How do firms cope with economic shocks in real time?

Thiemo Fetzer Christina Palmou Jakob Schneebacher*

February 29, 2024

Abstract

How do firms adapt to large increases in their energy input costs? This question is key to policy design in both the current energy crisis and on the longer-term path towards Net Zero. We build the machinery for evaluating the impact of input price shocks on firm adaptation with real-time firm-level administrative and survey data and provide the first firm-level evidence on adaptations to the large, unexpected energy price shock triggered by Russia's ongoing war in Ukraine. To discipline the analysis, we pre-registered an analysis plan that set out a simple framework for firm responses along output, price, input, process and survival margins. We test these predictions using a mix of novel and previously under-utilised high-frequency firm-level survey and administrative data in the UK and a shift-share strategy that exploits firms' energy intensity prior to the unexpected energy price shock. On average, firms pass on some of the increased input costs, respond by increasing cash reserves and see their debt obligations worsen. We do not yet see increased redundancies or bankruptcies. However, these average effects mask large heterogeneity. Small firms respond by keeping larger inventories, and are more likely to pass on input cost increases. Large firms are more likely to make capital investments. We estimate separate elasticities in small industry-size cells and use k-means clustering techniques to classify firms into a small number of archetypes. The adaptation elasticities we estimate can be used to tailor firm support in the energy transition both in the short and the long term. More generally, the machinery developed in this paper will enable policymakers to evaluate

*Fetzer is based at Warwick University and University of Bonn. Palmou is based at the Office for National Statistics (ONS). Schneebacher is based at the Competition and Markets Authority (CMA) and affiliated with King's College London (KCL). We are grateful to Peter Lambert, Ludovic Panon and the audience of the CEPR-Bank of Italy workshop "Adapting to a riskier and more fragmented world" 2023 for comments. Any views expressed are solely those of the authors and do not necessarily represent those of the CMA or the ONS. This paper uses ONS statistical research datasets via the Secure Research Service (SRS). Outputs may not exactly reproduce National Statistics aggregates. Fetzer acknowledges support through the Leverhulme Prize in Economics, the European Research Council Starting Grant (ERC, MEGEO, 101042703), Deutsche Forschungsgemeinschaft (EconTribute, DFG, EXC 2126/1-390838866) Corresponding author: Jakob Schneebacher (jakob.schneebacher@cma.gov.uk).

and adjust economic policy in near real time.

JEL Classification: D22; D24; H23; L11; O30
Keywords: energy price shock; firm dynamics; energy transition

1 Introduction

Economic shocks to both supply and demand are a feature of modern economies across the economic cycle. In many instances, the underlying shocks have heterogenous impacts across different parts of the economy. How, if at all, should policy makers intervene to stabilize the economy? A series of recent crises, from Covid-19 to Russia's invasion of Ukraine has made this question ever more salient.

Energy is a fundamental input into many firms' production processes. In the context of transitioning towards Net Zero, understanding how firms might react to large increases in energy prices through Pigouvian taxation is crucial for identifying the trade-offs and design welfare-improving business support policies. More imminently, governments around the world are grappling with how best to support businesses affected by the large and sudden change in energy prices triggered by Russia's ongoing war in Ukraine.

We cannot provide targeted support for what we cannot measure accurately and in a timely manner. Evaluating firm responses to these shocks, and designing optimal policies, is further complicated by the fact that firms may adapt on many different margins: they might adjust their output prices or quantity, their input mix, their production processes or might exit the market altogether. Different types of firms might also respond differently. Size (Kalemli-Ozcan and Saffie, 2021), production technology (Durante et al., 2022), market structure (Duso and Szücs, 2017) and firm management (Lamorgese et al., 2021; Li et al., 2022) might all matter for the precise bundle of actions an affected firm might take. This heterogeneity in responses is as important to

understand as the average treatment effects.

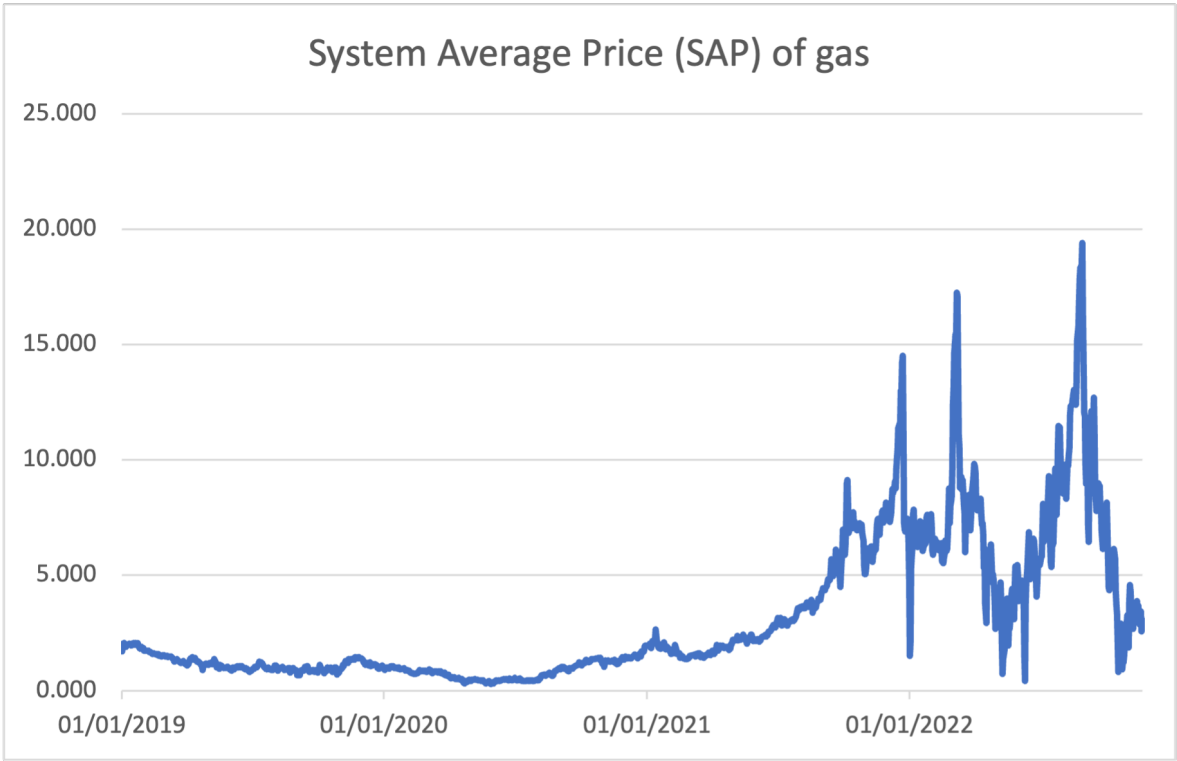
This paper builds the machinery to solve the three problems of timeliness, multiple response margins and heterogeneity in firm responses and provides the first evidence of firm adaptations in response to the ongoing energy crisis triggered by Russia's invasion of Ukraine. In order to do so, we combine and cross-validate high-frequency, real-time, firm-level administrative and survey data from the UK Office for National Statistics (ONS). Many of these data sources are novel or have not been used for firm-level research before. The high frequency and close to real-time nature of the data allow us to see how firms' adjustments evolve over the short, medium and longer term at different margins with little delay. Combining administrative and survey data helps us to supplement the reliability and coverage of the former with the richness of the latter.

To identify causal effects of the energy price shock, we follow a shift-share identification strategy (Bartik, 1991; Borusyak et al., 2022) that exploits pre-shock energy intensity at the firm level and the unforeseen nature of Russia's invasion of Ukraine. Figure 1 shows the magnitude of the resulting energy price shock. Within a few months, wholesale energy prices in the UK quadrupled. In addition, we flexibly control for a host of firm characteristics and progressively saturate the specification with more and more granular fixed effects.

Having established the average treatment effects, we estimate the model separately for hundreds of different industry-employment cells. This allows us to characterise the heterogeneity in firm responses, and with the help of a k-means algorithm to cluster firms into archetypal categories. To discipline our analysis, at the beginning of the project we publicly pre-registered an analysis plan (https://osf.io/5entz/). We believe that this combination of real-time data and pre-registered analysis provides a blueprint for policy-relevant economic analysis more widely.

We find that on average firms exposed to the shock do not appear to be any more likely to reduce labour inputs or to exit the market. For the smaller sample of firms in the Business Insights and Conditions Survey (BICS), we additionally observe rich qualitative outcomes at high frequency. On average, energy-intensive firms increase their

Figure 1: System Average Price for Natural Gas in Great Britain



Notes: This is the average price of all gas traded through the balancing market. Market participants post bids or offers for volumes of gas as day-ahead and within-day trades. The SAP aggregates the trades conducted on the On-the-Day Commodity Market (OCM). This is the market that National Grid use in their role as residual balancer. Other markets exist for wholesale gas trading in GB. These data can be used to understand the general trend of gas prices within Great Britain. The daily SAP is used to determine the futures price and is therefore a useful indicator of supply constraints and demand pressures.

output prices as they see the prices of their inputs rise. Turnover expectations adjust downwards. Both large and small firms increase their cash reserves by a similar amount. We find no significant increase in the perceived risk of insolvency or in reported trading status. However, we find debt indicators to rise differentially for energy-intensive firms. Affected firms are more likely to have increased debt obligations and expect their debt repayments relative to turnover to increase.

In terms of heterogeneity, smaller firms are twice as likely to increase their output prices as large firms. Larger firms on the other hand increase their capital spending. We find differences in the dynamics between large and small firms too. While smaller firms

increase their stock levels in response to the shock, there is no evidence larger firms do likewise. This split in responsiveness between small and large firms echoes Choi et al. (2024) who find similar results for the transmission of monetary policy shocks.

Finally, we show that differences in elasticities are systematically correlated across response margins. For instance, manufacturing firms see a relatively muted response on price margins and large impacts on indebtedness. Wholesellers and retail traders react much more responsively on price and stock level margins, but do not invest in capital. Construction companies invest heavily and see no effects on prices.

This paper makes three contributions. The first is methodological: we combine real-time administrative and survey microdata with a pre-registered analysis plan to understand firm responses to ongoing, relevant economic shocks in near-real time. Pre-registering quasi-experimental research is still uncommon in economics[1] but even for randomised controlled trials (RCTs), Brodeur et al. (2022) find that a posted pre-analysis plan reduces the likelihood of p-hacking and publication bias.[2] Being explicit about our hypotheses and plans going into this project disciplines our empirical analysis even as we explore heterogeneity in firm responses along a large number of dimensions. We can thus identify mechanisms as joint distributions on marginal effects and validate implicit narratives by looking across multiple coefficients.

Our second contribution is to the emerging literature on the energy price shock and Russia's war in Ukraine more generally. Recent papers have explored fiscal (Bachmann et al., 2022; Auclert et al., 2023), trade (Itskhoki and Mukhin, 2022; Babina et al., 2023) and inflationary (Lafrogne-Joussier et al., 2023) effects of the war and the resulting energy price spike. This paper to the best of our knowledge is the first to investigate the real effects on firm behaviour across a variety of margins. Despite much of recent policy being devoted to supporting firms in the face of higher energy prices, much of our evidence of how firms respond to such shocks comes from the experience of the

[1] For a recent exception see Clemens and Lewis (2022).

[2] Decker and Ottaviani (2023) similarly find that merely pre-registering a trial reduces p-hacking for medical studies.

1970s and oil price shocks and are thus decades out of date (Kilian, 2008, 2014).[3]

Finally, this paper contributes to a large and growing literature on the Green Transition and the structural transformation required to reach a carbon-neutral economy (Gillingham and Stock, 2018; Glennerster and Jayachandran, 2023). Most papers in this literature argue that higher carbon taxes will be required along the transition path (Metcalf, 2009; Marron and Toder, 2014). Mechanically, a proportional carbon tax on carbon-intensive inputs is identical to the observed energy price shock generated by Russia's war in Ukraine. Therefore, the estimated elasticities in this paper can be used to design optimal taxation and business support policies to smooth the path towards Net Zero. Our results suggest that large firms with market power act as 'shock absorbers' by incompletely passing cost increases through. Our results also suggest at least in the short to medium term bankruptcies are unlikely to be a large concern, at least at the price differentials we observe. However, firms' financial positions worsen, which may impact their survival rate in the longer term. Finally, without targeted subsidies, capital investments to help the economy move away from energy-intensive production seem to be concentrated in larger firms.

This paper is part of a larger research programme to estimate consumer, financial markets, firm and political responses to energy price shocks in real time (Fetzer et al., 2022; Fetzer, 2023a,b). Together, these papers highlight the social value of timely access to research data in enabling more evidence-based policy decisions.

The rest of the paper is structured as follows. Section 2 outlines our conceptual framework and our pre-analysis plan. Section 3 describes the data construction and main variables of interest. Section 4 explains the sources of variation and our empirical strategy. Section 5 covers our empirical results. Section 6 discusses implications for policy design and a brief final section concludes.

[3]Recent exceptions are Fontagné et al. (2023), who examine the responses of French manufacturing firms to energy price fluctuations, and André et al. (2023) who look across countries on firm-level responses to sectoral price changes. However, both data series stop short of the current crisis. Additionally, Ari et al. (2022) pull together some lessons for policymakers.

2 Conceptual framework and pre-analysis plan

2.1 The conceptual framework

To understand how firms might respond to energy price shocks, we start from a simple model of a profit-maximising firm. The firm will choose labour L_i, capital K_i, intermediate inputs M_i and energy E_i at their respective input prices w, r, p_M, p_E. It produces output Y_i subject to its particular production function $Y_i = f_i(K_i, L_i, , M_i, E_i)$ which it sells at output price P.[4] It may have power in some input or output markets, but is a price taker in the energy market. Additionally, as is standard in the literature, the firm only operates as long as profits are weakly positive, $\Pi_i \geq 0$.

An increase in the price of energy, p_E will potentially lead to adjustments along all of the firm's endogenous margins. Unambiguously, the quantity of energy consumed, E_i will weakly decrease due to the own price effect. The impact on the other inputs, labour, capital and intermediate consumption, will depend on the shape of the production function and the market structure in input and output markets. Additionally, firms will change their output and may be able to pass some of their cost increase on to customers if they have market power. Firms may also adapt their technological or organisational processes in response to the price shock, changing the shape of the production function f_i. Finally, the firm may now not be able to satisfy its non-negative profit constraint and may choose to cease operating. Table 1 summarises the potential adjustment margins and how they map into our key outcome variables.

[4] To fix ideas, we assume a single-output firm.

Table 1: Conceptual framework

Margin	Variable	Hypothesis
Output Q	Turnover, exports	Expect Q to go down
Output price P	Prices for goods and services sold	Expect P to go up
Input mix (K, L, M, E)	Capital, imports, redundancies	Expect E to go down (K, L, M) ambiguous
Process $f(\cdot)$	Cash reserves, stock levels, working from home	Expect cash levels and stock reserves to go up
Survival	Risk of insolvency, debt, death rate, redundancies	Expect survival probability to decrease

2.2 The pre-registered analysis plan

Initial pre-analysis plan. We posted a pre-analysis plan (PAP) publicly and irreversibly on 1 December, 2022 at the Open Science Foundation (OSF) using the URL https://osf.io/5entz/. Posting the PAP predates our earliest data linking and analysis in the ONS Secure Research Service (SRS) which began in early December 2022.

The stated goal of the PAP was not to limit analysis to only those hypotheses that seemed plausible before handling the data, but rather to create a transparent, public record of the order of hypothesis generation and testing. As per the initial PAP, and to further prevent data mining, we developed the energy intensity measure $E_{i,s(t)}$ separately from the construction of the outcome panel data sets.

1 April 2023 update. An update to the PAP on 1 April 2023 set out additional predictions due to a change in energy support policies for UK firms. This evaluation remains work in progress.

3 Data sources and key variables

3.1 Data structure

Unit of analysis. The unit of analysis in this project is an individual firm i, measured at the UK Office for National Statistics (ONS) reporting unit level (RUREF).[5] A firm might have multiple establishments or local units, denoted by the local unit reference (LUREF) and may be part of an enterprise group, denoted by the Who-Owns-What reference (WOWREF).

Energy data. We use two ONS firm-level surveys to obtain firm-level pre-shock energy cost shares. The first is the Annual Purchases Survey (APS) which records detailed information on annual input expenditures. The second is the Annual Business Survey (ABS) which is the UK's structural business survey and reports less fine-grained input information but for a larger number of firms. Both data sources are described in more detail in the next subsection. Energy-shock exposure variables follow the energy intensity measures reported in ONS (2022).

Outcome data. We use two main outcome data sources. The first is the Longitudinal Business Database, a new administrative data product derived from the UK's business register. This provides sparse but near-universal information for the UK's business population. The second is the Business Insights and Conditions Survey (BICS), a large, voluntary business survey running since the early days of the Covid-19 pandemic. We also link to a variety of other high-frequency survey and administrative sources. The next subsection gives more information on specific sources.

[5] More precisely, the reporting unit is the economically meaningful entity at which ONS surveys are administered. Some larger firms may consist of multiple reporting units.

3.2 Data sources

The Annual Purchases Survey. The Annual Purchases Survey (APS) collects detailed information on business expenditures. We use APS2018 (the latest year available) to construct our baseline energy intensity measure, $\mathbf{E}_{1i}$. $\mathbf{E}_{1i}$ is a vector of expenditures on specific energy inputs (e.g. natural gas, electricity, diesel) divided by total purchases. If a firm is not sampled in APS2018, we go back to APS2017. If the firm is not present in either wave, we impute energy input intensities as average energy intensities in the same industry-region-sizeband cell.

The Annual Business Survey. The Annual Business Survey (ABS) is the UK's structural business survey. We use ABS2019 (the last pre-pandemic year available) to compute an alternative energy intensity measure, E_{2i}. E_{2i} is computed as a firm's energy purchases divided by its total purchases. If a firm is not sampled in ABS2019, we go back to ABS2018 and ABS2017. If the firm is not present in any of the last three waves, we impute energy intensity as average energy intensity in the same industry-region-sizeband cell.

The Business Insights and Conditions Survey. The Business Insights and Conditions Survey (BICS) is a qualitative, fortnightly, topical business survey established during the pandemic. The BICS is a voluntary survey sent to approximately 50,000 businesses every two weeks, with a response rate of roughly 25%. Large businesses often receive many consecutive survey waves, whereas small firms are rotated in and out to reduce survey burden. The BICS provides rich and timely information for a sample of the UK business population. We use three types of variables from the BICS. First, we use a set of questions intermittently asked on the BICS about the length and coverage of businesses' current electricity and gas contracts. We use this to construct a third energy intensity measure, EI_{3i} which interacts EI_{2i} with a dummy for contracts that expire in the near term or cover gas and electricity costs only partially. Second, we use questions asked about a firms climate attitudes and behaviour as well as their perceived

exposure to the energy shock. A list of these questions is provided in the appendix. Third, we use BICS questions on firm input, output, pricing and innovation behaviour, as well as firms' subjective measures of their financial and economic health, as the main outcome variables in this project. The exact variables of interest as well as how we put together the BICS panel can be found in the appendix.

The Longitudinal Business Database. The Longitudinal Business Database (LBD) is an experimental data infrastructure project of the ONS, aimed at allowing the quick assembly of firm-level linked datasets from a variety of sources for microdata analysis (Lui et al. (2023)). The LBD is a quarterly, linked, firm-level dataset constructed using the UK's business register, the Interdepartmental Business Register (IDBR). The IDBR captures the universe of UK firms that either pay value-addded tax (VAT) or contribute to pay-as-you-earn (PAYE) income tax schemes. In a given quarter, active firms on the IDBR number approximately 3 million. A first dataset with linked, firm-level Inter-Departmental Business Register (IDBR) data at quarterly frequency is now available in the ONS Secure Research Service (SRS). We use survival, employment, and establishment count at a quarterly frequency as outcome variables in our analysis. The LBD also contains turnover (which can be used to construct labour productivity) which we use in secondary analysis. However, since turnover and to some extent employment is recorded on the IDBR from a variety of sources and at variable lags, these results need to be treated with caution. We also plan to use IDBR data to construct control variables (e.g. industry, region, employment, employment growth, legal status and industry concentration).

The Monthly Business Survey. The Monthly Business Survey (MBS) is a monthly business survey for the services sector in the UK and the production sector in Great Britain. It samples approximately 34,000 businesses and asks about turnover and changes in turnover on a monthly basis, and employment on a quarterly basis. The MBS is used in the construction of Gross Domestic Product (GDP) figures and for

monthly statistical bulletins.

The Producer Price Indeces. The Producer Price Indeces (PPI) are a set of statutory, monthly surveys that measure changes in the price of goods bought and sold by UK manufacturing businesses. For some industries (like agriculture, energy and commodities) additional survey, commercial and administrative data sources are used. Sales and volumes data used for weighting purposes also comes from a variety of survey and administrative sources.

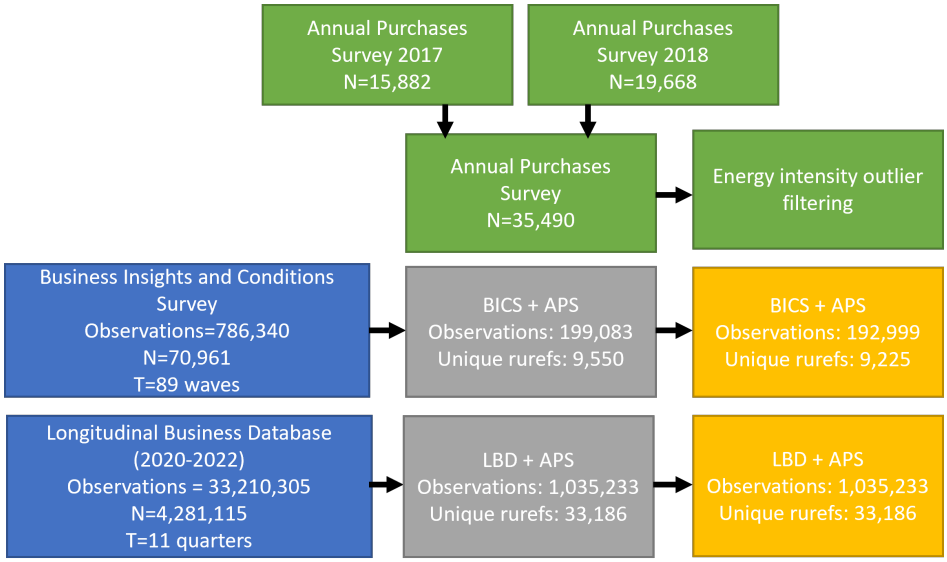
The Management and Expectations Survey. The Management and Expectations Survey (MES) is an experimental UK business survey that aims to capture managerial and organisational practices in the UK. Managerial practices have proved quite important for adaptation and resilience in the pandemic (Lamorgese et al. (2021), Li et al. (2022)). We therefore plan to examine heterogeneous impacts of energy price shocks interacted with a measure of management quality as well as ownership characteristics from the last wave of the survey, MES2020.

3.3 Data linking and cleaning

Figure 2 summarises the data linking process. We link BICS waves 1-89, corresponding to March 2020 to August 2023, by RUREF to our units of analysis. We harmonise responses to BICS questions on variables of interest, over time. For some variables a sufficiently long pre- and post-treatment panel exists to test anticipation effects. For others, we only have a post-treatment panel or even a single cross section.

We then link BICS respondents to the APS 2018 and 2017 using the latest available data point for each RUREF. The resulting sample consists of 9,550 firms and 199,083 observations. We strip our energy intensity measure of outliers by trimming observations below the first and above the 99th percentile. The resulting sample consists of 9,225 firms and 192,999 observations.

Figure 2: Data linking and cleaning



3.4 Key variable construction

Energy intensity measure. We measure energy intensity $E_{is(i)}$ as a share of total costs. This presents two problems. First, there may be firm-specific idiosyncratic variations in the energy cost shares that are not due to the technical requirements in the production processes used by firm i. Second, firms may be exposed to the energy price shocks *indirectly*, through the costs they pay for other inputs if the production of these inputs is energy-intensive (or in turn requires energy-intensive inputs).

Comparisons to more direct quantity measures. The ONS environmental accounts provide us with energy measures of (absolute) gross calorific values, million tonnes of oil equivalent (Mtoe). This is only available at the relatively coarse sector level, see https://www.ons.gov.uk/economy/environmentalaccounts/datasets/ukenvironmentala Figure X in the appendix compares this direct measure of energy intensity quantities with our cost share measures. [FINDINGS TBD.]

Indirect exposure to energy shocks. First, we compare an industry-level measure on actual real-time energy expenditure flows from ONS (2023) against our industry-

level elasticities. [FINDINGS TBD.] Second, we compute total industry-level energy intensity by inverting the ONS Input-Output tables [CITE]. [FINDINGS TBD.]

4 Empirical methodology

This section explains the empirical methodology we employ. It covers first the estimating equation and assumptions required for causal inference, then how we explore heterogeneity and quantile effects and finally how we explore the correlations across adjustment margins via clustering on industry-size specific estimates.

4.1 Estimating equation

We pre-registered our main estimating equation in the initial PAP. This estimating equation takes the following form:

$$Y_{is(i)t} = \alpha_i + \beta_{s(i)t} + \xi \times Post_t \times E_{is(i)} + \nu \times X_{is(s)t} + _{is(i)} \tag{1}$$

Here, α_i captures a firm i fixed effect, absorbing any time-invariant (un)observable firm characteristics. We also control for time fixed effects $\beta_{s(i)t}$. These account for time-varying non-linear shocks that are common to all firms. These time-fixed effects could be specific to the (sub) sector that a firm i operates in, indicated by $s(i)$. The extent to which we can control for more demanding time-fixed effects is strongly informed by the amount of *intra-sector* variation in the energy intensity measure across firms, $E_{is(i)}$.

$E_{is(i)}$ denotes the energy intensity measure, calculated as the Annual Purchases Survey energy purchases as a share of total. The indicator $Post_t$ is a binary measure that captures the time-period after the gas price shock. Figure 1 provides an indication that a good time point is November 2021, alternatively, 24 February 2022. Since then, spot market prices for natural gas have averaged around 7 p/kWh. This is 4.3 times the average for the period from 2018 to October 2021 inclusive.

The indicator $Post_t$ is a binary measure that captures the time-period after the gas

price shock. Figure 1 provides an indication that a good time point is November 2021. We report results for both this date and the other plausible alternative, the start of the invasion on 24 February 2022. Since then, spot market prices for natural gas have averaged around 7 p/kWh. This is 4.3 times the average for the period from 2018 to October 2021 inclusive.

We also allow the inclusion of potentially other sets of control variables, $X_{is(s)t}$. There are good reasons, for example, to allow for flexible time-trends in other variables that are measured at the firm level. The degree to which the empirical specification can be saturated with more demanding fixed effects or additional controls, ultimately, depends on the nature of the variation, the expected estimated effect size and its distribution. These parameters were of course unknown ex ante. We therefore estimate our estimating equation with progressively more demanding controls and fixed effects and show results across all specifications.

Logic of the estimation protocol There are four choices around the empirical design that applied researchers wishing to study the impact of the energy crisis at the firm i level can make. Every firm i is mapped to a sector g through a mapping $s = g(i)$. The sector mapping can have different granularities that arises from the nomenclature used to classify economic activities of a firm. The UK's Standard Industrial Classification distinguishes between 732 industry codes.[6] Similarly, we observe the energy intensities E_i measured either directly at the firm or, when imputed, as a sector level characteristic, $E_{g(i)}$. Lastly, there is a decision over the functional form or the parameterisation of the energy intensity measure. When we use a continuous measure $E_{g(i)}$, implicitly, we assume that we can identify the treatment effect through the differential exposure that is captured by the energy intensities of a firm whereby a firms that have a higher energy intensity is treated with a higher dose. An alternative way of parameterising the shock is to dummify the continuous measure $E_{g(i)}$, for example, for this to be above-

[6] See https://resources.companieshouse.gov.uk/sic/. Internationally, the most granular representation of industries is at the four digit level distinguishing 419 different codes (https://unstats.un.org/unsd/classifications/Econ).

or below the mean or median. The binary indicator can be computed with regards to a changing reference point for ease of interpretation. For example, we can discretize the exposure measure to identify firms that, *within industry*, have an above median or mean energy intensity.

If we consider specifications in least granular form with industry or firm level shifter fixed effects at varying granularities, e.g. 3, 4, 5 and the firm level, together with time fixed effects at the 2,3,4,5 level, a total 10 potential specifications are estimable.

Technically, we can also estimate industry aggregated models but since our dataset is an unbalanced panel with variying composition and the sample changing compositionally, we stick with the granular version. This could help on external validity and may improve measurement error.

Having the $E_{g(i)}$ at sector level measure, for example, rather than firm will attenuate the variation but can increase the signal quality if the firm-specific measure is measured with noise, but then comparisons will be explicitly between sector not within, especially for exercises with less granular sector by time fixed effects.

If, for example, we do not find systematic results across all nested models this would raise some flags about the reliability of the empirical design. The risk of cherrypicking results through presenting a set of nested specifications becomes much lower.

Also transparently showing when results disappear is important as it highlights the nature of variation. Closely monitoring the evolution of R2 to see at what level models become too saturated for effects to be detectable.

We present a whole menu of specifications going from the least-demanding to the most-demanding specification. In the estimation of such specifications there is a bias-variance trade-off to consider. The menu of outcomes we consider are varying within firms over time.

Moving from a standard difference-in-difference setups with two groups

for this paper

Estimation of treatment effect. The causal effect in these regressions is estimated by interacting common, unanticipated shocks to energy prices with pre-existing variation in the exposure to the shock, as measured by a firm's energy intensity before the shock. In the empirical specification this is captured by the estimated coefficient ξ on the interaction term $Post_t \times E_{is(i)}$.

This identification strategy is in the spirit of the shift-share approach pioneered by Bartik (1991) and recently characterised in much fuller detail by Borusyak et al. (2022). We report results for all three exposure measures described above. Given the voluntary nature of the BICS, we test for selective non-response using IDBR characteristics of sampled firms (industry, region, employment, turnover).

Inference. Conceptually, inference is suggested to be carried out at the firm level, as we anticipate to measure the energy intensity at that level. The treatment effect estimate combines time-variation and cross-sectional variation. Hence, another suitable way of carrying out inference is to account for two-way clustering at the firm- and time level. Yet, especially for the data sets that are not available in high frequency, this may not be feasible given the relatively short panel dimension and further complicated by the unbalancedness of, in particular, the BICS data.

4.2 Estimating heterogeneous and quantile effects

In line with much of the existing literature, we first estimate average treatment effects along all of our different margins. We refer to this as the one-dimensional analysis. We report estimated coefficients with more and more granular fixed effects to evaluate at what level of aggregation the variation we exploit takes place. This sheds light on the robustness of the empirical approach and the nature of the variation that we are exploiting. For example, if our empirical specification yields very similar results with less granular sector-by-time fixed effects compared to with more granular sector-by-time fixed effects, this is suggesting that our exposure measure that is constructed at a very granular firm- or sector level carries sufficient within-sector variation.

Discretizing treatment intensity As an alternative to estimating the specification with the continuous measure $E_{is(i)}$, we discretize the exposure measure into percentiles. Our implicit assumption when estimating the interaction term $\xi \times Post_t \times E_{is(i)}$ in specification **??** is that the treatment effect is monotonically increasing in $E_{is(i)}$. That is, firms that have a higher energy intensity and thereby experience a higher treatment dosage, within the same sub-sector are driving the estimated treatment effect. We validate whether this is genuinely the case by discretizing the exposure measure relative to a quantile *within subsector*.

However, this paper does not stop here. After verifying that the estimated coefficients are monotonic in the level of fixed effects, we separately estimate elasticities for small industry-sizeband cells. These estimates allow us to trace out non-parametrically the response function across the firm population.

4.3 Methods for higher-dimensional analysis and clustering

We conduct heterogeneity analysis to discover joint distribution patterns and relationships that can provide insight into firm behaviors beyond the partial, single-variable analysis. We employed clustering analysis to identify common archetypes or patterns in how variables move together across industries. This can show if the one-dimensional reads are consistent with joint distributions found in the data. We then examine heterogeneity by firm characteristics to explain differences found, such as why some industries adjust capital while others increase stock.

Clustering on the beta vector This referred to performing k-means clustering on the vector of point estimates (betas) obtained from the regressions for each dependent variable. This would identify common archetypes or patterns in how the betas/effects moved together across industries. It aimed to see if the one-dimensional results were consistent with joint distributions in the clustered data.

5 Results

5.1 Average treatment effects

The main dependent variables in which effects were detected through the one-dimensional analysis include output and input prices; the capital mix; stock levels and cash reserves; and expectations over future turnover and survival.

For input prices, the one dimensional analysis detected that both small and large firms passed on higher energy costs to their suppliers. As energy intensive firms, they had little ability to absorb increasing input costs given competitive pressures.

Turnover expectations varied between large and small firms. Large companies anticipated declines in revenue due to the energy cost increases. However, small firms did not expect decreases to the same degree. This suggests large firms may have better forecasting abilities or perceive broader macroeconomic impacts, while small firms feel insulated through supply contracts or view themselves as price takers.

Firms' confidence levels showed an interesting divergence. Contrary to expectations, small businesses were surprisingly bullish about their survival prospects despite raising stock levels but not adjusting capital. In contrast, large companies became less optimistic about the future despite making capital mix adjustments. This mismatch between behaviors and expectations warrants further investigation.

Regarding output prices, some industries detected price increases while others saw prices decrease. Sectors experiencing deflation tended to be in services like publishing and printing that face disruption from technological changes. Manufacturing industries showed more inflation, consistent with their role as producers facing rising input costs.

All firms built up cash reserves significantly with no differences between small and large sizes. This applied uniformly, suggesting firms raised cash from various sources to finance upcoming investments and adaptations. Small businesses additionally increased stock levels, likely to maintain supplier relationships while interrupting operations for changes.

Large firms made earlier adjustments to their capital mix compared to small firms.

This indicates larger companies anticipated needing to expand production capacity in response to the energy cost increases.

Tables 2 to 7 report coefficients from our main specification using the linked waves of the Business Insights and Conditions Survey (BICS). On average, energy intensive firms increase their prices as they see the prices of their inputs rise. Turnover expectations adjust downwards. These results are consistent in sign between larger and smaller firms (defined as firms with more, or less, than 250 employees, respectively) and are robust to the inclusion of finer industry, region and size band fixed effects. Smaller firms are twice as likely to increase their output prices. Pass-through in large firms is more limited. Smaller firms affected by the input price shock adjust their prices almost instantaneously, within the first three months of the shock. The effect size rises from January to March 2022, peaks in the window April to June 2022 and peters out in the summer of 2022. Turnover expectations drop following the peak in price rises.

In terms of their input mix, we find that larger firms increase their capital spending but do not significantly change their labour inputs.

In terms of processes, we find that both large and small firms increase their cash reserves by a similar amount. Coefficients are stable across specifications, but only in the case of large firms do we have the statistical power to reject the null hypothesis. There is some evidence that smaller firms adjust increase their stock levels in response to the shock. There is no evidence larger firms do likewise.

Finally, in terms of survival, we find that the confidence of energy-intensive firms that they will survive the next 3 months increases. This is driven by smaller firms and is consistent with the ability of smaller firms to pass on the input price increases to a larger degree than large firms. This increase in confidence is driven by the early stages of the shock and is positive and significant in the first quarter of 2022 before the price increase effect peaks. The effect becomes insignificant from April 2022 onwards.

We find no significant results in the perceived risk of insolvency or in reported changes in trading status from fully operating to partial, full or temporary closure. This is consistent with any statistically significant effect on redundancies. However, we find

debt indicators to be worse for energy-intensive firms. In the post-treatment period, energy intensive firms are more likely to have debt obligations and expect their debt repayments relative to turnover to increase. Debt repayments rise compared to turnover after April 2022 and peak during the summer.

Using quarterly data on turnover, employment and survival from the Longitudinal Business Database (LBD) we find similar results. We find no statistically significant drops in firm-level employment or turnover following 2021 Q4 or increases in firm exits among more energy-intensive firms.

5.2 Dynamics

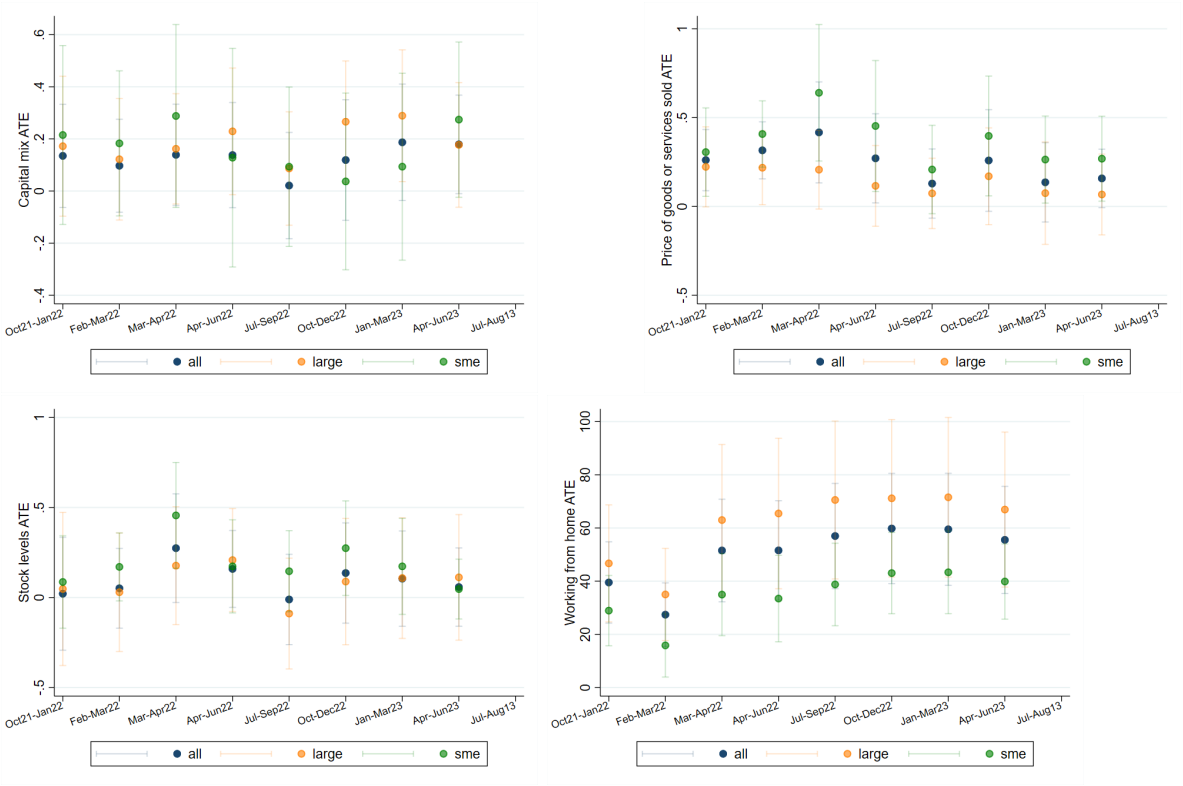
For our baseline outcome variables, we can exploit the panel nature of most questions to investigate the dynamics of firms' response to the energy price shock. Figure 3 plots the dynamics for four key outcomes: the capital mix, output prices, stocklevels and working from home. The results show key differences between short- and long-run responses and between large and small firms.

5.3 Heterogeneous and quantile effects

The average effects estimated in the previous subsection may however mask significant heterogeneity. Firms will adjust differently on different margins based on their production function, market structure or management capabilities. We therefore test to what extent the estimated marginal effects are driven by particular industries or types of firms. Figure 4 plots the distribution of coefficients from restricted sample regressions on each 5-digit industry against the industry's energy intensity.

The one-dimensional analysis involved running separate regressions for each dependent variable of interest (outcomes like prices, costs, expectations etc.) on the independent variable of energy intensity. This allowed detecting the main effects for each variable:

Figure 3: Dynamic effects for key margins of adjustment, by firm size



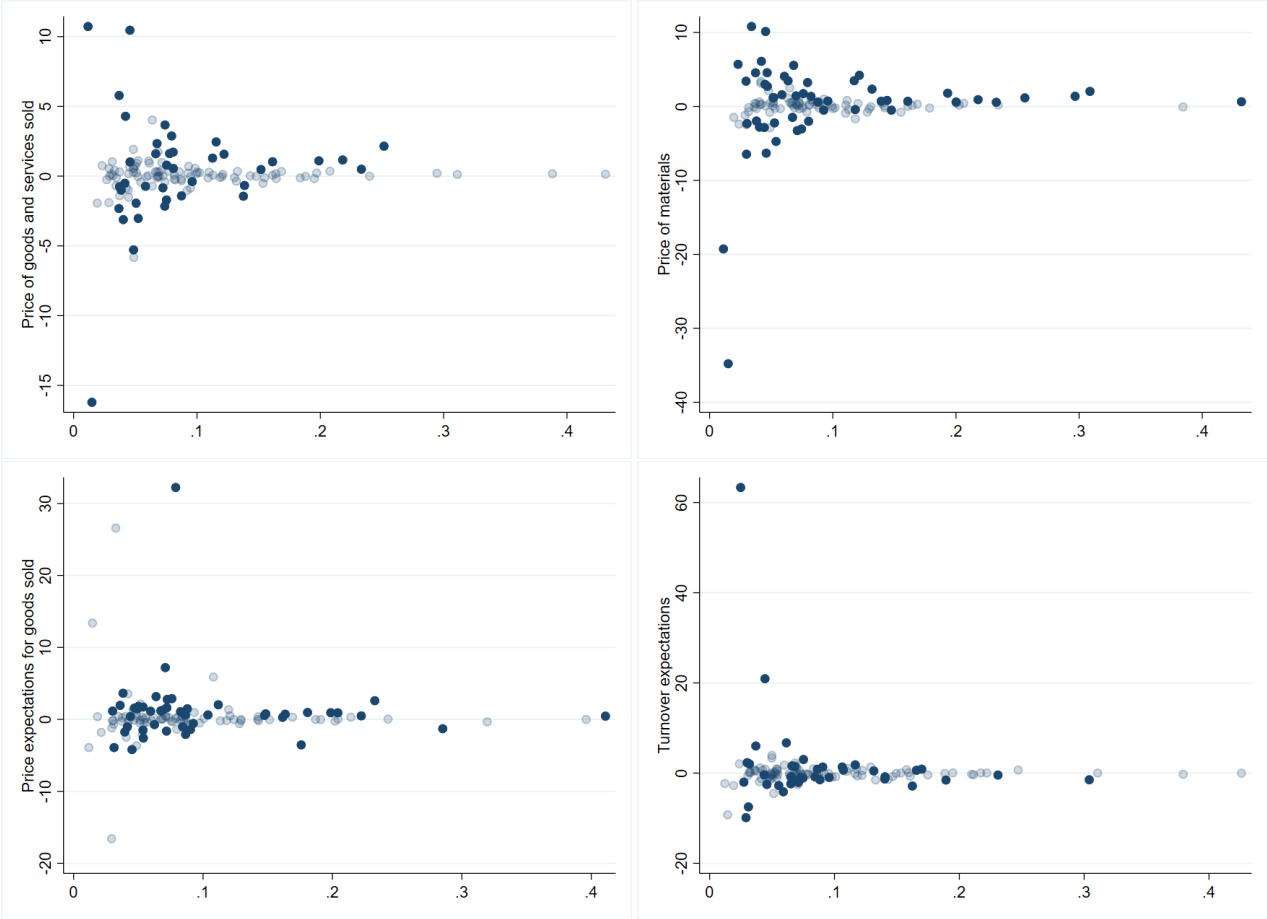
Input prices. Firms passed on higher energy costs to suppliers, suggesting they had little ability to absorb costs due to competitive pressures.

Output prices. Varying effects found across industries. Some increased prices while others like publishing/printing saw deflation, facing disruption from technological changes.

Turnover expectations. Large firms anticipated declines but small firms did not to the same degree, possibly due to forecasting abilities or perceiving broader macro impacts.

Confidence. Small firms surprisingly more bullish than large ones about survival prospects despite behaviors like increasing stock but not capital.

