.143) | (0.0590) | (0.143) | | (0.176) | (0.0629) | (0.176) | | (0.150) | (0.0596) | (0.150) |
| 2015.year | | 0.366** | 0.141** | 0.366** | | 0.167 | 0.121* | 0.167 | | 0.310* | 0.133** | 0.310* |
| | | (0.151) | (0.0596) | (0.151) | | (0.303) | (0.0636) | (0.303) | | (0.173) | (0.0606) | (0.173) |
| 2016.year | | 0.145 | 0.192*** | 0.145 | | -0.274 | 0.179*** | -0.274 | | 0.233 | 0.204*** | 0.233 |
| | | (0.146) | (0.0587) | (0.146) | | (0.369) | (0.0630) | (0.369) | | (0.149) | (0.0593) | (0.149) |
| 2017.year | | 0.305** | 0.325*** | 0.305** | | 0.128 | 0.321*** | 0.128 | | 0.268 | 0.326*** | 0.268 |
| | | (0.127) | (0.0567) | (0.127) | | (0.277) | (0.0608) | (0.277) | | (0.162) | (0.0579) | (0.162) |
| 2018.year | | 0.394*** | 0.314*** | 0.394*** | | 0.296 | 0.304*** | 0.296 | | 0.371** | 0.317*** | 0.371** |
| | | (0.133) | (0.0571) | (0.133) | | (0.313) | (0.0614) | (0.313) | | (0.158) | (0.0581) | (0.158) |
| 2019.year | | 0.318** | 0.335*** | 0.318** | | 0.255 | 0.331*** | 0.255 | | 0.304* | 0.343*** | 0.304* |
| | | (0.127) | (0.0571) | (0.127) | | (0.287) | (0.0614) | (0.287) | | (0.168) | (0.0588) | (0.168) |
| 2020.year | | 0.125 | 0.270*** | 0.125 | | 0.0124 | 0.275*** | 0.0124 | | 0.150 | 0.284*** | 0.150 |
| | | (0.131) | (0.0627) | (0.131) | | (0.300) | (0.0673) | (0.300) | | (0.181) | (0.0647) | (0.181) |
| 2021.year | | -0.0231 | 0.252*** | -0.0231 | | -0.0714 | 0.274*** | -0.0714 | | -0.0462 | 0.271*** | -0.0462 |
| | | (0.144) | (0.0623) | (0.144) | | (0.334) | (0.0668) | (0.334) | | (0.195) | (0.0642) | (0.195) |
| Size_Micro | | | -1.462*** | | | | -1.505*** | | | | -1.489*** | |
| | | | (0.0847) | | | | (0.0887) | | | | (0.0858) | |

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| | | | | | | | | | | | | |
|---------------------------------------|---------------------|---------------------|----------------------|---------------------|---------------------|---------------------|----------------------|---------------------|---------------------|---------------------|----------------------|---------------------|
| Constant | 3.912*** (0.146) | 3.714*** (0.188) | 4.346*** (0.0874) | 3.714*** (0.188) | 3.415*** (0.240) | 3.359*** (0.352) | 4.412*** (0.0934) | 3.359*** (0.352) | 3.944*** (0.151) | 3.761*** (0.195) | 4.376*** (0.0880) | 3.761*** (0.195) |
| Observations | 16,365 | 16,365 | 8,672 | 939 | 15,721 | 15,721 | 7,963 | 230 | 16,070 | 16,070 | 8,442 | 709 |
| R-squared | 0.560 | 0.564 | 0.525 | 0.665 | 0.554 | 0.559 | 0.516 | 0.555 | 0.560 | 0.677 | 0.521 | 0.677 |
| Robust standard errors in parentheses | | | | | | | | | | | | |
| *** p<0.01, ** p<0.05, * p<0.1 | | | | | | | | | | | | |

Table A.7 Estimated effects of ATI grants on employment

| Model | Employment | | | | | | | | | | | |
|-------------------|-----------------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|-----------------------|----------------------|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| All/Lead/Not Lead | All | All | All | All | Lead | Lead | Lead | Lead | Not Lead | Not Lead | Not Lead | Not Lead |
| N_Projects | 0.0664*** (0.0116) | 0.0666*** (0.0117) | 0.0638*** (0.0114) | 0.0438*** (0.00935) | 0.148*** (0.0537) | 0.153*** (0.0537) | 0.187*** (0.0558) | 0.147** (0.0725) | 0.0681*** (0.0119) | 0.0682*** (0.0120) | 0.0659*** (0.0117) | 0.0394* (0.0200) |
| Region_2 | 0.0579* (0.0297) | 0.0579* (0.0297) | -0.0679 (0.0457) | -0.417 (0.304) | 0.0612** (0.0296) | 0.0611** (0.0296) | -0.0619 (0.0456) | 0.0643 (0.352) | 0.0593** (0.0297) | 0.0592** (0.0297) | -0.0669 (0.0459) | -0.949*** (0.346) |
| Region_3 | 0.0374 (0.0303) | 0.0374 (0.0303) | -0.0439 (0.0487) | -0.411 (0.292) | 0.0404 (0.0301) | 0.0403 (0.0301) | -0.0393 (0.0486) | -0.0646 (0.351) | 0.0388 (0.0302) | 0.0388 (0.0302) | -0.0443 (0.0488) | |
| Region_4 | 0.0256 (0.0303) | 0.0255 (0.0303) | -0.0341 (0.0472) | -0.0393 (0.395) | 0.0285 (0.0302) | 0.0284 (0.0302) | -0.0276 (0.0470) | 0.360 (0.437) | 0.0229 (0.0302) | 0.0228 (0.0302) | -0.0397 (0.0471) | -0.225 (1.006) |
| Region_5 | 0.0140 (0.0292) | 0.0140 (0.0292) | -0.0524 (0.0461) | -0.719** (0.332) | 0.0165 (0.0291) | 0.0165 (0.0291) | -0.0477 (0.0459) | -0.361 (0.375) | 0.0168 (0.0292) | 0.0168 (0.0292) | -0.0480 (0.0463) | -1.249*** (0.399) |
| Region_6 | 0.00184 (0.0294) | 0.00181 (0.0294) | -0.0443 (0.0445) | -0.347 (0.333) | 0.00466 (0.0293) | 0.00460 (0.0293) | -0.0388 (0.0443) | 0.0803 (0.381) | -0.00229 (0.0293) | -0.00231 (0.0293) | -0.0506 (0.0444) | -1.137** (0.433) |
| Region_7 | -0.0627** (0.0315) | -0.0629** (0.0315) | -0.159*** (0.0479) | -0.660 (0.464) | -0.0603* (0.0314) | -0.0605* (0.0314) | -0.155*** (0.0478) | -0.447 (0.454) | -0.0617** (0.0314) | -0.0618** (0.0314) | -0.160*** (0.0481) | 0.231 (0.217) |
| Region_8 | -0.00712 (0.0278) | -0.00716 (0.0278) | -0.0791* (0.0424) | -0.156 (0.312) | -0.00881 (0.0277) | -0.00886 (0.0277) | -0.0836** (0.0419) | -0.0414 (0.345) | -0.00770 (0.0278) | -0.00774 (0.0278) | -0.0819* (0.0423) | -0.0957 (0.273) |
| Region_9 | -0.0319 (0.0297) | -0.0319 (0.0297) | -0.0886* (0.0461) | -0.551* (0.298) | -0.0291 (0.0296) | -0.0291 (0.0296) | -0.0840* (0.0460) | -0.188 (0.340) | -0.0305 (0.0298) | -0.0305 (0.0298) | -0.0903* (0.0464) | -1.077*** (0.291) |
| Region_10 | 0.0273 (0.0392) | 0.0273 (0.0393) | -0.0935 (0.0594) | 0.0862 (0.443) | 0.0294 (0.0391) | 0.0294 (0.0391) | -0.0925 (0.0592) | 0.478 (0.546) | 0.0202 (0.0387) | 0.0202 (0.0387) | -0.113* (0.0581) | -0.374 (0.240) |
| Region_11 | 0.0123 (0.0345) | 0.0122 (0.0345) | -0.123*** (0.0473) | -0.478 (0.330) | 0.0162 (0.0344) | 0.0162 (0.0344) | -0.118** (0.0472) | -0.0252 (0.357) | 0.0143 (0.0345) | 0.0143 (0.0345) | -0.127*** (0.0475) | -1.492*** (0.235) |
| SIC_2 | -0.771*** (0.105) | -0.790*** (0.105) | -0.841*** (0.0763) | -0.398 (0.242) | -0.772*** (0.115) | -0.789*** (0.115) | -0.801*** (0.0934) | -0.625*** (0.225) | -0.317 (0.329) | -0.316 (0.329) | 0.147*** (0.0279) | -0.292 (0.327) |
| SIC_3 | -1.044*** (0.0647) | -1.062*** (0.0647) | -0.912*** (0.0741) | -0.105 (0.270) | -1.025*** (0.0829) | -1.038*** (0.0827) | -0.874*** (0.0919) | -0.399* (0.231) | -0.620** (0.292) | -0.620** (0.292) | 0.0784*** (0.0194) | 0.0754 (0.468) |

