

# The Impact of Lockdown Easing and “Eat Out to Help Out” on Company Registrations in the UK <sup>\*</sup>

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## Abstract

We present new data and analysis on the response of UK company creation to lockdown easing policies. In general, we show that company registrations responded sensitively to policy announcements during the summer of 2020. This highlights that company registrations data is a meaningful and rapidly-available measure of business environment which can form a useful tool for researchers and policymakers. As an application of the dataset, we study the “Eat Out to Help Out” policy which subsidised people to eat-out at participating restaurants during August 2020. We find that the policy is associated with an increase in business registrations in areas with participating restaurants.

**Keywords:** COVID-19 pandemic, Eat Out to Help Out, firm creation, entrepreneurship, small businesses, spillovers

**JEL codes:** H25, L26, E6

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# Introduction

Business creation is a fundamental economic indicator, as new firms stimulate job growth, drive innovation, and intensify competition. This, in turn, fosters productivity gains and overall economic growth (Criscuolo, Gal, and Menon 2014; Haltiwanger 2022). During the COVID-19 pandemic, real-time economic data played an important role in reflecting the pressures facing businesses, particularly small businesses disrupted by lockdown policies. We introduce and analyse a new dataset on company registrations during the pandemic, and illustrate its value for policy evaluation by examining the Eat Out to Help Out scheme. Since new registrations are typically small businesses, the data offers an important insight into the small business environment.

Our research has two primary objectives. Firstly, we aim to collect, clean, and describe the economic content of a new primary dataset focused on UK business creation. Secondly, we provide an application of this dataset by evaluating the impact of the Eat Out to Help Out scheme, which was a policy to subsidise restaurant meals during August 2020. These objectives motivate us to investigate the following key research questions: Did business creation respond meaningfully to lockdown-easing policies? And, did subsidising UK restaurants during the COVID-19 pandemic stimulate economic activity in affected areas? Our results show that company registrations responded rapidly to lockdown policies as they were implemented and relaxed over the summer of 2020. And, areas with more subsidised restaurants experienced greater firm creation, particularly through spillovers to other, non-hospitality, sectors.

Our research methodology encompasses several stages, from data collection and cleaning to descriptive statistical analysis supported by a narrative analysis of relevant policies. Finally, we employ a difference-in-differences (DID) analysis to assess the Eat Out to Help Out (EOTHO) scheme. We begin with a descriptive analysis that illustrates how firm creation trends fluctuated during the summer of 2020, aligning with lockdown policies. We complement this with descriptive statistics highlighting the distribution of registrations across sectors, weeks, and postcodes, and identify the sectors with the highest and lowest registration activity. To understand the impact of the EOTHO policy, we initially compare a time series of firm creation in EOTHO postcode areas with those without the scheme, and test for statistical differences. Subsequently, we use a DID analysis to compare firm creation in a treatment group (postcodes with subsidized restaurants) to a control group (postcodes without subsidized restaurants). This approach allows us to isolate the causal effect of the EOTHO policy on firm creation, accounting for pre-existing trends and other potential confounding factors.

Our main data source is the Companies House register of all UK firms. This register includes details such as company name, postcode, 5-digit SIC sector, and activity status for all limited-liability companies. We track the register month-on-month for new additions and removals. By aggregating up from the firm-level up, we establish registrations in different

areas and sectors of the UK economy.<sup>1</sup> We complement our Companies House data with HM Revenue & Customs (HMRC) tax data on restaurants participating in the EOTHO scheme. The HMRC data allows us to identify the number of subsidised restaurants by postcode.

Our descriptive analysis reveals that company registrations span most 5-digit sectors, with a few sectors dominating activity, particularly ‘Retail sale via mail order houses or via Internet’. We find that registrations are observed in approximately 130,000 postcode areas, and most postcodes are linked to a single registration. This suggests that the registration postcode accurately reflects the location of economic activity. We present time series plots of company registrations that show the measure is sensitive to policy announcements. A significant surge in registrations followed the mid-July relaxations, including the EOTHO policy announcement. Our policy evaluation exercise, reveals a significant change in firm creation patterns in EOTHO areas after the policy’s implementation. Our DID analysis establishes a positive link between the EOTHO subsidy and firm creation. Specifically, postcode areas with a higher number of subsidized restaurants experienced greater firm creation compared to areas (identical in other characteristics) with fewer subsidized restaurants.

## Related Literature

Our research has implications for three strands of literature, covered in the next three paragraphs. First, emerging work to develop large-scale datasets on firm creation. Second, well-established studies of the effect of firm creation on regional economics. And, third public policy studies related to COVID-19 policies.

Increasingly researchers are using administrative data on firm registrations as a supply-side economic indicator (OECD 2021). We contribute to this growing body of work by developing a comparable dataset for the UK. A parallel to our UK data work is the US Bureau for Labor Statistics’ Business Formation Statistics (BFS) dataset, which has made significant contributions in the US context (Bayard, Dinlersoz, Dunne, Haltiwanger, Miranda, and Stevens 2018; Dinlersoz, Dunne, Haltiwanger, and Penciakova 2021; Buffington, Chapman, Dinlersoz, Foster, and Haltiwanger 2021; Dinlersoz, Dunne, Haltiwanger, and Penciakova 2023; Asturias, Dinlersoz, Haltiwanger, and Hutchinson 2023). Some advantages of the UK data is that it is a more direct measure of firm creation, capturing legal form, postcode, and 5-digit industry directly from the registration form, whereas the BFS measures firm creation indirectly from Employee Identification Numbers (EINs), which are submitted by businesses intending to employ someone. Other recent efforts to measure firm creation at a granular level include: Guzman and Stern (2020), Andrews, Fazio, Guzman, Liu, and Stern (2022), Duprey, Rigobon, Kotlicki, and Schnattinger (2023), and Akcigit, Chhina, Cilasun, Miranda, Ocakverdi, and Serrano-Velarde (2023). Unlike this work, we focus on the UK and cover the universe of all firms created across all sectors and regions.

Firm creation is an essential part of local and aggregate economic activity. New businesses produce, innovate, create jobs and compete (Decker, Haltiwanger, Jarmin, and Mi-

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<sup>1</sup>Our data is publicly available at: <https://asavagar.shinyapps.io/BusinessDynamicsDashboard/>.

randa (2014). Bahaj, Piton, and Savagar (2024) show that following an immediate fall at the start of the pandemic, firm creation boomed in the UK, but the employment effects were limited due to the differing characteristics of firms created during the pandemic. Lychagin, Pinkse, Slade, and Van Reenen (2016) explain that new businesses contribute to productivity and growth through local spillovers. Both Anyadike-Danes, Hart, and Du (2015), for the UK, and Haltiwanger, Jarmin, and Miranda (2013), for the US, demonstrate that small, young firms, despite constituting a minority of businesses, play a disproportionately large role in job creation. Walsh (2019) stresses that new businesses play an important role in the long-run growth of local areas and their employment.

Several papers already study other effects of the Eat Out to Help Out policy, but without a focus on firm creation. González-Pampillón, Nunez-Chaim, and Ziegler (2021) and Fetzer (2022) study the effect of the EOTHO scheme on footfall, job postings and COVID-19 infection rates. Both find a temporary increase in restaurant visits during the scheme. González-Pampillón, Nunez-Chaim, and Ziegler (2021) show increased recruitment activity in the sector, while Fetzer (2022) proposes a link to increased cases of COVID-19. However, our paper does not only focus on the hospitality sector and its business activity. We study how EOTHO impacted firm creation across the UK economy.

*Roadmap:* The remainder of this paper is structured as follows. Section 1 presents our background which describes the policy context and provides our research hypotheses. Section 2 describes our data sources and analyses descriptive statistics. Section 3 presents our main results, which includes Section 3.1 on time series analysis and Section 3.2 on our difference-in-differences analysis. Section 4 discusses our results and explores potential mechanisms, along with limitations and future research in Section 4.1. Lastly, Section 5 summarises our key contributions and concludes the paper.

## 1 Background and Hypotheses

First, we examine the policy background and context that inform our hypotheses. Following that, we propose two research hypotheses and discuss the theory that underpins them.

### 1.1 UK Policy Context and Background

In this section we present information about registering a company in the UK, lockdown reopening policies which may have affected firm creation, and background to the Eat Out to Help Out policy.

#### 1.1.1 Registering a Company in the UK

Our analysis focuses on new company registrations in the UK. In the UK a ‘company’ is a specific legal entity. Companies are typically private limited entities. They have a separate legal identity from the owner. For example, if a company is setup by an individual intending

to operate alone they will typically setup the company with one share, valued at £1, owned entirely by themselves. They are then registered as director which is an employee of the company. Hence there is legal distinction between the company and the individual. This form of business structure differs from the other main form of business structure in the UK, which is self-employed individuals who are not separate legal entities from their business. Roughly half of the UK business population is self-employed individuals and half is companies. Companies represent a far greater proportion of total employment and total revenue.<sup>2</sup>

To register a company in the UK a business owner must complete an online filing with a government department called Companies House. In turn, Companies House maintains a publicly-available register of all active companies in the UK. Registering with Companies House is the first step in forming a company in the UK. A filing consists of a company name, 5-digit SIC code, registered office address including postcode, and company legal structure (the majority are private limited companies). Nearly all registrations are online which costs £12. The process is automated and it takes roughly 24 hours for the registration to be recorded. Since the process is entirely automated, there were no disruptions to the service due to lockdown policies.

Companies frequently appear on the register long before – if ever – they appear in official business creation statistics. Consequently, the register provides a real-time insight into business activity, particularly for smaller firms.

### **1.1.2 Lockdown Reopening Policies**

Our sample of company creation data runs from 1st June 2020 - 31 August 2020. It covers a period when major reopening took place in the UK following severe lockdown restrictions in April and May. Table 1 summarises policy events over the sample period.

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<sup>2</sup>Department for Business and Trade (2023) provides detailed information on the UK's business population.

Table 1: Timeline of Policy Announcements

Week No.	Dates	Event
23	Mon 01 Jun - Sun 07 Jun	Sample starts Lockdown regulations (no. 2) begin
24	Mon 08 Jun - Sun 14 Jun	
25	Mon 15 Jun - Sun 21 Jun	Non-essential stores reopen
26	Mon 22 Jun - Sun 28 Jun	
27	Mon 29 Jun - Sun 05 Jul	
28	Mon 06 Jul - Sun 12 Jul	HMT spending announced EOTHO announced DCMS reopening announcement
29	Mon 13 Jul - Sun 19 Jul	Personal health services reopen PM announced Aug 01 reopening
30	Mon 20 Jul - Sun 26 Jul	Gyms & leisure centres reopen
31	Mon 27 Jul - Sun 02 Aug	Aug 01 reopening delayed to Aug 15
32	Mon 03 Aug - Sun 09 Aug	EOTHO begins WFH guidance relaxed
33	Mon 10 Aug - Sun 16 Aug	Reopening
34	Mon 17 Aug - Sun 23 Aug	
35	Mon 24 Aug - Sun 30 Aug	
36	Mon 31 Aug - Sun 06 Sep	EOTHO ends 31st Aug

Source: Authors' elaboration

The UK's "Lockdown Regulations" were enacted on 26 March 2020. The formal name was *The Health Protection (Coronavirus, Restrictions) (England) Regulations 2020 (SI 2020/350)*. It documented legislation restricting freedom of movement, gatherings, and business closures. On 4 July 2020 it was replaced and relaxed by *The Health Protection (Coronavirus, Restrictions) (No. 2) (England) Regulations 2020* which expired on 4 January 2021. Throughout the periods these regulations were subject to amendments.