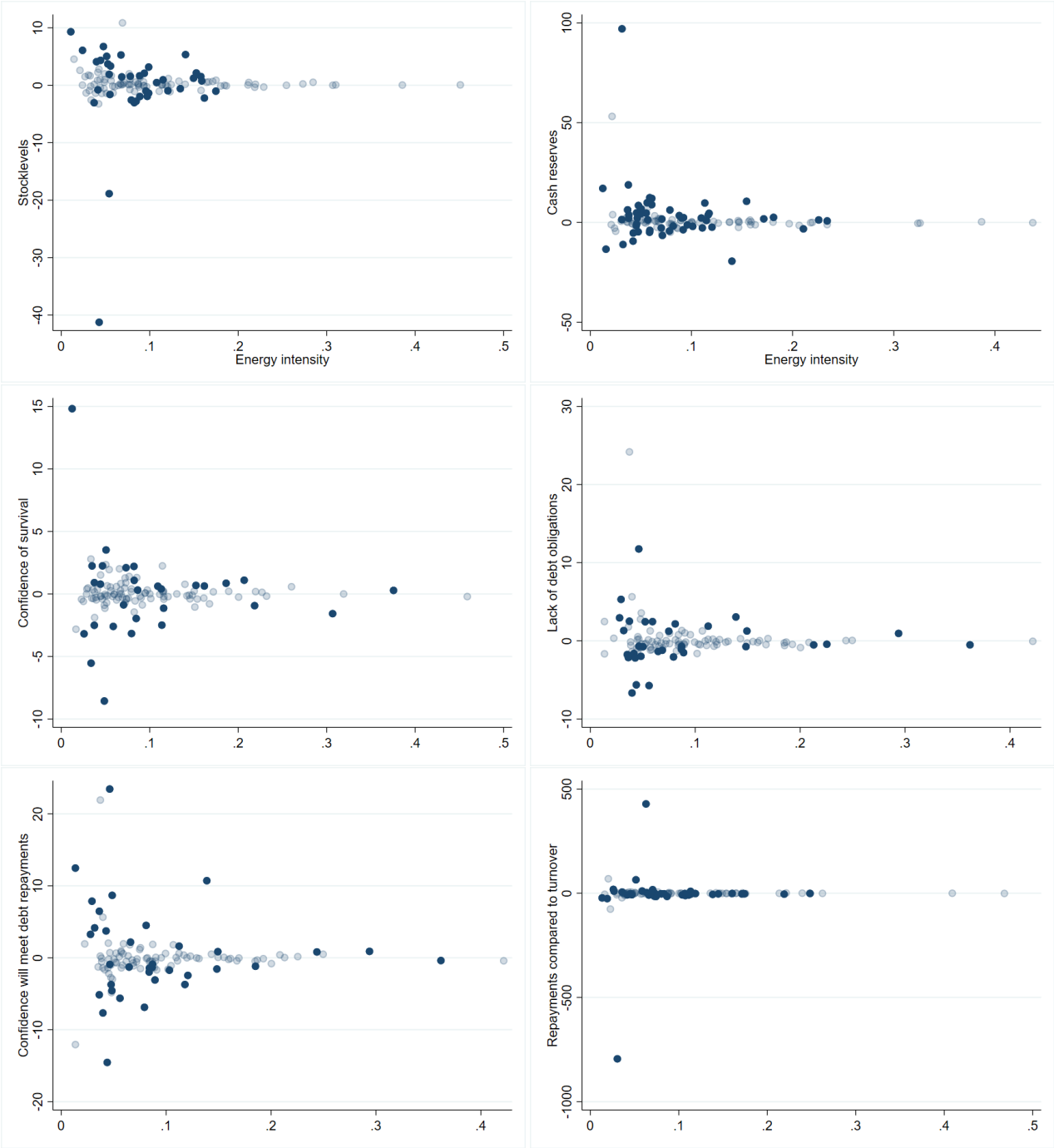
Figure 4: Coefficient distributions against energy intensity



Cash reserves. All firms significantly increased reserves with no differences between sizes, implying raising cash from various sources.

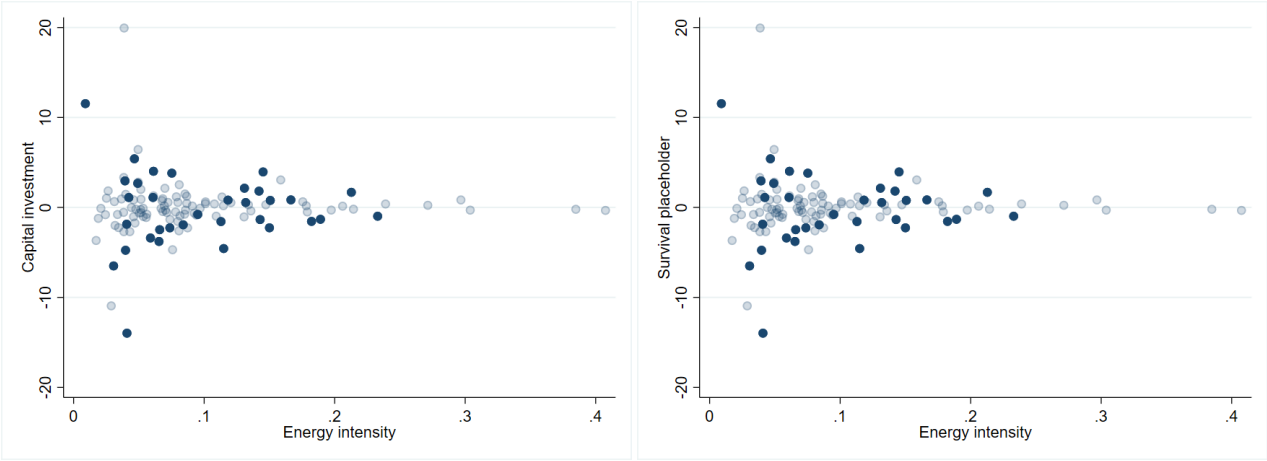
Stock levels. Small businesses specifically increased stocks, likely to maintain supplier relationships while adjusting operations.

Capital mix. Large firms showed earlier adjustments compared to small firms, indicating anticipating needing expanded capacity.



5.4 Higher-dimensional analysis and clustering

The estimated elasticities are systematically correlated across the different response margins. To impose structure on the estimates, this section reports results from a



simple k-means clustering exercise.

6 Implications for policy design

The results in this paper have direct implications for policy design in two ways. First, they can be used to design business support policies in the short term in response to the energy crisis triggered by Russia's ongoing war in Ukraine. We show that even one year after the initial invasion, direct energy price shocks have not led to increased business deaths for more affected firms, but debt loads have increased and firms have built cash buffers, so long-term effects on firm survival remain to be seen. Updates to this paper will speak to this issue and inform policymakers in near-real time.

Additionally, we see large firms invest in capital to adapt to the shock and act as "shock absorbers" by being less likely to pass through input price increases. Small firms on the other hand reduce their stock levels and mostly pass on the input price increases to their customers.

When we estimate elasticities separately for small industry-sizeband cells and use a machine-learning algorithm to divide firms into archetypes we see that not all firms cope with the increase in energy prices equally well.

Table 2: Average treatment effects for firms' output

Output		Estimate (ξ Treatment * Energy intensity)		
		all	large	small
Turnover change (3 cat)	ξ	0.0781	0.0831	0.0685
	se	(0.114)	(0.129)	(.)
	R^2	0.373	0.361	0.397
	N	115544	72300	43244
Turnover change (6 cat)	ξ	0.0476	0.220	-0.246
	se	(0.150)	(0.252)	(0.244)
	R^2	0.484	0.465	0.521
	N	84870	54021	30849
Turnover expectations (3 cat)	ξ	-0.164*	-0.173	-0.157
	se	(0.0779)	(.)	(0.102)
	R^2	0.274	0.257	0.304
	N	103876	65011	38865
Turnover expectations (5 cat)	ξ	-0.0730	-0.0616	-0.149
	se	(0.0560)	(0.0628)	(0.154)
	R^2	0.324	0.302	0.361
	N	74755	47774	26981
Export status (2 cat)	ξ	-0.0224	-0.0173	-0.0167
	se	(0.0279)	(0.0339)	(0.0404)
	R^2	0.898	0.895	0.904
	N	120464	75163	45301
Export status (3 cat)	ξ	-0.0704	-0.0464	-0.100
	se	(.)	(.)	(.)
	R^2	0.942	0.938	0.946
	N	75718	45647	30071
Export change	ξ	0.0572	0.255	-0.297
	se	(0.206)	(0.255)	(0.217)
	R^2	0.422	0.395	0.461
	N	43332	26538	16794

Notes: Table represents estimated treatment effects with firm and wave fixed effects. Standard errors are clustered by wave and industry division (2 digit sic). The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table 3: Average treatment effects for firms' input mix

Input mix		Estimate (ξ Treatment * Energy intensity)		
		all	large	small
Capital	ξ	0.161*	0.152	0.220
	se	(0.0731)	(0.147)	(0.185)
	R^2	0.644	0.624	0.676
	N	32354	21217	11137
Capital mix	ξ	0.225*	0.262	0.203
	se	(0.103)	(.)	(0.168)
	R^2	0.490	0.472	0.518
	N	37758	24722	13036
Imports change	ξ	0.251	0.238	0.135
	se	(0.173)	(0.213)	(.)
	R^2	0.379	0.371	0.400
	N	54139	33757	20382
Import status (2 cat)	ξ	-0.0232	-0.0453	0.00133
	se	(.)	(.)	(0.0457)
	R^2	0.871	0.870	0.873
	N	119004	74345	44659
Import status (3 cat)	ξ	-0.0404	-0.0750	-0.00101
	se	(.)	(0.0648)	(0.0709)
	R^2	0.932	0.931	0.934
	N	58802	35570	23232
Log employment (LBD)	ξ	0.0186	-0.0615*	0.0422*
	se	(0.0179)	(0.0247)	(0.0187)
	R^2	0.985	0.985	0.979
	N	299650	69542	230000
Employment (LBD)	ξ	-12.38	-155.4	1.732*
	se	(.)	(.)	(0.680)
	R^2	0.993	0.993	0.977
	N	299790	69542	230141

Notes: Table represents estimated treatment effects with firm and wave fixed effects. Standard errors are clustered by wave and industry division (2 digit sic). The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table 4: Average treatment effects for firms' prices

Prices		Estimate (ξ Treatment * Energy intensity)		
		all	large	small
Price of materials	ξ	0.370**	0.326*	0.456
	se	(0.109)	(0.145)	(.)
	R^2	0.392	0.359	0.434
	N	94290	58584	35706
Price of goods sold	ξ	0.249	0.185	0.389**
	se	(.)	(0.129)	(0.119)
	R^2	0.349	0.321	0.392
	N	97916	61229	36687
Prices of goods sold expectations	ξ	0.162	0.163	0.155
	se	(0.0906)	(.)	(0.0819)
	R^2	0.365	0.335	0.404
	N	66630	42277	24353

Notes: Table represents estimated treatment effects with firm and wave fixed effects. Standard errors are clustered by wave and industry division (2 digit sic). The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table 5: Average treatment effects for firms' processes

Process $f()$		Estimate (ξ Treatment * Energy intensity)		
		all	large	small
Stock levels	ξ	0.0329	-0.0256	0.164
	se	(.)	(0.182)	(0.117)
	R^2	0.359	0.335	0.397
	N	68668	42271	26397
Hybrid working	ξ	-5.769	-6.404	-5.131
	se	(3.348)	(4.972)	(3.756)
	R^2	0.787	0.768	0.817
	N	58129	35349	22780
Working from home	ξ	51.39	63.11***	30.00***
	se	(.)	(15.72)	(7.795)
	R^2	0.725	0.718	0.734
	N	126124	79111	47013
Working from normal place of work	ξ	16.63*	13.07	20.34
	se	(8.112)	(.)	(.)
	R^2	0.739	0.741	0.732
	N	126124	79111	47013

Notes: Table represents estimated treatment effects with firm and wave fixed effects. Standard errors are clustered by wave and industry division (2 digit sic). The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table 6: Average treatment effects for firms' debt and liquidity

Survival (Debt & liquidity)		Estimate (ξ Treatment * Energy intensity)		
		all	large	small
Cash reserve duration (6 cat)	ξ	0.263	0.245	0.288*
	se	(0.143)	(0.178)	(0.131)
	R^2	0.787	0.786	0.786
	N	77355	48748	28607
Cash reserve duration (3 cat)	ξ	0.0157	0.0123	0.0276
	se	(0.0164)	(.)	(0.0297)
	R^2	0.699	0.714	0.678
	N	77355	48748	28607
Cash reserve duration (2 cat)	ξ	0.0939	0.0707	0.134*
	se	(.)	(0.0913)	(0.0642)
	R^2	0.734	0.733	0.732
	N	77355	48748	28607
Confidence will meet debt obligations (4 cat)	ξ	-0.00229	-0.0342	0.0386
	se	(.)	(.)	(.)
	R^2	0.691	0.677	0.711
	N	31915	19362	12553
Confidence will meet debt obligations (5 cat)	ξ	-0.278**	-0.266	-0.293*
	se	(0.0937)	(.)	(0.126)
	R^2	0.663	0.645	0.690
	N	40204	24308	15896
Confidence will meet debt obligations (3 cat)	ξ	-0.258***	-0.220*	-0.306**
	se	(0.0654)	(0.0807)	(0.0842)
	R^2	0.612	0.590	0.647
	N	40204	24308	15896
Repayments compared to turnover (4 cat)	ξ	-0.0677	-0.00517	-0.132
	se	(0.139)	(.)	(0.173)
	R^2	0.649	0.632	0.674
	N	16768	9627	7141
Repayments compared to turnover (5 cat)	ξ	-0.438**	-0.231	-0.778
	se	(0.154)	(0.166)	(.)
	R^2	0.693	0.677	0.716
	N	26521	15612	10909

Notes: Table represents estimated treatment effects with firm and wave fixed effects. Standard errors are clustered by wave and industry division (2 digit sic). The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table 7: Average treatment effects for firms' survival

Survival (Trading status)		Estimate (ξ Treatment * Energy intensity)		
		all	large	small
Risk of insolvency	ξ	-0.162	-0.0800	-0.263*
	se	(.)	(.)	(0.112)
	R^2	0.666	0.664	0.669
	N	81177	49908	31269
Change in risk of insolvency	ξ	0.0239	0.0361	0.0274
	se	(0.0678)	(0.0932)	(0.0585)
	R^2	0.500	0.475	0.542
	N	40037	24954	15083
Trading status (6 cat)	ξ	0.0804	0.107	0.0617
	se	(0.202)	(.)	(.)
	R^2	0.437	0.403	0.497
	N	184810	115335	69475
Trading status (2 cat)	ξ	0.0384	0.0512	0.0252
	se	(0.0464)	(0.0640)	(.)
	R^2	0.377	0.352	0.427
	N	184291	115042	69249
Redundancies (share)	ξ	0.141	0.00461	0.413
	se	(0.321)	(0.239)	(0.677)
	R^2	0.230	0.214	0.254
	N	138778	87177	51601
Redundancy expectations	ξ	0.0125	-0.0158	0.0526
	se	(0.0337)	(0.0473)	(.)
	R^2	0.501	0.479	0.542
	N	43003	25538	17465
Confidence of 3m survival	ξ	0.0803	0.0369	0.169
	se	(.)	(0.0683)	(.)
	R^2	0.703	0.692	0.714
	N	59784	37104	22680
Log employment (LBD)	ξ	0.0186	-0.0615*	0.0422*
	se	(0.0179)	(0.0247)	(0.0187)
	R^2	0.985	0.985	0.979
	N	299650	69542	230000
Local sites (LBD)	ξ	-0.0718	-1.988	0.0439
	se	(.)	(2.127)	(.)
	R^2	0.964	0.963	0.920
	N	285430	67684	217580
Employment (LBD)	ξ	-12.38	-155.4	1.732*
	se	(.)	(.)	(0.680)
	R^2	0.993	0.993	0.977
	N	299790	69542	230141
Survival (LBD)	ξ	-0.0926**	0.00806	-0.100**
	se	(0.0277)	(.)	(0.0286)
	R^2	0.632	0.651	0.637
	N	299790	69542	230141

Notes: Table represents estimated treatment effects with firm and wave fixed effects. Standard errors are clustered by wave and industry division (2 digit sic). The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Figure 5: Coefficient distributions against energy intensity

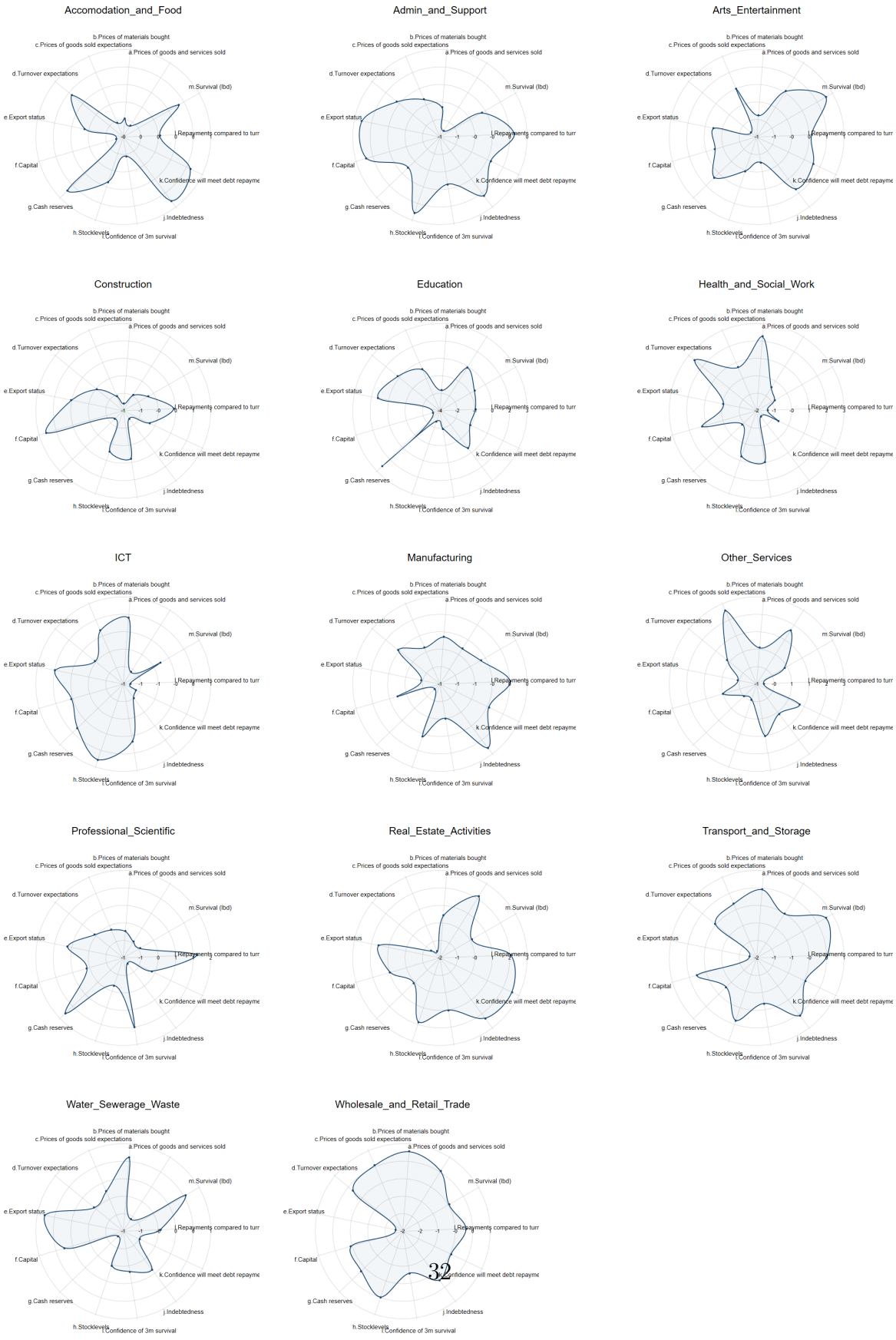


Figure 6: Average coefficients by firm size: baseline outcomes

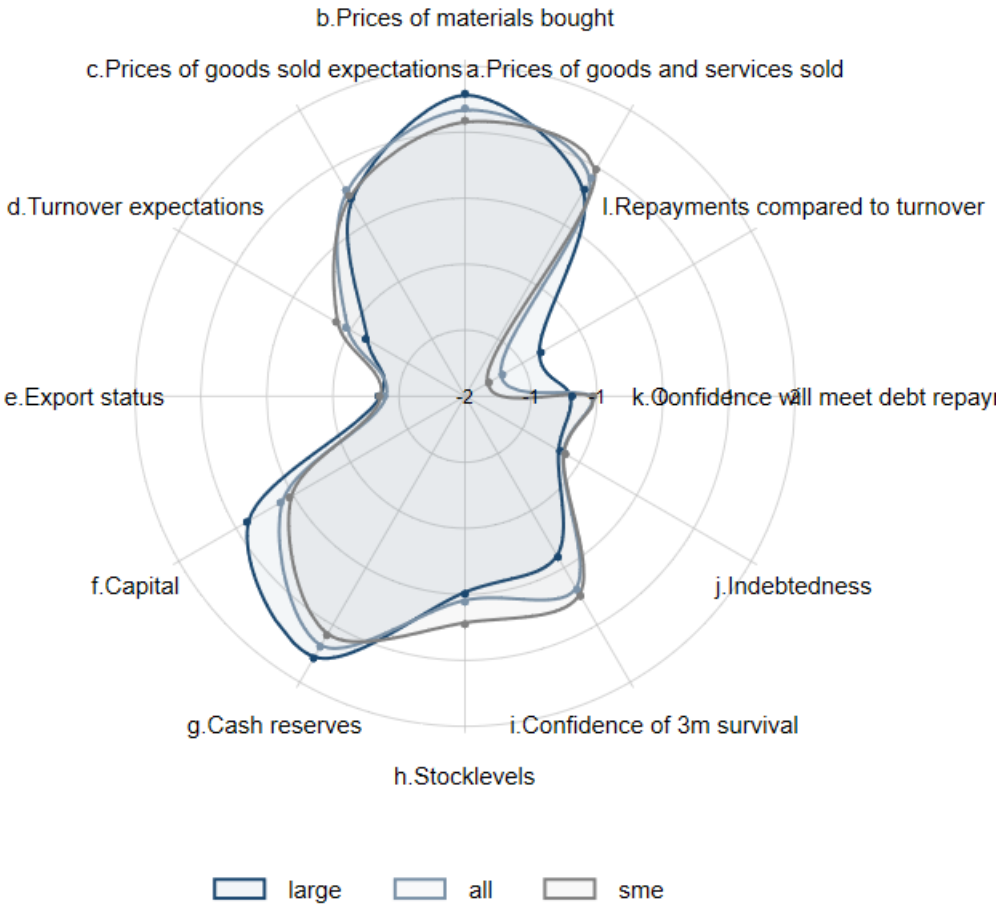


Table 8: Average point estimates in each cluster

Cluster	Three-digit industries	Firms	Point estimates										
			price sold	price mat	psold exp	pturnover_expn	conf	stockturn2	cash3	debt	confdebt	repayturn	capitalmix
1	14	672	[HTML]FEE582-0.167	[HTML][illegible] 0.149	[HTML]FBEAS40.086	[HTML]E8E583-0.069	[HTML]FCC07B-1.323	[HTML]FCC27C-0.213	[HTML]FDC97D-0.867	[HTML]FBEAS40.511	[HTML]FEE482-0.919	[HTML]63BE7B5.516	[HTML]FA9C74-1.316
2	54	4237	[HTML]F3E8840.206	[HTML][illegible]	[HTML][illegible]FAEAS40.088	[HTML]DDE1820.091	[HTML]FEEB840.152	[HTML]FDD27F0.350	[HTML]F7E9840.399	[HTML]FCBA7A-0.249	[HTML]FAEAS40.040	[HTML]F98870-0.167	[HTML]FDC67C0.015
3	2	70	[HTML]F8696B-1.670	[HTML][illegible] 0.552	[HTML]FDD47F-0.692	[HTML]F8756D-1.137	[HTML]F8696B-4.179	[HTML]F6E9841.516	[HTML]F8696B-3.380	[HTML]FBEAS40.549	[HTML]F8696B-9.799	[HTML]FFEB84-1.534	[HTML]F8696B-2.958
4	8	515	[HTML]FDEB84-0.033	[HTML][illegible]	[HTML][illegible]FFE9830.018	[HTML]FDD880-0.531	[HTML]ECE6831.006	[HTML]F9EA841.410	[HTML]F9EA840.298	[HTML]F6E9840.733	[HTML]CDDD823.770	[HTML]F8696B-1.087	[HTML]A9D8802.379
5	1	42	[HTML]AFD4801.920	[HTML][illegible]	[HTML][illegible]E5E5830.218	[HTML]FA9974-0.916	[HTML]FEE382-0.161	[HTML]63BE7B6.736	[HTML]F98470-2.674	[HTML]FBB078-0.375	[HTML]FDC87D-2.932	[HTML]FEE482-0.301	[HTML]8ACA7E2.807
6	3	134	[HTML]F97B6E-1.442	[HTML][illegible] 1.272	[HTML]63BE7B1.137	[HTML]F8E984-0.300	[HTML]FEE8830.012	[HTML]FEE3820.925	[HTML]FEDF81-0.278	[HTML]F8696B-1.246	[HTML]FCC07B-3.510	[HTML]6CC17C1.062	[HTML]FBA075-1.171
7	1	24	[HTML]FBAB77-0.865	[HTML][illegible]	[HTML][illegible]F8696B-4.197	[HTML]F8696B-1.212	[HTML]FEEB840.165	[HTML]F8696B-3.235	[HTML]63BE7B6.883	[HTML]FEDC810.161	[HTML]E4E4831.816	[HTML]F98370-3.297	[HTML]63BE7B3.327
8	2	65	[HTML]63BE7B3.805	[HTML][illegible] 6.582	[HTML][illegible]FBA175-2.359	[HTML]63BE7B1.851	[HTML]63BE7B7.402	[HTML]64BF7C6.701	[HTML]80C77D5.639	[HTML]63BE7B7.110	[HTML]63BE7B12.495	[HTML]63BE7B857.866	[HTML]9FD07F2.518

This implies that any support for businesses in the current crisis likely needs to be targeted to specific segments of the business population. It will also force policymakers to make their value judgements explicit: is the aim to help the economy adapt as quickly as possible, or to provide aid to struggling businesses? And what weights are they willing to attach to these outcomes?

Second, the elasticities estimated in this paper have policy relevance beyond the immediate crisis too. For any level of a proportional carbon tax, there is an equivalent energy price shock. In other words, we can use the short- and long-run elasticities estimated here directly to design a set of targeted taxes and subsidies that dynamically maximise the policymaker's desired social welfare function. What is the trade-off between the speed of transition and consumer purchasing power? How will green financing impact employment gains and losses along the transition path? How will a policy affect input reallocation and the survival of small businesses?

Debates around the optimal design of environmental damage abatement incentives are not new (Metcalf, 2009). A lively recent literature emphasises the complications and unintended consequences when designing environmental taxation to promote the switch to clean technologies. Acemoglu et al. (2012) model endogenous and directed technological change in a model with environmental externalities and derive optimal dynamic taxes. They find that generally a mix of carbon taxation and innovation incentives is necessary to maximise welfare dynamically, and that the optimal amount of taxation of dirty innovation and production depends crucially on the substitutability of the inputs firms use. Aghion et al. (2016) use data from the global car industry to show that car manufacturers innovate more in clean technologies when faced with higher total fuel prices. In complementary work, Acemoglu et al. (2023) exploit the US shale gas boom to argue that where firms respond endogenously on the innovation margin, fluctuations in energy input prices can push economies into bad equilibria that result in less clean innovation in the long run. Similarly, Phan et al. (2019) find that crude oil uncertainty can depress corporate investment in both producer and consumer countries.

Two additional strands of the literature indicate environmental taxes and subsidies need to be tailored to firms to be successful and cost-efficient. Colmer et al. (2022) and Dechezleprêtre and Kruse (2022) both find that environmental incentives affect behaviour of directly targeted firms and sectors, but not along the wider supply chain. Martin et al. (2023) find that credit constraints and firm management are key barriers for different types of green investment. Consistent with these results, this paper finds that firms' responses on the investment margin is dependent on their financial position. Additionally, it provides the necessary granular elasticities to make such target policy possible.

Finally, the comparison of our alternative energy measures allows policymakers to back out partial and total fuel elasticities in line with Hyland and Haller (2018). As the authors note, it is crucial to account for both interfuel and interfactor substitution when considering environmental taxation. This paper shows that in addition to these margins, some firms will also adjust on pricing, output process and survival margins.

7 Conclusion

Understanding how firms react to energy price shocks is crucial in both the short and the long run, but doing so in a timely manner, and capturing all relevant adjustment margins, is a tall order. In this paper, we bring together three components in order to do just that. First, we build a data pipeline from a variety of firm-level administrative and data sources. Second, we publicly pre-register an analysis plan to discipline our analysis. Third, we explore the adaptation of firms in a shift-share design, starting from average effects on all relevant margins, then estimating heterogeneous treatment effects for hundreds of industry-size cells and clustering cells on their elasticities to extract firm archetypes.

Affected firms are on average no more likely to reduce labour inputs or exit the market. Their expected insolvency risk does also not increase. Instead, these firms increase their output prices as they see their energy input prices rise. Turnover expectations

adjust downwards. Both large and small firms increase their cash reserves by a similar amount and debt indicators worsen for energy-intensive firms. Smaller firms also increase their stock levels in response to the shock, and are twice as likely to increase their output prices. Only larger firms on the other hand increase their capital spending in response to the shock. When we estimate coefficients for small industry-size cells and cluster across response margins, we see that different firms respond to the same shocks quite differently.

Our results have direct policy implications in the short-term for optimal business support in the energy crisis and on the long-term path towards Net Zero. Recent papers have emphasised three features of optimal environmental incentives for firms. First, they need to take the dynamics into account as short- and long-run responses may differ. This includes the risk of bad equilibria that lower the green innovation rate in the long term. Second, they need to be firm- and sector-specific to take into account the large amount of heterogeneity in firm responses to higher energy prices. Third, a single elasticity is not enough for policymaking: firms repond on many different margin, substituting between different types of fuels, different inputs and changing prices, quantities and production processes.

This paper makes progress on all three fronts and provides policymakers with granular elasticities, in the short and in the long term to design optimal environmental taxes and subsidies. What shape these incentives take, and how this may depend on the preferences of the policymakers themselves, is an open question for future work.

References

D. Acemoglu, P. Aghion, L. Bursztyn, and D. Hemous. The environment and directed technical change. *American economic review*, 102(1):131–166, 2012.

D. Acemoglu, P. Aghion, L. Barrage, and D. Hémous. Climate change, directed innovation, and energy transition: The long-run consequences of the shale gas revolution. Technical report, National Bureau of Economic Research, 2023.

P. Aghion, A. Dechezleprêtre, D. Hemous, R. Martin, and J. Van Reenen. Carbon taxes, path dependency, and directed technical change: Evidence from the auto industry. *Journal of Political Economy*, 124(1):1–51, 2016.

C. André, H. Costa, L. Demmou, and G. Franco. Rising energy prices and productivity: short-run pain, long-term gain? 2023.

M. A. Ari, M. N. Arregui, M. S. Black, O. Celasun, M. D. M. Iakova, M. A. Mineshima, V. Mylonas, I. W. Parry, I. Teodoru, and K. Zhunussova. *Surging energy prices in Europe in the aftermath of the war: How to support the vulnerable and speed up the transition away from fossil fuels*. Number 2022-2152. International Monetary Fund, 2022.

A. Auclert, H. Monnery, M. Rognlie, and L. Straub. Managing an energy shock: Fiscal and monetary policy. Technical report, Working Paper, 2023.

T. Babina, B. Hilgenstock, O. Itskhoki, M. Mironov, and E. Ribakova. Assessing the impact of international sanctions on russian oil exports. *Available at SSRN*, 2023.

R. Bachmann, D. Baqaee, C. Bayer, M. Kuhn, A. Löschel, B. Moll, A. Peichl, K. Pittel, and M. Schularick. What if? the economic effects for germany of a stop of energy imports from russia. Technical report, ECONtribute Policy Brief, 2022.

T. J. Bartik. Who benefits from state and local economic development policies? 1991.

K. Borusyak, P. Hull, and X. Jaravel. Quasi-experimental shift-share research designs. *The Review of Economic Studies*, 89(1):181–213, 2022.

A. Brodeur, N. Cook, J. Hartley, and A. Heyes. Do pre-registration and pre-analysis plans reduce p-hacking and publication bias? *Available at SSRN*, 2022.

S. Choi, T. Willems, and S. Y. Yoo. Revisiting the monetary transmission mechanism through an industry-level differential approach. *Journal of Monetary Economics*, page 103556, 2024.

M. A. Clemens and E. G. Lewis. The effect of low-skill immigration restrictions on us firms and workers: Evidence from a randomized lottery. Technical report, National Bureau of Economic Research, 2022.

J. Colmer, R. Martin, M. Muûls, and U. J. Wagner. Does pricing carbon mitigate climate change? firm-level evidence from the european union emissions trading scheme. 2022.

A. Dechezleprêtre and T. Kruse. The effect of climate policy on innovation and economic performance along the supply chain: A firm-and sector-level analysis. 2022.

C. Decker and M. Ottaviani. Preregistration and credibility of clinical trials. *medRxiv*, pages 2023–05, 2023.

E. Durante, A. Ferrando, and P. Vermeulen. Monetary policy, investment and firm heterogeneity. *European Economic Review*, 148:104251, 2022.

T. Duso and F. Szücs. Market power and heterogeneous pass-through in german electricity retail. *European Economic Review*, 98:354–372, 2017.

T. Fetzer. Did the policy response to the energy crisis cause crime? evidence from england. 2023a.

T. Fetzer. Regulatory barriers to climate action: evidence from conservation areas in england. 2023b.

T. Fetzer, L. Gazze, and M. Bishop. How large is the energy savings potential in the uk? *CAGE Working Paper*, 644, 2022.

L. Fontagné, P. Martin, and G. Orefice. The many channels of firm's adjustment to energy shocks: Evidence from france. Technical report, Technical Report, Mimeo, 2023.

K. Gillingham and J. H. Stock. The cost of reducing greenhouse gas emissions. *Journal of Economic Perspectives*, 32(4):53–72, 2018.

R. Glennerster and S. Jayachandran. Think globally, act globally: Opportunities to mitigate greenhouse gas emissions in low-and middle-income countries. *Journal of Economic Perspectives*, 37(3):111–135, 2023.

M. Hyland and S. Haller. Firm-level estimates of fuel substitution: an application to carbon pricing. *The Energy Journal*, 39(6), 2018.

O. Itskhoki and D. Mukhin. Sanctions and the exchange rate. Technical report, National Bureau of Economic Research, 2022.

S. Kalemli-Ozcan and F. Saffie. Finance and growth: Firm heterogeneity and creative destruction. 2021.

L. Kilian. The economic effects of energy price shocks. *Journal of economic literature*, 46(4):871–909, 2008.

L. Kilian. Oil price shocks: Causes and consequences. *Annu. Rev. Resour. Econ.*, 6(1): 133–154, 2014.

R. Lafrogne-Joussier, J. Martin, and I. Mejean. Cost pass-through and the rise of inflation. *Unpublished Manuscript*, 2023.

A. Lamorgese, A. Linarello, M. Patnaik, and F. Schivardi. Management practices and resilience to shocks: Evidence from covid-19. *CEPR Discussion Paper Series*, 15987, 2021.

W. Li, P. Mizen, R. Riley, and J. Schneebacher. Are better managed firms more resilient and adaptable to shocks? *Working Paper*, 2022.

S. Lui, L. Romaniuk, J. Schneebacher, and N. Wolf. The uk longitudinal business database. *ESCoE Discussion Paper*, 2023.

D. B. Marron and E. J. Toder. Tax policy issues in designing a carbon tax. *American Economic Review*, 104(5):563–568, 2014.

R. Martin, R. De Haas, M. Muûls, and H. Schweiger. Managerial and financial barriers during the green transition. 2023.

G. E. Metcalf. Market-based policy options to control us greenhouse gas emissions. *Journal of Economic perspectives*, 23(2):5–27, 2009.

ONS. Business energy spending: experimental measures from the office for national statistics' business surveys, 2022. URL https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/articles/businessenergyspendingexperimentalmeasuresfromtheofficefornationalstatisticsbusiness2022-09-07.

ONS. Industry-to-industry payment flows, uk: 2016 to 2023, experimental data and insights, 2023. URL https://www.ons.gov.uk/economy/economicoutputandproductivity/output/articles/industrytoindustrypaymentflowsuk/2016to2023experimentaldataandinsights.

D. H. B. Phan, V. T. Tran, and D. T. Nguyen. Crude oil price uncertainty and corporate investment: New global evidence. *Energy Economics*, 77:54–65, 2019.

A Data appendix

Table A.1: BICS variables

variables	Waves	description	response options
turnover change (3 cat)	67	W 6-43: How does your business' turnover for the last two weeks compare to normal expectations for this time of year? W 47-53: How does your business' turnover over the last month compare to normal expectations for this time of year? W 54-89: How did your business' turnover in [survey reference period] compare to the previous calendar month?	2-Higher than normal 1-Within normal range 0-lower than normal
turnover change (6 cat)	48	W 6-43: How does your business' turnover for the last two weeks compare to normal expectations for this time of year? W 47- 53: How does your business' turnover over the last month compare to normal expectations for this time of year?	6-Turnover has increased by more than 50% 5-Turnover has increased between 20% and 50% 4-Turnover has increased up to 20% 3-Turnover has not been affected 2-Turnover has decreased between 20% and 50% 1-Turnover has decreased by up to 20% 0-Turnover has decreased by more than 50%
turnover expectations	63	W 1-23: Please explain how the coronavirus pandemic affected your business' turnover compared with normal expectations this time last year? W 24-42: What are your expectations about turnover for the next two weeks? W 43-54: What are your expectations about turnover for the next month? W 55-89: How did your business turnover in [survey reference period] compared to last month?	2-Expect turnover to increase 1-Expect turnover to stay the same 0-Expect turnover to decrease
turnover expectations	46	W 1-23: Please explain how the coronavirus pandemic affected your business' turnover compared with normal expectations this time last year? W 24-42: What are your expectations about turnover for the next two weeks? W 43-54: What are your expectations about turnover for the next month? W 55-89: How did your business turnover in [survey reference period] compared to last month?	4-Expect turnover to substantially increase 3-Expect turnover to increase a little 2-Expect turnover to stay the same 1-Expect turnover to decrease a little 0-Expect turnover to substantially decrease

Figure 7: Rurefs by wave

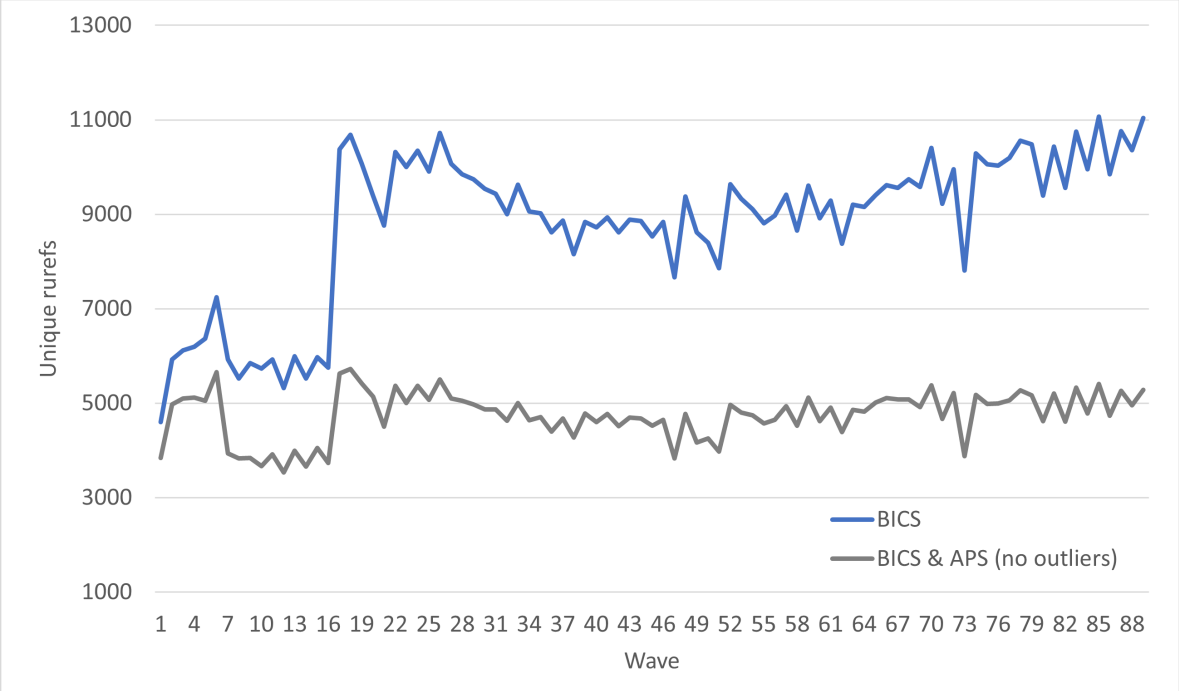


Figure 8: Ruref wave density

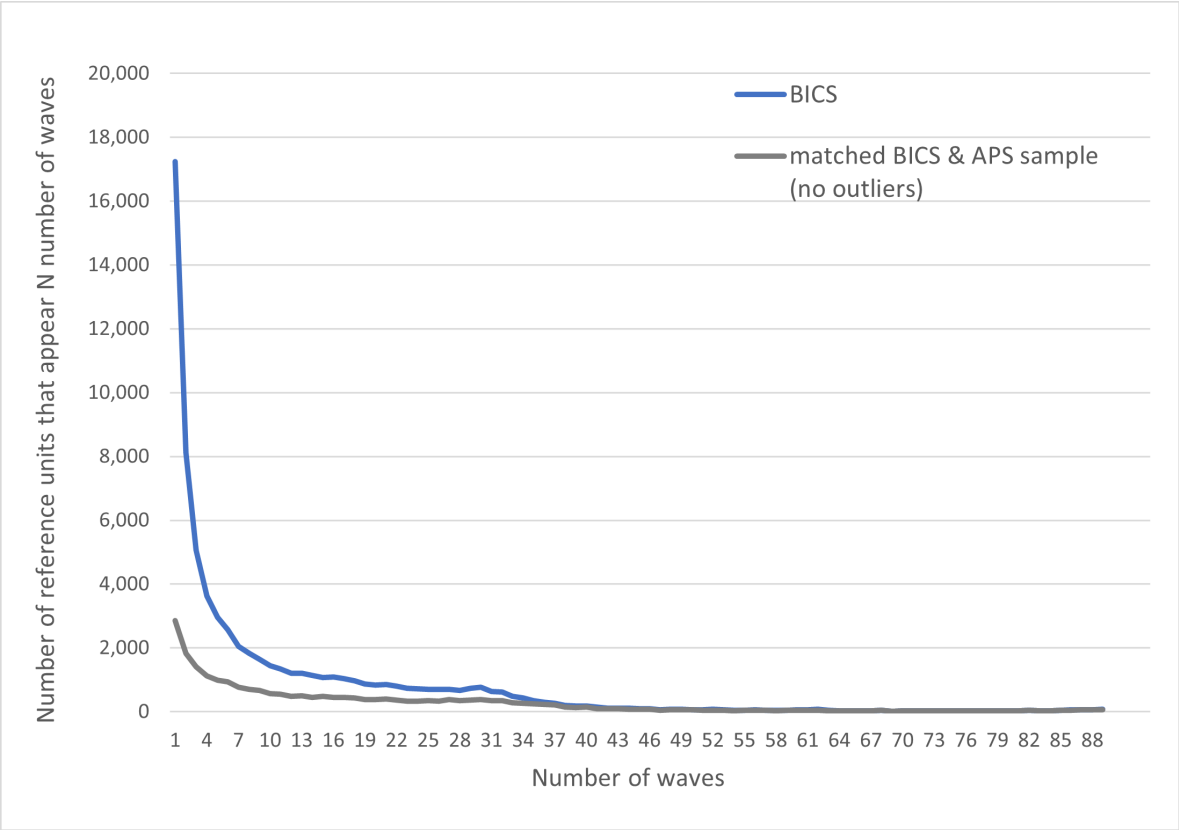


Table A.2: BICS variables

variables	Waves	description	response options
trading status (6 cat)	88	W 2-89: Which of the following statements best describes your business' trading status?	6 - Currently fully trading 5 - Currently partially trading 4 - Started trading within the last two weeks after a pause in trading 3 - Paused trading but intends to restart in the next two weeks 2 - Paused trading and does not intend to restart in the next two weeks/ Has temporarily closed or paused trading / No, the business has temporarily closed or paused trading 1 - Permanently ceased trading
trading status (2 cat)	88	W 2-89: Which of the following statements best describes your business' trading status?	2 - Currently trading 1-Paused trading
price of materials	60	W 1-40: How did the prices of materials, goods or services bought by your business change in the last two weeks, compared with normal price fluctuations? W 42-52: How did the prices of materials, goods or services bought by your business change over the last month, compared with normal price fluctuations? W 55-89: How did the prices of goods and services bought by your business in [survey reference period] compared with previous calendar month?	3-Prices increased 2-Prices stayed the same 1-Some increased, some decreased 0-Prices decreased
price of goods sold	59	W 1-40: How did the prices of materials, goods or services sold by your business change in the last two weeks, compared with normal price fluctuations? W 42-52: How did the prices of materials, goods or services sold by your business change over the last month, compared with normal price fluctuations? W 55-89: How did the prices of goods and services sold by your business in [survey reference period] compared with previous calendar month?	3-Prices increased 2-Prices stayed the same 1-Some increased, some decreased 0-Prices decreased
price of goods sold expectations	40	W 1-23: What are your expectations about changes in prices of goods or services that your business will sell over the next two weeks? W 55-89: what are your expectations about the goods and services sold by your business in [month following the reference period]?	2-Prices will increase 1-Prices will stay the same 1-Prices decreased