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| | | | | | | | | | | | | |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| SIC_4 | - | - | - | - | - | - | - | - | - | - | - | - |
| SIC_5 | - | - | - | - | - | - | - | - | - | - | - | - |
| SIC_6 | - | - | - | - | - | - | - | - | - | - | - | - |
| SIC_7 | -0.727*** | -0.746*** | -0.996*** | -0.363 | -0.869*** | -0.886*** | -0.954*** | -0.705** | | | | |
| | (0.167) | (0.167) | (0.0725) | (0.324) | (0.118) | (0.118) | (0.0910) | (0.322) | | | | |
| SIC_8 | -2.057*** | -2.058*** | -1.819*** | -1.073** | -2.121*** | -2.121*** | -1.904*** | -1.168*** | | | | |
| | (0.0695) | (0.0695) | (0.0808) | (0.490) | (0.0644) | (0.0644) | (0.0732) | (0.414) | | | | |
| SIC_9 | - | - | - | - | - | - | - | - | - | - | - | - |
| Size_Medium | -1.883*** | -1.882*** | -1.950*** | -2.424*** | -1.823*** | -1.822*** | -1.880*** | -2.407*** | -1.767*** | -1.767*** | -1.819*** | -2.704*** |
| | (0.0664) | (0.0664) | (0.0760) | (0.204) | (0.0621) | (0.0620) | (0.0706) | (0.212) | (0.0637) | (0.0637) | (0.0733) | (0.394) |
| Size_Micro | -5.422*** | -5.421*** | -5.675*** | -6.036*** | -5.363*** | -5.362*** | -5.600*** | -6.189*** | -5.318*** | -5.318*** | -5.557*** | -5.722*** |
| | (0.0633) | (0.0633) | (0.0716) | (0.407) | (0.0587) | (0.0587) | (0.0651) | (0.333) | (0.0606) | (0.0606) | (0.0681) | (0.426) |
| Size_Small | -3.514*** | -3.514*** | -3.593*** | -3.725*** | -3.455*** | -3.455*** | -3.520*** | -3.643*** | -3.412*** | -3.412*** | -3.481*** | -4.269*** |
| | (0.0634) | (0.0634) | (0.0718) | (0.203) | (0.0588) | (0.0588) | (0.0654) | (0.204) | (0.0607) | (0.0608) | (0.0684) | (0.377) |
| 2011.year | | -0.010*** | -0.00807 | -0.0286 | | -0.010*** | -0.00797 | -0.0358 | | -0.010*** | -0.00783 | |
| | | (0.00387) | (0.00558) | (0.0327) | | (0.00387) | (0.00557) | (0.0335) | | (0.00390) | (0.00565) | |
| 2012.year | | 0.00157 | 0.0124 | -0.0387 | | 0.00154 | 0.0126 | -0.0503 | | 0.00182 | 0.0136* | |
| | | (0.00502) | (0.00781) | (0.0446) | | (0.00502) | (0.00779) | (0.0437) | | (0.00506) | (0.00791) | |
| 2013.year | | -0.00905 | 0.000523 | -0.0928 | | -0.0119** | -0.00446 | -0.261*** | | -0.00589 | 0.00839 | |
| | | (0.00578) | (0.00855) | (0.0585) | | (0.00586) | (0.00872) | (0.0836) | | (0.00587) | (0.00875) | |
| 2014.year | | -0.00668 | 0.00925 | -0.122** | | -0.00917 | 0.00455 | -0.300*** | | -0.00339 | 0.0171* | -0.0653 |
| | | (0.00614) | (0.00903) | (0.0606) | | (0.00621) | (0.00918) | (0.0929) | | (0.00619) | (0.00918) | (0.0557) |
| 2015.year | | -0.00122 | 0.00812 | -0.0753 | | -0.00358 | 0.00357 | -0.229** | | 0.00168 | 0.0151 | -0.0765 |
| | | (0.00638) | (0.00954) | (0.0593) | | (0.00645) | (0.00969) | (0.0916) | | (0.00643) | (0.00969) | (0.0644) |
| 2016.year | | -0.00425 | -0.0119 | -0.116* | | -0.00621 | -0.0158 | -0.243** | | -0.00146 | -0.00514 | -0.193** |
| | | (0.00652) | (0.00967) | (0.0670) | | (0.00658) | (0.00981) | (0.0998) | | (0.00655) | (0.00976) | (0.0909) |
| 2017.year | | -0.00551 | -0.0146 | -0.119* | | -0.00731 | -0.0183* | -0.251** | | -0.00281 | -0.00799 | -0.209* |