On Monday 1st June the *Health Protection (Coronavirus, Restrictions) (England) (Amendment No. 3) Regulations 2020 (SI 588)* came into effect. This allowed outdoor non-food markets and car showrooms to re-open. Outdoor sports amenities were also allowed to re-open, including water sports, stables, shooting and archery venues, golf courses and driving ranges.

From Saturday 13th to Monday 15th June the *Health Protection (Coronavirus, Restrictions) (England) (Amendment No. 4) Regulations 2020 (SI 588)* came into effect. This allowed the general reopening of English retail shops and public-facing businesses apart from restaurants, bars, pubs, nightclubs, most cinemas, theatres, museums, hairdressers, indoor sports

and leisure facilities.

On Wednesday, July 8 2020 the UK Treasury announced a £30bn spending package aimed at mitigating the economic impact of the COVID-19 pandemic. The announcement included a temporary reduction in VAT for the hospitality sector, the Eat Out to Help Out scheme, a scheme to pay firms £1,000 for each employee brought back from furlough, a scheme to get young people into employment, a temporary rise in the stamp duty threshold (rise in house sale value in order to qualify for property tax) and support for green home investments.<sup>34</sup>

On Thursday July 9th 2020 the UK Department for Culture, Media and Sports (DCMS) announced that: outdoor theatres & performances and recreational sport could reopen from Saturday July 11th 2020; beauticians, tattooists, spas, tanning salons and other close-contact services would reopen from Monday July 13th; gyms, indoor pools and leisure centres would reopen from Saturday July 25th 2020.<sup>5</sup>

On Friday 17 July 2020, the Prime Minister announced relaxation of the work from home rules from 1st August 2020, and from this date remaining leisure settings, namely bowling, skating rinks and casinos, and close-contact services at beauticians could reopen. Additionally, weddings of up to 30 participants could take place.<sup>6</sup> On Friday 24 July 2020, the UK Government formalised these details in the “**Next Chapter**” of the UK’s Covid-19 recovery strategy. This detailed reopenings between August and October 2020. However, on Friday 31 July, the Prime Minister announced that reopenings expected on 1 August were to be postponed until 15 August.

The EOTHO scheme applied across the UK. Scotland, Northern Ireland and Wales followed different reopening strategies than England. The above reopening dates are for England. Specific country details are in the House of Commons Library Briefing ‘Coronavirus: Business reopening’.<sup>7</sup>

### 1.1.3 Eat Out to Help Out Policy Background

The EOTHO scheme was eligible to UK establishments, licensed to sell food on or before July 7th 2020. Once registered, establishments were permitted to offer a 50% discount on food and non-alcoholic drinks up to £10 per diner. Subsequently, the establishment could claim back this amount from the government. The discount was available on Mondays, Tuesdays and Wednesdays between August 3-31st, 2020. It applied only to meals eaten on the premises (i.e. excluding take-away meals or catering for private functions).

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<sup>3</sup>The VAT reduction was a temporary VAT cut from 20% to 5% on various hospitality sectors including food and non-alcoholic drinks; hotels & accommodation and some attractions: <https://www.gov.uk/guidance/vat-reduced-rate-for-hospitality-holiday-accommodation-and-attractions>. The reduced VAT rate ran over the EOTHO period. Initially it ran from 15 July 2020 to 30 September 2021, but was extended until 31 March 2021).

<sup>4</sup>Further details of the July 8 policy announcements are available at <https://www.parliament.uk/business/news/2020/july/summer-economic-update/>.

<sup>5</sup>Further details of the July 9 policy announcement are available in the <https://www.gov.uk/government/speeches/digital-culture-media-and-sport-secretarys-statement-on-coronavirus-covid-19-9-july-2020>.

<sup>6</sup>Prime Ministers 17 July 2020 reopening speech.

<sup>7</sup><https://researchbriefings.files.parliament.uk/documents/CBP-8945/CBP-8945.pdf>.



The purpose of EOTHO was to stimulate the hospitality sector that suffered due to lockdown restrictions. Its geographical diffusion was swift and widespread, covering various regions, from metropolitan city centres to quieter suburban areas. A diverse range of dining establishments, from high-end restaurants to local cafes, used the scheme, resulting in increased customer footfall throughout the country (Hutton 2020).

The EOTHO scheme was announced to Parliament on July 8th (Hansard 2020). Figure 1 illustrates the timeline of the EOTHO and the key dates we consider in our analysis.

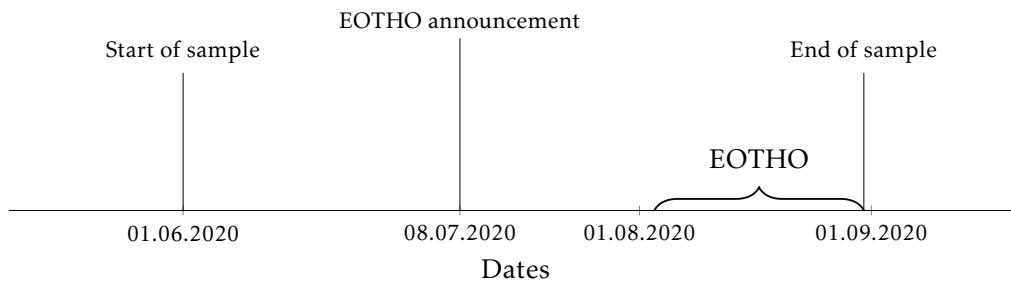


Figure 1: Timeline of EOTHO

Source: Authors' illustration

## 1.2 Research Hypotheses

We formulate two research hypotheses and discuss their rationale. Hypothesis 1 is a broad hypothesis to establish the basic effect of the EOTHO policy on firm creation. Establishing a broad effect is necessary since the policy was not aimed at boosting entrepreneurship, and there are opposing channels through which it could operate. Hypothesis 2 provides a refinement of hypothesis 1 in order to understand the potential drivers of firm creation by focusing on intra- versus inter- industry effects.

**Hypothesis 1.** *There is a positive relationship between Eat Out to Help Out participation in an area and firm creation.*

The real economic impact of EOTHO was sizeable. Over 63,000 establishments registered for EOTHO. Collectively they claimed £849 million for over 160 million meals (HMRC 2020). Office for National Statistics (2020) state that 65% of the monthly output growth in services came from accommodation and food and beverage service activities (1.5% of the overall 2.5% month-on-month growth). This occurred because many establishments reopened during this period to take advantage of the scheme. The report also documents that turnover in Food and Beverage Services increased by £1,506m from July to August 2020 leading to total turnover of £4,092m in August 2020. Furthermore, it reports that the number of reservations on Monday, Tuesday, and Wednesday (the days that EOTHO applied) was typically 100% higher than on the same days in the previous year. Therefore, the evidence shows



that the EOTH policy had a significant real economic impact on the hospitality sector.

Given the size and real economic impact of the EOTH scheme, we expect economic activity, as measured by firm creation, to respond positively to the introduction of the policy. In economic theory, an individual's decision to set up a firm depends on whether the present discounted value of future profits from a new firm exceeds the opportunity cost. The opportunity cost of starting a firm depends on the individual's alternative, next best, use of their time and capital. Whether this increased or decreased during the COVID-19 pandemic depends on many factors. For example, if an individual was furloughed this would reduce the opportunity cost, whereas if they had caring responsibilities this would increase opportunity cost. Overall, factors that raise the present discounted value of a firm or decrease the opportunity cost will stimulate firm creation.

In relation to the EOTH policy, there are three channels which could affect the equilibrium between the value of creating a firm and the opportunity cost. First, local demand. Greater footfall in an area with EOTH registered restaurants could indicate a local demand stimulus that would increase the present-discounted value of a firm, increasing firm creation relative to areas without EOTH participants. Second, the policy may have signalled a broader economic recovery, encouraging entrepreneurship in anticipation of future growth. These entrepreneurial 'animal spirits' raise profit expectations, and consequently increase the present-discount value of firm creation, thereby encouraging firm entry. However, if it is only a signal of general policy relaxation, this channel should apply to all regions over the EOTH period (August 2020), rather than to the specific areas with EOTH restaurants. A differential effect in EOTH areas would arise if entrepreneurs anticipate EOTH to lead to a demand stimulus in areas with participating restaurants. Third, although we hypothesise a positive impact on firm creation, competing factors could lead to a decrease or no change. This can occur if the opportunity cost of starting a new firm during the EOTH period rises. For instance, even if the expected demand growth increases the potential value of a new firm, the opportunity cost will increase if there are better uses for the individual's time and capital. In particular, if entrepreneurs see more potential in investing resources into existing catering businesses or expanding nearby incumbent firms, they might choose those options over creating new firms.

**Hypothesis 2.** *There is a positive relationship between Eat Out to Help Out participation and firm creation in non-hospitality sectors (inter-industry effect), but no relationship in the hospitality sector (intra-industry effect).*

Hypothesis 2 refines hypothesis 1 by focusing on the inter- and intra-sectoral channels. This is motivated by spillover theory and the scheme design. Spillover theory suggests that increased footfall in areas with participating restaurants may have stimulated the creation of new businesses in nearby sectors, such as retail or personal services, to cater for the increased customer traffic. The scheme design limited profit opportunities for new entrants within the hospitality sector because they would not qualify for the subsidy, and thus be at a disadvantage relative to existing competitors.

Spillovers occur when economic stimulus to one firm or sector influences a connected firm or sector. These spillovers can be inter-industry, affecting sectors beyond the initial one, or intra-industry, staying within the same sector. In our context, temporary regional fiscal spillovers are more likely to drive short-term firm creation. Fiscal spillovers occur as a demand stimulus in one area indirectly raises demand in other sectors, as the targeted sector increases production. New firms may emerge to meet a temporary demand surge within the sector, or in other sectors that can benefit from access to customers of the targeted sectors or workers with a wage stimulus in the targeted sector. We hypothesise that the government aimed to boost existing hospitality, leading entrepreneurs to anticipate increased foot traffic near participating restaurants. This could benefit neighbouring high-street businesses, potentially increasing company registrations in those areas leading to a positive inter-industry spillover effect.

Within hospitality itself, there was little incentive for creating new businesses after the scheme’s announcement. New outlets were not eligible, and even if they opened to capitalize on increased footfall, they would be at a price disadvantage compared to participating restaurants. Thus, we do not anticipate significant intra-industry spillovers within hospitality.

## 2 Data

In this section, we provide data descriptions (Section 2.1) and descriptive statistics (Section 2.2).

### 2.1 Data Description

Our main dataset consists of merging the Companies House register of all companies in the UK with the HMRC register of companies that received EOTHO support. Ultimately, we derive a dataset that shows for each postcode in each time period the number of company registrations in that postcode and the number of registered EOTHO establishments in the postcode.

#### 2.1.1 Companies House Register

Our main data source is the Companies House register, which contains a record of all limited liability companies incorporated in the UK.<sup>8</sup> The key variables in the dataset are the date of registration, postcode and 5-digit Standard Industrial Classification (SIC) code (e.g. “95250 - Repair of watches, clocks and jewellery”). We focus on a subset of the full register: all companies incorporated between 01/06/20 and 31/08/20. Throughout our analysis ‘postcode’

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<sup>8</sup>The name of the dataset is “Basic Company data”. We use the dataset from October 2020 to include all active businesses in the period of interest. This can be found via the National Archives, [https://webarchive.nationalarchives.gov.uk/20201001110505/http://download.companieshouse.gov.uk/en\\_output.html](https://webarchive.nationalarchives.gov.uk/20201001110505/http://download.companieshouse.gov.uk/en_output.html).

refers to the 5- to 7-digit postcode (e.g. CT2 7FS). In the UK a postcode represents on average 15 postal delivery addresses and at most 100 postal delivery addresses.