Table A.3: BICS variables

variables	Waves	description	response options
export status (2 cat)	63	W 4-87: Has your business exported in the last 12 months?	1-Yes 0-No
export status (3 cat)	48	W 10-87: Which of the following best describes your business' export status?	2-Exported in the last 12 months 1-Exported more than 12 months ago 0-Never exported and do not have goods or services that could be developed for export / Never exported but have goods or services that could be developed for export
export change	66	W1-20: How has your business' exporting been affected by covid in the last 2 weeks? W 21-42: How does your business' exporting in the last two weeks compare with normal expectations for this time of year? W 43-53: How does your business' exporting over the last month compare with normal expectations for this time of year? W 54-89: How didi your business' exporting in [survey reference period] compare with this calendar month?	3-Exporting as normal 2-Exporting but less than normal 1-Inable to export
imports change	63	W 9-20: How has your business' importing of goods and services been affected by Covid in the last two weeks? W 21-41: How does your business' importing in the last two weeks compare with normal expectations for this time of year? W 43-53: How does your business' importing over the last month compare with normal expectations for this time of year? W 56-89: How didi your business' importing in [survey reference period] compare with this calendar month last year?	4 - Importing more than normal 3-Importing as normal 2-Importing but less than normal 1-Not been able to import
import status (2 cat)	64	W 4-34: Has your business imported goods and services in the last 12 months? W 35-89: Which of the following best describes your importing status? Yes imported more than 12 months ago/ No imported more than 12 months ago or never imported	1 - Yes 0-No
import status (3 cat)	32	W 35-89: Which of the following best describes your importing status?	2 -Imported in the last 12 months 1 -Imported more than 12 months ago 0-Never imported

Table A.4: BICS variables

variables	Waves	description	response options
capital	23	W 7-23: How has the covid pandemic affected your business capital expenditure? W 25-52: How does your business' capital expenditure for the last two weeks compare to normal expectations for this time last year?	0-Capital expenditure has stopped 1-Capital expenditure is lower than normal 2-Capital expenditure has not been affected 3-Capital expenditure is higher than normal
capital mix	29	W 7-23: How has the covid pandemic affected your business capital expenditure? W 25-52: How does your business' capital expenditure for the last two weeks compare to normal expectations for this time last year? W 55-74: What are your business' expectations for capital expenditure over the next three months?	1-Capital expenditure is lower than normal/ will decrease 2-Capital expenditure has not been affected/ will stay the same 3-Capital expenditure is higher than normal / will increase
cash reserve duration (6 cat)	46	W 4-86: How long do you think/expect your business' cash reserves will last?	0-No cash reserves 1-Less than 1 months 2-1 to 3 months 3-4 to 6 months 4-More than 6 months
cash reserve duration (2 cat)	46	W 4-86: How long do you think/expect your business' cash reserves will last?	0-No cash reserves 1-Any cash reserve duration
cash reserve duration (3 cat)	46	W 4-86: How long do you think/expect your business' cash reserves will last?	0-No cash reserves 1-Less than 1 months or 1 to 3 months 2- 4 to 6 months or More than 6 months
stock levels	51	W 7:23: How has the coronavirus pandemic affected your business' stock levels? W 23-52: How do your business' stock levels for the past two weeks, compare to normal expectations for this time last year? W 55-74: How did your business' stock levels of raw materials in [survey reference period] compare with the previous calendar month? How did your business' stock levels of finished materials in [survey reference period] compare with the previous calendar month?	0 - Stock levels were lower 1-Stock levels have not changed 2-Stock levels are higher

Table A.5: BICS variables

variables	Waves	description	response options
Risk of insolvency	43	W 18-89: What is your business' risk of insolvency?	4-The business is insolvent 3-Severe risk 2-Moderate risk 1-Low risk 0-No risk
Change in risk of insolvency	20	W 18-23: How has the coronavirus pandemic affected your risk of insolvency? W 24-46: How has your business' risk of insolvency changed in the last two weeks? W 47-51: How has your business' risk of insolvency changed in the last two months?	2-Risk has increased 1-Risk has stayed the same 0-Risk has decreased
Confidence of 3 month survival	30	W 14-69: What is your confidence you will survive the next 3 months?	3-High confidence 2-Moderate confidence 1-Low confidence 0-No confidence
Confidence will meet debt repayments	25	W 31-89: How much confidence does your business have that it will meet its debt obligations?	3-High confidence 2-Moderate confidence 1-Low confidence 0-No confidence
Confidence will meet debt repayments	25	W 31-89: How much confidence does your business have that it will meet its debt obligations?	4-Do not have any debt obligations 3-High confidence 2-Moderate confidence 1-Low confidence 0-No confidence
Indebtedness	25	W 31-89: How much confidence does your business have that it will meet its debt obligations?	2-Do not have any debt obligations 1-otherwise
Repayments compared to turnover	29	W 19-53: Over the last month, how did your business' debt repayments compare with turnover? W 57-89: In the survey reference period how did your business' debt repayments compare with turnover?	4-Repayments were more than 100% of turnover 3-Repayments were between 50% and 100% of turnover 2- Repayments were between 20% and 50% of turnover 1-Repayments were up to 20% of turnover
Repayments compared to turnover	29	W 19-53: Over the last month, how did your business' debt repayments compare with turnover? W 57-89: In the survey reference period how did your business' debt repayments compare with turnover?	4-Repayments were more than 100% of turnover 3-Repayments were between 50% and 100% of turnover 2- Repayments were between 20% and 50% of turnover 1-Repayments were up to 20% of turnover 0-No repayments

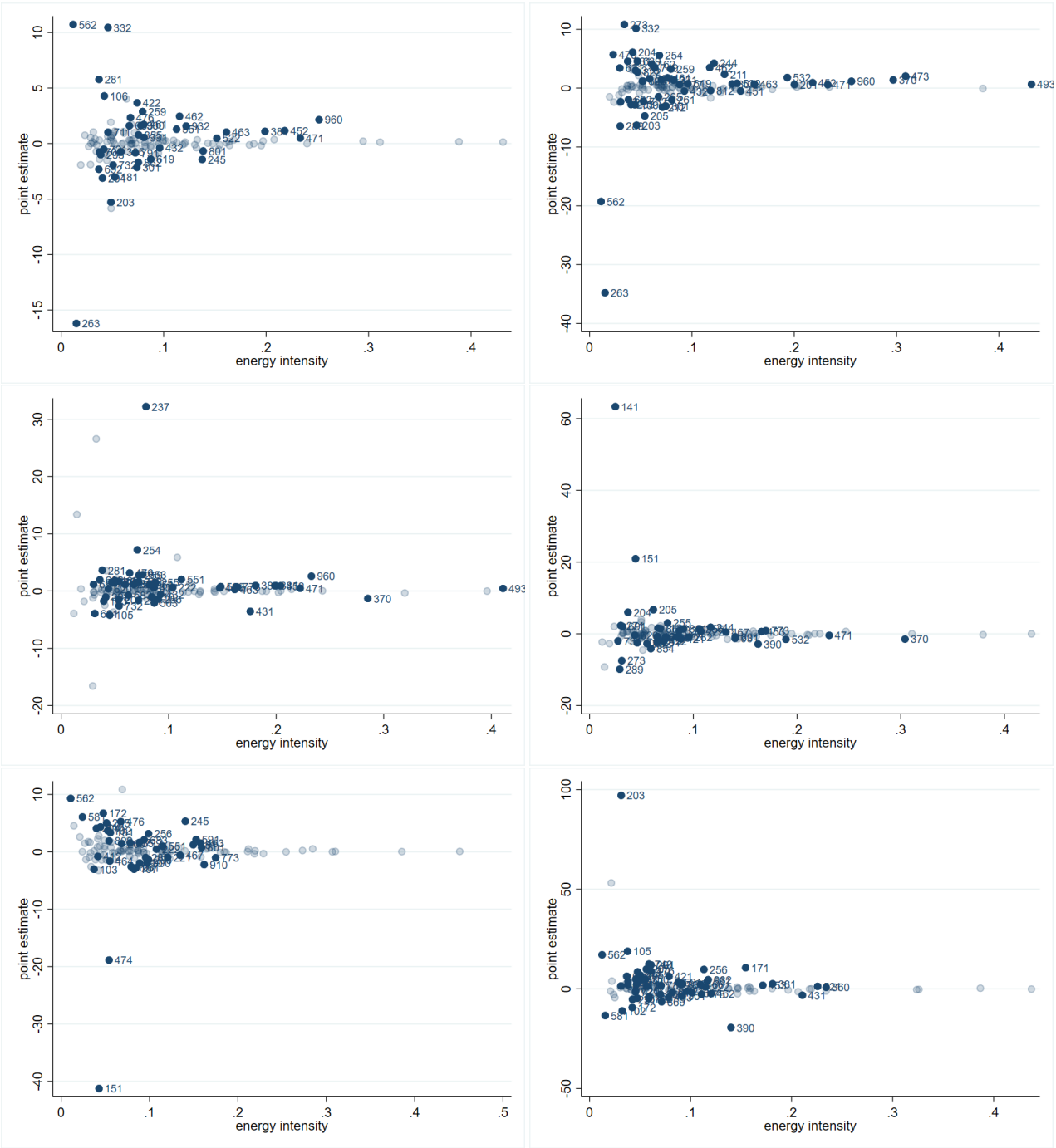
Table A.6: BICS variables

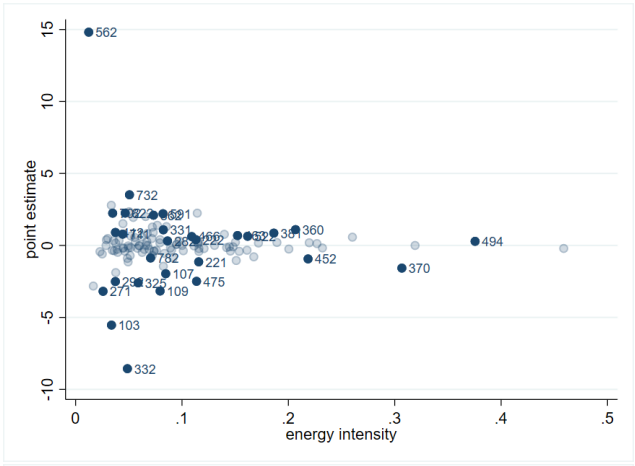
variables	Waves	description	response options
Made permanently redundant	66	W 5-53: In the last two weeks, approximately what percentage of your workforce were made permanently redundant? W 55-89: In [month previous to survey reference period] what percentage of your workforce were made permanently redundant?	%
share of workers expect to make redudant	28	W 8-16: In the next two weeks, approximately what percentage of your workforce will be made redundant? W 15-	%
redundancy expectations	32	Does your business expect to make any of your workforce redundant over the next 3 months?	0-No 1-Yes
Hybrid working	66	W 5-53: In the last two weeks, approximately what percentage of your workforce were hybrid working? W 55-89: In [month previous to survey reference period] what percentage of your workforce were hybrid working?	%
Working from home	66	W 5-53: In the last two weeks, approximately what percentage of your workforce were working from home? W 55-89: In [month previous to survey reference period] what percentage of your workforce were working from home?	%
Working from usual place of work	66	W 5-53: In the last two weeks, approximately what percentage of your workforce were working from the usual place of work? W 55-89: In [month previous to survey reference period] what percentage of your workforce were working from the usual place of work?	%

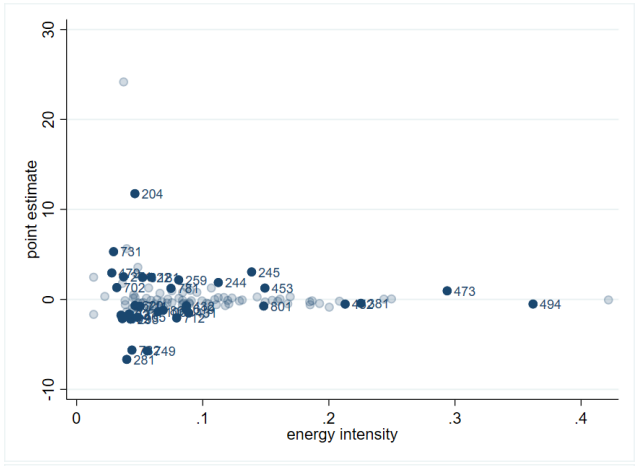
Table A.7: BICS variable descriptives

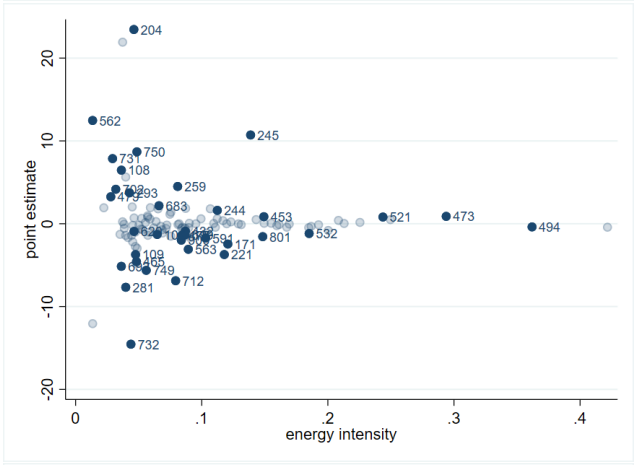
Variables	BICS & APS		BICS only	
	mean	sd	mean	sd
Turnover change (3 cat)	0.789	0.716	0.800	0.680
Turnover change (6 cat)	2.377	1.275	2.392	1.254
Turnover expectations (3 cat)	1.061	0.594	1.022	0.599
Turnover expectations (5 cat)	2.042	0.667	1.967	0.719
Export status (2 cat)	0.388	0.487	0.188	0.390
Export status(3 cat)	0.638	0.909	0.305	0.695
Export change	2.773	0.587	2.812	0.616
Prices of materials	2.232	0.594	2.338	0.607
Prices of goods and services sold	2.047	0.496	2.080	0.538
Prices of goods sold expectations	2.144	0.408	2.210	0.462
Capital	1.596	0.762	1.640	0.858
Capital (backward & forward looking)	1.864	0.581	1.973	0.585
Import change	2.671	0.645	2.665	0.695
Import status (2 cat)	0.488	0.500	0.224	0.417
Import status (3 cat)	1.026	0.974	0.496	0.840
Stocklevels	1.028	0.608	0.931	0.598
Cash reserves (2 cat)	3.154	1.080	2.743	1.235
Cash reserves (3 cat)	0.965	0.183	0.922	0.268
Cash reserves (6 cat)	1.679	0.536	1.493	0.637
Hybrid working (%)	21.714	33.601	19.528	34.822
Working from home (%)	17.045	29.060	15.605	31.294
Working from normal place of work (%)	61.554	38.801	56.353	43.697
Redundancies (%)	0.277	2.639	0.345	4.054
% of workers expect to make redundant	2.300	8.730	4.789	15.575
Redundancy expectations	0.067	0.250	0.045	0.207
Confidence will meet debt repayments (5 cat)	2.753	0.473	2.601	0.603
Confidence will meet debt repayments (4 cat)	3.017	0.660	2.964	0.803
Indebtedness	1.211	0.408	1.259	0.438
Repayments compared to turnover (4 cat)	1.341	0.733	1.558	0.925
Repayments compared to turnover (5 cat)	0.867	0.871	0.964	1.050
Risk of insolvency	0.729	0.645	0.794	0.731
Change in the risk of insolvency	1.162	0.449	1.181	0.471
Confidence of 3 month survival	2.731	0.491	2.528	0.647
Trading status (2 cat)	5.868	0.685	5.669	1.055
Trading status (6 cat)	1.975	0.155	1.944	0.231

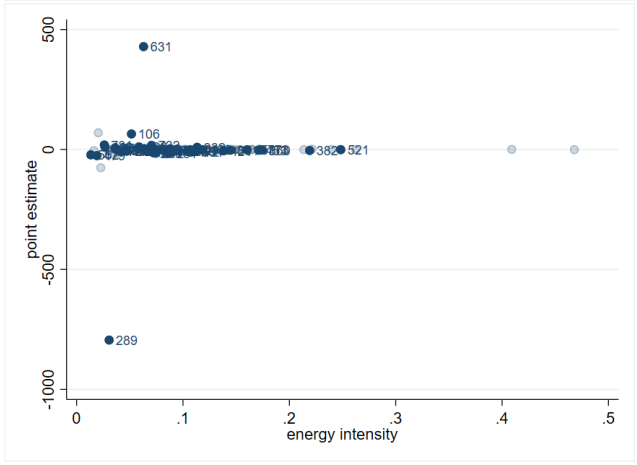
B Figures and tables











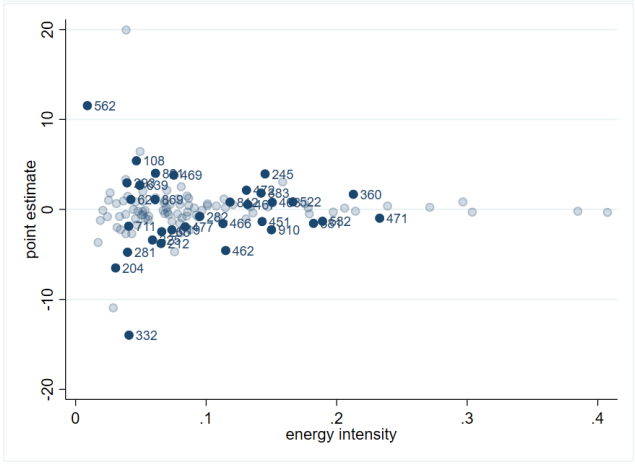


Table B.52: Av
fixed effects, la

Survival (Tradi
Redundancies

Table A.8: Energy intensity cross-sectional regression on a basic set of firm characteristics

Energy intensity (APS)	Estimate		
	(1)	(2)	(3)
both in BICS & APS	-0.00224	-0.000836	
	(0.00313)	(0.00361)	
10-49 employees	-0.0354***	-0.0875***	-0.119**
	(0.00479)	(0.00681)	(0.0427)
50-99 employees	-0.0380***	-0.0960***	-0.116**
	(0.00573)	(0.00861)	(0.0425)
10-249 employees	-0.0387***	-0.0972***	-0.116**
	(0.00516)	(0.00803)	(0.0425)
>250 employees	-0.0479***	-0.108***	-0.129**
	(0.00597)	(0.00905)	(0.0425)
East of England	-0.00755	-0.00697	-0.00591
	(0.00540)	(0.00448)	(0.00777)
London	-0.0489***	-0.0472***	-0.0424***
	(0.00507)	(0.00556)	(0.00721)
North East	0.0120	0.0144	0.0102
	(0.00811)	(0.00777)	(0.0139)
North West	-0.00469	-0.0000485	-0.00347
	(0.00450)	(0.00490)	(0.00805)
Scotland	0.000847	-0.000339	0.00298
	(0.00481)	(0.00493)	(0.00694)
South East	-0.0212***	-0.0201***	-0.0244**
	(0.00397)	(0.00398)	(0.00746)
South West	-0.00904*	-0.00885*	-0.00541
	(0.00428)	(0.00423)	(0.00679)
Wales	0.0179**	0.0109	0.0116
	(0.00540)	(0.00601)	(0.00884)
West Midlands	-0.00476	-0.00357	0.000331
	(0.00438)	(0.00441)	(0.00735)
Yorkshire and the Humber	-0.00264	-0.00279	-0.00544
	(0.00518)	(0.00400)	(0.00621)
Mining & quarrying	-0.0713	-0.0784	0.175***
	(0.0448)	(0.0482)	(0.0323)
Manufacturing	-0.121***	-0.126***	0.0167
	(0.0100)	(0.0127)	(0.0187)
Electricity, gas, steam	0.0501***	0.0766***	0.695***
	(0.00916)	(0.0118)	(0.0195)
Water supply, sewerage, waste management	-0.0250	-0.0332*	0.126***
	(0.0138)	(0.0156)	(0.0250)
Construction	-0.106***	-0.122***	0.0279
	(0.0215)	(0.0203)	(0.0264)
Wholesale & retail, repair of motor vehicles	-0.0834***	-0.0902***	0.0644**
	(0.0106)	(0.0124)	(0.0201)
Transportation & storage	0.0620	0.0695	0.234**
	(0.0533)	(0.0610)	(0.0783)
Accomodation & food services	-0.101***	-0.109***	0.0429
	(0.0155)	(0.0196)	(0.0253)
Information & communication	-0.134***	-0.117***	0.0259
	(0.0117)	(0.0132)	(0.0203)
Financial & Insurance activities	-0.156***	-0.153***	-0.00730
	(0.00935)	(0.0119)	(0.0185)
Real estate	-0.121***	-0.116***	0.0202
	(0.00907)	(0.0117)	(0.0181)
Professional, scientific & technical activities	-0.137***	-0.109***	0.00576
	(0.0119)	(0.0145)	(0.0188)
Admin & support services	-0.0965***	-0.0824***	0.0510*
	(0.0168)	(0.0177)	(0.0239)
Education	-0.116***	-0.0978***	0.0344
	(0.00907)	(0.0117)	(0.0184)
Human health & social work	-0.100***	-0.0944***	0.0422*
	(0.0154)	(0.0167)	(0.0182)
Arts, entertainment & recreation	-0.0670***	-0.0589***	0.102***
	(0.0167)	(0.0154)	(0.0205)
Other services	-0.0765***	-0.0880***	0.0861**
	(0.0113)	(0.0138)	(0.0289)
Constant	0.246***	0.303***	0.178***
	(0.0101)	(0.0135)	(0.0471)
R^2	0.103	0.182	0.193
N	32780	26311	8391

Notes: Table presents estimates of region, industry section and sizeband dummies regressed against energy intensity. Energy intensity granularity is at ruref level and reflects the ratio of energy purchases to total purchases in the 2018 APS or in the 2017 APS if 2018 is missing. (1) is estimated on the entire sample of 2017-2018 firms in the APS, (2) strips the sample of outliers by dropping firms below the 1st and above the 99th percentile of energy intensity within their industry group. (3) strips the sample of outliers and uses only firms that appear in both the APS and the BICS. The base categories for the industry, region and sizeband dummies are firms in Agriculture, Forestry and Fishing, in East Midlands with 0-9 employees. For the matched sample dummy the base category are firms only in the APS. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.1: Average treatment effects on firms' output under increasingly demanding fixed effects, all firms

Output	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Turnover change (3 cat)	1	ξ	0.0781	0.0417	0.0277	0.0928	0.110	0.103	0.134	0.162
		se	(0.114)	(0.123)	(0.123)	(0.118)	(0.121)	(0.123)	(0.126)	(0.131)
		R^2	0.373	0.389	0.391	0.397	0.446	0.419	0.448	0.476
		N	115544	115542	115541	115541	113629	114845	113982	107370
	2	ξ	0.0781	-0.0133	-0.0236	0.0489	0.151	0.0771	0.172	0.147
		se	(0.114)	(0.135)	(0.134)	(0.126)	(0.172)	(0.138)	(0.168)	(0.170)
		R^2	0.373	0.417	0.419	0.425	0.554	0.468	0.539	0.562
		N	115544	115412	115411	115411	101177	112104	104382	85674
	3	ξ	0.0781	-0.0467	-0.0529	0.0170	0.0438	0.0576	0.0249	-0.0432
		se	(0.114)	(0.158)	(0.158)	(0.147)	(0.243)	(0.156)	(0.236)	(0.240)
		R^2	0.373	0.455	0.457	0.462	0.622	0.515	0.605	0.618
		N	115544	113772	113771	113771	80797	105327	87785	66742
	4	ξ	0.0781	-0.0288	-0.0292	0.0323	-0.158	0.0522	-0.183	-0.224
		se	(0.114)	(0.158)	(0.158)	(0.147)	(0.232)	(0.187)	(0.216)	(0.221)
		R^2	0.373	0.503	0.505	0.510	0.647	0.560	0.639	0.637
		N	115544	109732	109723	109723	60379	94667	70044	51187
	5	ξ	0.0781	-0.00503	-0.00419	0.0579	-0.0863	0.0805	-0.136	-0.127
		se	(0.114)	(0.169)	(0.170)	(0.159)	(0.289)	(0.210)	(0.247)	(0.273)
		R^2	0.373	0.511	0.512	0.517	0.659	0.567	0.652	0.650
		N	115544	108406	108397	108397	56694	92327	66576	48204
Turnover change (6 cat)	1	ξ	0.0476	-0.141	-0.167	-0.0731	-0.0262	-0.0255	-0.0221	0.116
		se	(0.150)	(.)	(0.221)	(0.220)	(0.236)	(.)	(.)	(0.258)
		R^2	0.484	0.498	0.500	0.504	0.545	0.522	0.546	0.566
		N	84870	84868	84867	84867	83458	84394	83732	78803
	2	ξ	0.0476	-0.188	-0.210	-0.106	0.111	0.00968	0.0312	0.243
		se	(0.150)	(0.243)	(0.246)	(0.243)	(0.287)	(0.268)	(0.279)	(0.287)
		R^2	0.484	0.520	0.521	0.525	0.628	0.559	0.618	0.632
		N	84870	84776	84775	84775	74219	82293	76625	63066
	3	ξ	0.0476	-0.327	-0.336	-0.225	-0.0746	-0.0231	-0.162	-0.0931
		se	(0.150)	(0.272)	(0.276)	(0.265)	(0.358)	(0.280)	(0.375)	(0.472)
		R^2	0.484	0.547	0.548	0.552	0.678	0.592	0.667	0.672
		N	84870	83601	83600	83600	59245	77397	64291	49161
	4	ξ	0.0476	-0.315	-0.333	-0.203	-0.375	-0.0626	-0.513	-0.461
		se	(0.150)	(0.273)	(0.274)	(0.265)	(0.416)	(0.322)	(0.379)	(0.506)
		R^2	0.484	0.584	0.585	0.589	0.691	0.626	0.691	0.684
		N	84870	80631	80622	80622	44381	69622	51262	38008
	5	ξ	0.0476	-0.232	-0.247	-0.113	-0.322	-0.0122	-0.400	-0.373
		se	(0.150)	(0.268)	(0.270)	(0.258)	(0.454)	(0.325)	(0.403)	(0.542)
		R^2	0.484	0.589	0.590	0.594	0.700	0.630	0.702	0.693
		N	84870	79627	79618	79618	41494	67826	48596	35700

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.2: Average treatment effects on firms' output under increasingly demanding fixed effects, all firms

Output	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Turnover expectations (3 cat)	1	ξ	-0.164*	-0.129	-0.134	-0.117	-0.123	-0.109	-0.140*	-0.144
		se	(0.0779)	(0.0771)	(0.0761)	(.)	(0.0740)	(0.0708)	(0.0676)	(0.0744)
		R^2	0.274	0.299	0.301	0.309	0.371	0.336	0.373	0.408
		N	103876	103874	103871	103871	102189	103231	102516	96449
	2	ξ	-0.164*	-0.0879	-0.0914	-0.0708	-0.0541	-0.0506	-0.0787	-0.0354
		se	(0.0779)	(0.0768)	(0.0763)	(0.0721)	(0.0877)	(0.0675)	(0.0818)	(0.0909)
		R^2	0.274	0.332	0.334	0.341	0.493	0.393	0.477	0.501
		N	103876	103764	103761	103761	90915	100710	93856	76753
	3	ξ	-0.164*	-0.104	-0.106	-0.0812	-0.0938	-0.0726	-0.0974	0.0331
		se	(0.0779)	(0.0681)	(0.0675)	(0.0641)	(0.0836)	(0.0698)	(0.0876)	(0.109)
		R^2	0.274	0.373	0.375	0.381	0.566	0.445	0.548	0.557
		N	103876	102306	102303	102303	72410	94564	78720	59673
	4	ξ	-0.164*	-0.101	-0.0961	-0.0657	0.0225	0.00579	-0.0157	0.154
		se	(0.0779)	(0.0759)	(0.0774)	(0.0745)	(0.128)	(0.0851)	(0.129)	(0.157)
		R^2	0.274	0.422	0.424	0.430	0.584	0.490	0.580	0.570
		N	103876	98662	98653	98653	54062	85023	62859	45765
	5	ξ	-0.164*	-0.0886	-0.0834	-0.0550	0.0551	0.0227	0.00637	0.199
		se	(0.0779)	(0.0856)	(0.0871)	(0.0844)	(0.134)	(0.0949)	(0.133)	(0.157)
		R^2	0.274	0.430	0.432	0.439	0.600	0.499	0.595	0.586
		N	103876	97519	97510	97510	50662	82931	59645	43008
Turnover expectations (5 cat)	1	ξ	-0.0730	-0.0653	-0.0995	-0.0902	-0.116*	-0.0425	-0.106	-0.0939**
		se	(0.0560)	(0.0392)	(.)	(0.0515)	(0.0558)	(.)	(0.0551)	(0.0290)
		R^2	0.324	0.353	0.355	0.362	0.420	0.387	0.424	0.453
		N	74755	74753	74752	74752	73544	74330	73804	69353
	2	ξ	-0.0730	-0.0396	-0.0732	-0.0641	-0.0818	-0.0233	-0.0807	-0.0882**
		se	(0.0560)	(0.0490)	(0.0528)	(0.0600)	(0.0665)	(0.0488)	(0.0540)	(0.0302)
		R^2	0.324	0.383	0.385	0.391	0.526	0.436	0.516	0.536
		N	74755	74674	74673	74673	65310	72417	67501	55374
	3	ξ	-0.0730	-0.0838	-0.117	-0.102	-0.0427	-0.0118	-0.0868	-0.0347
		se	(0.0560)	(0.0547)	(0.0599)	(0.0683)	(0.0661)	(0.0489)	(0.0779)	(0.0909)
		R^2	0.324	0.419	0.420	0.427	0.595	0.484	0.578	0.584
		N	74755	73642	73641	73641	52060	68112	56555	43112
	4	ξ	-0.0730	-0.152	-0.172	-0.150	-0.0304	-0.0303	-0.00300	0.00689
		se	(0.0560)	(0.0926)	(0.0998)	(0.108)	(0.117)	(0.0846)	(0.102)	(0.0822)
		R^2	0.324	0.463	0.465	0.471	0.601	0.519	0.602	0.590
		N	74755	71025	71018	71018	38961	61235	45160	33334
	5	ξ	-0.0730	-0.125	-0.145	-0.129	0.0132	-0.0196	0.0426	0.0370
		se	(0.0560)	(0.0973)	(0.105)	(0.112)	(0.116)	(0.0796)	(0.102)	(0.0634)
		R^2	0.324	0.471	0.473	0.479	0.615	0.528	0.616	0.604
		N	74755	70165	70158	70158	36360	59667	42741	31248

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.3: Average treatment effects on firms' output under increasingly demanding fixed effects, all firms

Output			Estimate (ξ Treatment × Energy intensity)							
	Sic digits		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Export change	1	ξ	0.0572	0.0804	0.0650	0.0802	0.130	0.163	0.180	0.247
		se	(0.206)	(0.234)	(.)	(0.244)	(0.278)	(0.264)	(.)	(.)
		R^2	0.422	0.434	0.436	0.451	0.496	0.488	0.513	0.523
		N	43332	43213	43176	43176	40821	42399	41104	38177
	2	ξ	0.0572	0.228	0.223	0.222	0.305	0.362	0.458	0.585
		se	(0.206)	(0.246)	(0.241)	(0.254)	(0.382)	(0.305)	(0.331)	(0.362)
		R^2	0.422	0.477	0.480	0.493	0.637	0.555	0.636	0.640
		N	43332	42803	42764	42764	30946	39779	33443	25742
	3	ξ	0.0572	0.301	0.285	0.264	0.405	0.382	0.536	0.445
		se	(0.206)	(0.246)	(0.244)	(0.256)	(0.278)	(0.304)	(0.324)	(0.300)
		R^2	0.422	0.536	0.539	0.553	0.713	0.623	0.716	0.702
		N	43332	40941	40904	40901	20028	34786	24049	16672
	4	ξ	0.0572	0.256	0.219	0.187	-0.341	0.312	-0.150	-0.293
		se	(0.206)	(0.214)	(0.209)	(0.207)	(0.445)	(0.240)	(0.337)	(0.475)
		R^2	0.422	0.601	0.605	0.619	0.728	0.679	0.751	0.714
		N	43332	37345	37314	37303	11507	27967	15704	10367
	5	ξ	0.0572	0.238	0.201	0.177	-0.361	0.294	-0.241	-0.335
		se	(0.206)	(0.218)	(0.213)	(0.211)	(0.455)	(0.246)	(0.364)	(0.484)
		R^2	0.422	0.606	0.610	0.625	0.730	0.683	0.756	0.717
		N	43332	36437	36406	36395	10690	26781	14726	9697
Export status (2 cat)	1	ξ	-0.0224	-0.0487	-0.0425	-0.0493	-0.0365	-0.0457	-0.0342	-0.0351
		se	(0.0279)	(0.0293)	(.)	(0.0295)	(.)	(0.0295)	(0.0284)	(.)
		R^2	0.898	0.899	0.899	0.900	0.909	0.904	0.908	0.914
		N	120464	120462	120461	120461	118635	119761	118989	112255
	2	ξ	-0.0224	-0.0685*	-0.0606*	-0.0669*	-0.0716	-0.0662*	-0.0550	-0.0525
		se	(0.0279)	(0.0304)	(0.0301)	(0.0310)	(0.0359)	(0.0329)	(0.0343)	(0.0357)
		R^2	0.898	0.902	0.903	0.903	0.927	0.911	0.924	0.927
		N	120464	120349	120348	120348	106491	117047	109662	90063
	3	ξ	-0.0224	-0.0693*	-0.0592	-0.0668*	-0.0861	-0.0626*	-0.0778	-0.0693
		se	(0.0279)	(0.0318)	(0.0309)	(0.0315)	(0.0463)	(0.0313)	(0.0403)	(0.0521)
		R^2	0.898	0.908	0.908	0.909	0.937	0.918	0.934	0.937
		N	120464	118888	118887	118887	85250	110361	92547	70155
	4	ξ	-0.0224	-0.0645*	-0.0528	-0.0598	-0.0987	-0.0878*	-0.0822*	-0.0982
		se	(0.0279)	(0.0323)	(0.0312)	(0.0330)	(0.0535)	(0.0362)	(0.0382)	(0.0492)
		R^2	0.898	0.916	0.917	0.917	0.945	0.927	0.941	0.943
		N	120464	115145	115143	115143	64471	99677	74693	54220
	5	ξ	-0.0224	-0.0660	-0.0551	-0.0617	-0.113*	-0.0960*	-0.0951**	-0.103*
		se	(0.0279)	(0.0333)	(0.0321)	(0.0340)	(0.0506)	(0.0369)	(0.0356)	(0.0488)
		R^2	0.898	0.918	0.918	0.918	0.946	0.928	0.942	0.943
		N	120464	113832	113830	113830	60703	97343	71044	51185
Export status (3 cat)	1	ξ	-0.0704	-0.107*	-0.0974*	-0.105*	-0.0984	-0.0994	-0.103	-0.122*
		se	(.)	(0.0503)	(0.0483)	(0.0475)	(0.0529)	(.)	(0.0544)	(0.0576)
		R^2	0.942	0.942	0.943	0.943	0.949	0.945	0.949	0.953
		N	75718	75716	75716	75716	74224	75151	74542	69470
	2	ξ	-0.0704	-0.137*	-0.124*	-0.131*	-0.138*	-0.121*	-0.133*	-0.145*
		se	(.)	(0.0565)	(0.0548)	(0.0524)	(0.0524)	(0.0575)	(0.0498)	(0.0652)
		R^2	0.942	0.945	0.945	0.946	0.960	0.951	0.958	0.960
		N	75718	75544	75543	75543	65912	73023	68111	55217
	3	ξ	-0.0704	-0.115	-0.102	-0.112	-0.157	-0.0938	-0.157	-0.165
		se	(.)	(0.0620)	(0.0597)	(0.0602)	(0.0906)	(0.0629)	(0.0852)	(0.125)
		R^2	0.942	0.949	0.949	0.949	0.963	0.955	0.962	0.964
		N	75718	74520	74519	74519	52439	68579	57306	42833
	4	ξ	-0.0704	-0.119	-0.101	-0.117	-0.111	-0.125	-0.118	-0.0746
		se	(.)	(0.0604)	(0.0564)	(0.0605)	(0.0816)	(0.0679)	(0.0655)	(0.0690)
		R^2	0.942	0.953	0.953	0.953	0.967	0.959	0.965	0.966
		N	75718	71917	71917	71917	40123	61721	46510	33344
	5	ξ	-0.0704	-0.123*	-0.105	-0.121	-0.118	-0.137	-0.132	-0.0739
		se	(.)	(0.0610)	(0.0574)	(0.0613)	(0.0853)	(0.0711)	(0.0661)	(0.0739)
		R^2	0.942	0.953	0.954	0.954	0.968	0.960	0.966	0.966
		N	75718	71098	71098	71098	37753	60288	44147	31430

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.4: Average treatment effects on firms' prices under increasingly demanding fixed effects, all firms

Prices	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Price of goods sold	1	ξ	0.249	0.260	0.276**	0.294**	0.237*	0.276**	0.240*	0.214*
		se	(.)	(.)	(0.0952)	(0.0895)	(0.0980)	(0.0924)	(0.0964)	(0.102)
		R^2	0.349	0.368	0.370	0.375	0.432	0.402	0.436	0.466
		N	97916	97913	97911	97911	96071	97243	96430	90399
	2	ξ	0.249	0.260*	0.273*	0.286**	0.313*	0.286**	0.298*	0.314*
		se	(.)	(0.103)	(0.104)	(0.0989)	(0.132)	(0.108)	(0.120)	(0.120)
		R^2	0.349	0.396	0.398	0.402	0.543	0.453	0.530	0.552
		N	97916	97770	97768	97768	84595	94653	87446	71215
	3	ξ	0.249	0.203*	0.220*	0.242**	0.227*	0.235**	0.210*	0.184
		se	(.)	(0.0838)	(0.0835)	(0.0785)	(0.100)	(0.0863)	(0.100)	(0.110)
		R^2	0.349	0.434	0.436	0.441	0.613	0.502	0.597	0.604
		N	97916	96165	96163	96163	66875	88655	73032	55052
	4	ξ	0.249	0.216*	0.237**	0.264**	0.186*	0.290*	0.211*	0.141
		se	(.)	(0.0859)	(0.0851)	(0.0800)	(0.0899)	(0.109)	(0.0919)	(0.108)
		R^2	0.349	0.480	0.482	0.487	0.631	0.543	0.630	0.614
		N	97916	92468	92462	92462	49223	79040	57557	41615
	5	ξ	0.249	0.233*	0.253**	0.281**	0.211	0.306**	0.229*	0.167
		se	(.)	(0.0893)	(0.0888)	(0.0827)	(0.106)	(0.110)	(0.0997)	(0.125)
		R^2	0.349	0.486	0.487	0.493	0.645	0.550	0.642	0.624
		N	97916	91330	91324	91324	46071	77012	54461	39057
Price of materials	1	ξ	0.370**	0.318**	0.323	0.308**	0.235*	0.288	0.243	0.244*
		se	(0.109)	(0.110)	(.)	(0.107)	(0.115)	(.)	(.)	(0.120)
		R^2	0.392	0.412	0.414	0.420	0.476	0.446	0.481	0.508
		N	94290	94286	94283	94283	92399	93627	92731	86794
	2	ξ	0.370**	0.335**	0.335**	0.325**	0.274	0.331*	0.234	0.322*
		se	(0.109)	(0.113)	(0.114)	(0.110)	(0.157)	(0.128)	(0.133)	(0.160)
		R^2	0.392	0.440	0.442	0.447	0.589	0.497	0.576	0.593
		N	94290	94143	94140	94140	80866	91041	83793	67692
	3	ξ	0.370**	0.310**	0.314**	0.307**	0.133	0.272*	0.144	0.118
		se	(0.109)	(0.0945)	(0.0958)	(0.0929)	(0.140)	(0.109)	(0.116)	(0.162)
		R^2	0.392	0.475	0.477	0.482	0.646	0.541	0.632	0.635
		N	94290	92495	92492	92492	63369	84936	69440	52118
	4	ξ	0.370**	0.287**	0.302**	0.302**	0.0899	0.286*	0.135	0.0244
		se	(0.109)	(0.0939)	(0.0958)	(0.0953)	(0.184)	(0.135)	(0.145)	(0.181)
		R^2	0.392	0.520	0.522	0.527	0.664	0.580	0.663	0.649
		N	94290	88683	88677	88677	46139	75277	54288	38883
	5	ξ	0.370**	0.286**	0.299**	0.297**	0.148	0.249	0.187	0.0753
		se	(0.109)	(0.0914)	(0.0941)	(0.0920)	(0.162)	(0.131)	(0.130)	(0.157)
		R^2	0.392	0.525	0.527	0.533	0.676	0.585	0.674	0.659
		N	94290	87533	87526	87526	43149	73253	51346	36492
Prices of goods sold expectations	1	ξ	0.162	0.193**	0.186**	0.180**	0.131*	0.158*	0.122	0.141*
		se	(0.0906)	(0.0637)	(0.0631)	(0.0651)	(0.0613)	(0.0636)	(.)	(0.0544)
		R^2	0.365	0.385	0.388	0.393	0.452	0.420	0.453	0.489
		N	66630	66628	66626	66626	65364	66108	65535	61580
	2	ξ	0.162	0.203**	0.194**	0.185*	0.177*	0.199**	0.155	0.211**
		se	(0.0906)	(0.0709)	(0.0714)	(0.0734)	(0.0806)	(0.0713)	(0.0771)	(0.0739)
		R^2	0.365	0.413	0.415	0.421	0.566	0.471	0.551	0.574
		N	66630	66534	66532	66532	57330	64406	59264	48376
	3	ξ	0.162	0.164*	0.160*	0.157*	0.156	0.167*	0.146	0.219**
		se	(0.0906)	(0.0693)	(0.0702)	(0.0729)	(0.0805)	(0.0739)	(0.0812)	(0.0720)
		R^2	0.365	0.447	0.450	0.455	0.627	0.516	0.613	0.620
		N	66630	65425	65423	65423	45298	60365	49309	37609
	4	ξ	0.162	0.161*	0.165*	0.164*	0.250*	0.220**	0.242*	0.237*
		se	(0.0906)	(0.0673)	(0.0659)	(0.0685)	(0.0947)	(0.0723)	(0.101)	(0.0979)
		R^2	0.365	0.496	0.498	0.503	0.651	0.561	0.647	0.627
		N	66630	62867	62865	62865	33315	53872	38971	28478
	5	ξ	0.162	0.152*	0.156*	0.156*	0.302**	0.219**	0.278**	0.286**
		se	(0.0906)	(0.0685)	(0.0676)	(0.0699)	(0.0935)	(0.0670)	(0.0984)	(0.0930)
		R^2	0.365	0.502	0.505	0.510	0.665	0.568	0.661	0.641
		N	66630	62102	62100	62100	31301	52571	36974	26824

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.5: Average treatment effects on firms' input mix under increasingly demanding fixed effects, all firms