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|---------------------------------------|----------|-----------|-----------|----------|----------|-----------|-----------|----------|----------|-----------|-----------|----------|
| | | (0.00663) | (0.00997) | (0.0668) | | (0.00669) | (0.0101) | (0.109) | | (0.00666) | (0.0101) | (0.109) |
| 2018.year | | -0.00634 | -0.0201** | -0.101 | | -0.00805 | -0.0237** | -0.229* | | -0.00378 | -0.0136 | -0.195 |
| | | (0.00676) | (0.0102) | (0.0705) | | (0.00681) | (0.0104) | (0.116) | | (0.00678) | (0.0103) | (0.135) |
| 2019.year | | -0.00936 | -0.0248** | -0.107 | | -0.0111 | -0.028*** | -0.258** | | -0.00680 | -0.0182* | -0.148 |
| | | (0.00686) | (0.0104) | (0.0755) | | (0.00691) | (0.0105) | (0.125) | | (0.00687) | (0.0104) | (0.138) |
| 2020.year | | -0.017*** | -0.029*** | -0.182** | | -0.021*** | -0.033*** | -0.357** | | -0.0166** | -0.0217** | -0.184 |
| | | (0.00700) | (0.0105) | (0.0772) | | (0.00705) | (0.0106) | (0.145) | | (0.00701) | (0.0105) | (0.152) |
| 2021.year | | -0.026*** | -0.038*** | -0.180** | | -0.028*** | -0.041*** | -0.344** | | -0.024*** | -0.031*** | -0.239 |
| | | (0.00707) | (0.0106) | (0.0734) | | (0.00712) | (0.0107) | (0.141) | | (0.00708) | (0.0106) | (0.165) |
| Constant | 7.445*** | 7.471*** | 7.557*** | 7.796*** | 7.365*** | 7.388*** | 7.441*** | 7.742*** | 6.917*** | 6.923*** | 6.443*** | 8.152*** |
| | | (0.0303) | (0.0312) | (0.0453) | (0.319) | (0.0598) | (0.0695) | (0.358) | (0.300) | (0.300) | (0.0779) | (0.433) |
| Observations | 103,488 | 103,488 | 54,068 | 1,224 | 103,182 | 103,182 | 53,762 | 918 | 102,570 | 102,570 | 53,150 | 306 |
| R-squared | 0.781 | 0.781 | 0.809 | 0.864 | 0.775 | 0.775 | 0.800 | 0.863 | 0.768 | 0.768 | 0.790 | 0.901 |
| Robust standard errors in parentheses | | | | | | | | | | | | |
| *** p<0.01, ** p<0.05, * p<0.1 | | | | | | | | | | | | |

Table A.8 Estimated effects of ATI grants on the location of intermediate goods and services (UK / no UK)

| Model | Intermediate purchases | | | | | | | |
|------------|------------------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|-----------------------|---------------------|
| | 1 Inside/Outside UK | 2 Inside | 3 Inside | 4 Inside | 1 Outside | 2 Outside | 3 Outside | 4 Outside |
| N_Projects | 0.0559* (0.0165) | 0.0560*** (0.0170) | 0.0418*** (0.0118) | 0.0231 (0.0170) | 0.0733*** (0.0245) | 0.0721*** (0.0247) | 0.0538*** (0.0162) | 0.0276 (0.0247) |
| Region_2 | 0.785* (0.434) | 0.704 (0.437) | -0.193 (0.204) | 0.704 (0.437) | 0.490 (0.421) | 0.453 (0.435) | -0.343 (0.228) | 0.453 (0.435) |
| Region_3 | 0.934*** (0.335) | 0.962*** (0.333) | 0.150 (0.184) | 0.962*** (0.333) | 0.495 (0.310) | 0.576* (0.312) | -0.107 (0.209) | 0.576* (0.312) |
| Region_4 | 0.382 (0.371) | 0.336 (0.373) | 0.321 (0.198) | 0.336 (0.373) | 1.052** (0.425) | 1.068** (0.414) | 0.339* (0.203) | 1.068** (0.414) |
| Region_5 | 0.887*** (0.324) | 0.898*** (0.320) | 0.829*** (0.136) | 0.898*** (0.320) | 1.353*** (0.395) | 1.343*** (0.392) | 0.831*** (0.154) | 1.343*** (0.392) |
| Region_6 | 0.544 (0.419) | 0.429 (0.397) | 0.0229 (0.180) | 0.429 (0.397) | -0.0139 (0.433) | -0.0415 (0.425) | -0.326* (0.195) | -0.0415 (0.425) |
| Region_7 | 0.0487 (0.372) | 0.0121 (0.377) | -0.302 (0.188) | 0.0121 (0.377) | -0.430 (0.356) | -0.493 (0.351) | -0.458** (0.201) | -0.493 (0.351) |
| Region_8 | 0.462 (0.413) | 0.570 (0.420) | 0.180 (0.186) | 0.570 (0.420) | 1.128** (0.443) | 1.123** (0.456) | 0.115 (0.207) | 1.123** (0.456) |
| Region_9 | 0.781 (0.492) | 0.767 (0.494) | -0.00254 (0.241) | 0.767 (0.494) | 1.752*** (0.466) | 1.726*** (0.457) | -0.00619 (0.252) | 1.726*** (0.457) |
| Region_10 | 0.619 (0.415) | 0.628 (0.396) | 0.286* (0.158) | 0.628 (0.396) | 1.019** (0.408) | 0.967** (0.386) | 0.263 (0.170) | 0.967** (0.386) |
| Region_11 | - | - | - | - | - | - | - | - |
| SIC_2 | -0.203** (0.0833) | -0.192** (0.0814) | -0.0106 (0.0365) | -0.192** (0.0814) | -0.126* (0.0683) | -0.125* (0.0683) | -0.0141 (0.0313) | -0.125* (0.0683) |
| SIC_3 | - | - | - | - | - | - | - | - |
| SIC_4 | 0.114** (0.0564) | 0.116** (0.0567) | -0.00232 (0.00345) | 0.116** (0.0567) | 0.00660 (0.0615) | 0.0140 (0.0609) | -0.00515 (0.00852) | 0.0140 (0.0609) |
| SIC_5 | -0.0114 (0.357) | 0.00484 (0.370) | 0.0409 (0.0454) | 0.00484 (0.370) | 0.377 (0.338) | 0.355 (0.360) | 0.0815 (0.0531) | 0.355 (0.360) |
| SIC_6 | 0.0500 | 0.0514 | 0.0162 | 0.0514 | -0.0543 | -0.0527 | -0.00198 | -0.0527 |