### 2.1.2 HMRC’S Eat Out to Help Out Register

HM Revenue and Customs (HMRC) provides a list of restaurants that participated in the EOTH scheme.<sup>9</sup> This allows us to create a variable for the number of EOTH participants by postcode. For our main analysis, we classify whether a postcode is an EOTH postcode or not with a binary indicator. Postcodes that include at least one outlet that participates in the scheme are identified as “EOTH postcode”.

## 2.2 Descriptive Statistics

Our data is a panel structure of postcode unit ( $k$ ) by week ( $w$ ) by industry, either 2-digit ( $2d$ ) or 5-digit ( $5d$ ). For context, in the UK there are roughly 1.8m postcode units, 729 5-digit or 88 2-digit SIC (2007) sectors and our sample is taken over 14 weeks.<sup>10</sup> During the period we analyse, there are company registrations over all 14 weeks, in 128,665 different postcodes and across 717 5-digit sectors. Therefore 7% of all UK postcodes observe firm registrations and 98% of 5-digit industries observe at least one registration over the sample period.

### 2.2.1 Descriptive Statistics for Registrations Variable: Full Sample

Table 2 presents distributional statistics on registrations for different groupings of the data. For example, in the first row we group the data by week, thus pooling together all sectors and postcodes, then there are only 14 observations, one for each week of the sample, and the average registrations each week is 16,967. If we analyse a more granular grouping, such as registrations by postcode, week, 5-digit sector we observe 198,357 data points with an average registration at each postcode-week-5d sector observation of 1.14 and a median of 1, even the 90th percentile at this level of granularity is 1 registration.

In our regression analysis, we aggregate 5-digit sectors to 2-digit sectors, therefore there are 191,001 observation in our regressions with hospitality excluded (Table E.3) and 206,313 in our regressions with hospitality included (Table 5 and E.1).<sup>11</sup> We observe 89 2-digit sectors. There are 88 2-digit sectors in total and we add an NA category. Therefore there is at least one registration in every 2-digit sector over the sample period, and we also observe registrations in NA. In total there are 731 5-digit sectors available in Companies House, but we only observe registrations in 717 (including our NA category). This implies that 25 5-digit sectors have no registrations in them over our sample period. In all cases the mean exceeds the median indicating a long right-hand tail (positive skew), where a small frequency of postcodes have a high number of registrations at them.

<sup>9</sup>The list is available at <https://github.com/hmrc/eat-out-to-help-out-establishments>.

<sup>10</sup>We observe registrations in 89 2-digit SIC because we add a category for NA.

<sup>11</sup>Table 2 only reports descriptive statistics for the dataset with hospitality excluded.

Table 2: Registrations Grouped at Different Levels of Aggregation, Full Sample

	Mean	SD	p10	p50	p90	min	max	No. Obs.
Registrations <sub>w</sub>	16,125	3,632.23	13,043	16,981	18,520	5,177	19,533	14
Registrations <sub>k</sub>	1.76	29.35	1	1	2	1	7,604	128,665
Registrations <sub>k,w</sub>	1.32	7.1	1	1	1	1	699	170,624
<b>5-digit</b>								
Registrations <sub>5d</sub>	314.9	921.11	4	57.0	624.8	1	11,270	717
Registrations <sub>w,5d</sub>	28.64	75.64	1	7	62	1	998	7,882
Registrations <sub>k,5d</sub>	1.25	5.2	1	1	1	1	964	180,730
Registrations <sub>k,w,5d</sub>	1.14	1.76	1	1	1	1	212	198,357
<b>2-digit</b>								
Registrations <sub>2d</sub>	2,537	4,522.9	70.8	708	7,448.6	3	28,802	89
Registrations <sub>w,2d</sub>	185	343.8	5	54	552	1	2,633	1,223
Registrations <sub>k,2d</sub>	1.32	7.55	1	1	1	1	1,743	171,588
Registrations <sub>k,w,2d</sub>	1.18	2.26	1	1	1	1	212	191,001

Note:  $k$  stands for postcode unit;  $w$  stands for week.

Source: Authors' calculations based on Companies House data. Note that the final week in our sample (week 36) only includes one day. This is the dataset excluding hospitality registrations.

Source: Authors' elaboration based on Companies House data

In Appendix A, we present the Table 2 results for different subsamples of the data. This provides information on registrations by week, postcode and sector for EOTH0 postcodes, Non-EOTH0 postcodes, pre-announcement, post-announcement and all combinations of these groups (e.g. EOTH0 postcodes pre-announcement).

In Appendix B, we analyse the tails of the registrations distribution in more detail. This shows that in Table 2 the maximum value of 11,270 corresponds to '47910: Retail sale via mail order houses or via Internet' and 28,802 corresponds to '47: Retail trade, except of motor vehicles and motorcycles'. Additionally, we detail other sectors and postcodes with high registrations, as well as 5-digit and 2-digit sectors with few registrations.

### 2.2.2 Descriptive Statistics for Registrations Variable: EOTH0 Sub-samples

Table 3 presents total company registrations for various sub-samples of the data. There are 225,749 firm registrations over the full sample (01/06/20 - 31/08/20). Once we have assigned an EOTH0 indicator variable to each registration in the full dataset of firm creations, we find that 36,972 registrations (16.4%) were created in EOTH0 postcodes, whereas 188,777 registrations (83.6%) were created in non-EOTH0 postcodes over the full period. Before the government announcement (01/06/20 - 07/07/20), 15,510 registrations (16.1%) were created in EOTH0 areas, whereas 80,872 registrations (83.9%) were created in non-EOTH0 areas out of 96,382 total registrations. After the government announcement (08/07/20 - 31/08/20), 21,462 registrations (16.6%) were created in EOTH0 areas, whereas 107,905

registrations (83.4%) were created in non-EOTHO areas out of 129,367 total registrations.

Table 3: Total Company Registrations, by Subsamples

	Pre & Post	Pre	Post
EOTHO & Non-EOTHO	225,749	96,382	129,367
EOTHO	36,972	15,510	21,462
Non-EOTHO	188,777	80,872	107,905

Notes: Pre-announcement is the period between 2020-06-01–2020-07-07. Post-announcement is the period between 2020-07-08–2020-08-31.

Source: Authors' calculations based on Companies House data

### 2.2.3 Descriptive Statistics for EOTHO Participation Variable

Company registrations classified by time, region, and sector is the key variable that we construct in our primary data collection exercise from the Companies House register. The granular nature, real-time availability, and demonstrated statistical robustness of this variable make it a powerful tool with wide-ranging applications.

For our EOTHO application, another important variable is the EOTHO participation variable, which records the number of EOTHO establishments in a postcode. This variable only varies across the postcode dimension, since the HMRC list of EOTHO establishments only reports the addresses of the establishments. The time and sector dimensions are irrelevant because the scheme only ran for one month and the scheme only applied to one sector.<sup>12</sup>

Table 4 presents summary statistics for number of participating EOTHO establishments in a postcode. There are 128,665 postcodes that observe registrations during the sample period. Of these postcodes with registration activity, 120,000 observe zero EOTHO participants and the remaining 8,665 postcodes contain at least one EOTHO establishment. At the 90th percentile there is 1 EOTHO participant in a postcode, and for the extreme case of the postcode with the most participating outlets there are 19 EOTHO participants. In Appendix C, we provide a frequency table with the number of postcodes with 0 to 19 registrations.

Table 4: Participating Outlets: Summary Statistics

	Mean	SD	p10	p50	p90	min	max	No. Obs.
Participating Outlet <sub>k</sub>	0.185	0.582	0	0	1	0	19	128,665

Source: Authors' calculations based on Companies House data

<sup>12</sup>While there could have been slight fluctuations in the data throughout the month due to establishments registering late for the scheme, this information is not recorded. We only have access to the final list of establishments that were registered at any point.

### 3 Empirical Results

In this section, we first explore the general time series behaviour of firm creation (Section 3.1), highlighting its responsiveness to policy announcements. We also present a non-causal analysis comparing firm creation trends between EOTH0 and Non-EOTH0 areas in the aggregate and across sectors. Subsequently, in Section 3.2, we employ a difference-in-differences (DID) approach to demonstrate that the EOTH0 policy led to a significant increase in firm creation in areas with registered restaurants.

#### 3.1 Time Series Analysis

In this section we study the time trends of firm creation in the UK economy over the lockdown easing period relative to a control year (2019), and we compare this behaviour to firm creation in EOTH0 areas before and after the policy announcement and implementation.

We define EOTH0 postcodes as postcodes that include at least one restaurant participating in the EOTH0 scheme. We define the relative difference as the difference between the ratio of registrations from 2019 to 2020 in EOTH0 postcodes and the ratio of registrations from 2019 to 2020 in all postcodes. Using the ratio of 2020 to 2019 mitigates seasonal effects.

$$\text{Relative difference}_w = \left( \frac{\text{EOTH0 postcodes 2020}_w}{\text{EOTH0 postcodes 2019}_w} \right) - \left( \frac{\text{All postcodes 2020}_w}{\text{All postcodes 2019}_w} \right)$$

For example, if the growth (ratio) of registrations in week 30 is 1.5 in EOTH0 postcodes and it is 1.2 in all postcodes, then the relative difference in week 30 is 0.3. In other words, there is a 30 percentage point difference in the growth rate of registrations in EOTH0 compared to all postcodes.

##### 3.1.1 Aggregate Analysis

Figure 2 shows that in general firm creation fluctuated over the sample period. There is a notable rise from weeks 23-26 which corresponds to the month of June 2020. New regulations permitting the reopening of some businesses were implemented from June 1st, as well as allowing gatherings of up to six people not restricted to one household.<sup>13</sup> From June 15th some non-essential retailers were permitted to reopen.<sup>14</sup> Another clear rise in firm creation follows the EOTH0 announcement, and other policy announcements (Table 1), that occurred in mid-July (week 28). The overall picture is that company registrations respond rapidly to events affecting the business economy.

In terms of the EOTH0 policy, Figure 2 shows that EOTH0 postcodes and all postcodes observed parallel trends in firm creation prior to the announcement. However, after the

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<sup>13</sup>Health Protection (Coronavirus, Restrictions) (England) (Amendment No. 3) Regulations 2020 (SI 558).

<sup>14</sup>Health Protection (Coronavirus, Restrictions) (England) (Amendment No. 4) Regulations 2020 (SI 588) came into effect, allowing the general reopening of English retail shops and public-facing businesses apart from those that are on a list of specific exclusions such as restaurants, bars, pubs, nightclubs, most cinemas, theatres, museums, hairdressers, indoor sports and leisure facilities.

announcement there is a clear divergence in trends: EOTH0 postcodes observe more firm creation than all postcodes, and after the implementation of EOTH0 there is a much sharper rise in firm creation in EOTH0 areas.