Input mix	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Import status (2 cat)	1	ξ	-0.0232	-0.0463	-0.0523	-0.0428	-0.0360	-0.0328	-0.0284	-0.0306
		se	(.)	(0.0355)	(.)	(0.0360)	(.)	(0.0367)	(0.0323)	(0.0346)
		R^2	0.871	0.873	0.873	0.874	0.887	0.879	0.887	0.894
		N	119004	119002	119001	119001	117184	118319	117510	110794
	2	ξ	-0.0232	-0.0570	-0.0631	-0.0490	-0.0274	-0.0184	-0.00664	0.00291
		se	(.)	(0.0401)	(0.0405)	(0.0402)	(0.0470)	(0.0426)	(0.0427)	(0.0498)
		R^2	0.871	0.878	0.878	0.879	0.911	0.890	0.906	0.912
		N	119004	118880	118879	118879	105159	115635	108216	88800
	3	ξ	-0.0232	-0.0320	-0.0355	-0.0201	-0.0506	0.0142	-0.0216	-0.0459
		se	(.)	(0.0403)	(0.0412)	(0.0403)	(0.0765)	(0.0457)	(0.0617)	(0.0784)
		R^2	0.871	0.885	0.886	0.886	0.921	0.900	0.916	0.920
		N	119004	117413	117412	117412	84041	108966	91238	69124
	4	ξ	-0.0232	0.0102	0.0105	0.0248	-0.0634	0.0346	0.00460	-0.0544
		se	(.)	(0.0439)	(0.0444)	(0.0439)	(0.0722)	(0.0517)	(0.0700)	(0.0815)
		R^2	0.871	0.894	0.894	0.895	0.925	0.908	0.923	0.921
		N	119004	113584	113582	113582	63184	98259	73395	53226
	5	ξ	-0.0232	0.0160	0.0163	0.0312	-0.0946	0.0421	-0.0216	-0.0845
		se	(.)	(0.0447)	(0.0452)	(0.0451)	(0.0822)	(0.0519)	(0.0778)	(0.0939)
		R^2	0.871	0.895	0.895	0.896	0.928	0.909	0.926	0.924
		N	119004	112309	112307	112307	59403	95891	69725	50214
Import status (3 cat)	1	ξ	-0.0404	-0.0844	-0.0895	-0.0821	-0.0898*	-0.101	-0.0590	-0.0948*
		se	(.)	(.)	(0.0512)	(0.0478)	(0.0353)	(0.0577)	(0.0368)	(0.0393)
		R^2	0.932	0.933	0.933	0.934	0.941	0.937	0.941	0.945
		N	58802	58802	58802	58802	57808	58417	57996	54645
	2	ξ	-0.0404	-0.0789	-0.0841	-0.0683	-0.0281	-0.0122	-0.0300	-0.0219
		se	(.)	(0.0611)	(0.0612)	(0.0580)	(0.0462)	(0.0699)	(0.0509)	(0.0578)
		R^2	0.932	0.936	0.936	0.936	0.953	0.942	0.951	0.955
		N	58802	58730	58730	58730	51768	57111	53249	43409
	3	ξ	-0.0404	-0.0485	-0.0499	-0.0344	-0.123	0.00430	-0.0836	-0.0516
		se	(.)	(0.0607)	(0.0596)	(0.0552)	(0.146)	(0.0707)	(0.101)	(0.128)
		R^2	0.932	0.939	0.939	0.940	0.959	0.947	0.956	0.958
		N	58802	58014	58014	58014	41059	53665	44856	33519
	4	ξ	-0.0404	0.0156	0.0168	0.0269	0.0997	0.0609	0.123	0.0950
		se	(.)	(0.0669)	(0.0668)	(0.0674)	(0.109)	(0.0800)	(0.109)	(0.138)
		R^2	0.932	0.944	0.944	0.944	0.960	0.951	0.959	0.958
		N	58802	56048	56048	56048	30565	48146	35922	25332
	5	ξ	-0.0404	0.0370	0.0393	0.0462	0.0655	0.0837	0.103	0.0682
		se	(.)	(0.0704)	(0.0706)	(0.0716)	(0.131)	(0.0821)	(0.129)	(0.161)
		R^2	0.932	0.945	0.945	0.946	0.962	0.952	0.961	0.960
		N	58802	55453	55453	55453	28746	46994	34145	23992
Imports change	1	ξ	0.251	0.180	0.111	0.155	0.174	0.152	0.0854	0.0922
		se	(0.173)	(0.176)	(.)	(0.172)	(0.184)	(.)	(.)	(.)
		R^2	0.379	0.397	0.402	0.413	0.460	0.449	0.474	0.489
		N	54139	54094	54063	54063	51296	53247	51624	48076
	2	ξ	0.251	0.203	0.135	0.159	0.371	0.248	0.283	0.331
		se	(0.173)	(0.182)	(0.183)	(0.178)	(0.233)	(0.190)	(0.224)	(0.232)
		R^2	0.379	0.437	0.442	0.452	0.595	0.511	0.591	0.602
		N	54139	53738	53707	53707	40435	50671	42967	34076
	3	ξ	0.251	0.218	0.150	0.154	0.290	0.157	0.322	0.140
		se	(0.173)	(0.209)	(0.218)	(0.209)	(0.290)	(0.215)	(0.262)	(0.397)
		R^2	0.379	0.485	0.489	0.500	0.667	0.570	0.662	0.661
		N	54139	51965	51934	51934	27355	45306	31941	22613
	4	ξ	0.251	0.244	0.188	0.189	0.381	0.201	0.236	0.287
		se	(0.173)	(0.227)	(0.226)	(0.237)	(0.764)	(0.291)	(0.619)	(0.812)
		R^2	0.379	0.544	0.548	0.558	0.709	0.627	0.721	0.689
		N	54139	48085	48054	48052	15895	37332	21284	13930
	5	ξ	0.251	0.184	0.125	0.130	-0.326	0.0782	-0.283	-0.537
		se	(0.173)	(0.219)	(0.219)	(0.230)	(0.623)	(0.278)	(0.446)	(0.642)
		R^2	0.379	0.552	0.556	0.566	0.708	0.635	0.724	0.690
		N	54139	47052	47021	47019	14875	35883	20032	13120

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.6: Average treatment effects on firms' input mix under increasingly demanding fixed effects, all firms

Input mix	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Capital	1	ξ	0.161*	0.173	0.183	0.186	0.181	0.277*	0.215*	0.205
		se	(0.0731)	(0.0882)	(0.0902)	(0.0937)	(0.103)	(0.101)	(0.0989)	(0.120)
		R^2	0.644	0.652	0.655	0.658	0.693	0.676	0.695	0.710
		N	32354	32353	32352	32352	31715	32124	31817	29620
	2	ξ	0.161*	0.132	0.154	0.152	0.167	0.162	0.221	0.148
		se	(0.0731)	(0.104)	(0.104)	(0.107)	(0.125)	(0.115)	(0.124)	(0.142)
		R^2	0.644	0.667	0.669	0.672	0.761	0.704	0.754	0.759
		N	32354	32304	32303	32303	27612	31124	28669	23171
	3	ξ	0.161*	0.0790	0.104	0.0982	0.0332	0.131	0.0473	0.123
		se	(0.0731)	(0.112)	(0.116)	(0.116)	(0.162)	(0.117)	(0.142)	(0.188)
		R^2	0.644	0.686	0.689	0.692	0.789	0.725	0.784	0.779
		N	32354	31754	31753	31753	21380	29048	23480	17739
	4	ξ	0.161*	0.0574	0.0761	0.0597	0.0165	0.0442	-0.00433	0.0554
		se	(0.0731)	(0.138)	(0.145)	(0.141)	(0.260)	(0.140)	(0.237)	(0.281)
		R^2	0.644	0.712	0.714	0.717	0.790	0.744	0.798	0.781
		N	32354	30487	30486	30486	15640	25751	18465	13607
	5	ξ	0.161*	0.0613	0.0800	0.0481	-0.0145	0.0166	-0.0369	0.0235
		se	(0.0731)	(0.143)	(0.150)	(0.145)	(0.246)	(0.156)	(0.229)	(0.272)
		R^2	0.644	0.718	0.720	0.723	0.798	0.748	0.807	0.789
		N	32354	30064	30063	30063	14563	25070	17394	12777
Capital mix	1	ξ	0.225*	0.148	0.168	0.196	0.128	0.190	0.133	0.128
		se	(0.103)	(0.0984)	(0.101)	(0.0991)	(0.101)	(0.0998)	(0.0950)	(0.115)
		R^2	0.490	0.498	0.501	0.507	0.561	0.529	0.564	0.583
		N	37758	37757	37755	37755	36878	37397	37038	34339
	2	ξ	0.225*	0.0463	0.0709	0.0993	0.124	0.0828	0.0843	0.0761
		se	(0.103)	(0.0989)	(0.0994)	(0.0977)	(0.125)	(0.119)	(0.115)	(0.129)
		R^2	0.490	0.526	0.529	0.533	0.667	0.574	0.657	0.662
		N	37758	37689	37687	37687	31618	36159	32989	26495
	3	ξ	0.225*	-0.0197	0.0156	0.0421	-0.0903	0.00933	-0.136	-0.0448
		se	(0.103)	(0.120)	(0.120)	(0.112)	(0.186)	(0.130)	(0.137)	(0.177)
		R^2	0.490	0.562	0.565	0.569	0.711	0.612	0.705	0.699
		N	37758	36980	36978	36978	23975	33561	26607	19925
	4	ξ	0.225*	0.0119	0.0426	0.0676	-0.230	-0.0304	-0.111	-0.157
		se	(0.103)	(0.143)	(0.146)	(0.135)	(0.241)	(0.142)	(0.225)	(0.251)
		R^2	0.490	0.599	0.601	0.606	0.714	0.640	0.722	0.702
		N	37758	35250	35244	35244	17281	29430	20546	14970
	5	ξ	0.225*	0.0386	0.0687	0.0860	-0.285	-0.00744	-0.166	-0.212
		se	(0.103)	(0.160)	(0.161)	(0.153)	(0.288)	(0.162)	(0.268)	(0.305)
		R^2	0.490	0.607	0.609	0.614	0.725	0.646	0.732	0.713
		N	37758	34727	34721	34721	16054	28604	19271	14003

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.7: Average treatment effects on firms' input mix under increasingly demanding fixed effects, all firms

Input mix	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Employment (LBD)	1	ξ	-12.38	-15.34	-24.62	-28.33	-21.15	-22.03	-25.97	-24.08
		se	(.)	(17.24)	(.)	(16.60)	(13.55)	(15.45)	(13.32)	(.)
		R^2	0.993	0.993	0.993	0.994	0.994	0.994	0.994	0.994
		N	299790	299788	299788	299776	299727	299776	299727	298659
	2	ξ	-12.38	-7.778	-16.58	-19.75	-8.938	-16.83	-13.40	-19.51
		se	(.)	(14.77)	(13.27)	(13.37)	(7.163)	(11.89)	(8.534)	(10.78)
		R^2	0.993	0.993	0.994	0.994	0.994	0.994	0.994	0.995
		N	299790	299788	299788	299776	298891	299738	298947	288702
	3	ξ	-12.38	-16.85	-25.01	-27.86	-16.75	-28.77	-21.18	-13.26
		se	(.)	(15.10)	(14.74)	(15.37)	(13.86)	(18.64)	(11.85)	(9.476)
		R^2	0.993	0.993	0.994	0.994	0.995	0.993	0.995	0.996
		N	299790	299767	299767	299755	293031	298732	294312	267684
	4	ξ	-12.38	-21.34	-28.92	-31.37	-20.70	-32.51	-22.24	-19.98
		se	(.)	(14.79)	(15.25)	(15.87)	(13.25)	(19.86)	(10.06)	(9.498)
		R^2	0.993	0.994	0.994	0.994	0.995	0.993	0.995	0.996
		N	299790	299505	299505	299493	279563	295605	284518	240482
	5	ξ	-12.38	-20.08	-27.43	-29.77	-21.04	-31.46	-19.88*	-19.41
		se	(.)	(14.67)	(15.03)	(15.63)	(12.24)	(19.84)	(8.369)	(9.428)
		R^2	0.993	0.994	0.994	0.994	0.996	0.993	0.995	0.996
		N	299790	299413	299413	299401	275731	294328	281702	234425
Log employment (LBD)	1	ξ	0.0186	0.0292	0.0336*	0.0293*	0.0331	0.0294*	0.0280*	0.0222
		se	(0.0179)	(0.0170)	(0.0124)	(0.0119)	(.)	(0.0122)	(0.0119)	(0.0112)
		R^2	0.985	0.985	0.993	0.993	0.994	0.994	0.994	0.995
		N	299650	299648	299648	299637	299588	299637	299588	298520
	2	ξ	0.0186	0.0196	0.0278	0.0238	0.0237	0.0159	0.0221	0.00663
		se	(0.0179)	(0.0158)	(0.0126)	(0.0120)	(0.0128)	(0.0115)	(0.0127)	(0.0114)
		R^2	0.985	0.986	0.993	0.993	0.995	0.994	0.994	0.996
		N	299650	299648	299648	299637	298750	299599	298806	288555
	3	ξ	0.0186	0.0195	0.0300*	0.0260	0.0145	0.0171	0.0152	0.00307
		se	(0.0179)	(0.0160)	(0.0131)	(0.0125)	(0.0119)	(0.0119)	(0.0114)	(0.00899)
		R^2	0.985	0.987	0.994	0.994	0.996	0.995	0.995	0.997
		N	299650	299626	299626	299615	292905	298594	294186	267549
	4	ξ	0.0186	0.0192	0.0273*	0.0233	0.00935	0.0116	0.00824	-0.00539
		se	(0.0179)	(0.0149)	(0.0119)	(0.0115)	(0.0130)	(0.0115)	(0.0120)	(0.00898)
		R^2	0.985	0.987	0.994	0.994	0.996	0.996	0.996	0.997
		N	299650	299365	299365	299354	279448	295479	284403	240366
	5	ξ	0.0186	0.0181	0.0275*	0.0238	0.00793	0.0115	0.00855	-0.00542
		se	(0.0179)	(0.0139)	(0.0121)	(0.0118)	(0.0131)	(0.0115)	(0.0120)	(0.00937)
		R^2	0.985	0.988	0.994	0.994	0.997	0.996	0.996	0.997
		N	299650	299278	299278	299267	275625	294205	281596	234318

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.8: Average treatment effects on firms' processes under increasingly demanding fixed effects, all firms

Process $f()$			Estimate (ξ Treatment × Energy intensity)							
	Sic digits		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Stock levels	1	ξ	0.0329	0.173	0.181	0.195	0.193	0.157	0.189	0.173
		se	(.)	(0.120)	(0.117)	(0.118)	(.)	(0.124)	(0.144)	(.)
		R^2	0.359	0.374	0.376	0.383	0.428	0.410	0.437	0.456
		N	68668	68662	68659	68659	66819	67984	67269	62517
	2	ξ	0.0329	0.129	0.137	0.149	0.270	0.138	0.221	0.253
		se	(.)	(0.121)	(0.121)	(0.123)	(0.212)	(0.142)	(0.195)	(0.242)
		R^2	0.359	0.402	0.404	0.411	0.544	0.462	0.536	0.552
		N	68668	68424	68421	68421	57307	65726	59603	48019
	3	ξ	0.0329	0.140	0.139	0.146	0.379*	0.142	0.394*	0.440*
		se	(.)	(0.113)	(0.116)	(0.117)	(0.172)	(0.117)	(0.189)	(0.211)
		R^2	0.359	0.441	0.443	0.450	0.627	0.517	0.614	0.621
		N	68668	67043	67040	67040	43284	60677	48061	35357
	4	ξ	0.0329	0.141	0.133	0.130	0.457	0.123	0.427	0.514
		se	(.)	(0.140)	(0.143)	(0.143)	(0.283)	(0.157)	(0.285)	(0.322)
		R^2	0.359	0.503	0.505	0.512	0.665	0.574	0.667	0.647
		N	68668	63959	63947	63947	29697	52897	35934	25091
	5	ξ	0.0329	0.162	0.152	0.147	0.494	0.156	0.438	0.556
		se	(.)	(0.146)	(0.151)	(0.146)	(0.297)	(0.141)	(0.300)	(0.332)
		R^2	0.359	0.510	0.513	0.519	0.673	0.580	0.675	0.655
		N	68668	63070	63058	63058	27806	51456	33985	23777

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.9: Average treatment effects on firms' processes under increasingly demanding fixed effects, all firms

Process $f()$	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hybrid working	1	ξ	-5.769	-6.036	-6.560*	-6.839	-3.094	-5.726	-4.875	-1.413
		se	(3.348)	(.)	(2.751)	(.)	(3.242)	(2.964)	(3.014)	(.)
		R^2	0.787	0.795	0.796	0.797	0.816	0.805	0.816	0.826
		N	58129	58129	58129	58129	57257	57792	57456	54346
	2	ξ	-5.769	-5.365	-5.843*	-6.157*	-3.447	-5.261	-3.681	-5.199
		se	(3.348)	(2.622)	(2.514)	(2.477)	(4.100)	(3.110)	(3.156)	(4.673)
		R^2	0.787	0.803	0.804	0.806	0.852	0.821	0.846	0.851
		N	58129	58072	58072	58072	51871	56666	53258	43878
	3	ξ	-5.769	-5.000	-5.488*	-5.476*	-8.288	-3.876	-4.984	-7.024
		se	(3.348)	(2.501)	(2.337)	(2.204)	(7.684)	(4.259)	(5.713)	(7.461)
		R^2	0.787	0.813	0.814	0.815	0.869	0.833	0.863	0.865
		N	58129	57398	57398	57398	42020	53351	45479	34729
	4	ξ	-5.769	-4.650*	-4.923**	-4.718*	-0.524	-2.429	0.750	-1.976
		se	(3.348)	(1.941)	(1.547)	(1.734)	(5.768)	(2.176)	(4.805)	(7.404)
		R^2	0.787	0.828	0.830	0.831	0.884	0.849	0.879	0.877
		N	58129	55625	55625	55625	31654	48174	36702	26396
	5	ξ	-5.769	-3.819	-4.031*	-3.922	0.848	-0.802	-1.404	-0.206
		se	(3.348)	(2.167)	(1.902)	(2.142)	(6.476)	(3.660)	(5.123)	(8.184)
		R^2	0.787	0.832	0.833	0.834	0.887	0.852	0.883	0.878
		N	58129	55060	55060	55060	29951	47009	35019	24911
Working from home	1	ξ	51.39	38.59	36.61***	33.64***	34.96	34.54***	34.59***	37.46***
		se	(.)	(.)	(8.547)	(8.109)	(.)	(8.224)	(8.082)	(8.625)
		R^2	0.725	0.765	0.767	0.770	0.794	0.779	0.793	0.807
		N	126124	126122	126122	126122	124507	125515	124847	118232
	2	ξ	51.39	36.56***	34.28***	30.78***	36.63***	34.52***	35.57***	41.61***
		se	(.)	(8.407)	(8.560)	(8.099)	(10.11)	(8.668)	(9.955)	(11.99)
		R^2	0.725	0.780	0.782	0.786	0.839	0.804	0.831	0.845
		N	126124	126024	126024	126024	113104	123005	116124	96200
	3	ξ	51.39	31.36***	28.69***	25.35***	31.39**	30.23***	25.97**	33.15**
		se	(.)	(6.816)	(6.813)	(6.491)	(10.07)	(7.115)	(9.103)	(11.65)
		R^2	0.725	0.795	0.797	0.801	0.864	0.821	0.853	0.865
		N	126124	124683	124683	124683	92177	116329	99379	76214
	4	ξ	51.39	32.39***	29.67***	26.42***	29.14*	30.95***	26.77*	28.49
		se	(.)	(7.346)	(7.458)	(7.112)	(13.05)	(7.984)	(11.01)	(14.76)
		R^2	0.725	0.810	0.812	0.815	0.877	0.835	0.869	0.877
		N	126124	121094	121093	121093	70134	105600	80764	59199
	5	ξ	51.39	31.99***	29.17***	25.93***	30.41*	30.71***	26.67*	29.02
		se	(.)	(7.354)	(7.481)	(7.183)	(14.01)	(8.107)	(11.70)	(15.89)
		R^2	0.725	0.813	0.815	0.818	0.879	0.838	0.871	0.879
		N	126124	119842	119841	119841	66226	103107	77020	55881
Working from normal place of work	1	ξ	16.63*	12.44	10.03	10.65	11.80*	10.47	12.65	10.51
		se	(8.112)	(6.575)	(6.611)	(6.252)	(5.363)	(6.073)	(.)	(5.846)
		R^2	0.739	0.759	0.760	0.763	0.786	0.774	0.786	0.799
		N	126124	126122	126122	126122	124507	125515	124847	118232
	2	ξ	16.63*	7.626	4.977	5.306	5.400	3.641	6.452	3.138
		se	(8.112)	(6.580)	(6.689)	(6.240)	(7.341)	(6.361)	(6.710)	(7.868)
		R^2	0.739	0.772	0.773	0.775	0.830	0.797	0.823	0.836
		N	126124	126024	126024	126024	113104	123005	116124	96200
	3	ξ	16.63*	8.359	5.699	5.921	3.994	3.834	4.703	0.548
		se	(8.112)	(6.910)	(6.955)	(6.565)	(9.942)	(6.925)	(8.459)	(10.25)
		R^2	0.739	0.787	0.788	0.790	0.857	0.815	0.847	0.857
		N	126124	124683	124683	124683	92177	116329	99379	76214
	4	ξ	16.63*	6.807	4.469	4.307	-1.659	0.802	4.801	-4.628
		se	(8.112)	(6.222)	(6.226)	(5.908)	(8.801)	(6.478)	(7.916)	(9.621)
		R^2	0.739	0.806	0.807	0.809	0.871	0.834	0.866	0.868
		N	126124	121094	121093	121093	70134	105600	80764	59199
	5	ξ	16.63*	5.508	3.244	2.812	-4.506	-0.701	2.290	-7.111
		se	(8.112)	(6.349)	(6.372)	(6.094)	(9.234)	(6.540)	(8.182)	(10.28)
		R^2	0.739	0.809	0.811	0.812	0.874	0.837	0.870	0.870
		N	126124	119842	119841	119841	66226	103107	77020	55881

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.10: Average treatment effects on firms' survival under increasingly demanding fixed effects, all firms

Survival (Debt & liquidity)	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Confidence will meet debt obligations (3 cat)	1	ξ	-0.258***	-0.211**	-0.183**	-0.177**	-0.185	-0.186**	-0.202**	-0.182*
		se	(0.0654)	(0.0644)	(0.0586)	(0.0611)	(.)	(0.0603)	(0.0675)	(0.0670)
		R^2	0.612	0.617	0.619	0.622	0.655	0.637	0.656	0.676
		N	40204	40204	40203	40203	39492	39926	39613	37192
	2	ξ	-0.258***	-0.226**	-0.192**	-0.188**	-0.211**	-0.181*	-0.221**	-0.235**
		se	(0.0654)	(0.0669)	(0.0607)	(0.0641)	(0.0646)	(0.0656)	(0.0725)	(0.0681)
		R^2	0.612	0.632	0.633	0.636	0.720	0.668	0.712	0.724
		N	40204	40149	40147	40147	34947	38931	36114	29322
	3	ξ	-0.258***	-0.229**	-0.197*	-0.198*	-0.266**	-0.222*	-0.209**	-0.344***
		se	(0.0654)	(0.0747)	(0.0703)	(0.0729)	(0.0912)	(0.0859)	(0.0644)	(0.0873)
		R^2	0.612	0.652	0.654	0.656	0.753	0.694	0.745	0.746
		N	40204	39579	39576	39576	27398	36354	30111	22498
	4	ξ	-0.258***	-0.235*	-0.209*	-0.212*	-0.377**	-0.197*	-0.256*	-0.464**
		se	(0.0654)	(0.0847)	(0.0803)	(0.0821)	(0.123)	(0.0867)	(0.107)	(0.134)
		R^2	0.612	0.676	0.678	0.681	0.775	0.718	0.770	0.761
		N	40204	38113	38109	38109	20150	32341	23851	16839
	5	ξ	-0.258***	-0.219*	-0.190*	-0.196*	-0.366**	-0.158	-0.231*	-0.448**
		se	(0.0654)	(0.0806)	(0.0752)	(0.0767)	(0.109)	(0.0781)	(0.0981)	(0.125)
		R^2	0.612	0.682	0.684	0.687	0.785	0.723	0.780	0.768
		N	40204	37692	37688	37688	18945	31544	22656	15863
Confidence will meet debt obligations (4 cat)	1	ξ	-0.00229	-0.0197	-0.0240	-0.00182	0.0466	-0.00565	0.0459	0.102
		se	(.)	(.)	(.)	(0.0664)	(0.0729)	(0.0664)	(0.0765)	(0.0886)
		R^2	0.691	0.696	0.697	0.701	0.737	0.717	0.738	0.750
		N	31915	31914	31911	31911	31127	31663	31242	28820
	2	ξ	-0.00229	-0.0161	-0.0207	0.00402	0.200	-0.0184	0.184	0.184
		se	(.)	(0.0650)	(0.0644)	(0.0689)	(0.100)	(0.0712)	(0.0988)	(0.122)
		R^2	0.691	0.709	0.710	0.714	0.797	0.740	0.788	0.796
		N	31915	31839	31835	31835	26401	30536	27626	21806
	3	ξ	-0.00229	-0.0251	-0.0365	-0.00728	0.256	0.0552	0.237*	0.300*
		se	(.)	(0.0610)	(0.0618)	(0.0680)	(0.137)	(0.0789)	(0.114)	(0.141)
		R^2	0.691	0.727	0.728	0.732	0.825	0.763	0.818	0.818
		N	31915	31200	31195	31195	19978	28034	22325	16362
	4	ξ	-0.00229	0.00949	-0.0103	0.00939	0.338	0.0766	0.323*	0.368*
		se	(.)	(0.0563)	(0.0603)	(0.0668)	(0.167)	(0.0722)	(0.138)	(0.172)
		R^2	0.691	0.746	0.747	0.751	0.833	0.780	0.833	0.827
		N	31915	29660	29652	29652	14418	24609	17217	12290
	5	ξ	-0.00229	0.0149	-0.00595	0.0144	0.381	0.0825	0.339*	0.408*
		se	(.)	(0.0562)	(0.0598)	(0.0663)	(0.187)	(0.0744)	(0.158)	(0.193)
		R^2	0.691	0.749	0.750	0.754	0.836	0.782	0.837	0.830
		N	31915	29277	29269	29269	13468	23938	16296	11557
Confidence will meet debt obligations (5 cat)	1	ξ	-0.278**	-0.242	-0.216	-0.192	-0.157	-0.199*	-0.185	-0.127
		se	(0.0937)	(.)	(.)	(0.0981)	(0.103)	(0.0954)	(0.110)	(0.109)
		R^2	0.663	0.667	0.669	0.671	0.701	0.686	0.703	0.719
		N	40204	40204	40203	40203	39492	39926	39613	37192
	2	ξ	-0.278**	-0.253*	-0.221*	-0.195	-0.119	-0.203	-0.136	-0.167
		se	(0.0937)	(0.102)	(0.0946)	(0.101)	(0.0987)	(0.102)	(0.118)	(0.117)
		R^2	0.663	0.679	0.680	0.683	0.759	0.710	0.752	0.760
		N	40204	40149	40147	40147	34947	38931	36114	29322
	3	ξ	-0.278**	-0.261*	-0.233*	-0.212	-0.132	-0.203	-0.0739	-0.208
		se	(0.0937)	(0.103)	(0.0978)	(0.103)	(0.0888)	(0.107)	(0.0831)	(0.121)
		R^2	0.663	0.697	0.698	0.700	0.790	0.733	0.780	0.782
		N	40204	39579	39576	39576	27398	36354	30111	22498
	4	ξ	-0.278**	-0.227	-0.205	-0.191	-0.140	-0.118	-0.0235	-0.227
		se	(0.0937)	(0.116)	(0.110)	(0.113)	(0.152)	(0.104)	(0.131)	(0.180)
		R^2	0.663	0.717	0.718	0.721	0.804	0.753	0.801	0.793
		N	40204	38113	38109	38109	20150	32341	23851	16839
	5	ξ	-0.278**	-0.206	-0.183	-0.172	-0.0953	-0.0799	-0.0117	-0.180
		se	(0.0937)	(0.115)	(0.108)	(0.111)	(0.145)	(0.102)	(0.122)	(0.174)
		R^2	0.663	0.721	0.722	0.725	0.810	0.756	0.807	0.798
		N	40204	37692	37688	37688	18945	31544	22656	15863

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.11: Average treatment effects on firms' survival under increasingly demanding fixed effects, all firms

Survival (Debt & liquidity)	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Repayments compared to turnover (4 cat)	1	ξ	-0.0677	-0.103	-0.0496	-0.0279	-0.0421	-0.00496	-0.0693	-0.0372
		se	(0.139)	(0.152)	(0.143)	(0.142)	(0.167)	(.)	(.)	(0.206)
		R^2	0.649	0.667	0.670	0.679	0.750	0.712	0.755	0.763
		N	16768	16755	16747	16747	15481	16297	15552	13017
	2	ξ	-0.0677	0.0748	0.108	0.120	0.00292	0.313*	0.00634	0.152
		se	(0.139)	(0.126)	(0.126)	(0.130)	(0.209)	(0.129)	(0.236)	(0.265)
		R^2	0.649	0.701	0.704	0.713	0.810	0.753	0.813	0.796
		N	16768	16538	16526	16526	10224	14656	11307	7990
	3	ξ	-0.0677	0.0483	0.0774	0.0880	0.136	0.365	-0.0344	0.0812
		se	(0.139)	(0.147)	(0.154)	(0.150)	(0.323)	(0.181)	(0.302)	(0.345)
		R^2	0.649	0.725	0.728	0.737	0.830	0.777	0.837	0.818
		N	16768	15660	15648	15648	6755	12510	7920	5656
	4	ξ	-0.0677	0.0145	0.0743	0.0719	0.0619	0.183	-0.104	0.00696
		se	(0.139)	(0.173)	(0.186)	(0.180)	(0.350)	(0.205)	(0.341)	(0.334)
		R^2	0.649	0.745	0.749	0.759	0.819	0.782	0.827	0.809
		N	16768	14029	14017	14017	5282	10263	6082	4574
	5	ξ	-0.0677	0.0272	0.0820	0.0535	-0.119	0.0791	-0.318	-0.235
		se	(0.139)	(0.183)	(0.194)	(0.179)	(0.687)	(0.191)	(0.600)	(0.659)
		R^2	0.649	0.750	0.754	0.764	0.829	0.788	0.837	0.823
		N	16768	13756	13744	13744	4822	9989	5598	4276
Repayments compared to turnover (5 cat)	1	ξ	-0.438**	-0.565**	-0.535**	-0.514**	-0.469	-0.496**	-0.558	-0.487
		se	(0.154)	(0.178)	(0.178)	(0.178)	(.)	(0.171)	(.)	(.)
		R^2	0.693	0.701	0.703	0.708	0.757	0.728	0.761	0.777
		N	26521	26509	26506	26506	25428	26097	25501	22620
	2	ξ	-0.438**	-0.377*	-0.359*	-0.339*	-0.187	-0.0935	-0.374	-0.175
		se	(0.154)	(0.152)	(0.153)	(0.159)	(0.227)	(0.158)	(0.230)	(0.256)
		R^2	0.693	0.721	0.723	0.728	0.814	0.760	0.809	0.815
		N	26521	26330	26324	26324	19797	24480	21109	15894
	3	ξ	-0.438**	-0.482*	-0.464*	-0.449*	0.0513	-0.209	-0.203	0.0139
		se	(0.154)	(0.192)	(0.187)	(0.190)	(0.225)	(0.196)	(0.240)	(0.260)
		R^2	0.693	0.740	0.741	0.746	0.838	0.780	0.835	0.834
		N	26521	25492	25486	25486	14364	22103	16323	11586
	4	ξ	-0.438**	-0.414*	-0.385*	-0.368	0.107	-0.194	-0.171	0.000640
		se	(0.154)	(0.192)	(0.183)	(0.199)	(0.266)	(0.196)	(0.281)	(0.285)
		R^2	0.693	0.760	0.762	0.767	0.831	0.792	0.840	0.829
		N	26521	23788	23781	23781	10383	18890	12381	8848
	5	ξ	-0.438**	-0.381	-0.362	-0.370	0.0886	-0.273	-0.323	-0.159
		se	(0.154)	(0.211)	(0.199)	(0.206)	(0.515)	(0.157)	(0.383)	(0.499)
		R^2	0.693	0.765	0.767	0.772	0.836	0.797	0.847	0.835
		N	26521	23417	23410	23410	9514	18315	11490	8205

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.12: Average treatment effects on firms' survival under increasingly demanding fixed effects, all firms

Survival (Debt & liquidity)			Estimate (ξ Treatment × Energy intensity)							
	Sic digits		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cash reserve duration (2 cat)	1	ξ	0.0939	0.0999	0.0945	0.106	0.130*	0.0950	0.146	0.130
		se	(.)	(0.0588)	(.)	(0.0556)	(0.0588)	(.)	(.)	(.)
		R^2	0.734	0.739	0.740	0.742	0.768	0.756	0.769	0.783
		N	77355	77353	77352	77352	76062	76847	76236	71248
	2	ξ	0.0939	0.117	0.113	0.120*	0.0760	0.113	0.114	0.0544
		se	(.)	(0.0608)	(0.0605)	(0.0592)	(0.0780)	(0.0632)	(0.0750)	(0.0916)
		R^2	0.734	0.749	0.750	0.752	0.818	0.778	0.810	0.821
		N	77355	77262	77260	77260	66732	74717	69122	55763
	3	ξ	0.0939	0.120	0.115	0.123	0.0844	0.136	0.130	0.0639
		se	(.)	(0.0624)	(0.0616)	(0.0617)	(0.115)	(0.0789)	(0.104)	(0.129)
		R^2	0.734	0.764	0.765	0.767	0.842	0.797	0.834	0.835
		N	77355	76120	76118	76118	52245	69837	57391	43022
	4	ξ	0.0939	0.152*	0.141*	0.145*	-0.0384	0.125	0.0326	-0.0678
		se	(.)	(0.0708)	(0.0678)	(0.0682)	(0.133)	(0.0888)	(0.106)	(0.144)
		R^2	0.734	0.782	0.782	0.785	0.846	0.813	0.844	0.839
		N	77355	73102	73099	73099	38943	62523	45574	33061
	5	ξ	0.0939	0.176*	0.164*	0.171*	0.0582	0.156	0.110	0.0362
		se	(.)	(0.0785)	(0.0753)	(0.0745)	(0.124)	(0.103)	(0.0986)	(0.138)
		R^2	0.734	0.784	0.785	0.787	0.849	0.816	0.848	0.841
		N	77355	72145	72142	72142	36190	60844	42856	30946
Cash reserve duration (3 cat)	1	ξ	0.0157	-0.000278	0.00136	0.00335	0.00899	-0.00139	0.00820	-0.00912
		se	(0.0164)	(0.0210)	(0.0200)	(.)	(.)	(0.0211)	(0.0244)	(.)
		R^2	0.699	0.703	0.704	0.706	0.735	0.724	0.737	0.758
		N	77355	77353	77352	77352	76062	76847	76236	71248
	2	ξ	0.0157	-0.0000109	0.00152	0.00444	-0.00571	-0.00550	-0.00513	-0.0269
		se	(0.0164)	(0.0174)	(0.0163)	(0.0167)	(0.0330)	(0.0195)	(0.0330)	(0.0382)
		R^2	0.699	0.714	0.715	0.718	0.791	0.751	0.783	0.800
		N	77355	77262	77260	77260	66732	74717	69122	55763
	3	ξ	0.0157	0.00418	0.00770	0.00959	-0.0297	-0.00754	-0.0136	-0.0446
		se	(0.0164)	(0.0197)	(0.0180)	(0.0179)	(0.0531)	(0.0226)	(0.0482)	(0.0615)
		R^2	0.699	0.734	0.735	0.738	0.825	0.775	0.815	0.819
		N	77355	76120	76118	76118	52245	69837	57391	43022
	4	ξ	0.0157	0.00920	0.0135	0.0136	-0.0553	-0.0111	-0.0466	-0.0581
		se	(0.0164)	(0.0200)	(0.0191)	(0.0193)	(0.0753)	(0.0253)	(0.0614)	(0.0807)
		R^2	0.699	0.757	0.758	0.760	0.828	0.796	0.829	0.821
		N	77355	73102	73099	73099	38943	62523	45574	33061
	5	ξ	0.0157	0.0125	0.0169	0.0172	-0.00488	-0.00748	-0.00568	-0.00470
		se	(0.0164)	(0.0209)	(0.0199)	(0.0197)	(0.0497)	(0.0261)	(0.0370)	(0.0499)
		R^2	0.699	0.760	0.761	0.763	0.836	0.802	0.836	0.829
		N	77355	72145	72142	72142	36190	60844	42856	30946
Cash reserve duration (6 cat)	1	ξ	0.263	0.266*	0.253*	0.289	0.374**	0.283	0.392**	0.384**
		se	(0.143)	(0.116)	(0.116)	(.)	(0.114)	(.)	(0.121)	(0.137)
		R^2	0.787	0.793	0.794	0.796	0.817	0.806	0.818	0.830
		N	77355	77353	77352	77352	76062	76847	76236	71248
	2	ξ	0.263	0.275*	0.267*	0.293*	0.278*	0.254*	0.332**	0.252
		se	(0.143)	(0.116)	(0.113)	(0.110)	(0.131)	(0.120)	(0.122)	(0.159)
		R^2	0.787	0.802	0.802	0.804	0.860	0.825	0.853	0.863
		N	77355	77262	77260	77260	66732	74717	69122	55763
	3	ξ	0.263	0.312**	0.308**	0.337**	0.363	0.371*	0.369*	0.246
		se	(0.143)	(0.110)	(0.107)	(0.106)	(0.210)	(0.138)	(0.173)	(0.194)
		R^2	0.787	0.814	0.815	0.817	0.881	0.840	0.874	0.877
		N	77355	76120	76118	76118	52245	69837	57391	43022
	4	ξ	0.263	0.350**	0.339**	0.358**	0.113	0.346*	0.216	0.0485
		se	(0.143)	(0.129)	(0.121)	(0.119)	(0.206)	(0.146)	(0.162)	(0.225)
		R^2	0.787	0.829	0.829	0.831	0.885	0.853	0.883	0.881
		N	77355	73102	73099	73099	38943	62523	45574	33061
	5	ξ	0.263	0.398**	0.386**	0.409**	0.283	0.417*	0.365*	0.237
		se	(0.143)	(0.143)	(0.133)	(0.129)	(0.213)	(0.175)	(0.172)	(0.236)
		R^2	0.787	0.831	0.832	0.834	0.887	0.856	0.885	0.883
		N	77355	72145	72142	72142	36190	60844	42856	30946

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.13: Average treatment effects on firms' survival under increasingly demanding fixed effects, all firms

Survival (Trading status)	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Change in risk of insolvency	1	ξ	0.0239	-0.0140	0.0134	0.0144	0.0247	-0.00713	0.0294	0.0119
		se	(0.0678)	(0.0623)	(0.0602)	(0.0622)	(0.0894)	(0.0675)	(0.0835)	(0.0991)
		R^2	0.500	0.527	0.529	0.534	0.579	0.553	0.581	0.604
		N	40037	40037	40035	40035	39417	39788	39518	36961
	2	ξ	0.0239	-0.0110	0.0221	0.0199	-0.00773	0.0644	0.0258	0.0319
		se	(0.0678)	(0.0774)	(0.0775)	(0.0786)	(0.159)	(0.0905)	(0.143)	(0.175)
		R^2	0.500	0.551	0.553	0.557	0.662	0.591	0.655	0.671
		N	40037	39983	39979	39979	34613	38612	35899	29042
	3	ξ	0.0239	0.00266	0.0348	0.0373	0.209	0.0981	0.220	0.274
		se	(0.0678)	(0.0695)	(0.0713)	(0.0727)	(0.184)	(0.101)	(0.149)	(0.204)
		R^2	0.500	0.577	0.579	0.583	0.713	0.625	0.705	0.707
		N	40037	39406	39402	39402	27161	36127	29884	22156
	4	ξ	0.0239	0.0389	0.0664	0.0826	0.308	0.123	0.301	0.374
		se	(0.0678)	(0.0783)	(0.0808)	(0.0840)	(0.264)	(0.103)	(0.235)	(0.273)
		R^2	0.500	0.610	0.612	0.616	0.724	0.656	0.724	0.720
		N	40037	37904	37899	37899	20171	32276	23616	17036
	5	ξ	0.0239	0.0619	0.0879	0.102	0.119	0.151	0.135	0.177
		se	(0.0678)	(0.0787)	(0.0795)	(0.0828)	(0.104)	(0.0954)	(0.0876)	(0.101)
		R^2	0.500	0.617	0.619	0.623	0.734	0.662	0.735	0.728
		N	40037	37424	37419	37419	18774	31404	22230	15958
Risk of insolvency	1	ξ	-0.162	-0.140	-0.126	-0.162	-0.139	-0.162	-0.129	-0.121
		se	(.)	(0.105)	(0.106)	(0.102)	(0.0971)	(.)	(0.0989)	(0.102)
		R^2	0.666	0.670	0.671	0.674	0.705	0.688	0.706	0.725
		N	81177	81177	81177	81177	80025	80707	80246	75510
	2	ξ	-0.162	-0.131	-0.119	-0.158	-0.114	-0.129	-0.112	-0.0484
		se	(.)	(0.118)	(0.119)	(0.116)	(0.153)	(0.122)	(0.140)	(0.163)
		R^2	0.666	0.681	0.682	0.685	0.761	0.713	0.752	0.767
		N	81177	81102	81102	81102	71414	78796	73691	60220
	3	ξ	-0.162	-0.113	-0.102	-0.137	-0.0724	-0.114	-0.0944	-0.0322
		se	(.)	(0.128)	(0.130)	(0.129)	(0.188)	(0.136)	(0.184)	(0.184)
		R^2	0.666	0.697	0.698	0.701	0.791	0.734	0.780	0.789
		N	81177	80077	80077	80077	56912	74074	62132	46642
	4	ξ	-0.162	-0.104	-0.0944	-0.133	0.0164	-0.120	-0.0909	0.0209
		se	(.)	(0.124)	(0.126)	(0.128)	(0.210)	(0.146)	(0.193)	(0.211)
		R^2	0.666	0.718	0.719	0.721	0.802	0.755	0.798	0.797
		N	81177	77372	77370	77370	42392	66485	49572	35556
	5	ξ	-0.162	-0.101	-0.0901	-0.129	-0.00516	-0.112	-0.107	-0.00517
		se	(.)	(0.128)	(0.131)	(0.132)	(0.245)	(0.151)	(0.219)	(0.247)
		R^2	0.666	0.721	0.722	0.724	0.809	0.757	0.804	0.802
		N	81177	76523	76521	76521	39756	64827	47044	33429

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.14: Average treatment effects on firms' survival under increasingly demanding fixed effects, all firms

Survival (Trading status)	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trading status (2 cat)	1	ξ	0.0384	0.0260	0.0226	0.0287	0.0406	0.0369	0.0386	0.0437
		se	(0.0464)	(0.0267)	(0.0272)	(0.0265)	(.)	(0.0287)	(0.0289)	(.)
		R^2	0.377	0.518	0.519	0.523	0.579	0.542	0.578	0.591
		N	184291	184289	184287	184287	182034	183414	182460	173091
	2	ξ	0.0384	-0.00129	-0.00606	-0.000641	-0.00259	0.000723	-0.00373	-0.00299
		se	(0.0464)	(0.0207)	(0.0221)	(0.0204)	(0.0254)	(0.0238)	(0.0233)	(0.0312)
		R^2	0.377	0.570	0.571	0.574	0.678	0.602	0.670	0.684
		N	184291	184162	184160	184160	165772	179854	169951	141308
	3	ξ	0.0384	-0.00188	-0.00549	0.00224	0.0182	0.00867	0.00866	0.0233
		se	(0.0464)	(0.0219)	(0.0228)	(0.0215)	(0.0265)	(0.0251)	(0.0224)	(0.0300)
		R^2	0.377	0.612	0.613	0.617	0.743	0.651	0.734	0.745
		N	184291	182258	182256	182256	135391	170318	145749	112093
	4	ξ	0.0384	-0.00411	-0.00661	0.000204	0.00268	0.000936	-0.00373	0.00771
		se	(0.0464)	(0.0146)	(0.0144)	(0.0141)	(0.0240)	(0.0182)	(0.0173)	(0.0247)
		R^2	0.377	0.659	0.660	0.663	0.772	0.693	0.769	0.770
		N	184291	177166	177163	177163	103497	154984	118798	87101
	5	ξ	0.0384	-0.00870	-0.0112	-0.00526	-0.0109	-0.00289	-0.0137	-0.00461
		se	(0.0464)	(0.0138)	(0.0133)	(0.0130)	(0.0198)	(0.0176)	(0.0158)	(0.0212)
		R^2	0.377	0.670	0.672	0.674	0.789	0.704	0.785	0.785
		N	184291	175390	175387	175387	97909	151460	113397	82304
Trading status (6 cat)	1	ξ	0.0804	0.0216	0.00600	0.0310	0.0921	0.0588	0.0703	0.0975
		se	(0.202)	(.)	(0.159)	(0.153)	(0.167)	(0.163)	(.)	(.)
		R^2	0.437	0.552	0.553	0.557	0.603	0.572	0.602	0.611
		N	184810	184808	184806	184806	182552	183926	182970	173567
	2	ξ	0.0804	-0.101	-0.121	-0.100	-0.114	-0.106	-0.136	-0.161
		se	(0.202)	(0.146)	(0.155)	(0.146)	(0.197)	(0.169)	(0.182)	(0.244)
		R^2	0.437	0.595	0.597	0.599	0.695	0.626	0.687	0.699
		N	184810	184686	184684	184684	166293	180384	170470	141776
	3	ξ	0.0804	-0.0777	-0.0954	-0.0621	0.0773	-0.0519	0.00989	0.0860
		se	(0.202)	(0.126)	(0.133)	(0.124)	(0.122)	(0.147)	(0.108)	(0.143)
		R^2	0.437	0.632	0.633	0.636	0.757	0.670	0.748	0.757
		N	184810	182784	182782	182782	135954	170852	146310	112563
	4	ξ	0.0804	-0.0560	-0.0667	-0.0363	-0.00808	-0.0546	-0.0440	0.000168
		se	(0.202)	(0.0828)	(0.0860)	(0.0808)	(0.0863)	(0.0905)	(0.0813)	(0.0955)
		R^2	0.437	0.673	0.674	0.677	0.783	0.706	0.778	0.778
		N	184810	177676	177673	177673	103985	155458	119310	87497
	5	ξ	0.0804	-0.0754	-0.0863	-0.0597	-0.0402	-0.0687	-0.0769	-0.0375
		se	(0.202)	(0.0803)	(0.0830)	(0.0791)	(0.0986)	(0.0889)	(0.0958)	(0.106)
		R^2	0.437	0.683	0.684	0.686	0.797	0.714	0.793	0.792
		N	184810	175908	175905	175905	98355	151928	113886	82676