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|---------------------------------------|-----------|-----------|-----------|-----------|------------|------------|-----------|------------|
| | (0.0511) | (0.0504) | (0.0165) | (0.0504) | (0.0388) | (0.0384) | (0.0169) | (0.0384) |
| SIC_7 | -0.0368* | -0.0374* | 0.00299 | -0.0374* | -0.0641*** | -0.0648*** | 0.0197 | -0.0648*** |
| | (0.0191) | (0.0190) | (0.0168) | (0.0190) | (0.0204) | (0.0199) | (0.0157) | (0.0199) |
| SIC_8 | 0.323 | 0.349 | 0.00586 | 0.349 | -0.190 | -0.144 | -0.00297 | -0.144 |
| | (0.384) | (0.387) | (0.00598) | (0.387) | (0.297) | (0.311) | (0.0136) | (0.311) |
| SIC_9 | 0.548 | 0.419 | -0.0347 | 0.419 | 0.656* | 0.677** | -0.0146 | 0.677** |
| | (0.640) | (0.637) | (0.0285) | (0.637) | (0.349) | (0.337) | (0.0643) | (0.337) |
| Size_Medium | -1.725*** | -1.889*** | -1.872*** | -1.889*** | -1.761*** | -1.795*** | -1.852*** | -1.795*** |
| | (0.370) | (0.369) | (0.158) | (0.369) | (0.456) | (0.450) | (0.182) | (0.450) |
| Size_Micro | -4.501*** | -4.874*** | -4.379*** | -4.874*** | | | -4.857*** | |
| | (0.415) | (0.462) | (0.383) | (0.462) | | | (0.324) | |
| Size_Small | -3.736*** | -3.801*** | -3.559*** | -3.801*** | -3.091*** | -3.177*** | -3.486*** | -3.177*** |
| | (0.488) | (0.498) | (0.176) | (0.498) | (0.585) | (0.558) | (0.201) | (0.558) |
| 2013.year | | 0.159 | 0.00363 | 0.159 | | 0.136 | 0.0593 | 0.136 |
| | | (0.239) | (0.118) | (0.239) | | (0.244) | (0.125) | (0.244) |
| 2014.year | | 0.103 | -0.118 | 0.103 | | 0.477 | 0.139 | 0.477 |
| | | (0.284) | (0.140) | (0.284) | | (0.375) | (0.154) | (0.375) |
| 2015.year | | 0.476* | 0.0912 | 0.476* | | 0.749* | 0.158 | 0.749* |
| | | (0.280) | (0.144) | (0.280) | | (0.391) | (0.152) | (0.391) |
| 2016.year | | 0.775** | 0.224 | 0.775** | | 0.932** | 0.128 | 0.932** |
| | | (0.326) | (0.137) | (0.326) | | (0.388) | (0.149) | (0.388) |
| 2017.year | | 0.942*** | 0.158 | 0.942*** | | 1.114*** | 0.198 | 1.114*** |
| | | (0.332) | (0.142) | (0.332) | | (0.383) | (0.151) | (0.383) |
| 2019.year | | 0.798** | 0.246 | 0.798** | | 0.588 | 0.137 | 0.588 |
| | | (0.356) | (0.152) | (0.356) | | (0.407) | (0.159) | (0.407) |
| 2020.year | | 0.503 | 0.119 | 0.503 | | 0.237 | -0.172 | 0.237 |
| | | (0.345) | (0.151) | (0.345) | | (0.381) | (0.162) | (0.381) |
| 2021.year | | 0.537 | 0.277* | 0.537 | | 0.0239 | 0.0515 | 0.0239 |
| | | (0.352) | (0.152) | (0.352) | | (0.426) | (0.163) | (0.426) |
| Constant | 6.626*** | 6.195*** | 7.344*** | 6.195*** | 7.162*** | 6.734*** | 8.579*** | 6.734*** |
| | (0.379) | (0.445) | (0.191) | (0.445) | (0.490) | (0.577) | (0.234) | (0.577) |
| Observations | 3,545 | 3,545 | 3,293 | 484 | 3,152 | 3,152 | 3,311 | 452 |
| R-squared | 0.382 | 0.382 | 0.369 | 0.557 | 0.326 | 0.329 | 0.353 | 0.570 |
| Robust standard errors in parentheses | | | | | | | | |
| *** p<0.01, ** p<0.05, * p<0.1 | | | | | | | | |