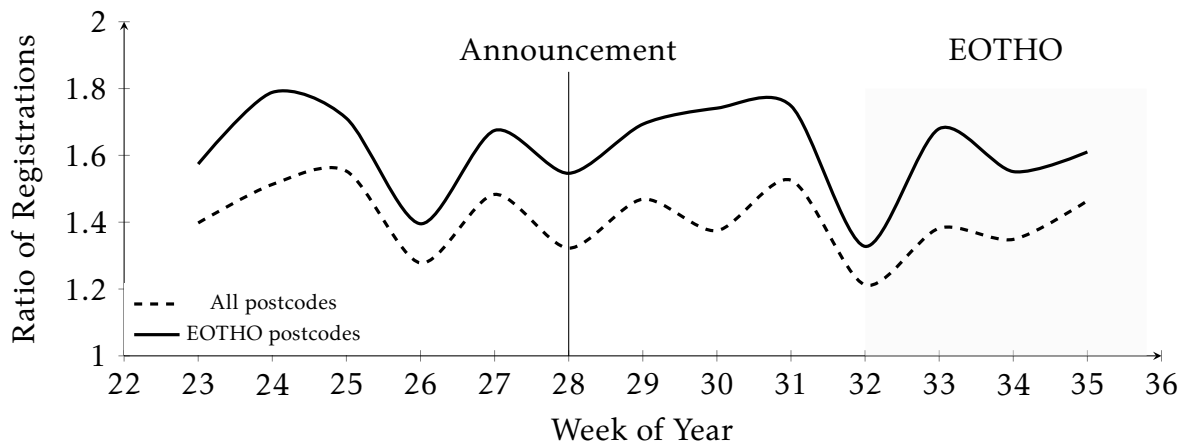


Figure 2: Ratio of 2020 to 2019 Registrations (excluding hospitality)

Figure 3 plots the relative difference for each week. It always exceeds zero and fluctuates around roughly 0.2. This implies that growth in registrations from 2019 to 2020 was always higher in EOTH0 areas than all areas and usually by 20%. There is a noticeable rise to nearly 40% after the announcement of the EOTH0 policy. Between the announcement and start of the scheme registrations are 20.7% higher in EOTH0 postcodes relative to the same week in 2019 (95% confidence interval: 15.52 – 26.29%).<sup>15</sup> During the scheme itself, this is lower but still significant, at 13.1% (95% confidence interval: 7.82 – 16.42%). Importantly there is a strong response on the week of EOTH0 implementation which, absent other policy implementation in the same week which solely affected EOTH0 areas, would suggest the scheme led to a rise in firm creation in EOTH0 areas relative to non-EOTH0 areas. We note that in the month prior to the announcement, the relative difference is 16.5% (95% confidence interval: 10.19 – 22.67%) and since the confidence intervals overlap there is not a statistically significant difference at the 95% level between the periods.

<sup>15</sup>To establish confidence intervals, we use a Monte Carlo-based bootstrapping algorithm. Full details are given in appendix D.



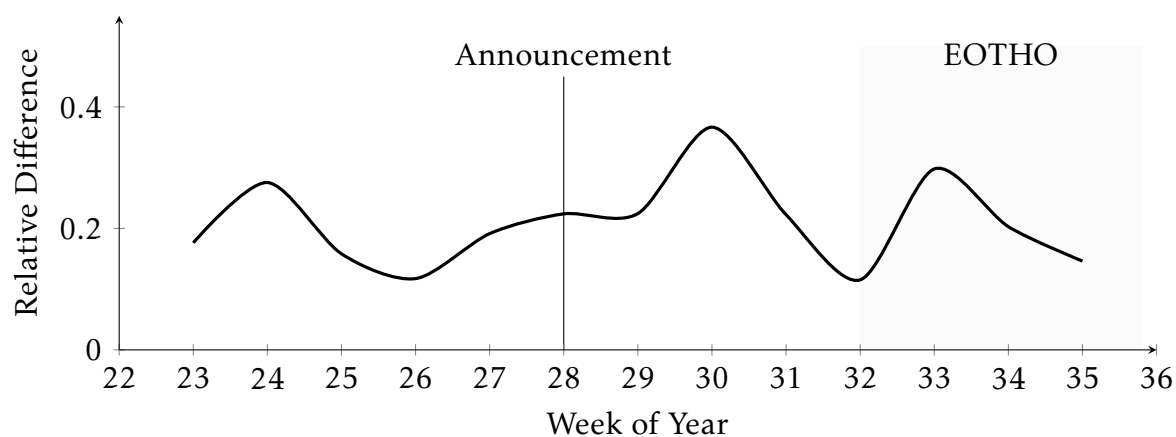
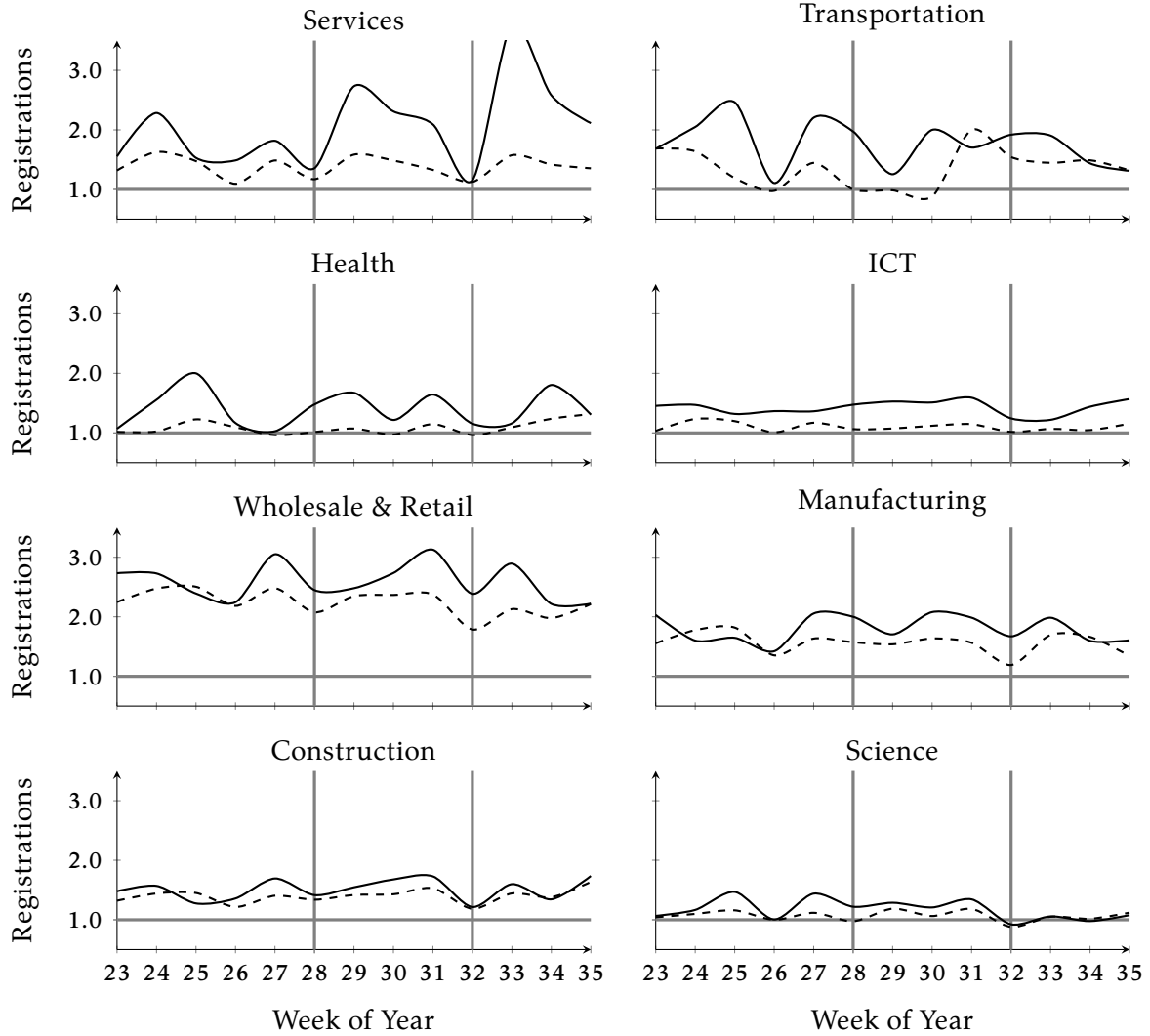


Figure 3: Difference between EOTH0 and All postcodes (excluding hospitality)

### 3.1.2 Sectoral Analysis

Figure 4 shows the time series behaviour of registrations in EOTH0 postcodes and all postcodes for different sectors. Most sectors display similar general trends to the aggregate picture discussed above. There are clear increases in firm creation in response to the mid-July policy announcements (week 28), and most sectors respond to the August 1st reopenings which marked the beginning of EOTH0 (shaded area). Transportation is the only sector that does not see an increase across all postcodes after week 32. The clearest sectoral effect of EOTH0 is on “Other service activities” and “Wholesale & Retail” and “Construction”.

Figure 4: Ratio of registrations in 2020 to same week in 2019 by 1-digit sector



Note: Solid line is EOTHO postcodes and dashed line is all postcodes. The y-axis is the ratio of 2020 registrations to 2019 registrations in the same week of the year. Vertical lines show date of policy announcement and date of policy implementation. We report sectors with statistically significant relative differences after the announcement.

Figure 5 shows the relative difference between EOTHO postcodes and all postcodes, between the announcement and start of the scheme, for each sector (SIC 1-digit). It also shows the 95% confidence interval to indicate whether the relative difference is statistically different from zero. The figure suggests that the effect is significant and positive in eight sectors. Typically sectors with wide confidence intervals, such as mining, water, public and energy, are sectors where registrations are low, so the small number of observations will contribute to not identifying a statistically significant difference in firm registrations in 2020 compared to 2019.

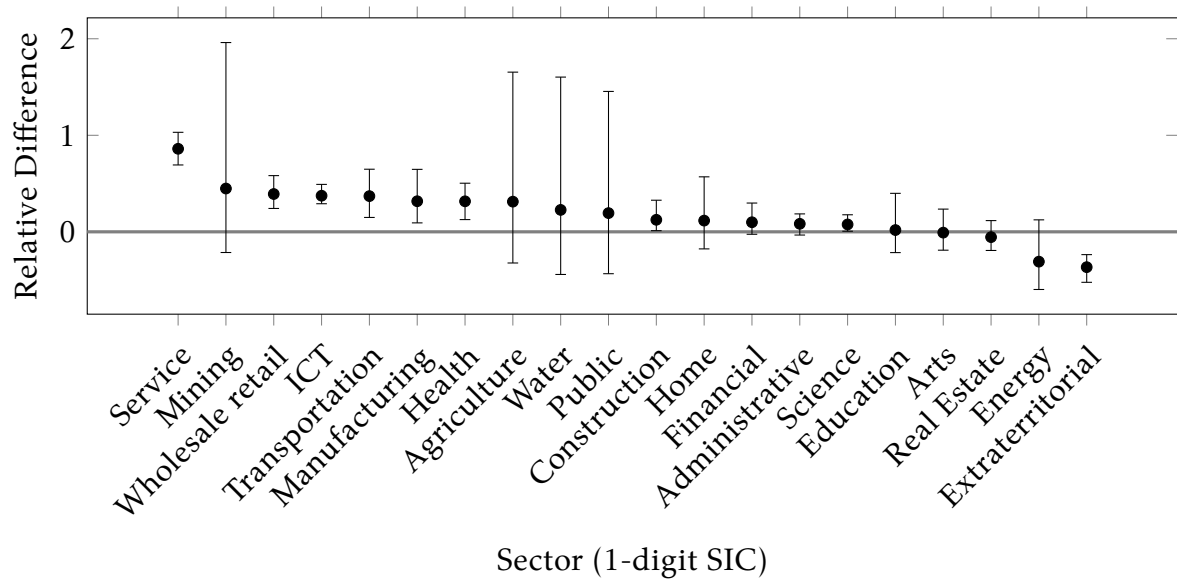


Figure 5: Relative difference post-announcement by 1-digit sector; excl. hospitality

Note: Points show the difference between the registrations (ratio relative to 2019) in EOTHO postcodes and all postcodes. Lines show the 95% confidence intervals. At the 95% level mining, agriculture, water, public, home, education, and energy are not significantly different from zero.