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.15: Average treatment effects on firms' survival under increasingly demanding fixed effects, all firms

Survival (Trading status)			Estimate (ξ Treatment × Energy intensity)							
	Sic digits		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Confidence of 3m survival	1	ξ	0.0803	0.0928	0.0921	0.107	0.148*	0.126*	0.133*	0.136
		se	(.)	(0.0570)	(0.0590)	(0.0567)	(0.0597)	(0.0579)	(0.0635)	(.)
		R^2	0.703	0.710	0.711	0.713	0.736	0.726	0.739	0.755
		N	59784	59784	59784	59784	58956	59458	59153	55741
	2	ξ	0.0803	0.0932	0.0912	0.103	0.153	0.107	0.151	0.107
		se	(.)	(0.0618)	(0.0644)	(0.0617)	(0.0931)	(0.0662)	(0.0898)	(0.103)
		R^2	0.703	0.719	0.720	0.722	0.787	0.748	0.780	0.792
		N	59784	59739	59739	59739	53012	58103	54643	44806
	3	ξ	0.0803	0.115	0.116	0.128*	0.0848	0.127	0.129	0.0500
		se	(.)	(0.0565)	(0.0600)	(0.0575)	(0.107)	(0.0678)	(0.0917)	(0.123)
		R^2	0.703	0.733	0.734	0.736	0.815	0.766	0.806	0.809
		N	59784	59046	59046	59046	42552	54791	46266	35024
	4	ξ	0.0803	0.0932	0.0966	0.105	0.115	0.125	0.191	0.0809
		se	(.)	(0.0510)	(0.0561)	(0.0552)	(0.146)	(0.0746)	(0.126)	(0.156)
		R^2	0.703	0.749	0.750	0.752	0.821	0.781	0.819	0.814
		N	59784	57217	57216	57216	32179	49456	37285	27141
	5	ξ	0.0803	0.0962	0.0977	0.108	0.134	0.125	0.200	0.101
		se	(.)	(0.0576)	(0.0621)	(0.0631)	(0.191)	(0.0825)	(0.155)	(0.203)
		R^2	0.703	0.752	0.753	0.755	0.826	0.783	0.825	0.819
		N	59784	56550	56549	56549	30162	48147	35359	25524
Local sites (LBD)	1	ξ	-0.0718	-0.0192	-0.216	-0.0594	0.225	0.0493	0.0320	-0.00890
		se	(.)	(0.538)	(.)	(.)	(.)	(0.260)	(0.231)	(0.250)
		R^2	0.964	0.964	0.964	0.964	0.964	0.964	0.964	0.965
		N	285430	285429	285429	285417	285368	285417	285368	284237
	2	ξ	-0.0718	0.534	0.279	0.435	0.131	0.151	0.225	0.272
		se	(.)	(0.505)	(0.361)	(0.387)	(0.314)	(0.320)	(0.399)	(0.418)
		R^2	0.964	0.964	0.964	0.964	0.965	0.965	0.965	0.966
		N	285430	285429	285429	285417	284473	285356	284526	274278
	3	ξ	-0.0718	0.268	0.0320	0.191	-0.242	-0.108	-0.228	-0.160
		se	(.)	(0.389)	(0.291)	(0.290)	(0.262)	(0.267)	(0.221)	(0.239)
		R^2	0.964	0.964	0.964	0.964	0.966	0.964	0.966	0.967
		N	285430	285403	285403	285391	278501	284316	279810	253485
	4	ξ	-0.0718	0.251	0.0179	0.178	-0.485	-0.237	-0.310	-0.363
		se	(.)	(0.405)	(0.322)	(0.309)	(0.366)	(0.273)	(0.278)	(0.333)
		R^2	0.964	0.964	0.964	0.965	0.966	0.964	0.966	0.965
		N	285430	285117	285117	285105	265091	281176	270047	227118
	5	ξ	-0.0718	0.292	0.0603	0.220	-0.473	-0.196	-0.291	-0.343
		se	(.)	(0.410)	(0.322)	(0.310)	(0.382)	(0.274)	(0.292)	(0.343)
		R^2	0.964	0.964	0.964	0.965	0.966	0.964	0.966	0.965
		N	285430	285044	285044	285032	261191	279880	267249	221148
Survival (LBD)	1	ξ	-0.0926**	-0.0987**	-0.0438	-0.0474*	-0.0441*	-0.0430*	-0.0487*	-0.0482*
		se	(0.0277)	(0.0282)	(.)	(0.0180)	(0.0170)	(0.0170)	(0.0182)	(0.0181)
		R^2	0.632	0.635	0.645	0.645	0.653	0.650	0.651	0.666
		N	299790	299788	299788	299776	299727	299776	299727	298659
	2	ξ	-0.0926**	-0.0991**	-0.0488*	-0.0522*	-0.0529*	-0.0493*	-0.0565*	-0.0573*
		se	(0.0277)	(0.0283)	(0.0188)	(0.0189)	(0.0188)	(0.0178)	(0.0200)	(0.0205)
		R^2	0.632	0.639	0.648	0.648	0.673	0.657	0.667	0.700
		N	299790	299788	299788	299776	298891	299738	298947	288702
	3	ξ	-0.0926**	-0.0963**	-0.0488*	-0.0519*	-0.0576*	-0.0499*	-0.0614*	-0.0726**
		se	(0.0277)	(0.0276)	(0.0189)	(0.0190)	(0.0186)	(0.0182)	(0.0201)	(0.0211)
		R^2	0.632	0.645	0.653	0.653	0.699	0.669	0.686	0.723
		N	299790	299767	299767	299755	293031	298732	294312	267684
	4	ξ	-0.0926**	-0.0958**	-0.0496*	-0.0525*	-0.0645**	-0.0514*	-0.0663**	-0.0735**
		se	(0.0277)	(0.0266)	(0.0183)	(0.0184)	(0.0191)	(0.0178)	(0.0204)	(0.0212)
		R^2	0.632	0.652	0.659	0.659	0.720	0.683	0.703	0.735
		N	299790	299505	299505	299493	279563	295605	284518	240482
	5	ξ	-0.0926**	-0.0970**	-0.0504*	-0.0534*	-0.0658**	-0.0524*	-0.0670**	-0.0751**
		se	(0.0277)	(0.0268)	(0.0184)	(0.0185)	(0.0187)	(0.0180)	(0.0200)	(0.0212)
		R^2	0.632	0.654	0.660	0.661	0.725	0.685	0.707	0.740
		N	299790	299413	299413	299401	275731	294328	281702	234425

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.16: Average treatment effects on firms' survival under increasingly demanding fixed effects, all firms

Survival (Trading status)	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Redundancies (share)	1	ξ	0.141	0.320	0.360	0.248	0.154	0.232	0.105	0.127
		se	(0.321)	(0.386)	(0.387)	(.)	(0.378)	(0.360)	(0.378)	(0.381)
		R^2	0.230	0.238	0.243	0.248	0.304	0.277	0.300	0.350
		N	138778	138776	138775	138775	137016	138116	137386	130119
	2	ξ	0.141	0.468	0.488	0.385	-0.0747	0.298	-0.124	-0.118
		se	(0.321)	(0.439)	(0.444)	(0.399)	(0.299)	(0.412)	(0.317)	(0.322)
		R^2	0.230	0.262	0.263	0.268	0.417	0.330	0.392	0.424
		N	138778	138675	138674	138674	124517	135307	127824	106053
	3	ξ	0.141	0.359	0.372	0.283	-0.0693	0.236	-0.117	0.0685
		se	(0.321)	(0.418)	(0.423)	(0.375)	(0.315)	(0.405)	(0.335)	(0.280)
		R^2	0.230	0.293	0.294	0.299	0.487	0.377	0.450	0.465
		N	138778	137218	137217	137217	101455	127993	109389	84033
	4	ξ	0.141	0.476	0.488	0.386	0.0823	0.536	-0.0300	0.541*
		se	(0.321)	(0.336)	(0.342)	(0.302)	(0.457)	(0.300)	(0.376)	(0.263)
		R^2	0.230	0.342	0.344	0.349	0.485	0.431	0.480	0.474
		N	138778	133268	133266	133266	77261	116276	88909	65355
	5	ξ	0.141	0.434	0.445	0.337	0.0135	0.486	-0.110	0.502*
		se	(0.321)	(0.342)	(0.348)	(0.311)	(0.490)	(0.305)	(0.387)	(0.240)
		R^2	0.230	0.349	0.351	0.355	0.486	0.437	0.485	0.475
		N	138778	131897	131895	131895	72958	113547	84779	61688
Redundancy expectations	1	ξ	0.0125	0.0424	0.0418	0.0186	-0.0324	0.00371	-0.0269	-0.0479
		se	(0.0337)	(0.0539)	(.)	(0.0526)	(0.0530)	(0.0559)	(0.0527)	(0.0583)
		R^2	0.501	0.508	0.509	0.515	0.563	0.534	0.563	0.586
		N	43003	43003	43003	43003	42145	42698	42339	39139
	2	ξ	0.0125	0.0796	0.0772	0.0571	0.0257	0.0592	0.0367	0.0129
		se	(0.0337)	(0.0457)	(0.0466)	(0.0455)	(0.0559)	(0.0479)	(0.0556)	(0.0584)
		R^2	0.501	0.531	0.532	0.537	0.664	0.578	0.650	0.670
		N	43003	42935	42935	42935	36326	41318	37785	29775
	3	ξ	0.0125	0.0695	0.0663	0.0476	0.114	0.0696	0.101	0.0506
		se	(0.0337)	(0.0473)	(0.0489)	(0.0494)	(0.0844)	(0.0585)	(0.0710)	(0.0891)
		R^2	0.501	0.564	0.565	0.570	0.705	0.613	0.694	0.698
		N	43003	42215	42214	42214	27596	38305	30778	22184
	4	ξ	0.0125	0.0934	0.0866	0.0721	0.154	0.106	0.170	0.134
		se	(0.0337)	(0.0486)	(0.0507)	(0.0510)	(0.116)	(0.0648)	(0.0887)	(0.123)
		R^2	0.501	0.606	0.607	0.613	0.721	0.649	0.718	0.714
		N	43003	40317	40312	40312	20219	33772	24133	16936
	5	ξ	0.0125	0.0911	0.0827	0.0646	0.162	0.103	0.180	0.144
		se	(0.0337)	(0.0491)	(0.0506)	(0.0500)	(0.126)	(0.0637)	(0.0949)	(0.135)
		R^2	0.501	0.612	0.614	0.619	0.728	0.654	0.729	0.721
		N	43003	39781	39776	39776	18595	32764	22500	15720

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.17: Average treatment effects on firms' output under increasingly demanding fixed effects, small and medium sized firms only

Output	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Turnover change (3 cat)	1	ξ	0.0685	-0.0540	-0.0541	-0.00819	0.0101	0.00740	0.00917	-0.0232
		se	(.)	(0.208)	(.)	(0.192)	(.)	(0.210)	(0.231)	(.)
		R^2	0.397	0.419	0.422	0.435	0.511	0.470	0.517	0.547
		N	43244	43227	43226	43226	40505	42570	40805	36809
	2	ξ	0.0685	-0.0789	-0.0818	-0.0341	0.00666	0.0205	0.000437	-0.198
		se	(.)	(0.228)	(0.226)	(0.216)	(0.435)	(0.248)	(0.372)	(0.499)
		R^2	0.397	0.473	0.476	0.488	0.637	0.548	0.629	0.637
		N	43244	42927	42925	42925	29056	40041	31473	23567
	3	ξ	0.0685	0.0584	0.0767	0.137	0.252	0.194	0.255	-0.0225
		se	(.)	(0.212)	(0.211)	(0.209)	(0.614)	(0.253)	(0.480)	(0.669)
		R^2	0.397	0.524	0.527	0.538	0.709	0.610	0.693	0.695
		N	43244	40634	40632	40632	19941	34972	23329	15651
	4	ξ	0.0685	-0.0879	-0.0642	-0.00332	-0.395	0.0635	-0.132	-0.443
		se	(.)	(0.219)	(0.221)	(0.231)	(0.788)	(0.379)	(0.682)	(0.805)
		R^2	0.397	0.574	0.577	0.590	0.729	0.658	0.728	0.718
		N	43244	36640	36629	36629	12405	28448	15888	10212
	5	ξ	0.0685	-0.111	-0.0861	-0.0213	-0.399	0.0154	-0.225	-0.482
		se	(.)	(0.233)	(0.237)	(0.243)	(0.883)	(0.403)	(0.747)	(0.876)
		R^2	0.397	0.578	0.582	0.595	0.736	0.664	0.735	0.726
		N	43244	35737	35726	35724	11355	27351	14772	9385
Turnover change (6 cat)	1	ξ	-0.246	-0.573	-0.583	-0.502	-0.596	-0.501	-0.583*	-0.621
		se	(0.244)	(0.294)	(0.292)	(0.284)	(.)	(.)	(0.252)	(0.340)
		R^2	0.521	0.538	0.540	0.550	0.612	0.580	0.615	0.638
		N	30849	30841	30840	30840	28762	30395	29028	26068
	2	ξ	-0.246	-0.508	-0.522	-0.485	-0.684	-0.465	-0.755*	-0.648
		se	(0.244)	(0.309)	(0.306)	(0.307)	(0.448)	(0.314)	(0.357)	(0.532)
		R^2	0.521	0.581	0.583	0.592	0.709	0.641	0.705	0.705
		N	30849	30615	30613	30613	20424	28455	22204	16634
	3	ξ	-0.246	-0.291	-0.280	-0.209	0.177	-0.0177	0.152	0.127
		se	(0.244)	(0.361)	(0.364)	(0.374)	(0.664)	(0.355)	(0.626)	(0.735)
		R^2	0.521	0.616	0.619	0.628	0.765	0.687	0.752	0.746
		N	30849	28928	28926	28926	13845	24797	16356	10909
	4	ξ	-0.246	-0.537	-0.520	-0.364	-0.613	-0.264	-0.425	-0.618
		se	(0.244)	(0.384)	(0.386)	(0.398)	(0.810)	(0.496)	(0.770)	(0.839)
		R^2	0.521	0.656	0.659	0.670	0.780	0.724	0.779	0.765
		N	30849	26039	26028	26028	8664	19971	11083	7245
	5	ξ	-0.246	-0.543	-0.526	-0.412	-0.624	-0.359	-0.498	-0.618
		se	(0.244)	(0.381)	(0.382)	(0.404)	(0.957)	(0.541)	(0.897)	(1.007)
		R^2	0.521	0.659	0.662	0.673	0.783	0.728	0.783	0.767
		N	30849	25357	25346	25344	7881	19153	10221	6625

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.18: Average treatment effects on firms' output under increasingly demanding fixed effects, small and medium sized firms only

Output	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Turnover expectations (3 cat)	1	ξ	-0.157	-0.139	-0.135	-0.122	-0.150	-0.115	-0.175	-0.190
		se	(0.102)	(0.104)	(0.104)	(.)	(.)	(.)	(0.0974)	(0.111)
		R^2	0.304	0.331	0.335	0.351	0.448	0.395	0.455	0.492
		N	38865	38854	38851	38851	36408	38247	36679	32927
	2	ξ	-0.157	-0.209	-0.208	-0.201*	-0.323	-0.222*	-0.346*	-0.362*
		se	(0.102)	(0.110)	(0.108)	(0.0964)	(0.168)	(0.101)	(0.153)	(0.171)
		R^2	0.304	0.396	0.399	0.414	0.589	0.485	0.584	0.591
		N	38865	38589	38586	38586	25974	35924	28226	20817
	3	ξ	-0.157	-0.221*	-0.223**	-0.210**	-0.304	-0.280**	-0.383*	-0.229
		se	(0.102)	(0.0854)	(0.0810)	(0.0689)	(0.177)	(0.103)	(0.176)	(0.210)
		R^2	0.304	0.457	0.460	0.475	0.666	0.557	0.656	0.647
		N	38865	36520	36517	36517	17617	31285	20756	13686
	4	ξ	-0.157	-0.260*	-0.248*	-0.227*	0.132	-0.143	-0.144	0.105
		se	(0.102)	(0.104)	(0.104)	(0.0893)	(0.370)	(0.150)	(0.300)	(0.364)
		R^2	0.304	0.516	0.520	0.536	0.678	0.613	0.697	0.663
		N	38865	32958	32949	32949	10857	25437	14063	8805
	5	ξ	-0.157	-0.293**	-0.283**	-0.261**	0.0790	-0.235	-0.133	0.0306
		se	(0.102)	(0.0962)	(0.0982)	(0.0761)	(0.369)	(0.134)	(0.322)	(0.344)
		R^2	0.304	0.523	0.527	0.543	0.690	0.624	0.705	0.676
		N	38865	32147	32138	32136	9904	24440	13027	8077
Turnover expectations (5 cat)	1	ξ	-0.149	-0.126	-0.131	-0.121	-0.265	-0.0414	-0.234	-0.101
		se	(0.154)	(0.143)	(.)	(0.126)	(0.189)	(0.116)	(0.173)	(.)
		R^2	0.361	0.390	0.394	0.408	0.496	0.449	0.506	0.541
		N	26981	26975	26974	26974	25144	26578	25400	22655
	2	ξ	-0.149	-0.257	-0.274	-0.252	-0.517	-0.199	-0.428	-0.161
		se	(0.154)	(0.181)	(0.175)	(0.163)	(0.432)	(0.232)	(0.343)	(0.373)
		R^2	0.361	0.453	0.457	0.471	0.624	0.533	0.625	0.635
		N	26981	26782	26781	26781	17730	24812	19359	14258
	3	ξ	-0.149	-0.369*	-0.407**	-0.357**	-0.277	-0.270	-0.498	-0.197
		se	(0.154)	(0.165)	(0.147)	(0.130)	(0.324)	(0.198)	(0.289)	(0.310)
		R^2	0.361	0.510	0.513	0.527	0.708	0.604	0.697	0.680
		N	26981	25306	25305	25305	11863	21576	14119	9249
	4	ξ	-0.149	-0.572**	-0.621**	-0.579**	-0.331	-0.239	-0.656*	-0.283
		se	(0.154)	(0.183)	(0.191)	(0.198)	(0.306)	(0.202)	(0.250)	(0.299)
		R^2	0.361	0.564	0.567	0.582	0.692	0.644	0.715	0.679
		N	26981	22809	22803	22803	7317	17300	9516	6046
	5	ξ	-0.149	-0.562**	-0.614**	-0.567**	-0.341	-0.357	-0.622*	-0.336
		se	(0.154)	(0.192)	(0.198)	(0.188)	(0.241)	(0.198)	(0.236)	(0.238)
		R^2	0.361	0.570	0.573	0.588	0.702	0.653	0.722	0.688
		N	26981	22223	22217	22215	6642	16585	8768	5520

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.19: Average treatment effects on firms' output under increasingly demanding fixed effects, small and medium sized firms only

Output	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Export change	1	ξ	-0.297	-0.291	-0.320	-0.317	-0.253	-0.288	-0.225	-0.145
		se	(0.217)	(0.229)	(0.225)	(0.212)	(0.286)	(0.189)	(0.225)	(0.254)
		R^2	0.461	0.478	0.482	0.510	0.552	0.558	0.579	0.583
		N	16794	16647	16610	16600	14844	16028	15028	13555
	2	ξ	-0.297	-0.339*	-0.368*	-0.396*	0.412*	-0.372	0.440*	0.743*
		se	(0.217)	(0.156)	(0.152)	(0.196)	(0.154)	(0.262)	(0.199)	(0.285)
		R^2	0.461	0.547	0.552	0.581	0.673	0.648	0.693	0.677
		N	16794	16012	15977	15971	8487	13769	9713	7198
	3	ξ	-0.297	-0.403**	-0.415**	-0.471*	0.516	-0.703**	0.397	0.730
		se	(0.217)	(0.134)	(0.145)	(0.196)	(0.450)	(0.214)	(0.503)	(0.532)
		R^2	0.461	0.620	0.626	0.659	0.759	0.736	0.781	0.753
		N	16794	14064	14029	14019	4309	10430	5552	3832
	4	ξ	-0.297	-0.539**	-0.572**	-0.520**	-0.242	-1.074**	-0.129	-0.235
		se	(0.217)	(0.197)	(0.195)	(0.188)	(0.756)	(0.334)	(0.793)	(0.777)
		R^2	0.461	0.680	0.687	0.722	0.767	0.801	0.801	0.758
		N	16794	11213	11170	11148	2017	7021	2738	1864
	5	ξ	-0.297	-0.577**	-0.605**	-0.543**	-0.303	-1.155**	-0.248	-0.296
		se	(0.217)	(0.208)	(0.199)	(0.200)	(0.773)	(0.377)	(0.794)	(0.795)
		R^2	0.461	0.681	0.689	0.726	0.776	0.805	0.809	0.768
		N	16794	10708	10665	10643	1889	6591	2548	1736
Export status (2 cat)	1	ξ	-0.0167	-0.00179	-0.00137	0.00190	0.0116	0.00941	0.00366	0.0145
		se	(0.0404)	(0.0250)	(0.0247)	(.)	(0.0308)	(.)	(0.0260)	(0.0325)
		R^2	0.904	0.906	0.906	0.908	0.922	0.914	0.922	0.927
		N	45301	45292	45291	45291	42681	44623	43015	38733
	2	ξ	-0.0167	0.00923	0.00816	0.0100	-0.00106	0.0214	0.00801	0.0504
		se	(0.0404)	(0.0267)	(0.0264)	(0.0280)	(0.0380)	(0.0330)	(0.0282)	(0.0470)
		R^2	0.904	0.914	0.915	0.917	0.942	0.928	0.941	0.940
		N	45301	45037	45036	45036	31179	42114	33758	24895
	3	ξ	-0.0167	0.0163	0.0179	0.0164	0.0465	0.0402	0.0128	0.0835
		se	(0.0404)	(0.0281)	(0.0285)	(0.0285)	(0.0638)	(0.0363)	(0.0396)	(0.0670)
		R^2	0.904	0.922	0.922	0.924	0.952	0.936	0.949	0.949
		N	45301	42832	42831	42831	21353	37001	24959	16444
	4	ξ	-0.0167	-0.00168	-0.00225	-0.00384	0.113	-0.0153	0.0121	0.100
		se	(0.0404)	(0.0337)	(0.0330)	(0.0372)	(0.0826)	(0.0538)	(0.0545)	(0.0863)
		R^2	0.904	0.931	0.931	0.933	0.958	0.946	0.956	0.955
		N	45301	38875	38872	38872	13362	30226	17233	10759
	5	ξ	-0.0167	-0.00742	-0.00555	-0.00557	0.118	-0.0236	-0.00244	0.116
		se	(0.0404)	(0.0330)	(0.0321)	(0.0362)	(0.0847)	(0.0517)	(0.0638)	(0.0892)
		R^2	0.904	0.933	0.933	0.935	0.960	0.948	0.958	0.957
		N	45301	37936	37933	37931	12277	29170	16001	9896
Export status (3 cat)	1	ξ	-0.100	-0.0729	-0.0755	-0.0694	-0.0814	-0.0459	-0.102	-0.109
		se	(.)	(0.0576)	(0.0573)	(.)	(.)	(0.0574)	(0.0609)	(.)
		R^2	0.946	0.948	0.948	0.949	0.957	0.952	0.958	0.960
		N	30071	30067	30067	30067	27940	29519	28233	25069
	2	ξ	-0.100	-0.0968	-0.0996	-0.101	-0.117	-0.0760	-0.0863	-0.136
		se	(.)	(0.0661)	(0.0655)	(0.0633)	(0.0930)	(0.0777)	(0.0720)	(0.120)
		R^2	0.946	0.953	0.953	0.954	0.967	0.960	0.967	0.967
		N	30071	29793	29792	29792	20451	27627	22220	16298
	3	ξ	-0.100	-0.0671	-0.0696	-0.0664	-0.00164	-0.0145	-0.0501	-0.0382
		se	(.)	(0.0803)	(0.0782)	(0.0736)	(0.194)	(0.110)	(0.139)	(0.207)
		R^2	0.946	0.957	0.957	0.959	0.972	0.965	0.970	0.973
		N	30071	28260	28259	28259	14082	24301	16406	10998
	4	ξ	-0.100	-0.130	-0.130	-0.115	0.0305	-0.151	-0.00417	0.0498
		se	(.)	(0.0888)	(0.0838)	(0.0854)	(0.160)	(0.136)	(0.130)	(0.159)
		R^2	0.946	0.963	0.963	0.964	0.976	0.971	0.974	0.976
		N	30071	25641	25641	25641	9224	20016	11554	7343
	5	ξ	-0.100	-0.118	-0.117	-0.103	0.0982	-0.123	0.00439	0.133
		se	(.)	(0.0922)	(0.0852)	(0.0841)	(0.127)	(0.117)	(0.0860)	(0.123)
		R^2	0.946	0.963	0.964	0.965	0.978	0.972	0.976	0.978
		N	30071	24994	24994	24994	8507	19281	10753	6722

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.20: Average treatment effects on firms' prices under increasingly demanding fixed effects, small and medium sized firms only

Prices	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Price of goods sold	1	ξ	0.389**	0.410**	0.412**	0.439***	0.465**	0.424**	0.426**	0.378*
		se	(0.119)	(0.125)	(0.130)	(0.124)	(0.138)	(0.131)	(0.134)	(0.158)
		R^2	0.392	0.412	0.415	0.428	0.505	0.466	0.517	0.543
		N	36687	36668	36666	36666	34128	36043	34443	30767
	2	ξ	0.389**	0.362*	0.361*	0.365*	0.627**	0.410*	0.572**	0.615***
		se	(0.119)	(0.144)	(0.149)	(0.149)	(0.225)	(0.171)	(0.172)	(0.169)
		R^2	0.392	0.463	0.466	0.479	0.640	0.544	0.640	0.639
		N	36687	36307	36304	36304	23878	33676	26044	19216
	3	ξ	0.389**	0.289*	0.293*	0.316*	0.593**	0.437**	0.606**	0.489*
		se	(0.119)	(0.124)	(0.128)	(0.126)	(0.204)	(0.164)	(0.179)	(0.185)
		R^2	0.392	0.522	0.525	0.537	0.706	0.616	0.702	0.688
		N	36687	34278	34275	34275	16035	29218	18981	12512
	4	ξ	0.389**	0.385*	0.385*	0.394*	0.523	0.613***	0.621**	0.501
		se	(0.119)	(0.159)	(0.163)	(0.152)	(0.271)	(0.167)	(0.218)	(0.285)
		R^2	0.392	0.584	0.588	0.601	0.732	0.678	0.748	0.708
		N	36687	30644	30638	30638	9556	23357	12495	7809
	5	ξ	0.389**	0.418**	0.417*	0.422**	0.487	0.658***	0.567*	0.465
		se	(0.119)	(0.154)	(0.159)	(0.148)	(0.276)	(0.151)	(0.218)	(0.291)
		R^2	0.392	0.590	0.593	0.607	0.738	0.685	0.753	0.713
		N	36687	29829	29823	29821	8662	22405	11511	7102
Price of materials	1	ξ	0.456	0.433***	0.436	0.388***	0.350	0.370	0.392***	0.363**
		se	(.)	(0.106)	(.)	(0.111)	(.)	(.)	(0.109)	(0.120)
		R^2	0.434	0.461	0.463	0.477	0.555	0.515	0.565	0.588
		N	35706	35682	35679	35679	33180	35071	33405	29881
	2	ξ	0.456	0.478***	0.478***	0.408**	0.431*	0.426**	0.399**	0.500***
		se	(.)	(0.121)	(0.120)	(0.130)	(0.163)	(0.158)	(0.116)	(0.128)
		R^2	0.434	0.509	0.512	0.526	0.669	0.590	0.667	0.671
		N	35706	35302	35298	35298	22883	32723	25068	18441
	3	ξ	0.456	0.369**	0.375**	0.348**	0.237	0.350*	0.381*	0.238
		se	(.)	(0.114)	(0.114)	(0.130)	(0.214)	(0.154)	(0.186)	(0.234)
		R^2	0.434	0.557	0.559	0.573	0.724	0.647	0.722	0.713
		N	35706	33246	33242	33242	15199	28252	18118	12002
	4	ξ	0.456	0.323*	0.353**	0.370*	0.281	0.509**	0.307	0.266
		se	(.)	(0.127)	(0.126)	(0.146)	(0.419)	(0.177)	(0.274)	(0.399)
		R^2	0.434	0.608	0.610	0.627	0.735	0.695	0.755	0.730
		N	35706	29589	29577	29577	9012	22395	11778	7394
	5	ξ	0.456	0.344**	0.371**	0.384**	0.137	0.461*	0.220	0.124
		se	(.)	(0.124)	(0.122)	(0.138)	(0.382)	(0.181)	(0.243)	(0.380)
		R^2	0.434	0.612	0.615	0.632	0.753	0.701	0.766	0.737
		N	35706	28789	28777	28775	8215	21427	10895	6775
Prices of goods sold expectations	1	ξ	0.155	0.169	0.171	0.173	0.106	0.111	0.0620	0.0543
		se	(0.0819)	(.)	(0.104)	(.)	(.)	(0.109)	(.)	(0.106)
		R^2	0.404	0.426	0.429	0.441	0.523	0.481	0.528	0.562
		N	24353	24342	24340	24340	22665	23853	22774	20419
	2	ξ	0.155	0.178	0.182	0.170	0.169	0.178	0.234*	0.225
		se	(0.0819)	(0.0996)	(0.104)	(0.111)	(0.111)	(0.109)	(0.112)	(0.130)
		R^2	0.404	0.479	0.482	0.494	0.641	0.559	0.637	0.639
		N	24353	24077	24074	24074	15451	22304	16812	12424
	3	ξ	0.155	0.0923	0.104	0.116	0.135	0.0829	0.355	0.225
		se	(0.0819)	(0.104)	(0.106)	(0.117)	(0.271)	(0.107)	(0.262)	(0.390)
		R^2	0.404	0.530	0.534	0.546	0.702	0.622	0.702	0.689
		N	24353	22678	22675	22675	10318	19330	12181	8174
	4	ξ	0.155	0.226	0.258	0.218	0.105	0.208	0.205	0.0733
		se	(0.0819)	(0.141)	(0.149)	(0.142)	(0.461)	(0.148)	(0.388)	(0.492)
		R^2	0.404	0.592	0.596	0.609	0.737	0.685	0.752	0.711
		N	24353	20161	20157	20157	6212	15494	8101	5137
	5	ξ	0.155	0.214	0.246	0.205	0.107	0.224	0.192	0.0856
		se	(0.0819)	(0.144)	(0.152)	(0.145)	(0.456)	(0.163)	(0.393)	(0.482)
		R^2	0.404	0.599	0.602	0.616	0.747	0.693	0.762	0.721
		N	24353	19682	19678	19676	5664	14907	7494	4728

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.21: Average treatment effects on firms' input mix under increasingly demanding fixed effects, small and medium sized firms only

Input mix	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Import status (2 cat)	1	ξ	0.00133	-0.0359	-0.0372	-0.0179	0.00451	-0.00127	0.0161	0.0285
		se	(0.0457)	(0.0460)	(0.0464)	(.)	(0.0445)	(.)	(0.0415)	(0.0580)
		R^2	0.873	0.877	0.877	0.879	0.898	0.888	0.900	0.906
		N	44659	44649	44648	44648	42029	43999	42341	38131
	2	ξ	0.00133	-0.0138	-0.0134	0.00955	0.0438	0.0491	0.0844	0.101
		se	(0.0457)	(0.0559)	(0.0556)	(0.0517)	(0.0764)	(0.0602)	(0.0607)	(0.115)
		R^2	0.873	0.887	0.888	0.890	0.929	0.907	0.927	0.928
		N	44659	44388	44387	44387	30634	41519	33075	24453
	3	ξ	0.00133	0.0157	0.0184	0.0364	-0.0475	0.0439	0.0578	-0.0198
		se	(0.0457)	(0.0628)	(0.0623)	(0.0616)	(0.149)	(0.0693)	(0.111)	(0.150)
		R^2	0.873	0.900	0.900	0.902	0.944	0.921	0.940	0.941
		N	44659	42217	42216	42216	20883	36430	24395	16176
	4	ξ	0.00133	0.0404	0.0431	0.0649	-0.0654	0.0519	0.0235	-0.0406
		se	(0.0457)	(0.0660)	(0.0654)	(0.0657)	(0.172)	(0.0896)	(0.129)	(0.171)
		R^2	0.873	0.914	0.915	0.917	0.950	0.934	0.950	0.946
		N	44659	38240	38237	38237	13001	29686	16825	10508
	5	ξ	0.00133	0.0455	0.0507	0.0747	-0.0711	0.0476	-0.0306	-0.0407
		se	(0.0457)	(0.0679)	(0.0671)	(0.0668)	(0.178)	(0.0864)	(0.130)	(0.175)
		R^2	0.873	0.916	0.917	0.919	0.952	0.935	0.952	0.948
		N	44659	37295	37292	37290	11900	28578	15603	9660
Import status (3 cat)	1	ξ	-0.00101	-0.0622	-0.0554	-0.0283	-0.0734	-0.0531	-0.0539	-0.0821
		se	(0.0709)	(0.0796)	(0.0777)	(.)	(.)	(0.0714)	(.)	(.)
		R^2	0.934	0.936	0.936	0.938	0.948	0.942	0.949	0.952
		N	23232	23229	23229	23229	21853	22857	22018	19928
	2	ξ	-0.00101	-0.0412	-0.0307	0.00253	0.0809	0.114	0.138	0.0652
		se	(0.0709)	(0.0977)	(0.0943)	(0.0769)	(0.112)	(0.119)	(0.104)	(0.175)
		R^2	0.934	0.941	0.942	0.943	0.962	0.952	0.961	0.964
		N	23232	23099	23099	23099	16070	21648	17319	12913
	3	ξ	-0.00101	-0.0245	-0.0181	-0.00331	-0.0217	0.00704	0.118	0.0318
		se	(0.0709)	(0.125)	(0.119)	(0.0963)	(0.290)	(0.141)	(0.215)	(0.274)
		R^2	0.934	0.948	0.948	0.949	0.971	0.959	0.967	0.971
		N	23232	21963	21963	21963	11095	19011	12852	8705
	4	ξ	-0.00101	0.129**	0.137**	0.144**	0.150	0.167	0.213	0.160
		se	(0.0709)	(0.0367)	(0.0394)	(0.0470)	(0.297)	(0.155)	(0.262)	(0.314)
		R^2	0.934	0.955	0.956	0.957	0.978	0.967	0.975	0.977
		N	23232	19868	19868	19868	6831	15568	8807	5459
	5	ξ	-0.00101	0.186**	0.196***	0.200***	0.191	0.233	0.275	0.192
		se	(0.0709)	(0.0525)	(0.0495)	(0.0515)	(0.304)	(0.152)	(0.272)	(0.330)
		R^2	0.934	0.957	0.957	0.958	0.979	0.968	0.976	0.979
		N	23232	19349	19349	19349	6269	14963	8174	5032
Imports change	1	ξ	0.135	0.111	0.0814	0.0946	-0.0240	0.0631	-0.0821	-0.116
		se	(.)	(0.233)	(0.242)	(0.222)	(.)	(.)	(0.255)	(.)
		R^2	0.400	0.425	0.430	0.458	0.503	0.506	0.533	0.539
		N	20382	20224	20193	20193	18022	19575	18260	16693
	2	ξ	0.135	0.0532	0.0317	-0.0218	0.277	0.0443	-0.0460	-0.0118
		se	(.)	(0.285)	(0.301)	(0.299)	(0.417)	(0.318)	(0.374)	(0.361)
		R^2	0.400	0.490	0.494	0.523	0.629	0.585	0.648	0.629
		N	20382	19547	19514	19512	11281	17318	12425	9650
	3	ξ	0.135	0.177	0.179	0.128	0.538	-0.0683	0.287	0.386
		se	(.)	(0.308)	(0.339)	(0.401)	(0.460)	(0.359)	(0.500)	(0.467)
		R^2	0.400	0.564	0.568	0.598	0.701	0.667	0.730	0.696
		N	20382	17564	17532	17528	6335	13754	7784	5296
	4	ξ	0.135	0.0633	0.0813	-0.0545	-0.844	-0.360	-0.656	-0.823
		se	(.)	(0.274)	(0.289)	(0.313)	(0.854)	(0.420)	(0.845)	(0.864)
		R^2	0.400	0.628	0.633	0.665	0.718	0.734	0.757	0.708
		N	20382	14396	14355	14348	2846	9548	3813	2599
	5	ξ	0.135	0.0188	0.0316	-0.132	-0.858	-0.605	-0.732	-0.837
		se	(.)	(0.283)	(0.300)	(0.305)	(0.854)	(0.456)	(0.793)	(0.864)
		R^2	0.400	0.632	0.637	0.672	0.715	0.741	0.754	0.705
		N	20382	13844	13803	13795	2675	8972	3555	2436

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.22: Average treatment effects on firms' input mix under increasingly demanding fixed effects, small and medium sized firms only

Input mix	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Capital	1	ξ	0.220	0.0919	0.0877	0.130	0.232	0.441	0.335	0.445
		se	(0.185)	(0.191)	(0.188)	(0.194)	(.)	(0.236)	(0.253)	(.)
		R^2	0.676	0.690	0.695	0.703	0.759	0.732	0.763	0.780
		N	11137	11134	11133	11133	10206	10919	10300	8991
	2	ξ	0.220	0.0375	0.0353	0.0419	0.212	0.187	0.279	0.164
		se	(0.185)	(0.205)	(0.205)	(0.216)	(0.525)	(0.315)	(0.393)	(0.689)
		R^2	0.676	0.725	0.729	0.737	0.831	0.786	0.827	0.826
		N	11137	10992	10991	10991	6591	10008	7338	5162
	3	ξ	0.220	0.104	0.111	0.112	0.106	0.295	0.0188	0.146
		se	(0.185)	(0.180)	(0.174)	(0.171)	(0.436)	(0.296)	(0.268)	(0.512)
		R^2	0.676	0.755	0.759	0.767	0.877	0.818	0.866	0.856
		N	11137	10275	10274	10274	4115	8469	5059	3116
	4	ξ	0.220	-0.101	-0.0784	-0.0822	-0.489	-0.0625	-0.394	-0.484
		se	(0.185)	(0.179)	(0.182)	(0.196)	(0.475)	(0.326)	(0.453)	(0.488)
		R^2	0.676	0.790	0.794	0.802	0.872	0.847	0.877	0.857
		N	11137	9033	9029	9029	2409	6450	3187	1970
	5	ξ	0.220	-0.0580	-0.0153	-0.0293	-0.448	-0.0947	-0.430	-0.438
		se	(0.185)	(0.214)	(0.218)	(0.222)	(0.505)	(0.368)	(0.467)	(0.510)
		R^2	0.676	0.794	0.798	0.807	0.873	0.853	0.879	0.859
		N	11137	8776	8772	8769	2134	6162	2917	1795
Capital mix	1	ξ	0.203	0.0129	0.0168	-0.00773	-0.0279	0.103	0.0560	0.0595
		se	(0.168)	(0.181)	(.)	(.)	(.)	(0.194)	(0.242)	(.)
		R^2	0.518	0.536	0.541	0.557	0.633	0.596	0.642	0.662
		N	13036	13019	13017	13017	11814	12691	11944	10376
	2	ξ	0.203	-0.0272	-0.0381	-0.0756	-0.0814	-0.0439	-0.133	-0.305
		se	(0.168)	(0.228)	(0.236)	(0.248)	(0.661)	(0.311)	(0.548)	(0.803)
		R^2	0.518	0.596	0.600	0.614	0.736	0.678	0.732	0.725
		N	13036	12793	12787	12787	7424	11567	8224	5900
	3	ξ	0.203	-0.202	-0.184	-0.194	0.155	-0.280	0.0885	0.210
		se	(0.168)	(0.232)	(0.236)	(0.224)	(0.602)	(0.246)	(0.539)	(0.706)
		R^2	0.518	0.648	0.651	0.665	0.791	0.733	0.783	0.766
		N	13036	11836	11830	11830	4543	9658	5577	3559
	4	ξ	0.203	-0.223	-0.214	-0.187	-0.492	-0.462	-0.0704	-0.501
		se	(0.168)	(0.298)	(0.309)	(0.284)	(0.778)	(0.267)	(0.904)	(0.772)
		R^2	0.518	0.690	0.693	0.709	0.790	0.770	0.800	0.769
		N	13036	10267	10254	10254	2660	7242	3432	2202
	5	ξ	0.203	-0.179	-0.160	-0.140	-0.579	-0.515	-0.160	-0.572
		se	(0.168)	(0.314)	(0.327)	(0.299)	(0.710)	(0.267)	(0.985)	(0.712)
		R^2	0.518	0.696	0.699	0.716	0.797	0.778	0.804	0.778
		N	13036	9959	9946	9943	2385	6917	3137	2006

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.23: Average treatment effects on firms' input mix under increasingly demanding fixed effects, small and medium sized firms only

Input mix	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Employment (LBD)	1	ξ	1.732*	2.108	0.641	0.531	0.564	0.623	0.556	0.516
		se	(0.680)	(.)	(0.358)	(.)	(0.346)	(0.309)	(.)	(.)
		R^2	0.977	0.977	0.986	0.987	0.987	0.987	0.987	0.989
		N	230141	230139	230139	230127	230073	230127	230073	229177
	2	ξ	1.732*	1.393*	0.312	0.208	0.359	0.534	0.112	0.0853
		se	(0.680)	(0.484)	(0.329)	(0.324)	(0.350)	(0.294)	(0.391)	(0.392)
		R^2	0.977	0.977	0.987	0.987	0.989	0.988	0.989	0.992
		N	230141	230139	230139	230127	229033	230096	229061	221130
	3	ξ	1.732*	1.386*	0.421	0.321	0.233	0.681	-0.0472	0.182
		se	(0.680)	(0.485)	(0.356)	(0.349)	(0.351)	(0.339)	(0.369)	(0.385)
		R^2	0.977	0.978	0.987	0.987	0.991	0.989	0.990	0.994
		N	230141	230096	230096	230084	222944	229295	223907	204219
	4	ξ	1.732*	1.143*	0.319	0.247	0.00579	0.425	-0.185	-0.237
		se	(0.680)	(0.447)	(0.301)	(0.299)	(0.325)	(0.311)	(0.379)	(0.284)
		R^2	0.977	0.979	0.987	0.987	0.992	0.990	0.990	0.994
		N	230141	229830	229830	229818	210693	226706	214463	182721
	5	ξ	1.732*	1.076*	0.282	0.225	-0.0664	0.343	-0.157	-0.250
		se	(0.680)	(0.411)	(0.293)	(0.292)	(0.295)	(0.268)	(0.363)	(0.276)
		R^2	0.977	0.980	0.988	0.988	0.992	0.991	0.991	0.994
		N	230141	229682	229682	229670	207466	225734	211994	178089
Log employment (LBD)	1	ξ	0.0422*	0.0492*	0.0428*	0.0391*	0.0390*	0.0395*	0.0371*	0.0343*
		se	(0.0187)	(0.0191)	(0.0145)	(0.0142)	(0.0152)	(0.0145)	(0.0149)	(0.0138)
		R^2	0.979	0.979	0.988	0.988	0.989	0.989	0.989	0.991
		N	230000	229998	229998	229987	229933	229987	229933	229037
	2	ξ	0.0422*	0.0289	0.0308*	0.0273	0.0248	0.0256	0.0243	0.0139
		se	(0.0187)	(0.0156)	(0.0136)	(0.0134)	(0.0146)	(0.0137)	(0.0147)	(0.0128)
		R^2	0.979	0.980	0.989	0.989	0.991	0.990	0.990	0.993
		N	230000	229998	229998	229987	228895	229956	228923	220982
	3	ξ	0.0422*	0.0272	0.0339*	0.0300	0.0149	0.0261	0.0131	0.00911
		se	(0.0187)	(0.0158)	(0.0143)	(0.0141)	(0.0132)	(0.0146)	(0.0129)	(0.0110)
		R^2	0.979	0.981	0.989	0.989	0.993	0.991	0.992	0.994
		N	230000	229956	229956	229945	222817	229156	223780	204081
	4	ξ	0.0422*	0.0234	0.0307*	0.0274	0.00847	0.0214	0.00505	-0.000133
		se	(0.0187)	(0.0146)	(0.0136)	(0.0133)	(0.0150)	(0.0146)	(0.0132)	(0.0116)
		R^2	0.979	0.983	0.990	0.990	0.994	0.992	0.992	0.995
		N	230000	229685	229685	229674	210575	226579	214347	182602
	5	ξ	0.0422*	0.0236	0.0312*	0.0282	0.00786	0.0211	0.00611	0.000151
		se	(0.0187)	(0.0140)	(0.0135)	(0.0133)	(0.0152)	(0.0144)	(0.0133)	(0.0123)
		R^2	0.979	0.983	0.990	0.990	0.994	0.992	0.992	0.995
		N	230000	229540	229540	229529	207357	225610	211887	177981