Table A.9 Estimated effects of ATI grants worker hourly earnings

| Model | Hourly earnings | | | | | | | | | | | |
|------------|--------------------------|-------------------------|--------------------------|--------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | All/Lead/Not Lead | All | All | All | All | Lead | Lead | Lead | Lead | Not Lead | Not Lead | Not Lead |
| N_Projects | 0.00956*** (0.000808) | 0.00728** (0.000798) | 0.00680*** (0.000694) | 0.00263*** (0.000450) | 0.125*** (0.0132) | 0.0682*** (0.0126) | 0.0653** (0.0152) | 0.0434*** (0.0168) | 0.00892*** (0.00121) | 0.00728*** (0.00109) | 0.00691*** (0.00110) | 0.00430** (0.000549) |
| sex | -0.0998*** (0.0128) | -0.104*** (0.0125) | -0.137*** (0.0128) | -0.165*** (0.0180) | -0.1047*** (0.0134) | -0.1092*** (0.0131) | -0.1438*** (0.0134) | -0.173*** (0.0189) | -0.094** (0.0121) | -0.0988** (0.0118) | -0.1301** (0.0121) | -0.1567** (0.0171) |
| ft | -0.0555*** (0.0173) | -0.0522*** (0.0170) | -0.00727 (0.0278) | -0.0688** (0.0321) | -0.0582*** (0.0181) | -0.0548*** (0.0178) | -0.0076*** (0.0291) | -0.072*** (0.0337) | -0.0527*** (0.0164) | -0.0495*** (0.0161) | -0.0069*** (0.0264) | -0.0653** (0.0304) |
| OCC_L2 | 0.172*** (0.0181) | 0.174*** (0.0183) | 0.150*** (0.0299) | 0.142*** (0.0449) | 0.1806*** (0.019) | 0.1827*** -0.019215 | 0.1575*** -0.031395 | 0.1491*** -0.047145 | 0.1634*** -0.017195 | 0.1653*** -0.017385 | 0.1425** -0.028405 | 0.1349** -0.042655 |
| OCC_L3 | 0.344*** (0.0222) | 0.348*** (0.0226) | 0.331*** (0.0368) | 0.295*** (0.0625) | 0.3612*** (0.0233) | 0.3654*** (0.0237) | 0.3475*** (0.0386) | 0.3097*** (0.0656) | 0.3268*** (0.0290) | 0.3306*** (0.0214) | 0.3144*** (0.0349) | 0.2802** (0.0593) |
| OCC_L4 | 0.703*** (0.0278) | 0.708*** (0.0278) | 0.648*** (0.0383) | 0.574*** (0.0626) | 0.7381*** (0.0291) | 0.7434*** (0.0291) | 0.6804*** (0.0402) | 0.6027*** (0.0657) | 0.6678** (0.0264) | 0.6726*** (0.0264) | 0.6156** (0.0363) | 0.5453** (0.0594) |
| Region_2 | 0.0954** (0.0411) | 0.0856** (0.0396) | 0.0799* (0.0438) | 0.0897 (0.0707) | 0.120** (0.0497) | 0.117** (0.0476) | 0.102* (0.0539) | 0.145** (0.0610) | 0.170*** (0.0647) | 0.157** (0.0613) | 0.139** (0.0606) | 0.125 (0.163) |
| Region_3 | 0.0448 (0.0355) | 0.0432 (0.0372) | 0.0310 (0.0424) | 0.104 (0.0705) | 0.0743* (0.0451) | 0.0747 (0.0469) | 0.0642 (0.0445) | 0.156** (0.0670) | 0.0532 (0.0509) | 0.0481 (0.0528) | 0.00687 (0.0491) | -0.0753 (0.205) |
| Region_4 | 0.0992** (0.0499) | 0.115** (0.0568) | 0.0739 (0.0503) | 0.156** (0.0781) | 0.150** (0.0629) | 0.155** (0.0660) | 0.0986* (0.0589) | 0.214*** (0.0786) | 0.105 (0.0699) | 0.110 (0.0695) | 0.0618 (0.0639) | 0.156 (0.199) |
| Region_5 | 0.0688* (0.0357) | 0.0678* (0.0356) | 0.0386 (0.0386) | 0.0948 (0.0789) | 0.0919** (0.0412) | 0.0930** (0.0413) | 0.0373 (0.0464) | 0.120 (0.0860) | 0.0975** (0.0456) | 0.0978** (0.0465) | 0.0193 (0.0535) | 0.0849 (0.183) |
| Region_6 | 0.0722** (0.0337) | 0.0663** (0.0338) | 0.0642* (0.0344) | 0.0686 (0.0786) | 0.104*** (0.0393) | 0.104*** (0.0394) | 0.0961** (0.0422) | 0.0617 (0.0850) | 0.133*** (0.0423) | 0.132*** (0.0429) | 0.145*** (0.0444) | 0.100 (0.196) |
| Region_7 | 0.102*** (0.0362) | 0.0966*** (0.0358) | 0.134*** (0.0393) | 0.110 (0.0822) | 0.149*** (0.0404) | 0.151*** (0.0403) | 0.193*** (0.0440) | 0.188** (0.0843) | 0.156*** (0.0459) | 0.151*** (0.0457) | 0.201*** (0.0487) | 0.159 (0.200) |
| Region_8 | 0.214*** (0.0396) | 0.210*** (0.0390) | 0.225*** (0.0428) | 0.180* (0.0990) | 0.274*** (0.0409) | 0.277*** (0.0407) | 0.281*** (0.0455) | 0.225*** (0.0796) | 0.304*** (0.0454) | 0.304*** (0.0456) | 0.312*** (0.0533) | 0.408* (0.201) |
| Region_9 | 0.138*** (0.0322) | 0.135*** (0.0318) | 0.149*** (0.0361) | 0.111 (0.0785) | 0.231*** (0.0389) | 0.231*** (0.0385) | 0.225*** (0.0411) | 0.186** (0.0817) | 0.235*** (0.0412) | 0.234*** (0.0420) | 0.232*** (0.0452) | 0.0902 (0.205) |
| Region_10 | 0.0457 (0.0343) | 0.0420 (0.0355) | 0.0225 (0.0346) | 0.0303 (0.0750) | 0.0570 (0.0430) | 0.0535 (0.0432) | 0.0236 (0.0444) | 0.0753 (0.0805) | 0.0395 (0.0464) | 0.0369 (0.0478) | -0.0335 (0.0443) | -0.0584 (0.185) |
| Region_11 | 0.101** | 0.0967** | 0.0673 | 0.104 | 0.132*** | 0.133*** | 0.0694 | 0.0595 | 0.156*** | 0.155*** | 0.0925* | 0.0687 |