Source: Authors' calculation

## 3.2 Difference-in-Differences Analysis

Our time series analysis shows that EOTHO areas experienced greater increases in firm creation relative to 2019 than all postcodes. And, the divergence increases after the implementation of EOTHO. If EOTHO postcodes, are also closely correlated with other types of businesses, then the surge in business creation when EOTHO is implemented could occur from other policies that benefit these businesses. In order to control for these spurious relationships we perform a difference in differences (DID) regression analysis. DID is a quasi-experimental research design that compares the outcome between a treatment and control group. In the next section, we describe how we identify the treatment and control groups, outline the assumptions of the Difference-in-Differences (DID) approach and how they are met in our context, and finally present our empirical model.

### 3.2.1 Identification

Our identification strategy classifies as treated those postcodes that were affected directly by the policy. Our natural experiment overcomes a common endogeneity problem in evaluating regional fiscal policy. In regional economics, a common problem is that areas may receive policy treatment because they are ex-ante successful, for example through lobbying, or they may become successful through policy treatment (Brühlhart and Simpson 2018). We avoid this reverse-causality because the scheme was open to all restaurants in the UK, and policy was implemented because of the adverse effect that lockdown was having on hospitality. The exogenous variation stems from the fact that EOTHO postcode areas received a targeted

fiscal stimulus specifically for restaurant establishments within their boundaries, while Non-EOTHO areas did not receive any such stimulus for any establishments within their areas.

Two criteria must be satisfied for a valid DID analysis: the parallel trend assumption and the conditional independence assumption. These assumptions ensure that the control group is a good counterfactual for the treatment group. In our context, the parallel trend assumption asserts that in the absence of the EOTHO policy, areas with subsidised restaurants and areas with no subsidised restaurants would have observed similar trends in firm creation. The conditional independence assumption asserts that the subsidy was not targeted at areas based on their firm creation (or another variable closely correlated with firm creation). We present formal robustness analysis to show that our parallel trend assumption is valid. And, we rely on the design of the policy – being aimed at supporting the hospitality sector – to alleviate concerns about the conditional independence assumption. In other words, the policy was not aimed at hospitality because of its poor firm creation or something closely correlated with this – which would invalidate our method – instead the policy was aimed at hospitality to protect jobs and increase demand due to lockdown policies which affected the sector.

Our primary analysis specifies the treatment variables as a binary measure which classifies a postcode as 1 if it has at least one EOTHO registered establishment in it and 0 if no registered EOTHO establishments are in the postcode.<sup>16</sup>

### 3.2.2 Difference-in-differences Implementation

We investigate the effect of the EOTHO scheme on the company registrations using a difference-in-differences approach. We rely on (i) the timing of the policy and (ii) the complete postcodes of business registrations.

Our difference-in-differences estimates come from the following regression

$$\begin{aligned} \ln(\text{registrations})_{k,w,2d} = & \beta_1 \text{EOTHO postcode}_k + \beta_2 \text{EOTHO period}_w \\ & + \beta_3 (\text{EOTHO postcode}_k \times \text{EOTHO period}_w) \\ & + \eta_w + \gamma_k + \delta_2 d + (\eta_w \times \gamma_k) + (\eta_w \times \delta_2 d) + (\delta_2 d \times \gamma_k) + (\eta_w \times \delta_2 d \times \gamma_k) \\ & + \varphi T_{t,2d} + \vartheta(\chi_i \times \eta_w) + u_{k,w,2d} \end{aligned} \quad (1)$$

where  $\ln(\text{registrations})_{k,w,2d}$  is the natural log of company registrations in postcode  $k$ , week  $w$  and 2-digit SIC code  $2d$ . *EOTHO postcode* defines the treatment. It receives a value equal to 1 if there is at least one outlet that participates in the EOTHO in a given postcode; 0 otherwise. The variable *EOTHO period* is a dummy variable indicating the post-treatment period. It receives value equal to 1 if the registration occurs between Aug 3, 2020 - Aug 31, 2020; 0 otherwise (Jun 1, 2020 - Aug 2, 2020).

<sup>16</sup>In the Appendix we investigate a continuous treatment variable which captures the number of EOTHO firms in an area. The results are qualitatively similar and the magnitudes are stronger which reflects great firm creation with more registered establishments in an area.

We include week fixed effects ( $\eta_w$ ) to account for time-varying factors common to all regions; regional fixed effects ( $\gamma_k$ ) to consider any time-invariant unobservable factors at NUTS 3 level regions; and, sector fixed effects ( $\delta_2 d$ ) to account for time-invariant constant differences in registrations across 2-digit SIC sectors. The week-postcode effect ( $\eta_w \times \gamma_k$ ) controls for constant shifts in registrations that affect a postcode in a particular week, across all sectors (e.g. a localized lockdown or weather event). The week-sector effect ( $\eta_w \times \delta_2 d$ ) controls for any shock that hits a particular sector in a particular week, across all postcodes (e.g. seasonal industries). The sector-postcode effect ( $\delta_2 d \times \gamma_k$ ) controls for effects that are constant in a sector at a postcode, across all weeks (e.g. accounting activity where a postcode is used to register a large numbers of businesses in a specific sector each week).

Fixed effects account for the reduced VAT rate, which ran 15 July 2020 - 31 March 2021, so occurred concurrently to EOTH0 but affected a wider number of sectors and postcodes, and for a longer time period. This policy shock affects most sectors across all weeks post-announcement, and across all regions with qualifying businesses. Hence it will be accounted for in sector-week effects.

We include a linear daily time trend ( $T_{t,2d}$ ) for pre-announcement time periods for each NUTS 3 region. This controls for business creation time-trends across different regions, prior to the policy announcement. We include a population week interaction variable ( $\chi_i \times \eta_w$ ). The variable  $\chi_i$  is the natural log of postcode district  $i$  population. This controls for weekly changes in population in different areas, and can capture the effect of lockdowns, and the easing of work from home restrictions. The subscript changes as the data for population is available at the postcode district, but not full postcode, level.<sup>17</sup>

### 3.2.3 Difference-in-Differences Results

To establish a relationship between the policy and the firm creation we report the estimates from the difference-in-differences approach we followed. Appendix E.4 shows the parallel trends before the implementation of EOTH0.

Table 5 reports estimates of difference-in-differences coefficients  $\beta_1$ , i.e. treated (in EOTH0 postcode) and  $\beta_3$ , i.e. treated (in EOTH0 postcode)  $\times$  EOTH0 period from equation (1).

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<sup>17</sup>The postcode district is the outcode part of a full postcode. For example, let full postcode CT2 7NZ. CT2 is the postcode district and corresponds to a wider area than the full postcode. Population information was retrieved from <https://www.doogal.co.uk/PostcodeDownloads.php>.

Table 5: Estimates of EOTH0 on company registrations; binary treatment measure

	Dependent variable: Natural log of incorporations							
	(1)		(2)		(3)		(4)	
Treated (in EOTH0 postcode)	0.0495	***	0.0495	***	0.0494	***	0.0494	***
	(0.0016)		(0.0016)		(0.0016)		(0.0016)	
Treated $\times$ EOTH0 period	0.0067	**	0.0066	**	0.0065	**	0.0065	**
	(0.0030)		(0.0030)		(0.0030)		(0.0030)	
Baseline FE	Yes		Yes		Yes		Yes	
Pre-treatment trend	No		Yes		No		Yes	
$\chi_i \times \eta_w$	No		No		Yes		Yes	
Observations	206,420		206,420		206,313		206,313	
R squared	0.0627		0.0627		0.0629		0.0630	

\*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.1$ .

Note: Estimates for the natural logarithm of the company registrations. Baseline fixed effects refer to fixed effect for the week, NUTS3, 2-digit SIC code and their interaction. Robust standard errors in parentheses.

Source: Authors' calculation

Our specifications include various controls and the linear pre-treatment trend. The common feature of all reported specifications is the baseline fixed effects. They refer to the fixed effects for the week, NUTS3 regions and 2-digit SIC codes, and their interaction. The variable 'Treated' refers to postcodes with at least one participating outlet in the scheme. The coefficients of interest report the difference between before and after EOTH0, given the treatment. The effect of 5% captures the additional firm incorporations in treated areas generally. And, the effect of 0.7% captures the increase in incorporations for postcodes with at least one participating outlet during the period when the scheme was live. Note that in some sectors most of the registrations occurred before the start (August 3rd), but after the announcement (July 8th), of the scheme. The average treatment effect of the scheme is 5.6%.<sup>18</sup> This means that EOTH0 is related to a 5.6% increase in firm creation in treated areas during the period it took place. This supports our hypothesis 1.

## 4 Discussion

Our time trend analysis reveals that firm creation rates were highly responsive to policy interventions during the summer of 2020. This finding confirms our first objective: demonstrating that our real-time administrative data on UK firm creation is a valuable tool for evidence-based policymaking. It provides a rapidly available measure of real economic impacts, especially within the small business economy, which is where most new firms are found.

<sup>18</sup>This is the partial derivative of the dependent variable (natural log of incorporations) with respect to 'Treated' (*i.e.* EOTH0 postcode), where the post-EOTH0 variable is 1 during the EOTH0 period.

Beyond this baseline objective, our analysis shows that areas participating in the Eat Out to Help Out (EOTHO) scheme experienced significantly higher increases in firm creation compared to non-EOTHO areas, particularly in the services, wholesale, ICT, and transportation sectors. To establish a stronger causal relationship, we use a difference-in-difference analysis which shows that, when comparing two otherwise identical areas, the one with EOTHO-registered restaurants will experience higher firm creation rates, with strong statistical significance. A further question is: How did EOTHO affect firm creation? This focuses on the channels through which firm creation increased and is more challenging to identify. Although we do not attempt a strict identification of these channels, we discuss several interpretations based on our evidence.

A likely channel is geographic spillovers stemming from local demand stimulus. González-Pampillón, Nunez-Chaim, and Ziegler (2021) estimated a 5-6% footfall increase on discount days. This creates a local demand stimulus, if people visiting areas with EOTHO establishments subsequently demand goods and services from nearby businesses. This extra demand stimulates entrepreneurs to create new firms in the area. Our evidence supports this through strong effects in common highstreet businesses.

From a broader perspective, the EOTHO policy should be viewed as a general fiscal stimulus to specific areas, but mediated through the hospitality sector. In addition, to attracting greater footfall and raising demand through this channel, this fiscal stimulus can also affect demand in an area through a local wage multiplier effect. Increased income for hospitality workers transmits to other local businesses, which raises their potential profits and in turn potential returns from firm creation. In support of this, González-Pampillón, Nunez-Chaim, and Ziegler (2021) observed a 7-14% increase in hospitality job postings, which would increase the total wage income in the area. Local multipliers are well established in the literature, for example Moretti (2010), although usually in the context of job increases leading to further local job increases. The idea of job increases stimulating firm creation through a similar mechanism is plausible given the close relationship between job creation and firm creation. Our results also suggest that the demand-stimulus was factored into entrepreneurs expectations, leading them to setup firms in complementary sectors in anticipation of the demand increase.