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.24: Average treatment effects on firms' input mix under increasingly demanding fixed effects, small and medium sized firms only

Input mix	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Employment (LBD)	1	ξ	1.732*	2.108	0.641	0.531	0.564	0.623	0.556	0.516
		se	(0.680)	(.)	(0.358)	(.)	(0.346)	(0.309)	(.)	(.)
		R^2	0.977	0.977	0.986	0.987	0.987	0.987	0.987	0.989
		N	230141	230139	230139	230127	230073	230127	230073	229177
	2	ξ	1.732*	1.393*	0.312	0.208	0.359	0.534	0.112	0.0853
		se	(0.680)	(0.484)	(0.329)	(0.324)	(0.350)	(0.294)	(0.391)	(0.392)
		R^2	0.977	0.977	0.987	0.987	0.989	0.988	0.989	0.992
		N	230141	230139	230139	230127	229033	230096	229061	221130
	3	ξ	1.732*	1.386*	0.421	0.321	0.233	0.681	-0.0472	0.182
		se	(0.680)	(0.485)	(0.356)	(0.349)	(0.351)	(0.339)	(0.369)	(0.385)
		R^2	0.977	0.978	0.987	0.987	0.991	0.989	0.990	0.994
		N	230141	230096	230096	230084	222944	229295	223907	204219
	4	ξ	1.732*	1.143*	0.319	0.247	0.00579	0.425	-0.185	-0.237
		se	(0.680)	(0.447)	(0.301)	(0.299)	(0.325)	(0.311)	(0.379)	(0.284)
		R^2	0.977	0.979	0.987	0.987	0.992	0.990	0.990	0.994
		N	230141	229830	229830	229818	210693	226706	214463	182721
	5	ξ	1.732*	1.076*	0.282	0.225	-0.0664	0.343	-0.157	-0.250
		se	(0.680)	(0.411)	(0.293)	(0.292)	(0.295)	(0.268)	(0.363)	(0.276)
		R^2	0.977	0.980	0.988	0.988	0.992	0.991	0.991	0.994
		N	230141	229682	229682	229670	207466	225734	211994	178089
Log employment (LBD)	1	ξ	0.0422*	0.0492*	0.0428*	0.0391*	0.0390*	0.0395*	0.0371*	0.0343*
		se	(0.0187)	(0.0191)	(0.0145)	(0.0142)	(0.0152)	(0.0145)	(0.0149)	(0.0138)
		R^2	0.979	0.979	0.988	0.988	0.989	0.989	0.989	0.991
		N	230000	229998	229998	229987	229933	229987	229933	229037
	2	ξ	0.0422*	0.0289	0.0308*	0.0273	0.0248	0.0256	0.0243	0.0139
		se	(0.0187)	(0.0156)	(0.0136)	(0.0134)	(0.0146)	(0.0137)	(0.0147)	(0.0128)
		R^2	0.979	0.980	0.989	0.989	0.991	0.990	0.990	0.993
		N	230000	229998	229998	229987	228895	229956	228923	220982
	3	ξ	0.0422*	0.0272	0.0339*	0.0300	0.0149	0.0261	0.0131	0.00911
		se	(0.0187)	(0.0158)	(0.0143)	(0.0141)	(0.0132)	(0.0146)	(0.0129)	(0.0110)
		R^2	0.979	0.981	0.989	0.989	0.993	0.991	0.992	0.994
		N	230000	229956	229956	229945	222817	229156	223780	204081
	4	ξ	0.0422*	0.0234	0.0307*	0.0274	0.00847	0.0214	0.00505	-0.000133
		se	(0.0187)	(0.0146)	(0.0136)	(0.0133)	(0.0150)	(0.0146)	(0.0132)	(0.0116)
		R^2	0.979	0.983	0.990	0.990	0.994	0.992	0.992	0.995
		N	230000	229685	229685	229674	210575	226579	214347	182602
	5	ξ	0.0422*	0.0236	0.0312*	0.0282	0.00786	0.0211	0.00611	0.000151
		se	(0.0187)	(0.0140)	(0.0135)	(0.0133)	(0.0152)	(0.0144)	(0.0133)	(0.0123)
		R^2	0.979	0.983	0.990	0.990	0.994	0.992	0.992	0.995
		N	230000	229540	229540	229529	207357	225610	211887	177981

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.25: Average treatment effects on firms' processes under increasingly demanding fixed effects, small and medium sized firms only

Process $f()$			Estimate (ξ Treatment × Energy intensity)							
	Sic digits		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Stock levels	1	ξ	0.164	0.160	0.162	0.162	0.122	0.135	0.120	0.0573
		se	(0.117)	(0.150)	(0.152)	(0.151)	(0.235)	(0.169)	(0.227)	(.)
		R^2	0.397	0.413	0.417	0.434	0.489	0.473	0.506	0.522
		N	26397	26356	26353	26353	23900	25763	24259	21706
	2	ξ	0.164	0.0878	0.0840	0.0992	0.322	0.0906	0.200	0.181
		se	(0.117)	(0.170)	(0.178)	(0.177)	(0.394)	(0.223)	(0.339)	(0.379)
		R^2	0.397	0.465	0.469	0.486	0.609	0.552	0.612	0.607
		N	26397	25916	25913	25913	16716	23768	18241	13475
	3	ξ	0.164	0.0885	0.0720	0.0760	-0.0495	0.0552	0.0369	-0.0336
		se	(0.117)	(0.123)	(0.138)	(0.136)	(0.304)	(0.162)	(0.310)	(0.341)
		R^2	0.397	0.524	0.528	0.547	0.694	0.628	0.695	0.677
		N	26397	24255	24251	24251	10426	20018	12535	8180
	4	ξ	0.164	0.203	0.158	0.176	-0.139	0.217	-0.0733	-0.171
		se	(0.117)	(0.199)	(0.221)	(0.209)	(0.494)	(0.270)	(0.456)	(0.473)
		R^2	0.397	0.596	0.601	0.619	0.733	0.698	0.753	0.718
		N	26397	21147	21125	21125	5709	15349	7676	4691
	5	ξ	0.164	0.171	0.120	0.153	-0.0708	0.150	-0.0518	-0.122
		se	(0.117)	(0.218)	(0.245)	(0.235)	(0.541)	(0.285)	(0.499)	(0.515)
		R^2	0.397	0.601	0.605	0.625	0.733	0.705	0.753	0.717
		N	26397	20540	20518	20516	5191	14674	7079	4332

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.26: Average treatment effects on firms' processes under increasingly demanding fixed effects, small and medium sized firms only

Process $f()$	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hybrid working	1	ξ	-5.131	-4.249	-5.041	-5.419	0.615	-4.707	0.565	2.667
		se	(3.756)	(3.804)	(4.054)	(3.845)	(3.049)	(3.067)	(2.382)	(3.593)
		R^2	0.817	0.823	0.825	0.828	0.856	0.840	0.858	0.868
		N	22780	22778	22778	22778	21518	22444	21665	19732
	2	ξ	-5.131	-2.544	-3.491	-3.324	-2.795	-0.751	0.557	-2.755
		se	(3.756)	(4.289)	(4.431)	(4.347)	(5.461)	(3.846)	(4.089)	(7.094)
		R^2	0.817	0.837	0.839	0.842	0.891	0.865	0.885	0.888
		N	22780	22664	22664	22664	16057	21379	17258	12990
	3	ξ	-5.131	-2.794	-3.713	-2.854	-5.654	1.119	-2.465	-5.612
		se	(3.756)	(3.739)	(3.839)	(3.997)	(11.02)	(5.040)	(8.953)	(9.809)
		R^2	0.817	0.849	0.851	0.854	0.908	0.878	0.901	0.906
		N	22780	21626	21626	21626	11416	18822	13171	9022
	4	ξ	-5.131	-4.196	-5.520	-3.670	5.736	3.784	7.660	7.986
		se	(3.756)	(5.374)	(5.360)	(5.828)	(12.51)	(6.748)	(11.10)	(13.97)
		R^2	0.817	0.871	0.872	0.876	0.931	0.902	0.926	0.928
		N	22780	19648	19648	19648	7093	15544	9037	5692
	5	ξ	-5.131	-1.503	-2.455	-1.550	5.622	7.703	0.828	8.967
		se	(3.756)	(4.544)	(4.750)	(5.326)	(13.88)	(5.676)	(9.945)	(15.25)
		R^2	0.817	0.874	0.875	0.879	0.932	0.904	0.928	0.926
		N	22780	19172	19172	19172	6512	14919	8437	5220
Working from home	1	ξ	30.00***	24.45**	23.82	20.10	20.29**	21.33	19.62*	23.22**
		se	(7.795)	(7.905)	(.)	(.)	(7.551)	(.)	(7.879)	(7.083)
		R^2	0.734	0.759	0.762	0.769	0.808	0.784	0.807	0.827
		N	47013	47006	47006	47006	44545	46424	44855	40589
	2	ξ	30.00***	22.72*	22.44*	18.96*	27.37*	25.44**	20.23	30.40*
		se	(7.795)	(9.174)	(9.045)	(8.332)	(11.52)	(8.871)	(12.28)	(13.05)
		R^2	0.734	0.784	0.787	0.793	0.858	0.824	0.848	0.857
		N	47013	46793	46793	46793	33223	44073	35680	26554
	3	ξ	30.00***	20.70*	19.51*	16.02	25.42	25.08**	9.805	26.50
		se	(7.795)	(8.933)	(8.495)	(8.333)	(14.62)	(8.046)	(15.31)	(14.30)
		R^2	0.734	0.801	0.805	0.810	0.881	0.840	0.868	0.873
		N	47013	44723	44723	44723	23095	38838	26842	17939
	4	ξ	30.00***	21.05*	20.08*	17.25	19.57	22.83*	2.082	15.55
		se	(7.795)	(10.30)	(9.827)	(9.663)	(11.13)	(8.811)	(12.86)	(11.23)
		R^2	0.734	0.823	0.826	0.832	0.889	0.858	0.885	0.885
		N	47013	40809	40807	40807	14427	31910	18515	11675
	5	ξ	30.00***	20.12*	18.79*	16.24	16.66	23.81**	-2.370	15.61
		se	(7.795)	(9.556)	(9.066)	(8.989)	(11.14)	(8.230)	(12.82)	(11.26)
		R^2	0.734	0.826	0.830	0.836	0.890	0.862	0.890	0.888
		N	47013	39891	39889	39889	13164	30709	17205	10681
Working from normal place of work	1	ξ	20.34	21.38*	20.43*	19.85*	22.83	21.64**	23.11*	21.12
		se	(.)	(8.462)	(8.195)	(7.952)	(.)	(7.556)	(8.907)	(.)
		R^2	0.732	0.750	0.751	0.756	0.796	0.774	0.798	0.810
		N	47013	47006	47006	47006	44545	46424	44855	40589
	2	ξ	20.34	21.95*	20.62*	19.60*	28.21*	19.92*	27.37*	26.40
		se	(.)	(9.948)	(9.554)	(9.228)	(14.06)	(8.676)	(13.66)	(14.79)
		R^2	0.732	0.772	0.774	0.779	0.855	0.811	0.847	0.859
		N	47013	46793	46793	46793	33223	44073	35680	26554
	3	ξ	20.34	24.96*	23.34*	22.55*	34.05*	22.16*	38.80**	32.02*
		se	(.)	(10.76)	(10.10)	(9.517)	(13.52)	(9.153)	(12.40)	(14.56)
		R^2	0.732	0.793	0.794	0.800	0.889	0.835	0.876	0.883
		N	47013	44723	44723	44723	23095	38838	26842	17939
	4	ξ	20.34	23.39*	21.89*	20.86*	17.97	19.51	35.92	16.67
		se	(.)	(10.55)	(9.969)	(9.730)	(18.97)	(10.43)	(18.60)	(19.73)
		R^2	0.732	0.823	0.824	0.829	0.895	0.860	0.892	0.889
		N	47013	40809	40807	40807	14427	31910	18515	11675
	5	ξ	20.34	19.33	17.48	16.91	13.29	15.40	30.79	13.16
		se	(.)	(11.02)	(10.42)	(10.24)	(20.62)	(11.46)	(19.32)	(21.28)
		R^2	0.732	0.825	0.826	0.831	0.896	0.862	0.894	0.889
		N	47013	39891	39889	39889	13164	30709	17205	10681

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.27: Average treatment effects on firms' survival under increasingly demanding fixed effects, small and medium sized firms only

Survival (Debt & liquidity)	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Confidence will meet debt obligations (3 cat)	1	ξ	-0.306**	-0.305	-0.281**	-0.300**	-0.324***	-0.301	-0.310***	-0.299
		se	(0.0842)	(.)	(0.0885)	(0.0929)	(0.0829)	(.)	(0.0729)	(.)
		R^2	0.647	0.657	0.659	0.666	0.718	0.690	0.723	0.742
		N	15896	15892	15891	15891	14890	15627	14982	13481
	2	ξ	-0.306**	-0.271**	-0.251**	-0.250*	-0.370***	-0.281*	-0.325***	-0.378**
		se	(0.0842)	(0.0843)	(0.0826)	(0.0893)	(0.0883)	(0.102)	(0.0840)	(0.119)
		R^2	0.647	0.687	0.688	0.696	0.779	0.738	0.779	0.779
		N	15896	15769	15767	15767	10661	14714	11581	8527
	3	ξ	-0.306**	-0.236*	-0.209	-0.186	-0.281**	-0.182	-0.203	-0.334
		se	(0.0842)	(0.0995)	(0.101)	(0.113)	(0.0774)	(0.149)	(0.169)	(0.191)
		R^2	0.647	0.712	0.714	0.722	0.809	0.771	0.811	0.806
		N	15896	14920	14917	14917	7219	12748	8510	5715
	4	ξ	-0.306**	-0.253*	-0.233	-0.207	-0.0775	-0.0367	-0.00994	-0.0753
		se	(0.0842)	(0.121)	(0.128)	(0.121)	(0.157)	(0.190)	(0.139)	(0.194)
		R^2	0.647	0.742	0.744	0.753	0.831	0.805	0.838	0.823
		N	15896	13423	13421	13421	4398	10276	5767	3574
	5	ξ	-0.306**	-0.237	-0.218	-0.189	-0.0812	0.0105	-0.0155	-0.102
		se	(0.0842)	(0.128)	(0.134)	(0.122)	(0.159)	(0.205)	(0.178)	(0.199)
		R^2	0.647	0.750	0.752	0.760	0.844	0.813	0.851	0.833
		N	15896	13053	13051	13051	4003	9835	5316	3231
Confidence will meet debt obligations (4 cat)	1	ξ	0.0386	-0.0306	-0.0226	0.0239	0.123	0.0431	0.141	0.264
		se	(.)	(0.0847)	(0.0826)	(0.0799)	(0.116)	(.)	(0.125)	(0.166)
		R^2	0.711	0.720	0.721	0.729	0.777	0.754	0.779	0.786
		N	12553	12543	12540	12540	11512	12318	11553	10101
	2	ξ	0.0386	-0.0125	-0.00797	0.0409	0.354	0.0269	0.355*	0.320
		se	(.)	(0.102)	(0.0977)	(0.0854)	(0.173)	(0.113)	(0.164)	(0.264)
		R^2	0.711	0.748	0.750	0.757	0.841	0.791	0.833	0.838
		N	12553	12374	12370	12370	7576	11313	8398	5987
	3	ξ	0.0386	-0.0657	-0.0563	0.0128	0.358	0.193	0.363	0.301
		se	(.)	(0.0828)	(0.0792)	(0.0758)	(0.244)	(0.196)	(0.220)	(0.263)
		R^2	0.711	0.778	0.781	0.789	0.872	0.828	0.862	0.862
		N	12553	11548	11543	11543	4849	9439	5734	3841
	4	ξ	0.0386	-0.0779	-0.0895	-0.0419	0.458	0.302	0.462	0.466
		se	(.)	(0.112)	(0.117)	(0.127)	(0.450)	(0.331)	(0.386)	(0.466)
		R^2	0.711	0.800	0.802	0.812	0.882	0.848	0.879	0.872
		N	12553	10101	10096	10095	2879	7339	3674	2341
	5	ξ	0.0386	-0.0779	-0.0905	-0.0493	0.652	0.337	0.630	0.701
		se	(.)	(0.128)	(0.132)	(0.137)	(0.430)	(0.336)	(0.381)	(0.448)
		R^2	0.711	0.801	0.804	0.813	0.884	0.850	0.880	0.875
		N	12553	9774	9769	9767	2585	6951	3340	2095
Confidence will meet debt obligations (5 cat)	1	ξ	-0.293*	-0.345*	-0.309*	-0.306*	-0.248	-0.291	-0.252	-0.169
		se	(0.126)	(0.127)	(0.130)	(0.136)	(0.135)	(.)	(0.131)	(.)
		R^2	0.690	0.697	0.699	0.705	0.751	0.729	0.755	0.767
		N	15896	15892	15891	15891	14890	15627	14982	13481
	2	ξ	-0.293*	-0.300**	-0.274*	-0.240*	-0.213	-0.268*	-0.188	-0.268
		se	(0.126)	(0.0976)	(0.103)	(0.113)	(0.104)	(0.0969)	(0.138)	(0.218)
		R^2	0.690	0.725	0.727	0.733	0.806	0.769	0.804	0.802
		N	15896	15769	15767	15767	10661	14714	11581	8527
	3	ξ	-0.293*	-0.284**	-0.244*	-0.169	-0.137	-0.0150	-0.0354	-0.270
		se	(0.126)	(0.0859)	(0.103)	(0.101)	(0.185)	(0.151)	(0.241)	(0.225)
		R^2	0.690	0.750	0.752	0.759	0.833	0.801	0.831	0.824
		N	15896	14920	14917	14917	7219	12748	8510	5715
	4	ξ	-0.293*	-0.295	-0.268	-0.221	0.175	0.220	0.242	0.204
		se	(0.126)	(0.154)	(0.173)	(0.166)	(0.406)	(0.243)	(0.359)	(0.407)
		R^2	0.690	0.775	0.777	0.785	0.847	0.828	0.855	0.838
		N	15896	13423	13421	13421	4398	10276	5767	3574
	5	ξ	-0.293*	-0.283	-0.256	-0.211	0.329	0.279	0.295	0.337
		se	(0.126)	(0.164)	(0.179)	(0.170)	(0.401)	(0.251)	(0.361)	(0.404)
		R^2	0.690	0.780	0.782	0.790	0.853	0.832	0.862	0.843
		N	15896	13053	13051	13051	4003	9835	5316	3231

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.28: Average treatment effects on firms' survival under increasingly demanding fixed effects, small and medium sized firms only

Survival (Debt & liquidity)			Estimate (ξ Treatment × Energy intensity)							
	Sic digits		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Repayments compared to turnover (4 cat)	1	ξ	-0.132	-0.203	-0.210	-0.302	0.0678	-0.291	-0.0140	-0.0580
		se	(0.173)	(.)	(0.239)	(0.212)	(.)	(0.184)	(.)	(0.255)
		R^2	0.674	0.706	0.710	0.731	0.814	0.775	0.825	0.831
		N	7141	7084	7076	7074	5680	6678	5740	4399
	2	ξ	-0.132	-0.0441	-0.0804	-0.182	-0.0791	0.0579	-0.00257	-0.0407
		se	(0.173)	(0.255)	(0.258)	(0.196)	(0.232)	(0.136)	(0.203)	(0.207)
		R^2	0.674	0.753	0.757	0.777	0.855	0.824	0.870	0.852
		N	7141	6702	6686	6684	2555	5333	3019	2019
	3	ξ	-0.132	0.0133	-0.107	-0.0507	1.083	0.395	0.832	1.011
		se	(0.173)	(0.320)	(0.288)	(0.255)	(1.052)	(0.450)	(1.112)	(1.062)
		R^2	0.674	0.787	0.792	0.814	0.886	0.862	0.894	0.883
		N	7141	5832	5816	5811	1251	3973	1546	1100
	4	ξ	-0.132	0.395	0.325	0.337	1.303	0.396	1.146	1.311
		se	(0.173)	(0.570)	(0.526)	(0.534)	(1.229)	(0.690)	(1.196)	(1.228)
		R^2	0.674	0.801	0.808	0.834	0.890	0.875	0.898	0.886
		N	7141	4702	4684	4676	775	2868	929	688
	5	ξ	-0.132	0.424	0.378	0.413	1.509	0.420	1.312	1.516
		se	(0.173)	(0.591)	(0.540)	(0.562)	(1.386)	(0.752)	(1.349)	(1.386)
		R^2	0.674	0.802	0.809	0.837	0.887	0.881	0.895	0.885
		N	7141	4510	4492	4482	719	2678	873	651
Repayments compared to turnover (5 cat)	1	ξ	-0.778	-0.614*	-0.642*	-0.806**	-0.883	-0.837**	-0.953**	-0.977**
		se	(.)	(0.281)	(0.276)	(0.254)	(.)	(0.242)	(0.274)	(0.339)
		R^2	0.716	0.731	0.734	0.747	0.817	0.775	0.821	0.834
		N	10909	10867	10864	10863	9551	10487	9595	7975
	2	ξ	-0.778	-0.518	-0.547	-0.796**	-0.175	-0.415	-0.349	-0.157
		se	(.)	(0.282)	(0.277)	(0.262)	(0.240)	(0.213)	(0.318)	(0.175)
		R^2	0.716	0.767	0.770	0.782	0.878	0.824	0.877	0.873
		N	10909	10540	10534	10533	5569	9130	6318	4332
	3	ξ	-0.778	-0.556	-0.701	-0.983*	0.293	-0.441	0.0906	0.381**
		se	(.)	(0.431)	(0.424)	(0.425)	(0.236)	(0.428)	(0.409)	(0.106)
		R^2	0.716	0.796	0.799	0.812	0.900	0.856	0.904	0.893
		N	10909	9646	9640	9637	3302	7476	4052	2642
	4	ξ	-0.778	0.0298	-0.122	-0.644	0.535***	0.00976	0.467	0.594***
		se	(.)	(0.566)	(0.552)	(0.490)	(0.108)	(0.351)	(0.317)	(0.104)
		R^2	0.716	0.810	0.814	0.828	0.897	0.867	0.902	0.890
		N	10909	8170	8161	8160	2096	5703	2584	1716
	5	ξ	-0.778	0.137	-0.0149	-0.457	0.628***	0.0517	0.467	0.615***
		se	(.)	(0.618)	(0.604)	(0.536)	(0.0741)	(0.266)	(0.335)	(0.121)
		R^2	0.716	0.812	0.816	0.831	0.895	0.871	0.904	0.889
		N	10909	7878	7869	7866	1886	5388	2378	1567

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.29: Average treatment effects on firms' survival under increasingly demanding fixed effects, small and medium sized firms only

Survival (Debt & liquidity)			Estimate (ξ Treatment × Energy intensity)							
	Sic digits		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cash reserve duration (2 cat)	1	ξ	0.134*	0.118	0.113	0.116	0.105	0.113	0.148	0.178
		se	(0.0642)	(.)	(0.0829)	(.)	(.)	(.)	(.)	(0.0939)
		R^2	0.732	0.742	0.743	0.750	0.794	0.771	0.796	0.810
		N	28607	28591	28590	28590	26612	28125	26777	23768
	2	ξ	0.134*	0.170*	0.167	0.171	0.148	0.185**	0.161	0.204
		se	(0.0642)	(0.0769)	(0.0833)	(0.0860)	(0.0856)	(0.0599)	(0.0869)	(0.118)
		R^2	0.732	0.765	0.767	0.773	0.856	0.808	0.850	0.853
		N	28607	28357	28355	28355	18187	26163	19932	14438
	3	ξ	0.134*	0.156*	0.154	0.171	0.389	0.182	0.393	0.493*
		se	(0.0642)	(0.0765)	(0.0866)	(0.0940)	(0.251)	(0.0949)	(0.199)	(0.208)
		R^2	0.732	0.792	0.793	0.800	0.882	0.835	0.878	0.870
		N	28607	26672	26670	26670	11759	22468	13990	9110
	4	ξ	0.134*	0.246*	0.252*	0.248*	0.397	0.200	0.259	0.397
		se	(0.0642)	(0.0940)	(0.102)	(0.0959)	(0.232)	(0.110)	(0.184)	(0.248)
		R^2	0.732	0.816	0.817	0.824	0.888	0.858	0.891	0.880
		N	28607	24059	24052	24052	7420	18142	9542	6070
	5	ξ	0.134*	0.259*	0.259*	0.249*	0.354	0.170	0.278	0.348
		se	(0.0642)	(0.0989)	(0.108)	(0.103)	(0.287)	(0.0995)	(0.231)	(0.302)
		R^2	0.732	0.818	0.819	0.826	0.890	0.861	0.893	0.882
		N	28607	23417	23410	23410	6695	17365	8735	5505
Cash reserve duration (3 cat)	1	ξ	0.0276	0.0195	0.0191	0.0209	-0.000175	0.0288	0.00655	-0.0130
		se	(0.0297)	(.)	(0.0332)	(0.0339)	(0.0381)	(.)	(0.0400)	(0.0428)
		R^2	0.678	0.690	0.692	0.700	0.758	0.726	0.762	0.777
		N	28607	28591	28590	28590	26612	28125	26777	23768
	2	ξ	0.0276	0.0269	0.0253	0.0274	0.0255	0.0213	0.0249	0.0197
		se	(0.0297)	(0.0331)	(0.0349)	(0.0357)	(0.0436)	(0.0341)	(0.0387)	(0.0629)
		R^2	0.678	0.719	0.721	0.729	0.833	0.767	0.830	0.832
		N	28607	28357	28355	28355	18187	26163	19932	14438
	3	ξ	0.0276	0.0190	0.0196	0.0225	0.0264	0.00224	0.00860	0.0359
		se	(0.0297)	(0.0363)	(0.0384)	(0.0387)	(0.0696)	(0.0422)	(0.0544)	(0.0872)
		R^2	0.678	0.755	0.757	0.766	0.865	0.800	0.861	0.856
		N	28607	26672	26670	26670	11759	22468	13990	9110
	4	ξ	0.0276	0.0662	0.0733	0.0732	0.0794	0.0263	0.0242	0.0836
		se	(0.0297)	(0.0430)	(0.0460)	(0.0393)	(0.132)	(0.0544)	(0.0960)	(0.140)
		R^2	0.678	0.783	0.785	0.794	0.888	0.832	0.885	0.883
		N	28607	24059	24052	24052	7420	18142	9542	6070
	5	ξ	0.0276	0.0754	0.0801	0.0732	0.0505	0.0167	-0.0000560	0.0529
		se	(0.0297)	(0.0457)	(0.0484)	(0.0404)	(0.143)	(0.0570)	(0.109)	(0.150)
		R^2	0.678	0.785	0.786	0.795	0.892	0.837	0.885	0.887
		N	28607	23417	23410	23410	6695	17365	8735	5505
Cash reserve duration (6 cat)	1	ξ	0.288*	0.248	0.246	0.270	0.331	0.305	0.425*	0.468*
		se	(0.131)	(0.145)	(0.151)	(0.151)	(.)	(.)	(0.186)	(0.181)
		R^2	0.786	0.795	0.796	0.801	0.837	0.818	0.839	0.851
		N	28607	28591	28590	28590	26612	28125	26777	23768
	2	ξ	0.288*	0.318*	0.317*	0.349*	0.406*	0.340*	0.431*	0.616**
		se	(0.131)	(0.139)	(0.147)	(0.156)	(0.183)	(0.166)	(0.192)	(0.200)
		R^2	0.786	0.814	0.815	0.820	0.889	0.848	0.884	0.887
		N	28607	28357	28355	28355	18187	26163	19932	14438
	3	ξ	0.288*	0.351*	0.366*	0.435*	1.098*	0.559*	0.967*	1.306**
		se	(0.131)	(0.142)	(0.151)	(0.165)	(0.443)	(0.216)	(0.361)	(0.383)
		R^2	0.786	0.836	0.837	0.842	0.914	0.870	0.908	0.905
		N	28607	26672	26670	26670	11759	22468	13990	9110
	4	ξ	0.288*	0.480**	0.507**	0.546**	1.077*	0.663***	0.654	1.092*
		se	(0.131)	(0.157)	(0.154)	(0.158)	(0.452)	(0.166)	(0.448)	(0.492)
		R^2	0.786	0.855	0.856	0.862	0.924	0.888	0.923	0.918
		N	28607	24059	24052	24052	7420	18142	9542	6070
	5	ξ	0.288*	0.535**	0.552**	0.572**	1.142*	0.696***	0.761	1.134
		se	(0.131)	(0.165)	(0.167)	(0.176)	(0.533)	(0.149)	(0.525)	(0.569)
		R^2	0.786	0.857	0.858	0.864	0.924	0.891	0.924	0.919
		N	28607	23417	23410	23410	6695	17365	8735	5505

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.30: Average treatment effects on firms' survival under increasingly demanding fixed effects, small and medium sized firms only

Survival (Debt & liquidity)	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cash reserve duration (2 cat)	1	ξ	0.134*	0.118	0.113	0.116	0.105	0.113	0.148	0.178
		se	(0.0642)	(.)	(0.0829)	(.)	(.)	(.)	(.)	(0.0939)
		R^2	0.732	0.742	0.743	0.750	0.794	0.771	0.796	0.810
		N	28607	28591	28590	28590	26612	28125	26777	23768
	2	ξ	0.134*	0.170*	0.167	0.171	0.148	0.185**	0.161	0.204
		se	(0.0642)	(0.0769)	(0.0833)	(0.0860)	(0.0856)	(0.0599)	(0.0869)	(0.118)
		R^2	0.732	0.765	0.767	0.773	0.856	0.808	0.850	0.853
		N	28607	28357	28355	28355	18187	26163	19932	14438
	3	ξ	0.134*	0.156*	0.154	0.171	0.389	0.182	0.393	0.493*
		se	(0.0642)	(0.0765)	(0.0866)	(0.0940)	(0.251)	(0.0949)	(0.199)	(0.208)
		R^2	0.732	0.792	0.793	0.800	0.882	0.835	0.878	0.870
		N	28607	26672	26670	26670	11759	22468	13990	9110
	4	ξ	0.134*	0.246*	0.252*	0.248*	0.397	0.200	0.259	0.397
		se	(0.0642)	(0.0940)	(0.102)	(0.0959)	(0.232)	(0.110)	(0.184)	(0.248)
		R^2	0.732	0.816	0.817	0.824	0.888	0.858	0.891	0.880
		N	28607	24059	24052	24052	7420	18142	9542	6070
	5	ξ	0.134*	0.259*	0.259*	0.249*	0.354	0.170	0.278	0.348
		se	(0.0642)	(0.0989)	(0.108)	(0.103)	(0.287)	(0.0995)	(0.231)	(0.302)
		R^2	0.732	0.818	0.819	0.826	0.890	0.861	0.893	0.882
		N	28607	23417	23410	23410	6695	17365	8735	5505
Cash reserve duration (3 cat)	1	ξ	0.0276	0.0195	0.0191	0.0209	-0.000175	0.0288	0.00655	-0.0130
		se	(0.0297)	(.)	(0.0332)	(0.0339)	(0.0381)	(.)	(0.0400)	(0.0428)
		R^2	0.678	0.690	0.692	0.700	0.758	0.726	0.762	0.777
		N	28607	28591	28590	28590	26612	28125	26777	23768
	2	ξ	0.0276	0.0269	0.0253	0.0274	0.0255	0.0213	0.0249	0.0197
		se	(0.0297)	(0.0331)	(0.0349)	(0.0357)	(0.0436)	(0.0341)	(0.0387)	(0.0629)
		R^2	0.678	0.719	0.721	0.729	0.833	0.767	0.830	0.832
		N	28607	28357	28355	28355	18187	26163	19932	14438
	3	ξ	0.0276	0.0190	0.0196	0.0225	0.0264	0.00224	0.00860	0.0359
		se	(0.0297)	(0.0363)	(0.0384)	(0.0387)	(0.0696)	(0.0422)	(0.0544)	(0.0872)
		R^2	0.678	0.755	0.757	0.766	0.865	0.800	0.861	0.856
		N	28607	26672	26670	26670	11759	22468	13990	9110
	4	ξ	0.0276	0.0662	0.0733	0.0732	0.0794	0.0263	0.0242	0.0836
		se	(0.0297)	(0.0430)	(0.0460)	(0.0393)	(0.132)	(0.0544)	(0.0960)	(0.140)
		R^2	0.678	0.783	0.785	0.794	0.888	0.832	0.885	0.883
		N	28607	24059	24052	24052	7420	18142	9542	6070
	5	ξ	0.0276	0.0754	0.0801	0.0732	0.0505	0.0167	-0.0000560	0.0529
		se	(0.0297)	(0.0457)	(0.0484)	(0.0404)	(0.143)	(0.0570)	(0.109)	(0.150)
		R^2	0.678	0.785	0.786	0.795	0.892	0.837	0.885	0.887
		N	28607	23417	23410	23410	6695	17365	8735	5505
Cash reserve duration (6 cat)	1	ξ	0.288*	0.248	0.246	0.270	0.331	0.305	0.425*	0.468*
		se	(0.131)	(0.145)	(0.151)	(0.151)	(.)	(.)	(0.186)	(0.181)
		R^2	0.786	0.795	0.796	0.801	0.837	0.818	0.839	0.851
		N	28607	28591	28590	28590	26612	28125	26777	23768
	2	ξ	0.288*	0.318*	0.317*	0.349*	0.406*	0.340*	0.431*	0.616**
		se	(0.131)	(0.139)	(0.147)	(0.156)	(0.183)	(0.166)	(0.192)	(0.200)
		R^2	0.786	0.814	0.815	0.820	0.889	0.848	0.884	0.887
		N	28607	28357	28355	28355	18187	26163	19932	14438
	3	ξ	0.288*	0.351*	0.366*	0.435*	1.098*	0.559*	0.967*	1.306**
		se	(0.131)	(0.142)	(0.151)	(0.165)	(0.443)	(0.216)	(0.361)	(0.383)
		R^2	0.786	0.836	0.837	0.842	0.914	0.870	0.908	0.905
		N	28607	26672	26670	26670	11759	22468	13990	9110
	4	ξ	0.288*	0.480**	0.507**	0.546**	1.077*	0.663***	0.654	1.092*
		se	(0.131)	(0.157)	(0.154)	(0.158)	(0.452)	(0.166)	(0.448)	(0.492)
		R^2	0.786	0.855	0.856	0.862	0.924	0.888	0.923	0.918
		N	28607	24059	24052	24052	7420	18142	9542	6070
	5	ξ	0.288*	0.535**	0.552**	0.572**	1.142*	0.696***	0.761	1.134
		se	(0.131)	(0.165)	(0.167)	(0.176)	(0.533)	(0.149)	(0.525)	(0.569)
		R^2	0.786	0.857	0.858	0.864	0.924	0.891	0.924	0.919
		N	28607	23417	23410	23410	6695	17365	8735	5505

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.31: Average treatment effects on firms' survival under increasingly demanding fixed effects, small and medium sized firms only

Survival (Trading status)			Estimate (ξ Treatment × Energy intensity)							
	Sic digits		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Change in risk of insolvency	1	ξ	0.0274	0.0340	0.0477	-0.00411	-0.120	-0.0607	-0.109	-0.0294
		se	(0.0585)	(.)	(0.0486)	(0.0646)	(.)	(0.0938)	(.)	(0.131)
		R^2	0.542	0.565	0.567	0.577	0.648	0.609	0.656	0.674
		N	15083	15080	15078	15078	14069	14851	14196	12589
	2	ξ	0.0274	0.0463	0.0565	0.0226	0.0940	0.0697	-0.0146	0.200
		se	(0.0585)	(0.0738)	(0.0681)	(0.0681)	(0.0762)	(0.102)	(0.147)	(0.169)
		R^2	0.542	0.608	0.611	0.620	0.733	0.667	0.731	0.732
		N	15083	14955	14951	14951	9883	13781	10815	7836
	3	ξ	0.0274	-0.0489	-0.0276	-0.0327	0.261*	0.00179	0.201	0.234
		se	(0.0585)	(0.0752)	(0.0612)	(0.0729)	(0.119)	(0.192)	(0.184)	(0.180)
		R^2	0.542	0.647	0.650	0.658	0.788	0.715	0.784	0.766
		N	15083	14141	14137	14137	6444	11897	7700	4894
	4	ξ	0.0274	-0.0902	-0.0855	-0.108	0.00266	-0.113	-0.0667	0.00188
		se	(0.0585)	(0.0954)	(0.0755)	(0.107)	(0.143)	(0.173)	(0.148)	(0.125)
		R^2	0.542	0.681	0.683	0.693	0.796	0.743	0.801	0.784
		N	15083	12702	12696	12696	4005	9524	5132	3214
	5	ξ	0.0274	-0.0649	-0.0577	-0.0843	0.157	-0.117	-0.0240	0.151
		se	(0.0585)	(0.0898)	(0.0708)	(0.0869)	(0.0923)	(0.136)	(0.180)	(0.0965)
		R^2	0.542	0.689	0.691	0.701	0.806	0.752	0.809	0.791
		N	15083	12361	12355	12355	3592	9124	4722	2907
Risk of insolvency	1	ξ	-0.263*	-0.295	-0.301**	-0.346**	-0.339	-0.371***	-0.289**	-0.400**
		se	(0.112)	(.)	(0.106)	(0.0986)	(.)	(0.0971)	(0.0881)	(0.114)
		R^2	0.669	0.678	0.680	0.687	0.737	0.708	0.739	0.758
		N	31269	31262	31262	31262	29499	30818	29685	26674
	2	ξ	-0.263*	-0.287*	-0.293*	-0.343**	-0.380*	-0.313*	-0.343*	-0.335
		se	(0.112)	(0.109)	(0.109)	(0.107)	(0.163)	(0.119)	(0.157)	(0.243)
		R^2	0.669	0.706	0.708	0.715	0.803	0.751	0.796	0.804
		N	31269	31084	31084	31084	21460	29046	23242	17148
	3	ξ	-0.263*	-0.285*	-0.290*	-0.359**	-0.430*	-0.371*	-0.320	-0.435
		se	(0.112)	(0.121)	(0.125)	(0.125)	(0.196)	(0.156)	(0.167)	(0.220)
		R^2	0.669	0.734	0.736	0.743	0.838	0.784	0.832	0.833
		N	31269	29573	29573	29573	14565	25386	17134	11277
	4	ξ	-0.263*	-0.258*	-0.244*	-0.326**	-0.447	-0.387*	-0.376	-0.399
		se	(0.112)	(0.106)	(0.111)	(0.113)	(0.284)	(0.171)	(0.258)	(0.307)
		R^2	0.669	0.762	0.763	0.771	0.852	0.812	0.854	0.851
		N	31269	26826	26823	26823	9015	20608	11682	7259
	5	ξ	-0.263*	-0.279*	-0.264*	-0.336**	-0.405	-0.423*	-0.295	-0.337
		se	(0.112)	(0.110)	(0.117)	(0.115)	(0.302)	(0.190)	(0.261)	(0.331)
		R^2	0.669	0.765	0.766	0.774	0.855	0.816	0.858	0.852
		N	31269	26158	26155	26155	8141	19782	10798	6565

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.32: Average treatment effects on firms' survival under increasingly demanding fixed effects, small and medium sized firms only

Survival (Trading status)	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trading status (2 cat)	1	ξ	0.0252	0.00517	0.00461	0.000745	0.00732	0.0189	0.0137	0.0134
		se	(.)	(0.0208)	(0.0215)	(.)	(0.0253)	(0.0218)	(0.0265)	(0.0306)
		R^2	0.427	0.540	0.543	0.553	0.646	0.582	0.643	0.639
		N	69249	69239	69237	69237	65800	68398	66214	60140
	2	ξ	0.0252	-0.0340	-0.0355	-0.0365	-0.0524	-0.0282	-0.0537	-0.0791
		se	(.)	(0.0278)	(0.0280)	(0.0286)	(0.0366)	(0.0280)	(0.0415)	(0.0562)
		R^2	0.427	0.601	0.603	0.613	0.745	0.653	0.741	0.736
		N	69249	68952	68950	68950	49530	65070	52956	39835
	3	ξ	0.0252	-0.0136	-0.0147	-0.0171	0.0271	-0.00332	0.0313	0.0180
		se	(.)	(0.0276)	(0.0276)	(0.0265)	(0.0354)	(0.0234)	(0.0338)	(0.0405)
		R^2	0.427	0.649	0.651	0.661	0.798	0.703	0.793	0.796
		N	69249	65961	65959	65959	34715	57610	40018	27187
	4	ξ	0.0252	-0.0210	-0.0231	-0.0298	0.0247	-0.0239	-0.00371	0.0234
		se	(.)	(0.0196)	(0.0190)	(0.0210)	(0.0405)	(0.0239)	(0.0305)	(0.0427)
		R^2	0.427	0.700	0.702	0.711	0.819	0.743	0.820	0.817
		N	69249	60342	60338	60338	21998	47794	27866	17853
	5	ξ	0.0252	-0.0261	-0.0293	-0.0356	0.0171	-0.0276	-0.00768	0.0143
		se	(.)	(0.0192)	(0.0184)	(0.0203)	(0.0457)	(0.0232)	(0.0360)	(0.0474)
		R^2	0.427	0.708	0.710	0.719	0.822	0.751	0.823	0.818
		N	69249	58993	58989	58989	20200	46084	25896	16385
Trading status (6 cat)	1	ξ	0.0617	-0.0176	-0.0242	-0.0479	-0.00260	0.0167	-0.00502	0.0102
		se	(.)	(0.120)	(.)	(.)	(0.156)	(.)	(0.166)	(0.192)
		R^2	0.497	0.585	0.587	0.596	0.670	0.621	0.667	0.662
		N	69475	69465	69463	69463	66017	68617	66420	60326
	2	ξ	0.0617	-0.195	-0.203	-0.220	-0.300	-0.181	-0.360	-0.497
		se	(.)	(0.165)	(0.166)	(0.169)	(0.256)	(0.180)	(0.268)	(0.373)
		R^2	0.497	0.639	0.641	0.649	0.763	0.688	0.760	0.755
		N	69475	69185	69183	69183	49717	65307	53149	39998
	3	ξ	0.0617	-0.0552	-0.0630	-0.0743	0.0436	-0.0170	0.0864	0.0579
		se	(.)	(0.142)	(0.143)	(0.135)	(0.226)	(0.135)	(0.204)	(0.345)
		R^2	0.497	0.682	0.683	0.691	0.816	0.734	0.810	0.809
		N	69475	66198	66196	66196	34875	57851	40218	27315
	4	ξ	0.0617	-0.0440	-0.0547	-0.0877	-0.0717	-0.0709	-0.109	-0.0185
		se	(.)	(0.106)	(0.105)	(0.108)	(0.280)	(0.103)	(0.193)	(0.279)
		R^2	0.497	0.727	0.729	0.737	0.835	0.769	0.833	0.830
		N	69475	60575	60571	60571	22116	47989	28028	17936
	5	ξ	0.0617	-0.0543	-0.0695	-0.102	-0.119	-0.0709	-0.117	-0.0612
		se	(.)	(0.0990)	(0.0977)	(0.100)	(0.303)	(0.0861)	(0.222)	(0.298)
		R^2	0.497	0.730	0.732	0.740	0.836	0.771	0.833	0.829
		N	69475	59207	59203	59203	20316	46264	26044	16466