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| | | | | | | | | | | | | |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | (0.0394) | (0.0391) | (0.0438) | (0.109) | (0.0454) | (0.0453) | (0.0527) | (0.160) | (0.0422) | (0.0430) | (0.0487) | (0.195) |
| SIC_2 | 0.0741 | 0.143 | 0.110 | 0.203*** | 0.102** | 0.164*** | 0.224*** | 0.165** | 0.111 | 0.147 | 0.0877 | 0.182 |
| | (0.105) | (0.102) | (0.111) | (0.0636) | (0.0460) | (0.0499) | (0.0448) | (0.0795) | (0.114) | (0.113) | (0.0547) | (0.137) |
| SIC_3 | -0.00183 | 0.0635 | 0.117 | 0.234*** | 0.0278 | 0.0628** | 0.205*** | 0.223*** | -0.0957* | -0.0341 | 0.0766 | 0.183 |
| | (0.103) | (0.0992) | (0.114) | (0.0632) | (0.0264) | (0.0277) | (0.0377) | (0.0808) | (0.0574) | (0.0538) | (0.0714) | (0.113) |
| SIC_4 | 0.431*** | 0.480*** | 0.463*** | 0.464*** | 0.447*** | 0.490*** | 0.516*** | 0.395*** | 0.857*** | 0.895*** | 0.875*** | 1.058*** |
| | (0.133) | (0.129) | (0.139) | (0.0943) | (0.115) | (0.116) | (0.113) | (0.123) | (0.180) | (0.168) | (0.181) | (0.214) |
| SIC_5 | 0.343*** | 0.413*** | 0.354*** | 0.435*** | 0.497** | 0.544*** | 0.539*** | 0.469*** | 0.512*** | 0.552*** | 0.483*** | 0.643*** |
| | (0.120) | (0.130) | (0.123) | (0.111) | (0.196) | (0.203) | (0.190) | (0.155) | (0.109) | (0.134) | (0.0995) | (0.205) |
| SIC_6 | 0.122 | 0.176* | 0.190* | 0.285*** | 0.321*** | 0.394*** | 0.479*** | 0.427*** | 0.772*** | 0.805*** | 0.704*** | 0.918*** |
| | (0.108) | (0.104) | (0.115) | (0.0721) | (0.0437) | (0.0469) | (0.0455) | (0.0783) | (0.139) | (0.130) | (0.122) | (0.192) |
| SIC_7 | 0.0229 | 0.0870 | 0.105 | 0.174*** | 0.196*** | 0.247*** | 0.298*** | 0.276*** | 0.0758 | 0.113* | 0.148*** | 0.146 |
| | (0.110) | (0.106) | (0.111) | (0.0657) | (0.0645) | (0.0656) | (0.0344) | (0.0851) | (0.0712) | (0.0657) | (0.0525) | (0.113) |
| SIC_8 | 0.324 | 0.378 | 0.299 | 0.344 | -0.512*** | -0.434*** | -0.492*** | -0.673*** | 0.424*** | 0.424*** | 0.365*** | 0.418*** |
| | (0.307) | (0.263) | (0.265) | (0.255) | (0.0380) | (0.0473) | (0.0561) | (0.163) | (0.0685) | (0.0730) | (0.0732) | (0.0758) |
| SIC_9 | 0.133 | 0.184* | 0.164 | 0.290*** | 0.279*** | 0.325*** | 0.388*** | 0.386*** | 0.0657 | 0.0911 | 0.0569 | 0.242** |
| | (0.107) | (0.103) | (0.114) | (0.0720) | (0.0269) | (0.0301) | (0.0300) | (0.0637) | (0.0638) | (0.0586) | (0.0523) | (0.102) |
| Size_Medium | -0.167*** | -0.175*** | -0.141*** | -0.0957** | -0.213*** | -0.218*** | -0.157*** | -0.151** | -0.231*** | -0.228*** | -0.169*** | -0.324*** |
| | (0.0210) | (0.0227) | (0.0237) | (0.0449) | (0.0275) | (0.0279) | (0.0295) | (0.0662) | (0.0322) | (0.0314) | (0.0320) | (0.111) |
| Size_Micro | -0.345*** | -0.356*** | -0.366*** | -0.133 | -0.376*** | -0.386*** | -0.407*** | -0.112 | -0.393*** | -0.395*** | -0.419*** | |
| | (0.0229) | (0.0242) | (0.0314) | (0.104) | (0.0277) | (0.0281) | (0.0344) | (0.232) | (0.0316) | (0.0308) | (0.0366) | |
| Size_Small | -0.271*** | -0.281*** | -0.205*** | -0.188 | -0.290*** | -0.298*** | -0.229*** | -0.0973 | -0.312*** | -0.312*** | -0.240*** | -0.475*** |
| | (0.0209) | (0.0221) | (0.0279) | (0.133) | (0.0271) | (0.0275) | (0.0325) | (0.151) | (0.0313) | (0.0306) | (0.0337) | (0.169) |
| 2011.year | | 0.00881 | 0.0272*** | 0.0112 | | 0.00431 | 0.0374*** | 0.0158 | | -0.00377 | 0.0582*** | |
| | | (0.00768) | (0.00908) | (0.0134) | | (0.00948) | (0.00989) | (0.0122) | | (0.0149) | (0.0163) | |
| 2012.year | | 0.0490*** | 0.0504*** | 0.0576*** | | 0.0331*** | 0.0462*** | 0.0479*** | | 0.0255 | 0.0415** | |
| | | (0.0100) | (0.0112) | (0.0165) | | (0.00993) | (0.00984) | (0.0105) | | (0.0155) | (0.0164) | |
| 2013.year | | 0.0637*** | 0.0604*** | 0.0596*** | | 0.00259 | 0.0115 | 0.000964 | | 0.118*** | 0.130*** | |
| | | (0.00968) | (0.0105) | (0.0130) | | (0.0244) | (0.0235) | (0.0381) | | (0.0286) | (0.0263) | |
| 2014.year | | 0.0720*** | 0.0747*** | 0.0764*** | | -0.00392 | 0.0156 | -0.0191 | | 0.109*** | 0.132*** | 0.0144 |
| | | (0.00971) | (0.0116) | (0.0135) | | (0.0255) | (0.0236) | (0.0363) | | (0.0294) | (0.0281) | (0.0115) |
| 2015.year | | 0.0770*** | 0.0898*** | 0.0787*** | | 0.00881 | 0.0373 | -0.00394 | | 0.117*** | 0.143*** | 0.0135 |
| | | (0.0116) | (0.0138) | (0.0195) | | (0.0250) | (0.0242) | (0.0379) | | (0.0289) | (0.0275) | (0.0269) |
| 2016.year | | 0.103*** | 0.0990*** | 0.121*** | | 0.0336 | 0.0339 | 0.0259 | | 0.131*** | 0.138*** | 0.0596*** |
| | | (0.0114) | (0.0146) | (0.0172) | | (0.0262) | (0.0257) | (0.0361) | | (0.0237) | (0.0279) | (0.0191) |
| 2017.year | | 0.125*** | 0.120*** | 0.144*** | | 0.0531** | 0.0611** | 0.0526 | | 0.145*** | 0.158*** | 0.0834*** |

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| | | | | | | | | | | | | |
|---------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| | | (0.0120) | (0.0162) | (0.0220) | | (0.0261) | (0.0273) | (0.0378) | | (0.0239) | (0.0281) | (0.0292) |
| 2018.year | | 0.168*** | 0.163*** | 0.191*** | | 0.102*** | 0.106*** | 0.120*** | | 0.178*** | 0.189*** | 0.103*** |
| | | (0.0139) | (0.0154) | (0.0207) | | (0.0263) | (0.0272) | (0.0375) | | (0.0212) | (0.0239) | (0.0305) |
| 2019.year | | 0.175*** | 0.174*** | 0.177*** | | 0.113*** | 0.132*** | 0.0868** | | 0.190*** | 0.216*** | 0.104*** |
| | | (0.0154) | (0.0178) | (0.0184) | | (0.0281) | (0.0324) | (0.0437) | | (0.0212) | (0.0280) | (0.0276) |
| 2020.year | | 0.157*** | 0.163*** | 0.170*** | | 0.104*** | 0.127*** | 0.0910** | | 0.172*** | 0.200*** | 0.0872*** |
| | | (0.0158) | (0.0195) | (0.0205) | | (0.0284) | (0.0342) | (0.0402) | | (0.0217) | (0.0308) | (0.0284) |
| 2021.year | | 0.169*** | 0.170*** | 0.177*** | | 0.125*** | 0.143*** | 0.111** | | 0.183*** | 0.205*** | 0.0776** |
| | | (0.0173) | (0.0196) | (0.0227) | | (0.0299) | (0.0348) | (0.0448) | | (0.0241) | (0.0312) | (0.0309) |
| Constant | 2.388*** | 2.224*** | 2.232*** | 2.250*** | 2.586*** | 2.503*** | 2.433*** | 2.494*** | 2.719*** | 2.537*** | 2.508*** | 2.667*** |
| | | (0.109) | (0.106) | (0.122) | (0.117) | (0.0490) | (0.0573) | (0.0546) | (0.0976) | (0.0652) | (0.0677) | (0.231) |
| Observations | 12,679 | 12,679 | 7,546 | 940 | 12,002 | 12,002 | 6,869 | 335 | 12,416 | 12,416 | 7,283 | 605 |
| R-squared | 0.339 | 0.369 | 0.402 | 0.496 | 0.315 | 0.346 | 0.398 | 0.547 | 0.329 | 0.359 | 0.400 | 0.537 |
| Robust standard errors in parentheses | | | | | | | | | | | | |
| *** p<0.01, ** p<0.05, * p<0.1 | | | | | | | | | | | | |