A final possibility is that other policies introduced, or announced, concurrently with EOTHO were responsible for the firm increase in these areas. Since our analysis is regional the policies would have to have affected areas that also had EOTHO restaurants. Concurrent policies like local authority discretionary grants and the bounceback loan scheme could have encouraged firm creation. However, our focus on EOTHO locations and the specific EOTHO period, count against these hypotheses. Our methodologies, using controls for time-variant trends in our difference-in-differences analysis mitigate the influence of such policies.

Our findings reveal a notable increase in firm creation within non-hospitality industries situated in EOTHO areas. This observed inter-industry spillover effect is consistent with our second hypothesis, suggesting that the benefits of the scheme extended beyond the directly



targeted hospitality sector. Notably, we find no evidence of an intra-industry effect within the hospitality sector itself. When we exclude hospitality registrations from our analysis, the positive and significant effect on firm creation becomes marginally larger (6.3%, Appendix E.3). This can be attributed to the fact that the hospitality sector did not experience a substantial surge in new firm creation due to the EOTHO scheme. New entrants would have faced a significant competitive disadvantage without the subsidy, as their prices would be 50% higher than established competitors participating in the scheme. This lack of incentive to create new hospitality firms during the EOTHO period explains the absence of a strong intra-industry effect.

In summary, our discussion suggests that EOTHO acted as a local demand stimulus, leading entrepreneurs to create firms in EOTHO areas due to profit opportunities from greater demand. We also present evidence that entrepreneurs factored this into their expectations as there was a response in firm creation before the implementation of the scheme but after the announcement. In general, this may enhance productivity and economic growth in stimulated areas, which is an established benefit of firm creation (Lychagin, Pinkse, Slade, and Van Reenen 2016; Walsh 2019). Although, future work should seek to establish the quality of the firms that were created as a result of the scheme.

## 4.1 Limitations and Future Research

Our analysis focuses solely on the impact of lockdown easing and EOTHO on company registrations in the UK, utilizing Companies House data from the period surrounding the reopening and scheme announcement. While our primary aim is to introduce a dataset with potential for real-time policy evaluation, our application is retrospective. We anticipate future research using firm creation data in real-time for evidence-based policy decisions. We have shown that this dataset is a reliable economic indicator, which is uninterrupted during crisis times, responds meaningfully to economic shocks, and performs well on statistical quality checks.

We acknowledge that we have not examined the wider economic implications of new companies created due to EOTHO and lockdown policies. The economic impact depends on factors like long-term survival, employment impact, and growth potential. For example, if these new companies are predominantly in the retail sector, the firms are likely to be low-productivity and more likely to dissolve quickly.<sup>19</sup> Recent research by Barkema, Froemel, and Piton (2024) highlights a ‘COVID generation’ exit of companies, while Bahaj, Piton, and Savagar (2024) express caution about the short-term employment prospects of firms created during lockdowns. Documenting the real economic effects would enable a cost-benefit evaluation of EOTHO, comparing the benefits of greater firm creation against the scheme’s cost and public health implications. This is beyond the scope of our current work.

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<sup>19</sup>Galanakis and Savagar (2021) provide initial evidence linking firm creation during COVID-19 to sector productivity.

## 5 Conclusions

In this paper, we present new data and analysis on company creation in the UK during the first lockdown easing in summer 2020. By documenting the response of company creation to policy announcements over the reopening period, we find that the data is insightful for understanding the economic environment facing businesses, particularly small business which make up the majority of new entrants. Our data on company creation comes from the Companies House register. We present descriptive statistics on the data in addition to evidence that company registrations respond rapidly to policy announcements. As a proof-of-concept application of this data for policy evaluation relating to small businesses, we study the relationship between the “Eat Out to Help Out” policy and company creation. We match data from the Companies House register with HMRC data on restaurants participating in the EOTH scheme. We document increases in firm creation in postcodes with EOTH-registered businesses after the policy implementation. Overall, we conclude that administrative data on firm registrations in the UK can be a helpful tool for evidence-based policy.

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## A Descriptive Statistics on Registrations Variable

Table A.1: Index of Descriptive Statistics Tables for Sub-samples of the Data

	All postcodes	EOTH0 postcodes	N-EOTH0 postcodes
All time periods	Table 2	Table A.2	Table A.3
Pre-announcement	Table A.4	Table A.6	Table A.7
Post-announcement	Table A.5	Table A.8	Table A.9

In tables A.2 to A.9 we present descriptive statistics on registrations for different sub-samples of the data. Table A.1 shows the subsamples of interest. They allow us to compare registrations for EOTH0 and Non-EOTH0 areas both pre- and post- the policy announcement.

Table A.2: Registrations Grouped at Different Levels of Aggregation, EOTH0 postcodes

	Mean	SD	p10	p50	p90	min	max	No. Obs.
Registrations <sub>w</sub>	2,641	603.60	2,072	2,859	2,068	852	2,151	14
Registrations <sub>k</sub>	4.27	103.61	1	1	4	1	7,604	8,665
Registrations <sub>k,w</sub>	2.37	21.21	1	1	2	1	699	15,574
<b>5-digit</b>								
Registrations <sub>5d</sub>	57.86	174.65	1	11	108.2	1	1,939	639
Registrations <sub>w,5d</sub>	7.36	17.09	1	2	15	1	299	5,024
Registrations <sub>k,5d</sub>	2.01	13.34	1	1	2	1	964	18,397
Registrations <sub>k,w,5d</sub>	1.5	3.54	1	1	2	1	212	24,717
<b>2-digit</b>								
Registrations <sub>2d</sub>	415.4	816.65	13	113	1,090.4	1	4,987	89
Registrations <sub>w,2d</sub>	33.37	63.32	1	10	88.3	1	448	1,108
Registrations <sub>k,2d</sub>	2.32	21.66	1	1	2	1	1,743	15,920
Registrations <sub>k,w,2d</sub>	1.77	5.42	1	1	2	1	212	20,864

Note: *k* stands for postcode unit; *w* stands for week.

Source: Authors' calculations based on Companies House data

Table A.3: Registrations Grouped at Different Levels of Aggregation, non-EOTHO postcodes

	Mean	SD	p10	p50	p90	min	max	No. Obs.
Registrations <sub>w</sub>	13,484	3,036.83	10,959.3	14,095	15,601.3	4,325	16,382	14
Registrations <sub>k</sub>	1.57	12.17	1	1	2	1	3,417	120,000
Registrations <sub>k,w</sub>	1.22	3.19	1	1	1	1	316	155,050
<b>5-digit</b>								
Registrations <sub>5d</sub>	266.3	769.79	4	48	550.4	1	9,353	709
Registrations <sub>w,5d</sub>	24.78	63.87	1	6	56	1	825	7,618
Registrations <sub>k,5d</sub>	1.16	3.13	1	1	1	1	564	162,333
Registrations <sub>k,w,5d</sub>	1.09	1.32	1	1	1	1	201	173,640
<b>2-digit</b>								
Registrations <sub>2d</sub>	2,121	3,740.29	54.2	594	6,519.8	2	23,815	89
Registrations <sub>w,2d</sub>	155.5	277.46	4	46	485.1	1	2,224	1,214
Registrations <sub>k,2d</sub>	1.21	3.84	1	1	1	1	678	155,668
Registrations <sub>k,w,2d</sub>	1.11	1.44	1	1	1	1	201	170,137

Note: *k* stands for postcode unit; *w* stands for week.

Source: Authors' calculations based on Companies House data

Table A.4: Registrations Grouped at Different Levels of Aggregation, pre-announcement all postcodes

	Mean	SD	p10	p50	p90	min	max	No. Obs.
Registrations <sub>w</sub>	16,064	5,439.2	10,726	18,435	19,030	5,177	19,533	6
Registrations <sub>k</sub>	1.54	18.43	1	1	2	1	3,295	62,489
Registrations <sub>k,w</sub>	1.32	7.36	1	1	1	1	699	72,877
<b>5-digit</b>								
Registrations <sub>5d</sub>	140.5	403.59	2	28	301.5	1	5,029	686
Registrations <sub>w,5d</sub>	28.75	77.94	1	6	61.8	1	998	3,353
Registrations <sub>k,5d</sub>	1.21	3.57	1	1	1	1	433	79,953
Registrations <sub>k,w,5d</sub>	1.14	1.77	1	1	1	1	201	84,669
<b>2-digit</b>								
Registrations <sub>2d</sub>	1,083	1,959.6	30.6	302	3,261	2	12,856	89
Registrations <sub>w,2d</sub>	183.6	347.24	5	52	541.8	1	2,633	525
Registrations <sub>k,2d</sub>	1.26	5.06	1	1	1	1	767	76,541
Registrations <sub>k,w,2d</sub>	1.19	2.3	1	1	1	1	201	81,522

Note: *k* stands for postcode unit; *w* stands for week. Pre-announcement period is before 8 July 2020.

Source: Authors' calculations based on Companies House data

Table A.5: Registrations Grouped at Different Levels of Aggregation, post-announcement all postcodes

	Mean	SD	p10	p50	p90	min	max	No. Obs.
Registrations <sub>w</sub>	16,171	1,834.1	14,392.5	16,849	17,614.3	12,030	17,615	8
Registrations <sub>k</sub>	1.61	21.03	1	1	2	1	4,309	80,130
Registrations <sub>k,w</sub>	1.32	6.9	1	1	1	1	568	97,747
<b>5-digit</b>								
Registrations <sub>5d</sub>	184.5	531.68	3	34	378	1	6,241	701
Registrations <sub>w,5d</sub>	28.56	73.89	1	7	63	1	902	4,529
Registrations <sub>k,5d</sub>	1.22	4.04	1	1	1	1	614	105,774
Registrations <sub>k,w,5d</sub>	1.14	1.75	1	1	1	1	201	113,688
<b>2-digit</b>								
Registrations <sub>2d</sub>	1,454	2,568	40.4	401	4,187.6	1	15,946	89
Registrations <sub>w,2d</sub>	185.3	324.8	5	57	562.4	1	2,218	698
Registrations <sub>k,2d</sub>	1.28	5.7	1	1	1	1	976	101,040
Registrations <sub>k,w,2d</sub>	1.18	2.22	1	1	1	1	201	109,479

Note: *k* stands for postcode unit; *w* stands for week. Post-announcement period is on and after 8 July 2020.

Source: Authors' calculations based on Companies House data

Table A.6: Registrations Grouped at Different Levels of Aggregation, pre-announcement EOTH0 postcodes

	Mean	SD	p10	p50	p90	min	max	No. Obs.
Registrations <sub>w</sub>	2,585	877.19	1,691.5	2,932	3,131.5	852	3,151	6
Registrations <sub>k</sub>	3.25	60.71	1	1	3	1	3,295	4,769
Registrations <sub>k,w</sub>	2.35	21.98	1	1	2	1	699	6,594
<b>5-digit</b>								
Registrations <sub>5d</sub>	27.07	75.66	1	6	55.6	1	827	573
Registrations <sub>w,5d</sub>	7.28	16.62	1	2	15	1	177	2,129
Registrations <sub>k,5d</sub>	1.80	7.79	1	1	2	1	422	8,631
Registrations <sub>k,w,5d</sub>	1.49	3.12	1	1	2	1	103	10,436
<b>2-digit</b>								
Registrations <sub>2d</sub>	176.2	348.21	6	44	450.8	1	2,174	88
Registrations <sub>w,2d</sub>	33.21	64.36	1	9	87.4	1	448	467
Registrations <sub>k,2d</sub>	2.07	13.3	1	1	2	1	767	7,480
Registrations <sub>k,w,2d</sub>	1.76	5.23	1	1	2	1	162	8,817

Note: *k* stands for postcode unit; *w* stands for week. Pre-announcement period is before 8 July 2020.