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.33: Average treatment effects on firms' survival under increasingly demanding fixed effects, small and medium sized firms only

Survival (Trading status)	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Confidence of 3m survival	1	ξ	0.169	0.151	0.152	0.172	0.261**	0.233*	0.214*	0.255**
		se	(.)	(0.0874)	(0.0898)	(.)	(0.0933)	(0.0919)	(0.0908)	(0.0918)
		R^2	0.714	0.723	0.725	0.730	0.767	0.749	0.772	0.791
		N	22680	22677	22677	22677	21365	22372	21550	19359
	2	ξ	0.169	0.206*	0.202*	0.225*	0.425**	0.302***	0.354**	0.371**
		se	(.)	(0.0871)	(0.0909)	(0.0904)	(0.132)	(0.0727)	(0.109)	(0.115)
		R^2	0.714	0.747	0.749	0.753	0.839	0.789	0.832	0.845
		N	22680	22562	22562	22562	15706	21096	17004	12550
	3	ξ	0.169	0.207*	0.201*	0.219*	0.459**	0.313***	0.434***	0.365*
		se	(.)	(0.0815)	(0.0868)	(0.0885)	(0.157)	(0.0720)	(0.109)	(0.154)
		R^2	0.714	0.773	0.774	0.779	0.872	0.819	0.864	0.866
		N	22680	21518	21518	21518	10811	18495	12654	8355
	4	ξ	0.169	0.181	0.181	0.210*	0.652	0.456**	0.610**	0.588
		se	(.)	(0.0946)	(0.101)	(0.0981)	(0.372)	(0.156)	(0.216)	(0.383)
		R^2	0.714	0.797	0.799	0.804	0.883	0.843	0.882	0.879
		N	22680	19622	19620	19620	6778	15028	8665	5503
	5	ξ	0.169	0.196	0.192	0.214*	0.789	0.492**	0.690**	0.706
		se	(.)	(0.100)	(0.107)	(0.0986)	(0.403)	(0.166)	(0.234)	(0.414)
		R^2	0.714	0.799	0.801	0.806	0.881	0.844	0.882	0.876
		N	22680	19142	19140	19140	6092	14434	7993	4979
Local sites (LBD)	1	ξ	0.0439	0.0477	0.0336	0.0266	0.0278	0.0263	0.0209	0.0177
		se	(.)	(0.0454)	(0.0346)	(0.0366)	(0.0356)	(.)	(.)	(0.0362)
		R^2	0.920	0.921	0.921	0.921	0.924	0.922	0.924	0.934
		N	217580	217579	217579	217567	217494	217567	217494	216555
	2	ξ	0.0439	0.0480	0.0349	0.0273	0.0372	0.0410	0.0188	0.0388
		se	(.)	(0.0551)	(0.0439)	(0.0457)	(0.0362)	(0.0447)	(0.0388)	(0.0381)
		R^2	0.920	0.921	0.921	0.921	0.934	0.924	0.933	0.954
		N	217580	217579	217579	217567	216367	217513	216400	208525
	3	ξ	0.0439	0.0316	0.0177	0.00979	0.0200	0.0226	-0.0155	0.0159
		se	(.)	(0.0556)	(0.0437)	(0.0464)	(0.0352)	(0.0459)	(0.0460)	(0.0293)
		R^2	0.920	0.922	0.922	0.922	0.944	0.927	0.941	0.964
		N	217580	217527	217527	217515	210088	216678	211117	191842
	4	ξ	0.0439	0.0184	0.00355	-0.00241	-0.00416	-0.0106	-0.0289	-0.00900
		se	(.)	(0.0495)	(0.0361)	(0.0376)	(0.0376)	(0.0369)	(0.0457)	(0.0318)
		R^2	0.920	0.926	0.926	0.926	0.948	0.935	0.945	0.968
		N	217580	217225	217225	217213	197991	214084	201762	171106
	5	ξ	0.0439	0.0194	0.00412	-0.00154	-0.00862	-0.0135	-0.0354	-0.00357
		se	(.)	(0.0501)	(0.0369)	(0.0385)	(0.0396)	(0.0363)	(0.0506)	(0.0268)
		R^2	0.920	0.926	0.926	0.926	0.948	0.936	0.944	0.969
		N	217580	217078	217078	217066	194750	213095	199358	166578
Survival (LBD)	1	ξ	-0.100**	-0.101**	-0.0519*	-0.0562*	-0.0547*	-0.0525*	-0.0589	-0.0572*
		se	(0.0286)	(0.0283)	(0.0199)	(0.0202)	(0.0195)	(0.0192)	(.)	(0.0204)
		R^2	0.637	0.641	0.649	0.650	0.659	0.653	0.657	0.671
		N	230141	230139	230139	230127	230073	230127	230073	229177
	2	ξ	-0.100**	-0.101**	-0.0563*	-0.0599*	-0.0608*	-0.0570*	-0.0650*	-0.0645*
		se	(0.0286)	(0.0287)	(0.0205)	(0.0208)	(0.0208)	(0.0196)	(0.0221)	(0.0219)
		R^2	0.637	0.646	0.653	0.653	0.682	0.661	0.677	0.704
		N	230141	230139	230139	230127	229033	230096	229061	221130
	3	ξ	-0.100**	-0.0973**	-0.0552*	-0.0588*	-0.0656*	-0.0556*	-0.0704**	-0.0783**
		se	(0.0286)	(0.0281)	(0.0207)	(0.0209)	(0.0207)	(0.0198)	(0.0222)	(0.0228)
		R^2	0.637	0.652	0.658	0.659	0.707	0.673	0.696	0.725
		N	230141	230096	230096	230084	222944	229295	223907	204219
	4	ξ	-0.100**	-0.0963**	-0.0556*	-0.0589*	-0.0704**	-0.0573*	-0.0724**	-0.0780**
		se	(0.0286)	(0.0270)	(0.0201)	(0.0203)	(0.0212)	(0.0195)	(0.0224)	(0.0230)
		R^2	0.637	0.660	0.666	0.666	0.725	0.686	0.711	0.735
		N	230141	229830	229830	229818	210693	226706	214463	182721
	5	ξ	-0.100**	-0.0974**	-0.0566*	-0.0599*	-0.0703**	-0.0584*	-0.0720**	-0.0790**
		se	(0.0286)	(0.0271)	(0.0202)	(0.0204)	(0.0207)	(0.0196)	(0.0218)	(0.0227)
		R^2	0.637	0.662	0.667	0.668	0.730	0.688	0.715	0.740
		N	230141	229682	229682	229670	207466	225734	211994	178089

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.34: Average treatment effects on firms' survival under increasingly demanding fixed effects, small and medium sized firms only

Survival (Trading status)			Estimate (ξ Treatment × Energy intensity)							
	Sic digits		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Redundancies (share)	1	ξ	0.413	0.608	0.603	0.446	0.259	0.467	0.321	0.575
		se	(0.677)	(0.857)	(.)	(.)	(.)	(0.883)	(.)	(1.058)
		R^2	0.254	0.276	0.286	0.301	0.420	0.345	0.418	0.477
		N	51601	51593	51592	51592	48889	50963	49250	44547
	2	ξ	0.413	0.566	0.551	0.333	-1.019	0.234	-1.051	-0.661
		se	(0.677)	(1.013)	(1.027)	(0.916)	(0.737)	(1.070)	(0.697)	(0.601)
		R^2	0.254	0.327	0.329	0.343	0.584	0.429	0.559	0.581
		N	51601	51359	51358	51358	36489	48330	39185	29261
	3	ξ	0.413	0.525	0.521	0.375	0.241	0.235	-0.159	0.373
		se	(0.677)	(0.944)	(0.968)	(0.847)	(0.429)	(1.088)	(0.397)	(0.454)
		R^2	0.254	0.390	0.392	0.406	0.672	0.504	0.656	0.668
		N	51601	49081	49080	49080	25374	42595	29510	19803
	4	ξ	0.413	0.636	0.631	0.473	0.726	0.727	0.499	0.835
		se	(0.677)	(0.976)	(1.008)	(0.917)	(0.544)	(1.433)	(0.426)	(0.560)
		R^2	0.254	0.466	0.469	0.484	0.704	0.583	0.692	0.702
		N	51601	44800	44797	44797	15934	35048	20402	12976
	5	ξ	0.413	0.634	0.639	0.435	0.815	0.470	0.596	0.953
		se	(0.677)	(1.012)	(1.043)	(0.953)	(0.600)	(1.500)	(0.493)	(0.617)
		R^2	0.254	0.462	0.465	0.481	0.713	0.585	0.699	0.711
		N	51601	43790	43787	43787	14566	33742	18955	11873
Redundancy expectations	1	ξ	0.0526	0.0845*	0.0776	0.0735	0.0165	0.0546	0.0257	0.00791
		se	(.)	(0.0353)	(.)	(.)	(0.0469)	(0.0421)	(0.0443)	(.)
		R^2	0.542	0.557	0.560	0.572	0.645	0.601	0.652	0.677
		N	17465	17465	17465	17465	16121	17172	16309	14415
	2	ξ	0.0526	0.114*	0.105*	0.0996*	0.0879	0.110*	0.0707	0.0873
		se	(.)	(0.0422)	(0.0453)	(0.0373)	(0.0597)	(0.0534)	(0.0641)	(0.0912)
		R^2	0.542	0.602	0.604	0.616	0.754	0.673	0.752	0.765
		N	17465	17292	17292	17292	11176	15920	12298	8865
	3	ξ	0.0526	0.156**	0.143**	0.151***	0.0964	0.171*	0.0884	0.0672
		se	(.)	(0.0461)	(0.0478)	(0.0399)	(0.0900)	(0.0686)	(0.0720)	(0.0732)
		R^2	0.542	0.647	0.649	0.661	0.792	0.717	0.794	0.773
		N	17465	16261	16260	16260	7258	13629	8824	5625
	4	ξ	0.0526	0.125*	0.107	0.108*	0.0226	0.146	0.0970	-0.00731
		se	(.)	(0.0573)	(0.0562)	(0.0397)	(0.0790)	(0.0781)	(0.0672)	(0.0517)
		R^2	0.542	0.691	0.693	0.706	0.789	0.746	0.807	0.775
		N	17465	14638	14630	14630	4493	10895	5848	3725
	5	ξ	0.0526	0.138*	0.119*	0.118**	-0.0549	0.142*	0.0312	-0.0493
		se	(.)	(0.0592)	(0.0538)	(0.0380)	(0.0781)	(0.0662)	(0.0913)	(0.0743)
		R^2	0.542	0.701	0.703	0.716	0.785	0.756	0.808	0.772
		N	17465	14178	14170	14170	3968	10391	5297	3331

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.35: Average treatment effects on firms' output under increasingly demanding fixed effects, large firms only

Output	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Turnover change (3 cat)	1	ξ	0.0831	0.0821	0.0821	0.157	0.249	0.157	0.249	0.249
		se	(0.129)	(0.161)	(0.161)	(0.167)	(0.190)	(0.167)	(.)	(0.190)
		R^2	0.361	0.382	0.382	0.391	0.441	0.391	0.441	0.441
		N	72300	72275	72275	72275	70561	72275	70561	70561
	2	ξ	0.0831	0.0120	0.0120	0.104	0.250	0.104	0.250	0.250
		se	(0.129)	(0.174)	(0.174)	(0.181)	(0.248)	(0.181)	(0.248)	(0.248)
		R^2	0.361	0.417	0.417	0.425	0.535	0.425	0.535	0.535
		N	72300	72063	72063	72063	62107	72063	62107	62107
	3	ξ	0.0831	-0.0746	-0.0746	0.00564	-0.0477	0.00564	-0.0477	-0.0477
		se	(0.129)	(0.169)	(0.169)	(0.159)	(0.207)	(0.159)	(0.207)	(0.207)
		R^2	0.361	0.462	0.462	0.470	0.597	0.470	0.597	0.597
		N	72300	70355	70355	70355	51091	70355	51091	51091
	4	ξ	0.0831	-0.0270	-0.0270	0.0490	-0.187	0.0490	-0.187	-0.187
		se	(0.129)	(0.207)	(0.207)	(0.201)	(0.189)	(0.201)	(0.189)	(0.189)
		R^2	0.361	0.513	0.513	0.520	0.619	0.520	0.619	0.619
		N	72300	66219	66219	66219	40975	66219	40975	40975
	5	ξ	0.0831	0.0238	0.0238	0.0981	-0.0648	0.0981	-0.0648	-0.0648
		se	(0.129)	(0.235)	(0.235)	(0.230)	(0.252)	(0.230)	(0.252)	(0.252)
		R^2	0.361	0.520	0.520	0.528	0.633	0.528	0.633	0.633
		N	72300	64976	64976	64976	38819	64976	38819	38819
Turnover change (6 cat)	1	ξ	0.220	0.107	0.107	0.225	0.427	0.225	0.427	0.427
		se	(0.252)	(0.355)	(0.355)	(0.377)	(.)	(.)	(.)	(0.422)
		R^2	0.465	0.484	0.484	0.490	0.533	0.490	0.533	0.533
		N	54021	53999	53999	53999	52735	53999	52735	52735
	2	ξ	0.220	0.0554	0.0554	0.208	0.509	0.208	0.509	0.509
		se	(0.252)	(0.402)	(0.402)	(0.429)	(0.504)	(0.429)	(0.504)	(0.504)
		R^2	0.465	0.511	0.511	0.517	0.607	0.517	0.607	0.607
		N	54021	53838	53838	53838	46432	53838	46432	46432
	3	ξ	0.220	-0.170	-0.170	-0.0249	-0.149	-0.0249	-0.149	-0.149
		se	(0.252)	(0.368)	(0.368)	(0.371)	(0.513)	(0.371)	(0.513)	(0.513)
		R^2	0.465	0.543	0.543	0.549	0.652	0.549	0.652	0.652
		N	54021	52600	52600	52600	38252	52600	38252	38252
	4	ξ	0.220	-0.176	-0.176	-0.0107	-0.431	-0.0107	-0.431	-0.431
		se	(0.252)	(0.408)	(0.408)	(0.415)	(0.557)	(0.415)	(0.557)	(0.557)
		R^2	0.465	0.582	0.582	0.588	0.666	0.588	0.666	0.666
		N	54021	49651	49651	49651	30763	49651	30763	30763
	5	ξ	0.220	-0.0863	-0.0863	0.0734	-0.326	0.0734	-0.326	-0.326
		se	(0.252)	(0.403)	(0.403)	(0.405)	(0.590)	(0.405)	(0.590)	(0.590)
		R^2	0.465	0.586	0.586	0.592	0.677	0.592	0.677	0.677
		N	54021	48673	48673	48673	29075	48673	29075	29075

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.36: Average treatment effects on firms' output under increasingly demanding fixed effects, large firms only

Output	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Turnover expectations (3 cat)	1	ξ	-0.173	-0.138	-0.138	-0.106	-0.123	-0.106	-0.123	-0.123
		se	(.)	(.)	(.)	(0.0824)	(.)	(0.0824)	(0.0876)	(0.0876)
		R^2	0.257	0.289	0.289	0.299	0.361	0.299	0.361	0.361
		N	65011	64984	64984	64984	63522	64984	63522	63522
	2	ξ	-0.173	-0.0153	-0.0153	0.0275	0.0561	0.0275	0.0561	0.0561
		se	(.)	(0.0801)	(0.0801)	(0.0721)	(0.0867)	(0.0721)	(0.0867)	(0.0867)
		R^2	0.257	0.330	0.330	0.339	0.467	0.339	0.467	0.467
		N	65011	64786	64786	64786	55936	64786	55936	55936
	3	ξ	-0.173	-0.0439	-0.0439	0.000950	0.0872	0.000950	0.0872	0.0872
		se	(.)	(0.0810)	(0.0810)	(0.0774)	(0.113)	(0.0774)	(0.113)	(0.113)
		R^2	0.257	0.378	0.378	0.387	0.531	0.387	0.531	0.531
		N	65011	63279	63279	63279	45987	63279	45987	45987
	4	ξ	-0.173	-0.00765	-0.00765	0.0443	0.163	0.0443	0.163	0.163
		se	(.)	(0.0959)	(0.0959)	(0.0908)	(0.159)	(0.0908)	(0.159)	(0.159)
		R^2	0.257	0.427	0.427	0.436	0.549	0.436	0.549	0.549
		N	65011	59586	59586	59586	36960	59586	36960	36960
	5	ξ	-0.173	0.0357	0.0357	0.0866	0.229	0.0866	0.229	0.229
		se	(.)	(0.108)	(0.108)	(0.101)	(0.162)	(0.101)	(0.162)	(0.162)
		R^2	0.257	0.436	0.436	0.445	0.565	0.445	0.565	0.565
		N	65011	58491	58491	58491	34931	58491	34931	34931
Turnover expectations (5 cat)	1	ξ	-0.0616	-0.0741	-0.0741	-0.0430	-0.0910**	-0.0430	-0.0910**	-0.0910**
		se	(0.0628)	(0.0381)	(0.0381)	(0.0450)	(0.0280)	(0.0450)	(0.0280)	(0.0280)
		R^2	0.302	0.340	0.340	0.349	0.407	0.349	0.407	0.407
		N	47774	47752	47752	47752	46698	47752	46698	46698
	2	ξ	-0.0616	0.00282	0.00282	0.0402	-0.0692	0.0402	-0.0692	-0.0692
		se	(0.0628)	(0.0456)	(0.0456)	(0.0529)	(0.0426)	(0.0529)	(0.0426)	(0.0426)
		R^2	0.302	0.374	0.374	0.383	0.500	0.383	0.500	0.500
		N	47774	47605	47605	47605	41116	47605	41116	41116
	3	ξ	-0.0616	0.0118	0.0118	0.0591	0.00374	0.0591	0.00374	0.00374
		se	(0.0628)	(0.0502)	(0.0502)	(0.0589)	(0.162)	(0.0589)	(0.162)	(0.162)
		R^2	0.302	0.417	0.417	0.426	0.559	0.426	0.559	0.559
		N	47774	46536	46536	46536	33863	46536	33863	33863
	4	ξ	-0.0616	-0.0440	-0.0440	0.0134	0.0671	0.0134	0.0671	0.0671
		se	(0.0628)	(0.0687)	(0.0687)	(0.0836)	(0.117)	(0.0836)	(0.117)	(0.117)
		R^2	0.302	0.461	0.461	0.469	0.572	0.469	0.572	0.572
		N	47774	43935	43935	43935	27288	43935	27288	27288
	5	ξ	-0.0616	-0.00584	-0.00584	0.0477	0.114	0.0477	0.114	0.114
		se	(0.0628)	(0.0691)	(0.0691)	(0.0777)	(0.107)	(0.0777)	(0.107)	(0.107)
		R^2	0.302	0.470	0.470	0.478	0.587	0.478	0.587	0.587
		N	47774	43082	43082	43082	25728	43082	25728	25728

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.37: Average treatment effects on firms' output under increasingly demanding fixed effects, large firms only

Output	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Export change	1	ξ	0.255	0.338	0.338	0.397	0.456	0.397	0.456	0.456
		se	(0.255)	(0.304)	(.)	(.)	(.)	(.)	(0.316)	(0.316)
		R^2	0.395	0.412	0.412	0.436	0.483	0.436	0.483	0.483
		N	26538	26374	26374	26371	24622	26371	24622	24622
	2	ξ	0.255	0.570	0.570	0.639	0.545	0.639	0.545	0.545
		se	(0.255)	(0.337)	(0.337)	(0.342)	(0.470)	(0.342)	(0.470)	(0.470)
		R^2	0.395	0.474	0.474	0.495	0.622	0.495	0.622	0.622
		N	26538	26013	26013	26010	18544	26010	18544	18544
	3	ξ	0.255	0.620	0.620	0.663	0.370	0.663	0.370	0.370
		se	(0.255)	(0.336)	(0.336)	(0.350)	(0.340)	(0.350)	(0.340)	(0.340)
		R^2	0.395	0.542	0.542	0.564	0.684	0.564	0.684	0.684
		N	26538	24357	24357	24356	12840	24356	12840	12840
	4	ξ	0.255	0.571	0.571	0.564	-0.309	0.564	-0.309	-0.309
		se	(0.255)	(0.312)	(0.312)	(0.295)	(0.552)	(0.295)	(0.552)	(0.552)
		R^2	0.395	0.602	0.602	0.628	0.703	0.628	0.703	0.703
		N	26538	20948	20948	20946	8503	20946	8503	8503
	5	ξ	0.255	0.565	0.565	0.548	-0.346	0.548	-0.346	-0.346
		se	(0.255)	(0.314)	(0.314)	(0.302)	(0.557)	(0.302)	(0.557)	(0.557)
		R^2	0.395	0.607	0.607	0.633	0.704	0.633	0.704	0.704
		N	26538	20196	20196	20190	7961	20190	7961	7961
Export status (2 cat)	1	ξ	-0.0173	-0.0672	-0.0672	-0.0781*	-0.0588	-0.0781*	-0.0588	-0.0588
		se	(0.0339)	(.)	(0.0388)	(0.0377)	(0.0373)	(0.0377)	(0.0373)	(0.0373)
		R^2	0.895	0.896	0.896	0.897	0.906	0.897	0.906	0.906
		N	75163	75138	75138	75138	73522	75138	73522	73522
	2	ξ	-0.0173	-0.100*	-0.100*	-0.108**	-0.0831*	-0.108**	-0.0831*	-0.0831*
		se	(0.0339)	(0.0408)	(0.0408)	(0.0395)	(0.0395)	(0.0395)	(0.0395)	(0.0395)
		R^2	0.895	0.901	0.901	0.902	0.921	0.902	0.921	0.921
		N	75163	74933	74933	74933	65168	74933	65168	65168
	3	ξ	-0.0173	-0.0919*	-0.0919*	-0.102**	-0.103	-0.102**	-0.103	-0.103
		se	(0.0339)	(0.0363)	(0.0363)	(0.0359)	(0.0643)	(0.0359)	(0.0643)	(0.0643)
		R^2	0.895	0.908	0.908	0.909	0.933	0.909	0.933	0.933
		N	75163	73360	73360	73360	53711	73360	53711	53711
	4	ξ	-0.0173	-0.0970**	-0.0970**	-0.108**	-0.134*	-0.108**	-0.134*	-0.134*
		se	(0.0339)	(0.0341)	(0.0341)	(0.0357)	(0.0558)	(0.0357)	(0.0558)	(0.0558)
		R^2	0.895	0.918	0.918	0.919	0.940	0.919	0.940	0.940
		N	75163	69451	69451	69451	43461	69451	43461	43461
	5	ξ	-0.0173	-0.105**	-0.105**	-0.116**	-0.145*	-0.116**	-0.145*	-0.145*
		se	(0.0339)	(0.0367)	(0.0367)	(0.0375)	(0.0567)	(0.0375)	(0.0567)	(0.0567)
		R^2	0.895	0.918	0.918	0.919	0.940	0.919	0.940	0.940
		N	75163	68173	68173	68173	41289	68173	41289	41289
Export status (3 cat)	1	ξ	-0.0464	-0.103	-0.103	-0.127	-0.127	-0.127	-0.127	-0.127
		se	(.)	(0.0654)	(0.0654)	(0.0683)	(0.0778)	(0.0683)	(.)	(0.0778)
		R^2	0.938	0.940	0.940	0.941	0.948	0.941	0.948	0.948
		N	45647	45632	45632	45632	44401	45632	44401	44401
	2	ξ	-0.0464	-0.117	-0.117	-0.139	-0.147	-0.139	-0.147	-0.147
		se	(.)	(0.0790)	(0.0790)	(0.0773)	(0.0809)	(0.0773)	(0.0809)	(0.0809)
		R^2	0.938	0.944	0.944	0.945	0.956	0.945	0.956	0.956
		N	45647	45396	45396	45396	38919	45396	38919	38919
	3	ξ	-0.0464	-0.0943	-0.0943	-0.119	-0.190	-0.119	-0.190	-0.190
		se	(.)	(0.0774)	(0.0774)	(0.0785)	(0.150)	(0.0785)	(0.150)	(0.150)
		R^2	0.938	0.949	0.949	0.949	0.960	0.949	0.960	0.960
		N	45647	44278	44278	44278	31835	44278	31835	31835
	4	ξ	-0.0464	-0.0845	-0.0845	-0.119	-0.0948	-0.119	-0.0948	-0.0948
		se	(.)	(0.0777)	(0.0777)	(0.0825)	(0.0986)	(0.0825)	(0.0986)	(0.0986)
		R^2	0.938	0.953	0.953	0.953	0.963	0.953	0.963	0.963
		N	45647	41705	41705	41705	26001	41705	26001	26001
	5	ξ	-0.0464	-0.106	-0.106	-0.140	-0.109	-0.140	-0.109	-0.109
		se	(.)	(0.0777)	(0.0777)	(0.0826)	(0.0955)	(0.0826)	(0.0955)	(0.0955)
		R^2	0.938	0.953	0.953	0.954	0.963	0.954	0.963	0.963
		N	45647	41007	41007	41007	24708	41007	24708	24708

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.38: Average treatment effects on firms' prices under increasingly demanding fixed effects, large firms only

Prices	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Price of goods sold	1	ξ	0.185	0.173	0.173	0.189	0.136	0.189*	0.136	0.136
		se	(0.129)	(0.0892)	(0.0892)	(.)	(.)	(0.0862)	(0.0878)	(0.0878)
		R^2	0.321	0.349	0.349	0.357	0.418	0.357	0.418	0.418
		N	61229	61200	61200	61200	59632	61200	59632	59632
	2	ξ	0.185	0.207*	0.207*	0.226*	0.225*	0.226*	0.225*	0.225*
		se	(0.129)	(0.0968)	(0.0968)	(0.0945)	(0.108)	(0.0945)	(0.108)	(0.108)
		R^2	0.321	0.385	0.385	0.393	0.512	0.393	0.512	0.512
		N	61229	60977	60977	60977	51999	60977	51999	51999
	3	ξ	0.185	0.131	0.131	0.157	0.116	0.157	0.116	0.116
		se	(0.129)	(0.0828)	(0.0828)	(0.0825)	(0.116)	(0.0825)	(0.116)	(0.116)
		R^2	0.321	0.428	0.428	0.435	0.574	0.435	0.574	0.574
		N	61229	59437	59437	59437	42540	59437	42540	42540
	4	ξ	0.185	0.146	0.146	0.194	0.0755	0.194	0.0755	0.0755
		se	(0.129)	(0.112)	(0.112)	(0.117)	(0.120)	(0.117)	(0.120)	(0.120)
		R^2	0.321	0.470	0.470	0.479	0.590	0.479	0.590	0.590
		N	61229	55683	55683	55683	33806	55683	33806	33806
	5	ξ	0.185	0.156	0.156	0.205	0.112	0.205	0.112	0.112
		se	(0.129)	(0.115)	(0.115)	(0.120)	(0.139)	(0.120)	(0.139)	(0.139)
		R^2	0.321	0.478	0.478	0.486	0.601	0.486	0.601	0.601
		N	61229	54607	54607	54607	31955	54607	31955	31955
Price of materials	1	ξ	0.326*	0.245	0.245	0.241	0.191	0.241	0.191	0.191
		se	(0.145)	(0.145)	(0.145)	(0.138)	(0.147)	(.)	(0.147)	(.)
		R^2	0.359	0.382	0.382	0.391	0.452	0.391	0.452	0.452
		N	58584	58556	58556	58556	56913	58556	56913	56913
	2	ξ	0.326*	0.281	0.281	0.288	0.272	0.288	0.272	0.272
		se	(0.145)	(0.150)	(0.150)	(0.146)	(0.189)	(0.146)	(0.189)	(0.189)
		R^2	0.359	0.420	0.420	0.429	0.553	0.429	0.553	0.553
		N	58584	58318	58318	58318	49251	58318	49251	49251
	3	ξ	0.326*	0.232	0.232	0.244	0.0918	0.244	0.0918	0.0918
		se	(0.145)	(0.131)	(0.131)	(0.134)	(0.197)	(0.134)	(0.197)	(0.197)
		R^2	0.359	0.466	0.466	0.474	0.603	0.474	0.603	0.603
		N	58584	56684	56684	56684	40116	56684	40116	40116
	4	ξ	0.326*	0.223	0.223	0.226	-0.0183	0.226	-0.0183	-0.0183
		se	(0.145)	(0.159)	(0.159)	(0.163)	(0.220)	(0.163)	(0.220)	(0.220)
		R^2	0.359	0.511	0.511	0.520	0.624	0.520	0.624	0.624
		N	58584	52882	52882	52882	31489	52882	31489	31489
	5	ξ	0.326*	0.195	0.195	0.193	0.0662	0.193	0.0662	0.0662
		se	(0.145)	(0.150)	(0.150)	(0.151)	(0.191)	(0.151)	(0.191)	(0.191)
		R^2	0.359	0.516	0.516	0.526	0.636	0.526	0.636	0.636
		N	58584	51826	51826	51826	29717	51826	29717	29717
Prices of goods sold expectations	1	ξ	0.163	0.196**	0.196**	0.185	0.184**	0.185**	0.184**	0.184
		se	(.)	(0.0621)	(0.0621)	(.)	(0.0610)	(0.0641)	(0.0610)	(.)
		R^2	0.335	0.364	0.364	0.373	0.438	0.373	0.438	0.438
		N	42277	42255	42255	42255	41161	42255	41161	41161
	2	ξ	0.163	0.224**	0.224**	0.209*	0.208*	0.209*	0.208*	0.208*
		se	(.)	(0.0809)	(0.0809)	(0.0832)	(0.0861)	(0.0832)	(0.0861)	(0.0861)
		R^2	0.335	0.400	0.400	0.408	0.542	0.408	0.542	0.542
		N	42277	42102	42102	42102	35952	42102	35952	35952
	3	ξ	0.163	0.201*	0.201*	0.197*	0.218*	0.197*	0.218*	0.218*
		se	(.)	(0.0899)	(0.0899)	(0.0915)	(0.0967)	(0.0915)	(0.0967)	(0.0967)
		R^2	0.335	0.442	0.442	0.450	0.593	0.450	0.593	0.593
		N	42277	41035	41035	41035	29435	41035	29435	29435
	4	ξ	0.163	0.225**	0.225**	0.223**	0.264**	0.223**	0.264**	0.264**
		se	(.)	(0.0775)	(0.0775)	(0.0814)	(0.0820)	(0.0814)	(0.0820)	(0.0820)
		R^2	0.335	0.488	0.488	0.497	0.603	0.497	0.603	0.603
		N	42277	38378	38378	38378	23341	38378	23341	23341
	5	ξ	0.163	0.218**	0.218**	0.218**	0.321***	0.218**	0.321***	0.321***
		se	(.)	(0.0779)	(0.0779)	(0.0787)	(0.0756)	(0.0787)	(0.0756)	(0.0756)
		R^2	0.335	0.495	0.495	0.504	0.619	0.504	0.619	0.619
		N	42277	37664	37664	37664	22096	37664	22096	22096

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.39: Average treatment effects on firms' input mix under increasingly demanding fixed effects, large firms only

Input mix	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Import status (2 cat)	1	ξ	-0.0453	-0.0596	-0.0596	-0.0507	-0.0578	-0.0507	-0.0578	-0.0578
		se	(.)	(0.0443)	(0.0443)	(0.0412)	(0.0360)	(0.0412)	(0.0360)	(0.0360)
		R^2	0.870	0.873	0.873	0.874	0.888	0.874	0.888	0.888
		N	74345	74320	74320	74320	72663	74320	72663	72663
	2	ξ	-0.0453	-0.0674	-0.0674	-0.0504	-0.0251	-0.0504	-0.0251	-0.0251
		se	(.)	(0.0509)	(0.0509)	(0.0460)	(0.0481)	(0.0460)	(0.0481)	(0.0481)
		R^2	0.870	0.880	0.880	0.881	0.906	0.881	0.906	0.906
		N	74345	74116	74116	74116	64347	74116	64347	64347
	3	ξ	-0.0453	-0.0160	-0.0160	0.00282	-0.0518	0.00282	-0.0518	-0.0518
		se	(.)	(0.0539)	(0.0539)	(0.0519)	(0.0786)	(0.0519)	(0.0786)	(0.0786)
		R^2	0.870	0.888	0.888	0.889	0.914	0.889	0.914	0.914
		N	74345	72536	72536	72536	52948	72536	52948	52948
	4	ξ	-0.0453	0.0154	0.0154	0.0296	-0.0569	0.0296	-0.0569	-0.0569
		se	(.)	(0.0574)	(0.0574)	(0.0559)	(0.0903)	(0.0559)	(0.0903)	(0.0903)
		R^2	0.870	0.895	0.895	0.896	0.915	0.896	0.915	0.915
		N	74345	68573	68573	68573	42718	68573	42718	42718
	5	ξ	-0.0453	0.0212	0.0212	0.0406	-0.0929	0.0406	-0.0929	-0.0929
		se	(.)	(0.0588)	(0.0588)	(0.0578)	(0.106)	(0.0578)	(0.106)	(0.106)
		R^2	0.870	0.896	0.896	0.897	0.918	0.897	0.918	0.918
		N	74345	67313	67313	67313	40554	67313	40554	40554
Import status (3 cat)	1	ξ	-0.0750	-0.125	-0.125	-0.127	-0.100*	-0.127	-0.100*	-0.100
		se	(0.0648)	(.)	(.)	(.)	(0.0399)	(.)	(0.0399)	(.)
		R^2	0.931	0.932	0.932	0.933	0.941	0.933	0.941	0.941
		N	35570	35560	35560	35560	34717	35560	34717	34717
	2	ξ	-0.0750	-0.0722	-0.0722	-0.0651	-0.0468	-0.0651	-0.0468	-0.0468
		se	(0.0648)	(0.0877)	(0.0877)	(0.0777)	(0.0643)	(0.0777)	(0.0643)	(0.0643)
		R^2	0.931	0.936	0.936	0.937	0.951	0.937	0.951	0.951
		N	35570	35463	35463	35463	30496	35463	30496	30496
	3	ξ	-0.0750	-0.00376	-0.00376	0.00339	-0.0706	0.00339	-0.0706	-0.0706
		se	(0.0648)	(0.0850)	(0.0850)	(0.0786)	(0.116)	(0.0786)	(0.116)	(0.116)
		R^2	0.931	0.939	0.939	0.940	0.953	0.940	0.953	0.953
		N	35570	34654	34654	34654	24814	34654	24814	24814
	4	ξ	-0.0750	0.0339	0.0339	0.0339	0.0840	0.0339	0.0840	0.0840
		se	(0.0648)	(0.0898)	(0.0898)	(0.0862)	(0.130)	(0.0862)	(0.130)	(0.130)
		R^2	0.931	0.943	0.943	0.943	0.952	0.943	0.952	0.952
		N	35570	32578	32578	32578	19873	32578	19873	19873
	5	ξ	-0.0750	0.0463	0.0463	0.0488	0.0470	0.0488	0.0470	0.0470
		se	(0.0648)	(0.0939)	(0.0939)	(0.0913)	(0.158)	(0.0913)	(0.158)	(0.158)
		R^2	0.931	0.943	0.943	0.944	0.954	0.944	0.954	0.954
		N	35570	32031	32031	32031	18960	32031	18960	18960
Imports change	1	ξ	0.238	0.174	0.174	0.195	0.185	0.195	0.185	0.185
		se	(0.213)	(0.217)	(0.217)	(0.219)	(.)	(0.219)	(0.212)	(0.212)
		R^2	0.371	0.395	0.395	0.410	0.457	0.410	0.457	0.457
		N	33757	33672	33672	33672	31383	33672	31383	31383
	2	ξ	0.238	0.315	0.315	0.325	0.421	0.325	0.421	0.421
		se	(0.213)	(0.201)	(0.201)	(0.208)	(0.236)	(0.208)	(0.236)	(0.236)
		R^2	0.371	0.452	0.452	0.467	0.589	0.467	0.589	0.589
		N	33757	33353	33353	33353	24426	33353	24426	24426
	3	ξ	0.238	0.244	0.244	0.218	0.0927	0.218	0.0927	0.0927
		se	(0.213)	(0.246)	(0.246)	(0.249)	(0.482)	(0.249)	(0.482)	(0.482)
		R^2	0.371	0.504	0.504	0.520	0.647	0.520	0.647	0.647
		N	33757	31552	31552	31552	17317	31552	17317	17317
	4	ξ	0.238	0.369	0.369	0.316	0.516	0.316	0.516	0.516
		se	(0.213)	(0.336)	(0.336)	(0.322)	(0.894)	(0.322)	(0.894)	(0.894)
		R^2	0.371	0.564	0.564	0.582	0.683	0.582	0.683	0.683
		N	33757	27784	27784	27784	11331	27784	11331	11331
	5	ξ	0.238	0.280	0.280	0.217	-0.444	0.217	-0.444	-0.444
		se	(0.213)	(0.328)	(0.328)	(0.307)	(0.831)	(0.307)	(0.831)	(0.831)
		R^2	0.371	0.573	0.573	0.591	0.685	0.591	0.685	0.685
		N	33757	26911	26911	26911	10684	26911	10684	10684

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.40: Average treatment effects on firms' input mix under increasingly demanding fixed effects, large firms only

Input mix	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Capital	1	ξ	0.152	0.210	0.210	0.209	0.128	0.209	0.128	0.128
		se	(0.147)	(0.104)	(0.104)	(0.105)	(0.112)	(0.105)	(0.112)	(.)
		R^2	0.624	0.636	0.636	0.640	0.673	0.640	0.673	0.673
		N	21217	21206	21206	21205	20629	21205	20629	20629
	2	ξ	0.152	0.150	0.150	0.154	0.145	0.154	0.145	0.145
		se	(0.147)	(0.116)	(0.116)	(0.125)	(0.139)	(0.125)	(0.139)	(0.139)
		R^2	0.624	0.654	0.654	0.658	0.737	0.658	0.737	0.737
		N	21217	21117	21117	21116	18009	21116	18009	18009
	3	ξ	0.152	0.0953	0.0953	0.0896	0.120	0.0896	0.120	0.120
		se	(0.147)	(0.107)	(0.107)	(0.112)	(0.202)	(0.112)	(0.202)	(0.202)
		R^2	0.624	0.676	0.676	0.680	0.761	0.680	0.761	0.761
		N	21217	20580	20580	20579	14623	20579	14623	14623
	4	ξ	0.152	0.0842	0.0842	0.0687	0.133	0.0687	0.133	0.133
		se	(0.147)	(0.150)	(0.150)	(0.153)	(0.280)	(0.153)	(0.280)	(0.280)
		R^2	0.624	0.699	0.699	0.703	0.768	0.703	0.768	0.768
		N	21217	19302	19302	19301	11637	19301	11637	11637
	5	ξ	0.152	0.0738	0.0738	0.0416	0.0877	0.0416	0.0877	0.0877
		se	(0.147)	(0.155)	(0.155)	(0.160)	(0.267)	(0.160)	(0.267)	(0.267)
		R^2	0.624	0.704	0.704	0.709	0.777	0.709	0.777	0.777
		N	21217	18909	18909	18908	10982	18908	10982	10982
Capital mix	1	ξ	0.262	0.194	0.194	0.227	0.150	0.227	0.150	0.150
		se	(.)	(0.138)	(0.138)	(0.131)	(0.144)	(.)	(.)	(.)
		R^2	0.472	0.485	0.485	0.493	0.547	0.493	0.547	0.547
		N	24722	24707	24707	24706	23963	24706	23963	23963
	2	ξ	0.262	0.0883	0.0883	0.125	0.147	0.125	0.147	0.147
		se	(.)	(0.146)	(0.146)	(0.140)	(0.156)	(0.140)	(0.156)	(0.156)
		R^2	0.472	0.518	0.518	0.525	0.644	0.525	0.644	0.644
		N	24722	24593	24593	24592	20595	24592	20595	20595
	3	ξ	0.262	0.0554	0.0554	0.0802	-0.0812	0.0802	-0.0812	-0.0812
		se	(.)	(0.149)	(0.149)	(0.133)	(0.205)	(0.133)	(0.205)	(0.205)
		R^2	0.472	0.559	0.559	0.565	0.685	0.565	0.685	0.685
		N	24722	23904	23904	23903	16366	23903	16366	16366
	4	ξ	0.262	0.0326	0.0326	0.0549	-0.113	0.0549	-0.113	-0.113
		se	(.)	(0.182)	(0.182)	(0.158)	(0.260)	(0.158)	(0.260)	(0.260)
		R^2	0.472	0.592	0.592	0.599	0.690	0.599	0.690	0.690
		N	24722	22189	22189	22188	12768	22188	12768	12768
	5	ξ	0.262	0.0773	0.0773	0.0919	-0.164	0.0919	-0.164	-0.164
		se	(.)	(0.201)	(0.201)	(0.178)	(0.325)	(0.178)	(0.325)	(0.325)
		R^2	0.472	0.599	0.599	0.607	0.701	0.607	0.701	0.701
		N	24722	21688	21688	21687	11997	21687	11997	11997

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.41: Average treatment effects on firms' input mix under increasingly demanding fixed effects, large firms only

Input mix	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Employment (LBD)	1	ξ	-155.4	-161.3	-161.3	-175.4	-161.4	-175.4	-161.4	-161.4
		se	(.)	(.)	(108.1)	(.)	(94.10)	(.)	(94.10)	(.)
		R^2	0.993	0.993	0.993	0.994	0.994	0.994	0.994	0.994
		N	69542	69542	69542	69542	69376	69542	69376	69376
	2	ξ	-155.4	-124.8	-124.8	-134.6	-158.6	-134.6	-158.6	-158.6
		se	(.)	(93.23)	(93.23)	(89.56)	(93.14)	(89.56)	(93.14)	(93.14)
		R^2	0.993	0.994	0.994	0.994	0.995	0.994	0.995	0.995
		N	69542	69535	69535	69535	67470	69535	67470	67470
	3	ξ	-155.4	-235.7	-235.7	-240.7	-111.5	-240.7	-111.5	-111.5
		se	(.)	(144.9)	(144.9)	(139.0)	(89.57)	(139.0)	(89.57)	(89.57)
		R^2	0.993	0.993	0.993	0.993	0.996	0.993	0.996	0.996
		N	69542	69329	69329	69329	63370	69329	63370	63370
	4	ξ	-155.4	-274.7	-274.7	-279.8	-175.5	-279.8	-175.5	-175.5
		se	(.)	(153.3)	(153.3)	(148.3)	(84.87)	(148.3)	(84.87)	(84.87)
		R^2	0.993	0.993	0.993	0.993	0.997	0.993	0.997	0.997
		N	69542	68791	68791	68791	57674	68791	57674	57674
	5	ξ	-155.4	-273.5	-273.5	-274.9	-167.8	-274.9	-167.8	-167.8
		se	(.)	(154.6)	(154.6)	(147.9)	(85.14)	(147.9)	(85.14)	(85.14)
		R^2	0.993	0.993	0.993	0.993	0.997	0.993	0.997	0.997
		N	69542	68488	68488	68488	56246	68488	56246	56246
Log employment (LBD)	1	ξ	-0.0615*	-0.0421	-0.0421	-0.0490*	-0.0565	-0.0490*	-0.0565	-0.0565*
		se	(0.0247)	(.)	(.)	(0.0217)	(.)	(0.0217)	(.)	(0.0226)
		R^2	0.985	0.985	0.985	0.985	0.986	0.985	0.986	0.986
		N	69542	69542	69542	69542	69376	69542	69376	69376
	2	ξ	-0.0615*	-0.0391	-0.0391	-0.0458	-0.0560*	-0.0458	-0.0560*	-0.0560*
		se	(0.0247)	(0.0223)	(0.0223)	(0.0207)	(0.0192)	(0.0207)	(0.0192)	(0.0192)
		R^2	0.985	0.985	0.985	0.986	0.988	0.986	0.988	0.988
		N	69542	69535	69535	69535	67470	69535	67470	67470
	3	ξ	-0.0615*	-0.0503*	-0.0503*	-0.0547*	-0.0499*	-0.0547*	-0.0499*	-0.0499*
		se	(0.0247)	(0.0211)	(0.0211)	(0.0207)	(0.0207)	(0.0207)	(0.0207)	(0.0207)
		R^2	0.985	0.986	0.986	0.986	0.990	0.986	0.990	0.990
		N	69542	69329	69329	69329	63370	69329	63370	63370
	4	ξ	-0.0615*	-0.0560*	-0.0560*	-0.0596*	-0.0649*	-0.0596*	-0.0649*	-0.0649*
		se	(0.0247)	(0.0205)	(0.0205)	(0.0210)	(0.0236)	(0.0210)	(0.0236)	(0.0236)
		R^2	0.985	0.987	0.987	0.987	0.991	0.987	0.991	0.991
		N	69542	68791	68791	68791	57674	68791	57674	57674
	5	ξ	-0.0615*	-0.0556*	-0.0556*	-0.0584*	-0.0645*	-0.0584*	-0.0645*	-0.0645*
		se	(0.0247)	(0.0208)	(0.0208)	(0.0212)	(0.0257)	(0.0212)	(0.0257)	(0.0257)
		R^2	0.985	0.987	0.987	0.987	0.991	0.987	0.991	0.991
		N	69542	68488	68488	68488	56246	68488	56246	56246