Table A.10 Estimated effects of ATI grants employee hours worked

| Model | Hours worked | | | | | | | | | | | |
|------------|-------------------------|-------------------------|------------------------|-------------------------|-------------------------|-------------------------|------------------------|-------------------------|------------------------|-----------------------|-----------------------|-----------------------|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| | All/Lead/Not Lead | All | All | All | All | Lead | Lead | Lead | Lead | Not Lead | Not Lead | Not Lead |
| N_Projects | -0.000273 (0.000197) | -0.000152 (0.000209) | 9.33e-05 (0.000167) | -0.000192 (0.000150) | -0.000325 (0.000226) | -0.000181 (0.000228) | 0.000211 (0.000226) | -4.94e-05 (0.000163) | -0.000388 (0.00198) | 0.00571* (0.00319) | 0.00739 (0.00477) | -0.00321 (0.00299) |
| Region_2 | -0.00157 (0.0241) | -0.000431 (0.0241) | 0.0307 (0.0309) | 0.00172 (0.0214) | -0.00113 (0.0304) | 0.00122 (0.0305) | 0.0399 (0.0384) | 0.00411 (0.00594) | -0.00119 (0.0250) | -0.000796 (0.0251) | 0.0265 (0.0327) | 0.00824 (0.0233) |
| Region_3 | 0.000816 (0.0262) | 0.00108 (0.0263) | 0.0303 (0.0318) | 0.0225 (0.0227) | -0.00598 (0.0343) | -0.00494 (0.0343) | 0.0216 (0.0445) | 0.0339** (0.0136) | 0.000189 (0.0265) | 0.000302 (0.0265) | 0.0286 (0.0324) | 0.0220 (0.0224) |
| Region_4 | 0.0166 (0.0240) | 0.0145 (0.0242) | 0.0412 (0.0305) | 0.0149 (0.0210) | 0.0216 (0.0313) | 0.0202 (0.0315) | 0.0480 (0.0388) | 0.0152*** (0.00353) | 0.0156 (0.0245) | 0.0142 (0.0246) | 0.0388 (0.0315) | 0.0107 (0.0225) |
| Region_5 | -0.0118 (0.0255) | -0.0118 (0.0255) | 0.0359 (0.0297) | 0.00955 (0.0222) | -0.0175 (0.0327) | -0.0177 (0.0327) | 0.0416 (0.0384) | 0.0156* (0.00894) | -0.0144 (0.0261) | -0.0147 (0.0261) | 0.0324 (0.0304) | 0.00688 (0.0234) |
| Region_6 | -0.00294 (0.0245) | -0.00231 (0.0245) | 0.0130 (0.0300) | -0.0189 (0.0227) | 0.00211 (0.0311) | 0.00237 (0.0311) | 0.0190 (0.0379) | -0.0170 (0.0175) | 0.00144 (0.0250) | 0.00124 (0.0251) | 0.00973 (0.0316) | -0.0156 (0.0238) |
| Region_7 | 0.00160 (0.0252) | 0.00222 (0.0252) | 0.0439 (0.0292) | -0.0196 (0.0243) | 0.00771 (0.0321) | 0.00869 (0.0322) | 0.0581 (0.0363) | -0.0290 (0.0276) | 0.00647 (0.0257) | 0.00601 (0.0257) | 0.0466 (0.0297) | -0.00870 (0.0251) |
| Region_8 | 0.0189 (0.0283) | 0.0193 (0.0283) | 0.0146 (0.0313) | -0.00493 (0.0315) | 0.0304 (0.0353) | 0.0302 (0.0353) | 0.0202 (0.0384) | 0.00402 (0.0169) | 0.0178 (0.0288) | 0.0174 (0.0289) | 0.0113 (0.0319) | -0.0119 (0.0346) |
| Region_9 | -0.00928 (0.0243) | -0.00891 (0.0243) | 0.0326 (0.0294) | -0.0230 (0.0224) | -0.00501 (0.0309) | -0.00469 (0.0310) | 0.0471 (0.0366) | -0.0213 (0.0201) | -0.00775 (0.0247) | -0.00782 (0.0247) | 0.0346 (0.0298) | -0.0234 (0.0231) |
| Region_10 | 0.00499 (0.0247) | 0.00539 (0.0249) | 0.0401 (0.0298) | -0.00441 (0.0182) | 0.00512 (0.0319) | 0.00552 (0.0320) | 0.0482 (0.0402) | -0.022*** (0.00743) | 0.0105 (0.0245) | 0.0111 (0.0246) | 0.0466 (0.0300) | 0.00430 (0.0198) |
| Region_11 | 0.00461 (0.0244) | 0.00507 (0.0244) | 0.0552* (0.0303) | 0.00983 (0.0222) | 0.00417 (0.0308) | 0.00452 (0.0308) | 0.0663* (0.0377) | 0.0108* (0.00616) | 0.00432 (0.0250) | 0.00415 (0.0250) | 0.0565* (0.0313) | 0.0137 (0.0244) |
| SIC_2 | 0.226 (0.184) | 0.218 (0.183) | 0.208 (0.179) | 0.231 (0.190) | 0.425*** (0.0148) | 0.418*** (0.0155) | 0.412*** (0.0188) | 0.477*** (0.0292) | -0.098*** (0.0135) | -0.107*** (0.0145) | -0.105*** (0.0145) | -0.101*** (0.0251) |
| SIC_3 | 0.216 (0.184) | 0.209 (0.183) | 0.187 (0.179) | 0.212 (0.189) | 0.437*** (0.0120) | 0.425*** (0.0130) | 0.389*** (0.0186) | 0.465*** (0.0263) | -0.108*** (0.0101) | -0.112*** (0.0108) | -0.125*** (0.0156) | -0.114*** (0.0242) |
| SIC_4 | 0.0823 (0.223) | 0.0773 (0.222) | 0.0721 (0.218) | 0.0622 (0.226) | 0.287*** (0.0406) | 0.279*** (0.0427) | 0.281*** (0.0450) | 0.250*** (0.0291) | -0.232 (0.172) | -0.238 (0.172) | -0.239 (0.172) | -0.263 (0.175) |
| SIC_5 | 0.269 (0.188) | 0.262 (0.187) | 0.253 (0.184) | 0.256 (0.192) | 0.518*** (0.0144) | 0.509*** (0.0135) | 0.493*** (0.0195) | 0.486*** (0.0266) | -0.0714** (0.0283) | -0.078*** (0.0271) | -0.080*** (0.0278) | -0.097*** (0.0169) |
| SIC_6 | 0.209 | 0.203 | 0.194 | 0.206 | 0.258*** | 0.252*** | 0.233*** | 0.220*** | -0.114*** | -0.125*** | -0.124*** | -0.121*** |