Source: Authors' calculations based on Companies House data



Table A.7: Registrations Grouped at Different Levels of Aggregation, pre-announcement non-EOTHO postcodes

	Mean	SD	p10	p50	p90	min	max	No. Obs.
Registrations <sub>w</sub>	13,479	4,567.4	9,034.5	15,396	16,005	4,325	16,382	6
Registrations <sub>k</sub>	1.4	7.93	1	1	2	1	1,506	57,720
Registrations <sub>k,w</sub>	1.22	3.37	1	1	1	1	316	66,283
<b>5-digit</b>								
Registrations <sub>5d</sub>	120.2	340.55	2	23	264.4	1	4,202	673
Registrations <sub>w,5d</sub>	24.9	66.23	1	6	54	1	825	3,248
Registrations <sub>k,5d</sub>	1.13	2.63	1	1	1	1	433	71,322
Registrations <sub>k,w,5d</sub>	1.09	1.47	1	1	1	1	201	74,233
<b>2-digit</b>								
Registrations <sub>2d</sub>	908.7	1,625.19	24.8	265	2,885.2	1	10,682	89
Registrations <sub>w,2d</sub>	154.93	289.05	4	44	489.1	1	2,224	522
Registrations <sub>k,2d</sub>	1.17	3.02	1	1	1	1	433	69,061
Registrations <sub>k,w,2d</sub>	1.11	1.6	1	1	1	1	201	72,705

Note: *k* stands for postcode unit; *w* stands for week. Pre-announcement period is before 8 July 2020.

Source: Authors' calculations based on Companies House data

Table A.8: Registrations Grouped at Different Levels of Aggregation, post-announcement EOTHO postcodes

	Mean	SD	p10	p50	p90	min	max	No. Obs.
Registrations <sub>w</sub>	2,683	349.75	2,360.8	2,832	2,897.5	1,875	2,950	8
Registrations <sub>k</sub>	3.62	70.93	1	1	3	1	4,309	5,924
Registrations <sub>k,w</sub>	2.39	20.62	1	1	2	1	568	8,980
<b>5-digit</b>								
Registrations <sub>5d</sub>	36.19	106.61	1	8	69	1	1,256	593
Registrations <sub>w,5d</sub>	7.41	17.43	1	2	15	1	299	2,895
Registrations <sub>k,5d</sub>	1.91	10.5	1	1	2	1	614	11,228
Registrations <sub>k,w,5d</sub>	1.5	3.82	1	1	2	1	212	14,281
<b>2-digit</b>								
Registrations <sub>2d</sub>	243.9	473.4	7.7	68.5	647.3	3	2,813	88
Registrations <sub>w,2d</sub>	33.48	62.6	1	10	90	1	401	641
Registrations <sub>k,2d</sub>	2.2	16.21	1	1	2	1	976	9,748
Registrations <sub>k,w,2d</sub>	1.78	5.55	1	1	2	1	212	12,047

Note: *k* stands for postcode unit; *w* stands for week. Post-announcement period is on and after 8 July 2020.

Source: Authors' calculations based on Companies House data

Table A.9: Registrations Grouped at Different Levels of Aggregation, post-announcement non-EOTH0 postcodes

	Mean	SD	p10	p50	p90	min	max	No. Obs.
Registrations <sub>w</sub>	13,488	1,492.07	12,031.7	13,962	14,739.6	10,155	14,741	8
Registrations <sub>k</sub>	1.45	8.68	1	1	2	1	1,911	74,206
Registrations <sub>k,w</sub>	1.22	3.04	1	1	1	1	269	88,767
<b>5-digit</b>								
Registrations <sub>5d</sub>	156.6	443.6	3	29	328.2	1	5,151	689
Registrations <sub>w,5d</sub>	24.69	62.1	1	6	56	1	754	4,370
Registrations <sub>k,5d</sub>	1.14	2.26	1	1	1	1	315	94,546
Registrations <sub>k,w,5d</sub>	1.09	1.18	1	1	1	1	150	99,407
<b>2-digit</b>								
Registrations <sub>2d</sub>	1,212	2,118.6	30.4	347	3634.6	1	13,133	89
Registrations <sub>w,2d</sub>	155.9	268.6	4	47.5	482.4	1	1,842	692
Registrations <sub>k,2d</sub>	1.18	2.77	1	1	1	1	375	91,292
Registrations <sub>k,w,2d</sub>	1.11	1.3	1	1	1	1	150	97,432

Note: *k* stands for postcode unit; *w* stands for week. Post-announcement period is on and after 8 July 2020.

Source: Authors' calculations based on Companies House data

## B Outlier Analysis

Our main analysis does not drop potential outliers. We let regression fixed effects account for postcodes and sectors (and combinations of these units) that observe unusually high registrations.

### B.1 Extremely High Company Registration Observations

Table B.1 shows company registrations across postcode units at the upper tail of the firm registration distribution. Since UK postcode units contain a small number of properties – on average 15 and always less than 100 – if a postcode unit observes an unusually high amount of registrations it suggests activity not representative of true company creation in the area. For example, the postcode WC2H 9JQ is the postcode with 7,604 registrations over the sample and it is also the postcode-week with 699 observations. This postcode corresponds to a business that advertises a registered office address service at this postcode. Similarly, in week 33, postcode N19 4DX, SIC 96 (“Other Personal Service Activities”) there were 212 registrations and in week 33, postcode N19 4DX, SIC 96090 (“Other service activities not elsewhere classified”) there were 212 registrations. Hence, all registrations in the 2-digit sector were from one 5-digit sector. This postcode also corresponds to an accountant offering business creation services. The ONS provide further details on addresses with multiple

registrations.<sup>20</sup>

Table B.1: Upper-Tail Outlier Analysis, by postcode unit

	p95	p99	p99.5	p99.75	p99.9	p99.99	max	No. Obs
Registrations <sub><i>k,w,5d</i></sub>	1	4	6	10	20	82	212	198,357
Registrations <sub><i>k,w,2d</i></sub>	1	4	8	14	29	107	212	191,001
Registrations <sub><i>k,w</i></sub>	2	4	7	14	41	483	699	170,624
Registrations <sub><i>k</i></sub>	3	9	14	22	41.34	494	7,604	128,665

Note: *k* stands for postcode unit; *w* stands for week; *5d* stands for 5-digit SIC; *2d* stands for 2-digit SIC.

Source: Authors' calculations based on Companies House data

## B.2 Company Registrations by Sector

In this section, we list the 5-digit and 2-digit sectors with most and least registrations.

### B.2.1 5-digit Sectors with Most Registrations

Table B.2 shows the 5-digit sectors that observe the most firm creation.

Table B.2: Top Five Number of Registrations by 5-digit sector

	Registrations <sub>5d</sub>
47910: Retail sale via mail order houses or via Internet	11,270
68100: Buying and selling of own real estate	8,705
96090: Other personal service activities not elsewhere classified	7,433
70229: Management consultancy activities (other than financial management)	7,238
68209: Letting and operating of own or leased real estate (other than Housing Association real estate and conference and exhibition services) not elsewhere classified	7,206

Source: Authors' calculations based on Companies House data

The real estate related classifications 68100 and 68209 are commonly used by real estate investors. For example, mortgage lenders prefer buy-to-let investors to hold properties under special purpose vehicles (SPVs) – i.e. the property is owned by a limited liability company which receives rents and the director is the owner – registered with 68209. People trading properties (so-called ‘buying and flipping’) use 68100. These business structures improve the mortgage options available to owners.

The list of activities classified under 47910 include: Internet Auctions, Internet Retail Sales, Mail Order, Radio Direct Sales, Telephone Direct Sales, Television Direct Sales.

<sup>20</sup><https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/methodologies/multiplebusinessregistrationsatasinglepostcodeuk2021>.

The list of activities classified under 68100 include: Apartment Buildings Buying and Selling, Building Sales and Purchase, Dwelling Buying and Selling, Land Buying and Selling, Real Estate Buying and Selling, Real Estate Owner, Static Caravan Sales.

The list of activities classified under 96090 include: Weighing machine operation (coin operated), Pet sitting services, Pavement artist, Palmist, Outside porter, Naturalisation agent, Master of Ceremonies, Marriage bureau, Licensed porter, Knifegrinder (travelling), Key cutting services (while you wait), Photographic machines (coin-operated), Plastic coating services of identity cards, etc. (while you wait), Valet car parkers, Training of pet animals, Town crier, Toastmaster, Tattooist, Spiritualists activities, Shoe shiners, Salvation army emigration department, Porters, Poodle clipping, Kennels (not racing), Jobbing waiter, Dating services, Computer dating agency, Cloakroom (not railway, etc.), Clairvoyant, Cats home, Bootblack, Body piercing studios, Boarding of pet animals, Blood pressure machine operation (coin operated), Astrologer, Dogs home, Educational agency, Horse clipping, Historical research, Guide (other than tourist), Grooming of pet animals, Graphologist, Genealogist, Genealogical organisation services, Fortune telling (not fairground), Escort agency, Emigration agency (not of foreign government, etc.), Artists model.

The list of activities classified under 70229 include: Management Audits Consultancy Services, Management Consultancy Activities, Marketing Management Consultancy Activities, Policy Formulation Consultancy Services, Tourism Development Consultancy Services.

### **B.2.2 5-digit Sectors with Least Registrations**

Table B.3 shows the 5-digit sectors that observe the least registrations. There are 28 5-digit SIC sectors with only one registration over the time period we analyse. The table omits 5-digit sectors with no registrations as we do not observe them in our dataset. To appear in our dataset there must have been a registration in that sector over the time period we analyse.

Table B.3: 5-digit sectors with fewest registrations

5d SIC	Description	Registrations <sub>5d</sub>
01140	Growing of sugar cane	1
02300	Gathering of wild growing non-wood products	1
05101	Deep coal mines	1
05102	Open cast coal working	1
05200	Mining of lignite	1
08920	Extraction of peat	1
10310	Processing and preserving of potatoes	1
10620	Manufacture of starches and starch products	1
13940	Manufacture of cordage, rope, twine and netting	1
19100	Manufacture of coke oven products	1
20510	Manufacture of explosives	1
20520	Manufacture of glues	1
20600	Manufacture of man-made fibres	1
23130	Manufacture of hollow glass	1
23140	Manufacture of glass fibres	1
23510	Manufacture of cement	1
24320	Cold rolling of narrow strip	1
24460	Processing of nuclear fuel	1
25300	Manufacture of steam generators, except central heating boilers	1
25940	Manufacture of fasteners and screw machine products	1
27310	Manufacture of fibre optic cables	1
28132	Manufacture of compressors	1
28410	Manufacture of metal forming machinery	1
28921	Manufacture of machinery for mining	1
28940	Manufacture of machinery for textile, apparel and leather prod	1
77220	Renting of video tapes and disks	1
77342	Renting and leasing of freight water transport equipment	1
77352	Renting and leasing of freight air transport equipment	1

Source: Authors' calculations based on Companies House data

### B.2.3 2-digit Sectors with Most and Least Registrations

Table B.4 shows the 2-digit sectors that observe the most and least firm creation.

Table B.4: Top and Bottom Number of Registrations by 2-digit sector

	Registrations <sub>2d</sub>
<b>Top 3</b>	
47: Retail trade, except of motor vehicles and motorcycles	28,802
68: Real estate activities	18,498
56: Food and beverage service activities	13,176
<b>Bottom 3</b>	
19: Manufacture of coke and refined petroleum products	25
12: Manufacture of tobacco products	14
05: Mining of coal and lignite	3

Source: Authors' calculations based on Companies House data

## C Distributional Statistics for EOTHO Participation

Table C.1 presents a frequency table which shows the number of postcodes by number of EOTHO establishments. The sum of the products is 13,150 which is the total number of EOTHO establishments. Hence,  $13,150/8,665 = 1.5$  represents the average number of EOTHO establishments per postcode, among postcodes that have an EOTHO establishment.