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.42: Average treatment effects on firms' input mix under increasingly demanding fixed effects, large firms only

Input mix	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Employment (LBD)	1	ξ	-155.4	-161.3	-161.3	-175.4	-161.4	-175.4	-161.4	-161.4
		se	(.)	(.)	(108.1)	(.)	(94.10)	(.)	(94.10)	(.)
		R^2	0.993	0.993	0.993	0.994	0.994	0.994	0.994	0.994
		N	69542	69542	69542	69542	69376	69542	69376	69376
	2	ξ	-155.4	-124.8	-124.8	-134.6	-158.6	-134.6	-158.6	-158.6
		se	(.)	(93.23)	(93.23)	(89.56)	(93.14)	(89.56)	(93.14)	(93.14)
		R^2	0.993	0.994	0.994	0.994	0.995	0.994	0.995	0.995
		N	69542	69535	69535	69535	67470	69535	67470	67470
	3	ξ	-155.4	-235.7	-235.7	-240.7	-111.5	-240.7	-111.5	-111.5
		se	(.)	(144.9)	(144.9)	(139.0)	(89.57)	(139.0)	(89.57)	(89.57)
		R^2	0.993	0.993	0.993	0.993	0.996	0.993	0.996	0.996
		N	69542	69329	69329	69329	63370	69329	63370	63370
	4	ξ	-155.4	-274.7	-274.7	-279.8	-175.5	-279.8	-175.5	-175.5
		se	(.)	(153.3)	(153.3)	(148.3)	(84.87)	(148.3)	(84.87)	(84.87)
		R^2	0.993	0.993	0.993	0.993	0.997	0.993	0.997	0.997
		N	69542	68791	68791	68791	57674	68791	57674	57674
	5	ξ	-155.4	-273.5	-273.5	-274.9	-167.8	-274.9	-167.8	-167.8
		se	(.)	(154.6)	(154.6)	(147.9)	(85.14)	(147.9)	(85.14)	(85.14)
		R^2	0.993	0.993	0.993	0.993	0.997	0.993	0.997	0.997
		N	69542	68488	68488	68488	56246	68488	56246	56246
Log employment (LBD)	1	ξ	-0.0615*	-0.0421	-0.0421	-0.0490*	-0.0565	-0.0490*	-0.0565	-0.0565*
		se	(0.0247)	(.)	(.)	(0.0217)	(.)	(0.0217)	(.)	(0.0226)
		R^2	0.985	0.985	0.985	0.985	0.986	0.985	0.986	0.986
		N	69542	69542	69542	69542	69376	69542	69376	69376
	2	ξ	-0.0615*	-0.0391	-0.0391	-0.0458	-0.0560*	-0.0458	-0.0560*	-0.0560*
		se	(0.0247)	(0.0223)	(0.0223)	(0.0207)	(0.0192)	(0.0207)	(0.0192)	(0.0192)
		R^2	0.985	0.985	0.985	0.986	0.988	0.986	0.988	0.988
		N	69542	69535	69535	69535	67470	69535	67470	67470
	3	ξ	-0.0615*	-0.0503*	-0.0503*	-0.0547*	-0.0499*	-0.0547*	-0.0499*	-0.0499*
		se	(0.0247)	(0.0211)	(0.0211)	(0.0207)	(0.0207)	(0.0207)	(0.0207)	(0.0207)
		R^2	0.985	0.986	0.986	0.986	0.990	0.986	0.990	0.990
		N	69542	69329	69329	69329	63370	69329	63370	63370
	4	ξ	-0.0615*	-0.0560*	-0.0560*	-0.0596*	-0.0649*	-0.0596*	-0.0649*	-0.0649*
		se	(0.0247)	(0.0205)	(0.0205)	(0.0210)	(0.0236)	(0.0210)	(0.0236)	(0.0236)
		R^2	0.985	0.987	0.987	0.987	0.991	0.987	0.991	0.991
		N	69542	68791	68791	68791	57674	68791	57674	57674
	5	ξ	-0.0615*	-0.0556*	-0.0556*	-0.0584*	-0.0645*	-0.0584*	-0.0645*	-0.0645*
		se	(0.0247)	(0.0208)	(0.0208)	(0.0212)	(0.0257)	(0.0212)	(0.0257)	(0.0257)
		R^2	0.985	0.987	0.987	0.987	0.991	0.987	0.991	0.991
		N	69542	68488	68488	68488	56246	68488	56246	56246

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.43: Average treatment effects on firms' processes under increasingly demanding fixed effects, large firms only

Process $f()$			Estimate (ξ Treatment × Energy intensity)							
	Sic digits		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Stock levels	1	ξ	-0.0256	0.171	0.171	0.169	0.223	0.169	0.223	0.223
		se	(0.182)	(0.144)	(0.144)	(0.143)	(0.171)	(0.143)	(0.171)	(0.171)
		R^2	0.335	0.356	0.356	0.367	0.415	0.367	0.415	0.415
		N	42271	42221	42221	42221	40811	42221	40811	40811
	2	ξ	-0.0256	0.164	0.164	0.159	0.273	0.159	0.273	0.273
		se	(0.182)	(0.150)	(0.150)	(0.154)	(0.237)	(0.154)	(0.237)	(0.237)
		R^2	0.335	0.395	0.395	0.406	0.528	0.406	0.528	0.528
		N	42271	41958	41958	41958	34544	41958	34544	34544
	3	ξ	-0.0256	0.180	0.180	0.171	0.553*	0.171	0.553*	0.553*
		se	(0.182)	(0.147)	(0.147)	(0.146)	(0.235)	(0.146)	(0.235)	(0.235)
		R^2	0.335	0.445	0.445	0.456	0.601	0.456	0.601	0.601
		N	42271	40659	40659	40659	27177	40659	27177	27177
	4	ξ	-0.0256	0.130	0.130	0.0979	0.656	0.0979	0.656	0.656
		se	(0.182)	(0.180)	(0.180)	(0.173)	(0.340)	(0.173)	(0.340)	(0.340)
		R^2	0.335	0.507	0.507	0.518	0.629	0.518	0.629	0.629
		N	42271	37548	37548	37548	20400	37548	20400	20400
	5	ξ	-0.0256	0.187	0.187	0.158	0.709*	0.158	0.709*	0.709*
		se	(0.182)	(0.163)	(0.163)	(0.149)	(0.331)	(0.149)	(0.331)	(0.331)
		R^2	0.335	0.514	0.514	0.526	0.639	0.526	0.639	0.639
		N	42271	36782	36782	36782	19445	36782	19445	19445

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.44: Average treatment effects on firms' processes under increasingly demanding fixed effects, large firms only

Process $f()$	Sic digits		Estimate (ξ Treatment × Energy intensity) (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hybrid working	1	ξ	-6.404	-6.252	-6.252	-6.495	-4.003	-6.495	-4.003	-4.003
		se	(4.972)	(4.631)	(4.631)	(.)	(.)	(4.780)	(.)	(.)
		R^2	0.768	0.780	0.780	0.782	0.803	0.782	0.803	0.803
		N	35349	35348	35348	35348	34614	35348	34614	34614
	2	ξ	-6.404	-7.501	-7.501	-7.999	-6.233	-7.999	-6.233	-6.233
		se	(4.972)	(3.984)	(3.984)	(4.208)	(5.464)	(4.208)	(5.464)	(5.464)
		R^2	0.768	0.793	0.793	0.796	0.836	0.796	0.836	0.836
		N	35349	35287	35287	35287	30888	35287	30888	30888
	3	ξ	-6.404	-6.523	-6.523	-6.471	-7.489	-6.471	-7.489	-7.489
		se	(4.972)	(5.244)	(5.244)	(5.135)	(7.895)	(5.135)	(7.895)	(7.895)
		R^2	0.768	0.806	0.806	0.809	0.851	0.809	0.851	0.851
		N	35349	34529	34529	34529	25707	34529	25707	25707
	4	ξ	-6.404	-5.284	-5.284	-4.848	-4.272	-4.848	-4.272	-4.272
		se	(4.972)	(4.484)	(4.484)	(4.718)	(8.301)	(4.718)	(8.301)	(8.301)
		R^2	0.768	0.823	0.823	0.826	0.864	0.826	0.864	0.864
		N	35349	32630	32630	32630	20704	32630	20704	20704
	5	ξ	-6.404	-4.302	-4.302	-3.920	-2.416	-3.920	-2.416	-2.416
		se	(4.972)	(4.068)	(4.068)	(4.538)	(9.031)	(4.538)	(9.031)	(9.031)
		R^2	0.768	0.827	0.827	0.830	0.866	0.830	0.866	0.866
		N	35349	32090	32090	32090	19691	32090	19691	19691
Working from home	1	ξ	63.11***	44.90***	44.90	42.53***	44.56***	42.53	44.56***	44.56***
		se	(15.72)	(10.52)	(.)	(9.977)	(10.44)	(.)	(10.44)	(10.44)
		R^2	0.718	0.769	0.769	0.773	0.798	0.773	0.798	0.798
		N	79111	79091	79091	79091	77643	79091	77643	77643
	2	ξ	63.11***	42.46***	42.46***	39.03***	45.02**	39.03***	45.02**	45.02**
		se	(15.72)	(10.76)	(10.76)	(10.16)	(13.33)	(10.16)	(13.33)	(13.33)
		R^2	0.718	0.789	0.789	0.793	0.839	0.793	0.839	0.839
		N	79111	78932	78932	78932	69646	78932	69646	69646
	3	ξ	63.11***	35.68***	35.68***	32.30***	34.67*	32.30***	34.67*	34.67*
		se	(15.72)	(9.295)	(9.295)	(8.691)	(13.16)	(8.691)	(13.16)	(13.16)
		R^2	0.718	0.807	0.807	0.811	0.863	0.811	0.863	0.863
		N	79111	77491	77491	77491	58275	77491	58275	58275
	4	ξ	63.11***	36.61***	36.61***	33.44**	30.84	33.44**	30.84	30.84
		se	(15.72)	(10.26)	(10.26)	(9.704)	(16.75)	(9.704)	(16.75)	(16.75)
		R^2	0.718	0.823	0.823	0.826	0.875	0.826	0.875	0.875
		N	79111	73690	73690	73690	47524	73690	47524	47524
	5	ξ	63.11***	35.67**	35.67**	32.72**	31.49	32.72**	31.49	31.49
		se	(15.72)	(10.33)	(10.33)	(9.924)	(18.04)	(9.924)	(18.04)	(18.04)
		R^2	0.718	0.825	0.825	0.829	0.876	0.829	0.876	0.876
		N	79111	72398	72398	72398	45200	72398	45200	45200
Working from normal place of work	1	ξ	13.07	2.726	2.726	3.722	5.224	3.722	5.224	5.224
		se	(.)	(6.776)	(.)	(6.254)	(5.805)	(6.254)	(5.805)	(5.805)
		R^2	0.741	0.767	0.767	0.771	0.791	0.771	0.791	0.791
		N	79111	79091	79091	79091	77643	79091	77643	77643
	2	ξ	13.07	-5.158	-5.158	-4.454	-3.934	-4.454	-3.934	-3.934
		se	(.)	(6.804)	(6.804)	(6.090)	(6.427)	(6.090)	(6.427)	(6.427)
		R^2	0.741	0.783	0.783	0.786	0.827	0.786	0.827	0.827
		N	79111	78932	78932	78932	69646	78932	69646	69646
	3	ξ	13.07	-3.795	-3.795	-3.503	-6.639	-3.503	-6.639	-6.639
		se	(.)	(7.727)	(7.727)	(6.908)	(9.717)	(6.908)	(9.717)	(9.717)
		R^2	0.741	0.801	0.801	0.804	0.849	0.804	0.849	0.849
		N	79111	77491	77491	77491	58275	77491	58275	58275
	4	ξ	13.07	-5.159	-5.159	-4.940	-8.498	-4.940	-8.498	-8.498
		se	(.)	(7.260)	(7.260)	(6.467)	(9.446)	(6.467)	(9.446)	(9.446)
		R^2	0.741	0.819	0.819	0.822	0.862	0.822	0.862	0.862
		N	79111	73690	73690	73690	47524	73690	47524	47524
	5	ξ	13.07	-5.192	-5.192	-5.389	-10.84	-5.389	-10.84	-10.84
		se	(.)	(7.350)	(7.350)	(6.544)	(10.17)	(6.544)	(10.17)	(10.17)
		R^2	0.741	0.823	0.823	0.826	0.865	0.826	0.865	0.865
		N	79111	72398	72398	72398	45200	72398	45200	45200

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.45: Average treatment effects on firms' survival under increasingly demanding fixed effects, large firms only

Survival (Debt & liquidity)			Estimate (ξ Treatment × Energy intensity)							
	Sic digits		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Confidence will meet debt obligations (3 cat)	1	ξ	-0.220*	-0.140	-0.140	-0.129	-0.138	-0.129	-0.138	-0.138
		se	(0.0807)	(0.0723)	(.)	(.)	(0.0935)	(0.0746)	(.)	(0.0935)
		R^2	0.590	0.599	0.599	0.603	0.639	0.603	0.639	0.639
		N	24308	24299	24299	24299	23711	24299	23711	23711
	2	ξ	-0.220*	-0.150	-0.150	-0.142	-0.199	-0.142	-0.199	-0.199
		se	(0.0807)	(0.0831)	(0.0831)	(0.0870)	(0.106)	(0.0870)	(0.106)	(0.106)
		R^2	0.590	0.621	0.621	0.626	0.701	0.626	0.701	0.701
		N	24308	24217	24217	24217	20795	24217	20795	20795
	3	ξ	-0.220*	-0.234*	-0.234*	-0.233*	-0.346**	-0.233*	-0.346**	-0.346**
		se	(0.0807)	(0.0985)	(0.0985)	(0.104)	(0.122)	(0.104)	(0.122)	(0.122)
		R^2	0.590	0.648	0.648	0.652	0.725	0.652	0.725	0.725
		N	24308	23606	23606	23606	16783	23606	16783	16783
	4	ξ	-0.220*	-0.225*	-0.225*	-0.228*	-0.527**	-0.228*	-0.527**	-0.527**
		se	(0.0807)	(0.0995)	(0.0995)	(0.100)	(0.163)	(0.100)	(0.163)	(0.163)
		R^2	0.590	0.670	0.670	0.675	0.743	0.675	0.743	0.743
		N	24308	22065	22065	22065	13265	22065	13265	13265
	5	ξ	-0.220*	-0.185	-0.185	-0.190*	-0.504**	-0.190*	-0.504**	-0.504**
		se	(0.0807)	(0.0897)	(0.0897)	(0.0899)	(0.151)	(0.0899)	(0.151)	(0.151)
		R^2	0.590	0.675	0.675	0.680	0.750	0.680	0.750	0.750
		N	24308	21709	21709	21709	12632	21709	12632	12632
Confidence will meet debt obligations (4 cat)	1	ξ	-0.0342	-0.0494	-0.0494	-0.0280	0.0503	-0.0280	0.0503	0.0503
		se	(.)	(0.0850)	(.)	(0.0935)	(0.106)	(0.0935)	(0.106)	(0.106)
		R^2	0.677	0.686	0.686	0.692	0.730	0.692	0.730	0.730
		N	19362	19345	19345	19345	18719	19345	18719	18719
	2	ξ	-0.0342	-0.0580	-0.0580	-0.0340	0.153	-0.0340	0.153	0.153
		se	(.)	(0.0907)	(0.0907)	(0.0984)	(0.124)	(0.0984)	(0.124)	(0.124)
		R^2	0.677	0.703	0.703	0.709	0.781	0.709	0.781	0.781
		N	19362	19223	19223	19223	15819	19223	15819	15819
	3	ξ	-0.0342	-0.0127	-0.0127	0.0254	0.300	0.0254	0.300	0.300
		se	(.)	(0.0892)	(0.0892)	(0.100)	(0.156)	(0.100)	(0.156)	(0.156)
		R^2	0.677	0.722	0.722	0.729	0.806	0.729	0.806	0.806
		N	19362	18595	18595	18595	12521	18595	12521	12521
	4	ξ	-0.0342	0.00967	0.00967	0.0412	0.352	0.0412	0.352	0.352
		se	(.)	(0.0736)	(0.0736)	(0.0908)	(0.198)	(0.0908)	(0.198)	(0.198)
		R^2	0.677	0.743	0.743	0.750	0.817	0.750	0.817	0.817
		N	19362	17270	17270	17270	9949	17270	9949	9949
	5	ξ	-0.0342	0.0114	0.0114	0.0460	0.363	0.0460	0.363	0.363
		se	(.)	(0.0746)	(0.0746)	(0.0929)	(0.228)	(0.0929)	(0.228)	(0.228)
		R^2	0.677	0.746	0.746	0.753	0.821	0.753	0.821	0.821
		N	19362	16987	16987	16987	9462	16987	9462	9462
Confidence will meet debt obligations (5 cat)	1	ξ	-0.266	-0.184	-0.184	-0.153	-0.111	-0.153	-0.111	-0.111
		se	(.)	(0.103)	(.)	(0.108)	(0.125)	(0.108)	(0.125)	(0.125)
		R^2	0.645	0.652	0.652	0.656	0.690	0.656	0.690	0.690
		N	24308	24299	24299	24299	23711	24299	23711	23711
	2	ξ	-0.266	-0.203	-0.203	-0.178	-0.142	-0.178	-0.142	-0.142
		se	(.)	(0.113)	(0.113)	(0.122)	(0.137)	(0.122)	(0.137)	(0.137)
		R^2	0.645	0.670	0.670	0.674	0.743	0.674	0.743	0.743
		N	24308	24217	24217	24217	20795	24217	20795	20795
	3	ξ	-0.266	-0.280*	-0.280*	-0.253	-0.196	-0.253	-0.196	-0.196
		se	(.)	(0.123)	(0.123)	(0.134)	(0.144)	(0.134)	(0.144)	(0.144)
		R^2	0.645	0.691	0.691	0.695	0.768	0.695	0.768	0.768
		N	24308	23606	23606	23606	16783	23606	16783	16783
	4	ξ	-0.266	-0.208	-0.208	-0.186	-0.297	-0.186	-0.297	-0.297
		se	(.)	(0.116)	(0.116)	(0.121)	(0.208)	(0.121)	(0.208)	(0.208)
		R^2	0.645	0.711	0.711	0.716	0.781	0.716	0.781	0.781
		N	24308	22065	22065	22065	13265	22065	13265	13265
	5	ξ	-0.266	-0.170	-0.170	-0.147	-0.265	-0.147	-0.265	-0.265
		se	(.)	(0.112)	(0.112)	(0.116)	(0.202)	(0.116)	(0.202)	(0.202)
		R^2	0.645	0.714	0.714	0.719	0.787	0.719	0.787	0.787
		N	24308	21709	21709	21709	12632	21709	12632	12632

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.46: Average treatment effects on firms' survival under increasingly demanding fixed effects, large firms only

Survival (Debt & liquidity)			Estimate (ξ Treatment × Energy intensity)							
	Sic digits		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Repayments compared to turnover (4 cat)	1	ξ	-0.00517	0.0416	0.0416	0.113	-0.0311	0.113	-0.0311	-0.0311
		se	(.)	(0.176)	(0.176)	(.)	(.)	(0.181)	(0.253)	(.)
		R^2	0.632	0.655	0.655	0.670	0.726	0.670	0.726	0.726
		N	9627	9619	9619	9619	8618	9619	8618	8618
	2	ξ	-0.00517	0.318	0.318	0.401*	0.203	0.401*	0.203	0.203
		se	(.)	(0.190)	(0.190)	(0.185)	(0.321)	(0.185)	(0.321)	(0.321)
		R^2	0.632	0.701	0.701	0.716	0.777	0.716	0.777	0.777
		N	9627	9323	9323	9323	5971	9323	5971	5971
	3	ξ	-0.00517	0.243	0.243	0.360*	-0.0311	0.360*	-0.0311	-0.0311
		se	(.)	(0.166)	(0.166)	(0.169)	(0.346)	(0.169)	(0.346)	(0.346)
		R^2	0.632	0.727	0.727	0.742	0.800	0.742	0.800	0.800
		N	9627	8540	8540	8537	4556	8537	4556	4556
	4	ξ	-0.00517	0.0175	0.0175	0.158	-0.149	0.158	-0.149	-0.149
		se	(.)	(0.205)	(0.205)	(0.212)	(0.379)	(0.212)	(0.379)	(0.379)
		R^2	0.632	0.732	0.732	0.750	0.791	0.750	0.791	0.791
		N	9627	7403	7403	7395	3886	7395	3886	3886
	5	ξ	-0.00517	-0.0156	-0.0156	0.0442	-0.604	0.0442	-0.604	-0.604
		se	(.)	(0.193)	(0.193)	(0.186)	(0.702)	(0.186)	(0.702)	(0.702)
		R^2	0.632	0.739	0.739	0.756	0.808	0.756	0.808	0.808
		N	9627	7319	7319	7311	3625	7311	3625	3625
Repayments compared to turnover (5 cat)	1	ξ	-0.231	-0.434*	-0.434*	-0.345	-0.324	-0.345	-0.324	-0.324
		se	(0.166)	(0.197)	(0.197)	(0.205)	(.)	(.)	(0.293)	(0.293)
		R^2	0.677	0.689	0.689	0.696	0.745	0.696	0.745	0.745
		N	15612	15610	15610	15610	14645	15610	14645	14645
	2	ξ	-0.231	-0.116	-0.116	0.0201	-0.179	0.0201	-0.179	-0.179
		se	(0.166)	(0.165)	(0.165)	(0.181)	(0.303)	(0.181)	(0.303)	(0.303)
		R^2	0.677	0.716	0.716	0.723	0.794	0.723	0.794	0.794
		N	15612	15350	15350	15350	11562	15350	11562	11562
	3	ξ	-0.231	-0.294	-0.294	-0.164	-0.0428	-0.164	-0.0428	-0.0428
		se	(0.166)	(0.178)	(0.178)	(0.184)	(0.296)	(0.184)	(0.296)	(0.296)
		R^2	0.677	0.736	0.736	0.743	0.816	0.743	0.816	0.816
		N	15612	14627	14627	14627	8944	14627	8944	8944
	4	ξ	-0.231	-0.445*	-0.445*	-0.222	-0.0856	-0.222	-0.0856	-0.0856
		se	(0.166)	(0.205)	(0.205)	(0.210)	(0.337)	(0.210)	(0.337)	(0.337)
		R^2	0.677	0.753	0.753	0.761	0.813	0.761	0.813	0.813
		N	15612	13187	13187	13187	7132	13187	7132	7132
	5	ξ	-0.231	-0.457*	-0.457*	-0.313	-0.340	-0.313	-0.340	-0.340
		se	(0.166)	(0.189)	(0.189)	(0.166)	(0.551)	(0.166)	(0.551)	(0.551)
		R^2	0.677	0.758	0.758	0.766	0.821	0.766	0.821	0.821
		N	15612	12927	12927	12927	6638	12927	6638	6638

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.47: Average treatment effects on firms' survival under increasingly demanding fixed effects, large firms only

Survival (Debt & liquidity)			Estimate (ξ Treatment × Energy intensity)							
	Sic digits		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cash reserve duration (2 cat)	1	ξ	0.0707	0.0705	0.0705	0.0852	0.107	0.0852	0.107	0.107
		se	(0.0913)	(0.0769)	(0.0769)	(.)	(.)	(0.0746)	(.)	(0.0908)
		R^2	0.733	0.741	0.741	0.744	0.767	0.744	0.767	0.767
		N	48748	48722	48722	48722	47480	48722	47480	47480
	2	ξ	0.0707	0.0711	0.0711	0.0807	0.0101	0.0807	0.0101	0.0101
		se	(0.0913)	(0.0902)	(0.0902)	(0.0893)	(0.116)	(0.0893)	(0.116)	(0.116)
		R^2	0.733	0.755	0.755	0.758	0.808	0.758	0.808	0.808
		N	48748	48554	48554	48554	41325	48554	41325	41325
	3	ξ	0.0707	0.109	0.109	0.120	-0.0277	0.120	-0.0277	-0.0277
		se	(0.0913)	(0.102)	(0.102)	(0.103)	(0.143)	(0.103)	(0.143)	(0.143)
		R^2	0.733	0.771	0.771	0.774	0.825	0.774	0.825	0.825
		N	48748	47369	47369	47369	33912	47369	33912	33912
	4	ξ	0.0707	0.102	0.102	0.106	-0.145	0.106	-0.145	-0.145
		se	(0.0913)	(0.110)	(0.110)	(0.107)	(0.169)	(0.107)	(0.169)	(0.169)
		R^2	0.733	0.788	0.788	0.791	0.829	0.791	0.829	0.829
		N	48748	44381	44381	44381	26991	44381	26991	26991
	5	ξ	0.0707	0.134	0.134	0.153	-0.0181	0.153	-0.0181	-0.0181
		se	(0.0913)	(0.128)	(0.128)	(0.126)	(0.167)	(0.126)	(0.167)	(0.167)
		R^2	0.733	0.791	0.791	0.794	0.831	0.794	0.831	0.831
		N	48748	43479	43479	43479	25441	43479	25441	25441
Cash reserve duration (3 cat)	1	ξ	0.0123	-0.0144	-0.0144	-0.0180	-0.00733	-0.0180	-0.00733	-0.00733
		se	(.)	(.)	(0.0285)	(.)	(.)	(0.0267)	(.)	(0.0305)
		R^2	0.714	0.719	0.719	0.723	0.747	0.723	0.747	0.747
		N	48748	48722	48722	48722	47480	48722	47480	47480
	2	ξ	0.0123	-0.0165	-0.0165	-0.0179	-0.0407	-0.0179	-0.0407	-0.0407
		se	(.)	(0.0224)	(0.0224)	(0.0213)	(0.0464)	(0.0213)	(0.0464)	(0.0464)
		R^2	0.714	0.737	0.737	0.741	0.787	0.741	0.787	0.787
		N	48748	48554	48554	48554	41325	48554	41325	41325
	3	ξ	0.0123	-0.00860	-0.00860	-0.0109	-0.0618	-0.0109	-0.0618	-0.0618
		se	(.)	(0.0245)	(0.0245)	(0.0240)	(0.0734)	(0.0240)	(0.0734)	(0.0734)
		R^2	0.714	0.756	0.756	0.760	0.808	0.760	0.808	0.808
		N	48748	47369	47369	47369	33912	47369	33912	33912
	4	ξ	0.0123	-0.0147	-0.0147	-0.0203	-0.0818	-0.0203	-0.0818	-0.0818
		se	(.)	(0.0246)	(0.0246)	(0.0251)	(0.0910)	(0.0251)	(0.0910)	(0.0910)
		R^2	0.714	0.775	0.775	0.779	0.805	0.779	0.805	0.805
		N	48748	44381	44381	44381	26991	44381	26991	26991
	5	ξ	0.0123	-0.0122	-0.0122	-0.0133	-0.0147	-0.0133	-0.0147	-0.0147
		se	(.)	(0.0262)	(0.0262)	(0.0257)	(0.0565)	(0.0257)	(0.0565)	(0.0565)
		R^2	0.714	0.782	0.782	0.785	0.814	0.785	0.814	0.814
		N	48748	43479	43479	43479	25441	43479	25441	25441
Cash reserve duration (6 cat)	1	ξ	0.245	0.236	0.236	0.272	0.345	0.272	0.345	0.345
		se	(0.178)	(0.146)	(0.146)	(0.143)	(.)	(.)	(.)	(.)
		R^2	0.786	0.794	0.794	0.797	0.817	0.797	0.817	0.817
		N	48748	48722	48722	48722	47480	48722	47480	47480
	2	ξ	0.245	0.195	0.195	0.215	0.143	0.215	0.143	0.143
		se	(0.178)	(0.149)	(0.149)	(0.146)	(0.172)	(0.146)	(0.172)	(0.172)
		R^2	0.786	0.806	0.806	0.809	0.853	0.809	0.853	0.853
		N	48748	48554	48554	48554	41325	48554	41325	41325
	3	ξ	0.245	0.278	0.278	0.306	0.0198	0.306	0.0198	0.0198
		se	(0.178)	(0.152)	(0.152)	(0.159)	(0.193)	(0.159)	(0.193)	(0.193)
		R^2	0.786	0.820	0.820	0.823	0.869	0.823	0.869	0.869
		N	48748	47369	47369	47369	33912	47369	33912	33912
	4	ξ	0.245	0.249	0.249	0.268	-0.126	0.268	-0.126	-0.126
		se	(0.178)	(0.175)	(0.175)	(0.172)	(0.260)	(0.172)	(0.260)	(0.260)
		R^2	0.786	0.834	0.834	0.837	0.872	0.837	0.872	0.872
		N	48748	44381	44381	44381	26991	44381	26991	26991
	5	ξ	0.245	0.311	0.311	0.350	0.0811	0.350	0.0811	0.0811
		se	(0.178)	(0.213)	(0.213)	(0.210)	(0.282)	(0.210)	(0.282)	(0.282)
		R^2	0.786	0.837	0.837	0.839	0.874	0.839	0.874	0.874
		N	48748	43479	43479	43479	25441	43479	25441	25441

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.48: Average treatment effects on firms' survival under increasingly demanding fixed effects, large firms only

Survival (Debt & liquidity)			Estimate (ξ Treatment × Energy intensity)							
	Sic digits		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cash reserve duration (2 cat)	1	ξ	0.0707	0.0705	0.0705	0.0852	0.107	0.0852	0.107	0.107
		se	(0.0913)	(0.0769)	(0.0769)	(.)	(.)	(0.0746)	(.)	(0.0908)
		R^2	0.733	0.741	0.741	0.744	0.767	0.744	0.767	0.767
		N	48748	48722	48722	48722	47480	48722	47480	47480
	2	ξ	0.0707	0.0711	0.0711	0.0807	0.0101	0.0807	0.0101	0.0101
		se	(0.0913)	(0.0902)	(0.0902)	(0.0893)	(0.116)	(0.0893)	(0.116)	(0.116)
		R^2	0.733	0.755	0.755	0.758	0.808	0.758	0.808	0.808
		N	48748	48554	48554	48554	41325	48554	41325	41325
	3	ξ	0.0707	0.109	0.109	0.120	-0.0277	0.120	-0.0277	-0.0277
		se	(0.0913)	(0.102)	(0.102)	(0.103)	(0.143)	(0.103)	(0.143)	(0.143)
		R^2	0.733	0.771	0.771	0.774	0.825	0.774	0.825	0.825
		N	48748	47369	47369	47369	33912	47369	33912	33912
	4	ξ	0.0707	0.102	0.102	0.106	-0.145	0.106	-0.145	-0.145
		se	(0.0913)	(0.110)	(0.110)	(0.107)	(0.169)	(0.107)	(0.169)	(0.169)
		R^2	0.733	0.788	0.788	0.791	0.829	0.791	0.829	0.829
		N	48748	44381	44381	44381	26991	44381	26991	26991
	5	ξ	0.0707	0.134	0.134	0.153	-0.0181	0.153	-0.0181	-0.0181
		se	(0.0913)	(0.128)	(0.128)	(0.126)	(0.167)	(0.126)	(0.167)	(0.167)
		R^2	0.733	0.791	0.791	0.794	0.831	0.794	0.831	0.831
		N	48748	43479	43479	43479	25441	43479	25441	25441
Cash reserve duration (3 cat)	1	ξ	0.0123	-0.0144	-0.0144	-0.0180	-0.00733	-0.0180	-0.00733	-0.00733
		se	(.)	(.)	(0.0285)	(.)	(.)	(0.0267)	(.)	(0.0305)
		R^2	0.714	0.719	0.719	0.723	0.747	0.723	0.747	0.747
		N	48748	48722	48722	48722	47480	48722	47480	47480
	2	ξ	0.0123	-0.0165	-0.0165	-0.0179	-0.0407	-0.0179	-0.0407	-0.0407
		se	(.)	(0.0224)	(0.0224)	(0.0213)	(0.0464)	(0.0213)	(0.0464)	(0.0464)
		R^2	0.714	0.737	0.737	0.741	0.787	0.741	0.787	0.787
		N	48748	48554	48554	48554	41325	48554	41325	41325
	3	ξ	0.0123	-0.00860	-0.00860	-0.0109	-0.0618	-0.0109	-0.0618	-0.0618
		se	(.)	(0.0245)	(0.0245)	(0.0240)	(0.0734)	(0.0240)	(0.0734)	(0.0734)
		R^2	0.714	0.756	0.756	0.760	0.808	0.760	0.808	0.808
		N	48748	47369	47369	47369	33912	47369	33912	33912
	4	ξ	0.0123	-0.0147	-0.0147	-0.0203	-0.0818	-0.0203	-0.0818	-0.0818
		se	(.)	(0.0246)	(0.0246)	(0.0251)	(0.0910)	(0.0251)	(0.0910)	(0.0910)
		R^2	0.714	0.775	0.775	0.779	0.805	0.779	0.805	0.805
		N	48748	44381	44381	44381	26991	44381	26991	26991
	5	ξ	0.0123	-0.0122	-0.0122	-0.0133	-0.0147	-0.0133	-0.0147	-0.0147
		se	(.)	(0.0262)	(0.0262)	(0.0257)	(0.0565)	(0.0257)	(0.0565)	(0.0565)
		R^2	0.714	0.782	0.782	0.785	0.814	0.785	0.814	0.814
		N	48748	43479	43479	43479	25441	43479	25441	25441
Cash reserve duration (6 cat)	1	ξ	0.245	0.236	0.236	0.272	0.345	0.272	0.345	0.345
		se	(0.178)	(0.146)	(0.146)	(0.143)	(.)	(.)	(.)	(.)
		R^2	0.786	0.794	0.794	0.797	0.817	0.797	0.817	0.817
		N	48748	48722	48722	48722	47480	48722	47480	47480
	2	ξ	0.245	0.195	0.195	0.215	0.143	0.215	0.143	0.143
		se	(0.178)	(0.149)	(0.149)	(0.146)	(0.172)	(0.146)	(0.172)	(0.172)
		R^2	0.786	0.806	0.806	0.809	0.853	0.809	0.853	0.853
		N	48748	48554	48554	48554	41325	48554	41325	41325
	3	ξ	0.245	0.278	0.278	0.306	0.0198	0.306	0.0198	0.0198
		se	(0.178)	(0.152)	(0.152)	(0.159)	(0.193)	(0.159)	(0.193)	(0.193)
		R^2	0.786	0.820	0.820	0.823	0.869	0.823	0.869	0.869
		N	48748	47369	47369	47369	33912	47369	33912	33912
	4	ξ	0.245	0.249	0.249	0.268	-0.126	0.268	-0.126	-0.126
		se	(0.178)	(0.175)	(0.175)	(0.172)	(0.260)	(0.172)	(0.260)	(0.260)
		R^2	0.786	0.834	0.834	0.837	0.872	0.837	0.872	0.872
		N	48748	44381	44381	44381	26991	44381	26991	26991
	5	ξ	0.245	0.311	0.311	0.350	0.0811	0.350	0.0811	0.0811
		se	(0.178)	(0.213)	(0.213)	(0.210)	(0.282)	(0.210)	(0.282)	(0.282)
		R^2	0.786	0.837	0.837	0.839	0.874	0.839	0.874	0.874
		N	48748	43479	43479	43479	25441	43479	25441	25441

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.49: Average treatment effects on firms' survival under increasingly demanding fixed effects, large firms only

Survival (Trading status)			Estimate (ξ Treatment × Energy intensity)							
	Sic digits		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Change in risk of insolvency	1	ξ	0.0361	0.00546	0.00546	0.0186	0.0289	0.0186	0.0289	0.0289
		se	(0.0932)	(0.0867)	(0.0867)	(0.0923)	(0.132)	(0.0923)	(.)	(.)
		R^2	0.475	0.513	0.513	0.519	0.567	0.519	0.567	0.567
		N	24954	24937	24937	24937	24372	24937	24372	24372
	2	ξ	0.0361	0.0483	0.0483	0.0626	-0.0127	0.0626	-0.0127	-0.0127
		se	(0.0932)	(0.106)	(0.106)	(0.116)	(0.212)	(0.116)	(0.212)	(0.212)
		R^2	0.475	0.542	0.542	0.548	0.649	0.548	0.649	0.649
		N	24954	24831	24831	24831	21206	24831	21206	21206
	3	ξ	0.0361	0.107	0.107	0.125	0.282	0.125	0.282	0.282
		se	(0.0932)	(0.104)	(0.104)	(0.112)	(0.245)	(0.112)	(0.245)	(0.245)
		R^2	0.475	0.575	0.575	0.581	0.692	0.581	0.692	0.692
		N	24954	24230	24230	24230	17262	24230	17262	17262
	4	ξ	0.0361	0.130	0.130	0.170	0.427	0.170	0.427	0.427
		se	(0.0932)	(0.116)	(0.116)	(0.122)	(0.300)	(0.122)	(0.300)	(0.300)
		R^2	0.475	0.613	0.613	0.620	0.707	0.620	0.707	0.707
		N	24954	22752	22752	22752	13822	22752	13822	13822
	5	ξ	0.0361	0.164	0.164	0.200	0.181	0.200	0.181	0.181
		se	(0.0932)	(0.112)	(0.112)	(0.114)	(0.115)	(0.114)	(0.115)	(0.115)
		R^2	0.475	0.619	0.619	0.626	0.715	0.626	0.715	0.715
		N	24954	22280	22280	22280	13051	22280	13051	13051
Risk of insolvency	1	ξ	-0.0800	-0.0133	-0.0133	-0.0422	0.00671	-0.0422	0.00671	0.00671
		se	(.)	(0.131)	(0.131)	(0.130)	(0.134)	(.)	(0.134)	(.)
		R^2	0.664	0.671	0.671	0.674	0.706	0.674	0.706	0.706
		N	49908	49889	49889	49889	48836	49889	48836	48836
	2	ξ	-0.0800	-0.0116	-0.0116	-0.0399	0.0348	-0.0399	0.0348	0.0348
		se	(.)	(0.150)	(0.150)	(0.148)	(0.189)	(0.148)	(0.189)	(0.189)
		R^2	0.664	0.684	0.684	0.688	0.751	0.688	0.751	0.751
		N	49908	49750	49750	49750	43072	49750	43072	43072
	3	ξ	-0.0800	0.00457	0.00457	-0.0211	0.0509	-0.0211	0.0509	0.0509
		se	(.)	(0.158)	(0.158)	(0.157)	(0.199)	(0.157)	(0.199)	(0.199)
		R^2	0.664	0.702	0.702	0.705	0.773	0.705	0.773	0.773
		N	49908	48688	48688	48688	35365	48688	35365	35365
	4	ξ	-0.0800	-0.0315	-0.0315	-0.0519	0.0875	-0.0519	0.0875	0.0875
		se	(.)	(0.160)	(0.160)	(0.160)	(0.231)	(0.160)	(0.231)	(0.231)
		R^2	0.664	0.723	0.723	0.727	0.781	0.727	0.781	0.781
		N	49908	45877	45877	45877	28297	45877	28297	28297
	5	ξ	-0.0800	-0.0144	-0.0144	-0.0368	0.0492	-0.0368	0.0492	0.0492
		se	(.)	(0.164)	(0.164)	(0.164)	(0.267)	(0.164)	(0.267)	(0.267)
		R^2	0.664	0.726	0.726	0.730	0.789	0.730	0.789	0.789
		N	49908	45045	45045	45045	26864	45045	26864	26864

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05

Table B.50: Average treatment effects on firms' survival under increasingly demanding fixed effects, large firms only

Survival (Trading status)			Estimate (ξ Treatment × Energy intensity)							
	Sic digits		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trading status (2 cat)	1	ξ	0.0512	0.0365	0.0365	0.0477	0.0586	0.0477	0.0586	0.0586
		se	(0.0640)	(0.0402)	(.)	(0.0403)	(0.0437)	(0.0403)	(.)	(.)
		R^2	0.352	0.514	0.514	0.520	0.570	0.520	0.570	0.570
		N	115042	115016	115016	115016	112951	115016	112951	112951
	2	ξ	0.0512	0.00551	0.00551	0.0153	0.0200	0.0153	0.0200	0.0200
		se	(0.0640)	(0.0301)	(0.0301)	(0.0291)	(0.0344)	(0.0291)	(0.0344)	(0.0344)
		R^2	0.352	0.573	0.573	0.577	0.667	0.577	0.667	0.667
		N	115042	114784	114784	114784	101473	114784	101473	101473
	3	ξ	0.0512	0.00134	0.00134	0.0136	0.0245	0.0136	0.0245	0.0245
		se	(0.0640)	(0.0313)	(0.0313)	(0.0312)	(0.0363)	(0.0312)	(0.0363)	(0.0363)
		R^2	0.352	0.624	0.624	0.628	0.732	0.628	0.732	0.732
		N	115042	112708	112708	112708	84906	112708	84906	84906
	4	ξ	0.0512	-0.00444	-0.00444	0.00887	0.00489	0.00887	0.00489	0.00489
		se	(0.0640)	(0.0227)	(0.0227)	(0.0240)	(0.0289)	(0.0240)	(0.0289)	(0.0289)
		R^2	0.352	0.669	0.669	0.673	0.759	0.673	0.759	0.759
		N	115042	107190	107190	107190	69248	107190	69248	69248
	5	ξ	0.0512	-0.00848	-0.00848	0.00462	-0.00810	0.00462	-0.00810	-0.00810
		se	(0.0640)	(0.0209)	(0.0209)	(0.0220)	(0.0254)	(0.0220)	(0.0254)	(0.0254)
		R^2	0.352	0.682	0.682	0.686	0.778	0.686	0.778	0.778
		N	115042	105376	105376	105376	65919	105376	65919	65919
Trading status (6 cat)	1	ξ	0.107	0.0372	0.0372	0.0842	0.141	0.0842	0.141	0.141
		se	(.)	(0.208)	(.)	(0.204)	(.)	(.)	(.)	(0.219)
		R^2	0.403	0.540	0.540	0.545	0.589	0.545	0.589	0.589
		N	115335	115309	115309	115309	113241	115309	113241	113241
	2	ξ	0.107	-0.110	-0.110	-0.0687	-0.0585	-0.0687	-0.0585	-0.0585
		se	(.)	(0.191)	(0.191)	(0.180)	(0.225)	(0.180)	(0.225)	(0.225)
		R^2	0.403	0.590	0.590	0.594	0.680	0.594	0.680	0.680
		N	115335	115077	115077	115077	101778	115077	101778	101778
	3	ξ	0.107	-0.122	-0.122	-0.0661	0.0923	-0.0661	0.0923	0.0923
		se	(.)	(0.177)	(0.177)	(0.168)	(0.153)	(0.168)	(0.153)	(0.153)
		R^2	0.403	0.635	0.635	0.639	0.743	0.639	0.743	0.743
		N	115335	113001	113001	113001	85248	113001	85248	85248
	4	ξ	0.107	-0.109	-0.109	-0.0494	0.00355	-0.0494	0.00355	0.00355
		se	(.)	(0.112)	(0.112)	(0.110)	(0.0923)	(0.110)	(0.0923)	(0.0923)
		R^2	0.403	0.676	0.676	0.680	0.766	0.680	0.766	0.766
		N	115335	107469	107469	107469	69561	107469	69561	69561
	5	ξ	0.107	-0.124	-0.124	-0.0680	-0.0331	-0.0680	-0.0331	-0.0331
		se	(.)	(0.109)	(0.109)	(0.107)	(0.105)	(0.107)	(0.105)	(0.105)
		R^2	0.403	0.688	0.688	0.691	0.784	0.691	0.784	0.784
		N	115335	105664	105664	105664	66210	105664	66210	66210

Notes: Table presents estimated effects with differentially saturated two-way fixed effect specifications. The variables are ordinal outcomes indicating the direction of change of a given variable ie. if it increased or decreased in the survey reference period. The data granularity is at the ruref level and the specification includes ruref fixed effects throught. Time fixed effects are added at differential spatial and industry granularity across columns. Standard errors are reported in parentheses. Stars denote statistical significance obtained from estimating clustered standard errors by wave and 2 digit industry with stars indicating *** p<0.001, ** p<0.01, * p<0.05