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|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | (0.184) | (0.183) | (0.179) | (0.189) | (0.0514) | (0.0494) | (0.0588) | (0.0745) | (0.0125) | (0.0136) | (0.0156) | (0.0245) |
| SIC_7 | 0.191 | 0.184 | 0.161 | 0.198 | 0.406*** | 0.398*** | 0.365*** | 0.453*** | -0.133*** | -0.140*** | -0.151*** | -0.136*** |
| | (0.184) | (0.183) | (0.179) | (0.190) | (0.0252) | (0.0254) | (0.0200) | (0.0263) | (0.0166) | (0.0174) | (0.0122) | (0.0238) |
| SIC_8 | -0.0795 | -0.0851 | -0.0664 | -0.0810 | 0.435*** | 0.435*** | 0.464*** | 0.452*** | -1.117*** | -1.131*** | -1.132*** | -1.210*** |
| | (0.353) | (0.357) | (0.365) | (0.370) | (0.0201) | (0.0210) | (0.0218) | (0.0184) | (0.0196) | (0.0203) | (0.0238) | (0.0288) |
| SIC_9 | 0.260 | 0.254 | 0.238 | 0.269 | 0.242*** | 0.236*** | 0.222*** | 0.220*** | -0.032*** | -0.039*** | -0.047*** | -0.0243 |
| | (0.188) | (0.187) | (0.182) | (0.195) | (0.0108) | (0.0116) | (0.0149) | (0.0346) | (0.00747) | (0.00841) | (0.0110) | (0.0233) |
| Size_Medium | -0.00667 | -0.00565 | -0.0151 | -0.00216 | -0.00744 | -0.00785 | -0.0137 | 0.0393 | -0.00879 | -0.00747 | -0.0140 | -0.00641 |
| | (0.00670) | (0.00678) | (0.0103) | (0.0219) | (0.00705) | (0.00707) | (0.0113) | (0.0257) | (0.00678) | (0.00683) | (0.0107) | (0.0220) |
| Size_Micro | -0.302*** | -0.301*** | -0.280*** | 0.0305*** | -0.305*** | -0.304*** | -0.277*** | | -0.304*** | -0.302*** | -0.278*** | 0.0278** |
| | (0.0275) | (0.0274) | (0.0403) | (0.0114) | (0.0277) | (0.0277) | (0.0405) | | (0.0275) | (0.0273) | (0.0404) | (0.0118) |
| Size_Small | -0.076*** | -0.075*** | -0.084*** | -0.0101 | -0.079*** | -0.078*** | -0.085*** | 0.0453 | -0.078*** | -0.076*** | -0.082*** | 0.0309*** |
| | (0.0120) | (0.0119) | (0.0192) | (0.0283) | (0.0123) | (0.0123) | (0.0203) | (0.0344) | (0.0120) | (0.0120) | (0.0195) | (0.0106) |
| 2011.year | | -0.00190 | 0.000326 | -0.00735* | | 0.00151 | 0.00640 | | | -0.00192 | 0.000240 | -0.00775* |
| | | (0.00520) | (0.00532) | (0.00440) | | (0.00841) | (0.00869) | | | (0.00519) | (0.00531) | (0.00419) |
| 2012.year | | -0.00166 | 0.00549 | 0.00375 | | -0.00588 | 0.00719 | | | -0.00160 | 0.00549 | 0.00398 |
| | | (0.00647) | (0.00580) | (0.00554) | | (0.0102) | (0.00975) | | | (0.00647) | (0.00576) | (0.00559) |
| 2013.year | | -0.00684 | -0.00488 | -0.00249 | | -0.0155 | -0.00393 | | | -0.00247 | -0.00619 | -0.00290 |
| | | (0.00600) | (0.00655) | (0.00447) | | (0.00949) | (0.0105) | | | (0.00730) | (0.00824) | (0.00747) |
| 2014.year | | -0.00825 | -0.00531 | -0.000644 | | -0.0185* | -0.00684 | -0.00176 | | -0.00500 | -0.00683 | 0.00344 |
| | | (0.00626) | (0.00667) | (0.00483) | | (0.00958) | (0.0106) | (0.00308) | | (0.00765) | (0.00853) | (0.00860) |
| 2015.year | | -0.00648 | 0.00286 | 0.00486 | | -0.0184* | 0.00124 | 0.00121 | | -0.00352 | 0.00324 | 0.0122** |
| | | (0.00696) | (0.00662) | (0.00757) | | (0.00950) | (0.00992) | (0.0120) | | (0.00763) | (0.00744) | (0.00582) |
| 2016.year | | -0.0135* | -0.00425 | -0.000741 | | -0.025*** | -0.00694 | -0.00638 | | -0.0111 | -0.00365 | 0.00807 |
| | | (0.00712) | (0.00795) | (0.00693) | | (0.00973) | (0.0116) | (0.00933) | | (0.00796) | (0.00991) | (0.00768) |
| 2017.year | | -0.020*** | -0.00418 | 0.00182 | | -0.035*** | -0.00953 | -0.0115 | | -0.0190** | -0.00200 | 0.0197*** |
| | | (0.00755) | (0.00709) | (0.00616) | | (0.0102) | (0.0108) | (0.00854) | | (0.00856) | (0.00855) | (0.00744) |
| 2018.year | | -0.0158** | -0.0167* | -0.00301 | | -0.027*** | -0.0206 | -0.00947 | | -0.0141* | -0.0196* | 0.00493 |
| | | (0.00746) | (0.00921) | (0.00672) | | (0.0101) | (0.0128) | (0.00710) | | (0.00850) | (0.0117) | (0.0101) |
| 2019.year | | -0.0172** | -0.0149 | 0.00734 | | -0.030*** | -0.0211 | -0.00146 | | -0.0194** | -0.0209* | 0.0167* |
| | | (0.00781) | (0.00953) | (0.00491) | | (0.0107) | (0.0131) | (0.00894) | | (0.00925) | (0.0119) | (0.00842) |
| 2020.year | | -0.0181** | -0.0115 | 0.00662 | | 0.0317*** | -0.0173 | -0.00385 | | -0.0202** | -0.0157* | 0.0164** |
| | | (0.00709) | (0.00768) | (0.00419) | | (0.0100) | (0.0112) | (0.00747) | | (0.00830) | (0.00938) | (0.00760) |
| 2021.year | | -0.0192** | -0.0104 | 0.00248 | | -0.032*** | -0.0148 | -0.00536 | | -0.0218** | -0.0143* | 0.00909 |
| | | (0.00763) | (0.00696) | (0.00564) | | (0.0105) | (0.0100) | (0.00581) | | (0.00907) | (0.00868) | (0.0112) |

ATI Programme Impact Evaluation 2023-24 Technical Annex

| | | | | | | | | | | | | |
|---------------------------------------|---------------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Constant | 3.390*** (0.185) | 3.407*** (0.185) | 3.379*** (0.181) | 3.388*** (0.191) | 3.169*** (0.0329) | 3.201*** (0.0344) | 3.166*** (0.0404) | 3.135*** (0.0262) | 3.715*** (0.0264) | 3.729*** (0.0278) | 3.692*** (0.0318) | 3.716*** (0.0369) |
| Observations | 41,152 | 41,152 | 35,533 | 16,451 | 32,012 | 32,012 | 26,393 | 7,311 | 33,841 | 33,841 | 28,222 | 9,140 |
| R-squared | 0.073 | 0.073 | 0.061 | 0.029 | 0.073 | 0.074 | 0.059 | 0.045 | 0.075 | 0.076 | 0.064 | 0.050 |
| Robust standard errors in parentheses | | | | | | | | | | | | |
| *** p<0.01, ** p<0.05, * p<0.1 | | | | | | | | | | | | |

Department for Business and Trade

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