Table C.1: Frequency of postcodes by number of EOTH O establishments

Number of EOTH O establishments in postcode	Number of postcodes
0	120,000
1	6,048
2	1,627
3	558
4	251
5	82
6	41
7	22
8	17
9	6
10	5
11	2
12	1
14	1
17	1
18	2
19	1
<b>Total Postcodes</b>	<b>128,665</b>

Source: Authors' calculations based on Companies House data and HMRC

## D Confidence Intervals

This section outlines the algorithm to calculate the confidence intervals for the size of the relative effect. We cannot apply a standard parametric statistical test to the effect. This is because it depends on non-linear combinations of (not necessarily independent) random variables. We use the observed data simulations to obtain an approximate probability distribution. We then identify a 95% confidence interval.

Let  $EOTH O_{2020}$ ,  $EOTH O_{2019}$ ,  $All_{2020}$ ,  $All_{2019}$ , be the number of registrations in the relevant postcode subsets and years. Therefore, we have

$$\begin{aligned}
 \text{Effect} &:= \text{Ratio of registrations}_{EOTH O \text{ postcodes}} - \text{Ratio of registrations}_{all \text{ postcodes}} \\
 &= \frac{EOTH O_{2020}}{EOTH O_{2019}} - \frac{All_{2020}}{All_{2019}}.
 \end{aligned}$$

The effect is a non-linear function of four random variables with unknown distributions. We use a non-parametric bootstrapping algorithm to estimate confidence intervals for the effect size. We use a Monte Carlo approach to case sampling, and we build a function to generate N



(usually set at 1,000) re-samples on which to calculate the effect and use this to approximate a distribution and identify a 95% confidence interval. The function takes the original data and  $N$  as parameters.

## E Difference-in-Differences Robustness

In this section, we provide robustness checks for our difference-in-differences analysis.

### E.1 Continuous Treatment Variable

A continuous intensity measure of the EOTHO treatment variable captures that some EOTHO postcode areas have multiple registered EOTHO establishments (see Table C.1), for example, multiple establishments on a high street sharing the same postcode unit.<sup>21</sup>

To construct our EOTHO intensity measure, we measure the number of EOTHO establishments in a given postcode from the HMRC register. The variable equals to zero if there are no restaurants participating in the scheme in postcode  $k$ , and reaches 19 for the postcode area with the most EOTHO registrations. Appendix C presents summary statistics for the number of EOTHO participants per postcode area. There are 128,665 postcodes in total, 8,665 have at least one registered EOTHO establishment, and there are 13,150 EOTHO establishments in total. The majority (120,000) of total postcodes have no EOTHO registrations, followed by 6,048 postcodes with one EOTHO registrations, and 1,627 postcodes with two EOTHO registrations, then a gradual decline to one postcode with 19 EOTHO registrations. This EOTHO intensity measure does not vary by week, as our HMRC data only measures participants and their postcode, not when they registered for EOTHO.

To estimate the effect using the intensity measure, we replace the binary variable *EOTHO* in our main estimation equation with the number of participating firms in a postcode. Table E.1 reports the results for the continuous treatment variable.

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<sup>21</sup>A postcode unit is the most granular form of postcode in the UK, on average corresponding to 15 letter-boxes. It usually represents a street, part of a street, a single address, a group of properties, a single property, a sub-section of the property, an individual organisation or a subsection of the organisation.

Table E.1: Estimates of EOTH0 on company registrations; intensity treatment measure

	Dependent variable: Natural log of incorporations			
	(1)		(2)	
Number of participating restaurants	0.0149 (0.0010)	***	0.0149 (0.0010)	***
Number of participating restaurants $\times$ post-EOTH0	0.0042 (0.0019)	**	0.004 (0.0018)	**
Baseline FE	Yes		Yes	
Pre-treatment trend	No		Yes	
$\chi_i \times \eta_w$	Yes		Yes	
Observations	206,313		206,313	
R squared	0.0582		0.0583	

\*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.1$ .

Note: Estimates for the natural logarithm of the company registrations. Baseline fixed effects refer to fixed effect for the week, NUTS3, 2-digit SIC code and their interaction. Robust standard errors in parentheses.

Source: Authors' calculation

Table E.1 shows the effect using the number of participating restaurants as the treatment variable. In general, for every additional participating establishment in a postcode, there will be 1.5% more company registrations. During the EOTH0 period, this effect is stronger by 0.4%. The comparable effects in our main exercise with a binary treatment are 5% and 0.7% (Table 5). The 'Number of participating restaurants' coefficient is smaller in the continuous case compared to the binary case because it captures the effect of every additional restaurant, rather than the effect of one or more EOTH0 establishments, as in the binary case. Since many postcodes have more than one EOTH0 establishment, the result for the continuous treatment is a lower-bound estimate, assuming one establishment per postcode.

## E.2 Excluding Outliers

We run the regressions excluding week-postcode-sector observations with over 10 registrations. This approach eliminates concerns about suspicious registration activity. For example, it removes cases of registrations reported in a single postcode (e.g. of a hotel). Further, it removes accountancy firms that offer registered office address services which genuinely register the company in correct sector. In this case, the company intends to produce, but the postcode area does not correspond to area of economic activity. The sample size is reduced to 190,326 observations. The average treatment effect reduces from 5.6% to 5.03%.

Table E.2: Estimates of EOTH0 on company registrations; excluding Accommodation and food services (no outliers)

	Dependent variable: Natural log of incorporations							
	(1)		(2)		(3)		(4)	
Treated (in EOTH0 postcode)	0.0491	***	0.0492	***	0.0490	***	0.0490	***
	(0.0015)		(0.0015)		(0.0015)		(0.0015)	
Treated $\times$ post-EOTH0	0.0014	*	0.0014	*	0.0013	*	0.0013	*
	(0.0029)		(0.0029)		(0.0029)		(0.0029)	
Baseline FE	Yes		Yes		Yes		Yes	
Pre-treatment trend	No		Yes		No		Yes	
$\chi_i \times \eta_w$	No		No		Yes		Yes	
Observations	190,326		190,326		190,326		190,326	
R squared	0.0666		0.0666		0.0669		0.0669	

\*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.1$ .

Note: Estimates for the natural logarithm of the company registrations. Baseline fixed effects refer to fixed effect for the week, NUTS3, 2-digit SIC code and their interaction. Robust standard errors in parentheses.

Source: Authors' calculation

### E.3 Excluding Accommodation and Food Services

We run the regressions excluding the Accommodation and Food Services sector. Based on the eligibility criteria of the EOTH0 scheme, restaurants could participate if they were registered up until 7 July 2020. Since the announcement occurred on 8 July, eligible outlets could not have known about the subsidy. Therefore, they could not be motivated to register beforehand. Further, setting up a restaurant during the scheme would not benefit from the scheme. If they are set up in an area with participant restaurants, they would offer 50% more expensive services relative to those in the scheme. The sample size is reduced to 191,001 observations. Excluding the hospitality sector increases the average treatment effect from 5.6% to 6.3%.

Table E.3: Estimates of EOTH0 on companies registrations; excluding Accommodation and food services

	Dependent variable: Natural log of incorporations							
	(1)		(2)		(3)		(4)	
Treated (in EOTH0 postcode)	0.0563	***	0.0563	***	0.0561	***	0.0561	***
	(0.0018)		(0.0018)		(0.0018)		(0.0018)	
Treated $\times$ post-EOTH0	0.0070	**	0.0069	**	0.0068	**	0.0068	**
	(0.0033)		(0.0033)		(0.0033)		(0.0033)	
Baseline FE	Yes		Yes		Yes		Yes	
Pre-treatment trend	No		Yes		No		Yes	
$\chi_i \times \eta_w$	No		No		Yes		Yes	
Observations	191,001		191,001		191,001		191,001	
R squared	0.0652		0.0652		0.0654		0.0654	

\*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.1$ .

Note: Estimates for the natural logarithm of the company registrations. Baseline fixed effects refer to fixed effect for the week, NUTS3, 2-digit SIC code and their interaction. Robust standard errors in parentheses.

Source: Authors' calculation

## E.4 Parallel Trends

To apply the difference-in-differences approach, we show the parallel trends of registrations prior to the announcement of EOTH0 scheme. Figure E.1 plots the weekly average number of registrations by treatment (EOTH0) and control (non-EOTH0) groups at the unit level of our DID analysis, i.e. in a 2-digit sector, postcode and week observation. As an example, in week 24, we observe 1.11 registrations on average in a postcode in a 2-digit sector in the non-EOTH0 sub-sample, while the average firm registrations in week 24 for a 2-digit sector in a postcode is 1.89 registrations in the EOTH0 sub-sample. Note that the final week of our sample (week 36) only includes one day.

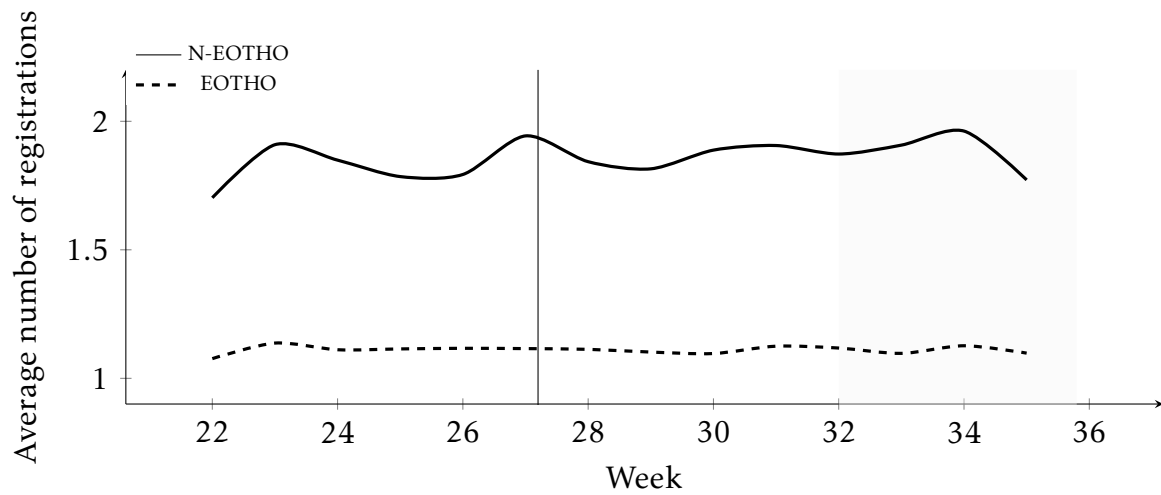


Figure E.1: Average number of registrations by treatment  
Source: Authors' calculation

Additionally, from the tables in Section [A](#) we observe that the average registrations for a 2-digit sector postcode observation is 1.77 for the EOTHO subsample over the full time period, 1.11 for the non-EOTHO subsample over the full period, 1.19 pooling EOTHO and non-EOTHO areas pre-announcement, 1.18 pooling EOTHO and non-EOTHO areas post-announcement, 1.76 for EOTHO pre-announcement, 1.11 for non-EOTHO pre-announcement, 1.78 for EOTHO post-announcement, and 1.11 for non-EOTHO post-announcement.