

Business creation during COVID-19

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Abstract

We use data on business registrations in the UK to study the response of firm entry to the COVID-19 pandemic. We find that firm entry increased during the pandemic, unlike typical recessions where firm entry declines. The rise in firm creation is driven by new company registrations from existing business groups, particularly creating companies in online retail. We link the rise in firm creation to declines in brick-and-mortar retail footfall via Google mobility data, and show that it takes around 10 weeks for a firm to be registered after a shock to footfall. Finally, we merge entry data with online job postings from Indeed and show that the rise in firm creation drives increased vacancy postings.

JEL: E32, L25, L26

Keywords: Firm Dynamics, COVID-19, Business Dynamism, Firm Entry.

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1 Introduction

Firm entry is a fundamental indicator of economic activity. New firms contribute to aggregate job creation and affect both growth and productivity through competition, innovation and reallocation. Typically firm entry is procyclical: it rises in booms and declines in recessions. However, during the COVID-19 recession, we observe that firm entry is countercyclical: it rises as output falls. Motivated by this observation, we analyse the dynamics behind firm creation in the UK during the COVID-19 pandemic. We investigate the drivers of firm creation and ask whether these new firms have any real aggregate impact.

We present four main findings. First, firm creation increases during the COVID-19 pandemic, unlike past recessions. The increase in firm creation is concentrated in online retail which accounts disproportionately for the rise in firm creation.¹ Second, new incorporations are driven by existing business groups incorporating new companies, not first-time start-ups. This adds to our understanding of cyclical firm creation which implicitly assumes new firm creation is by first-time start-ups. Third, entry is negatively correlated with retail footfall. In areas and time periods where retail footfall declines, firm registrations increase, and it takes roughly ten weeks for a decrease in footfall to have maximum effect on firm creation. Fourth, the increase in new incorporations corresponds to increased job postings. Moreover, companies created during the crisis post jobs quicker than companies created in the past. This shows that firm creation during COVID-19 affects the real economy.

To show these results we match real-time data from the UK's register of private limited firms (Companies House data) with Google data on footfall, Bureau Van Dijk (BvD) data on ownership structure and Indeed data on job postings. The Companies House data provides entry date, sector and location which allows us to characterise the sectoral composition of entry. The matched data allows us to: characterise the response of entry to footfall in different locations using local projections; categorise whether newly created companies are part of an existing business group or new start-ups; and it allows us to track whether the newly created companies post jobs.

An important mechanism that we uncover is that existing business groups are responsible for most firm creation during COVID-19. We refer to this distinction as firm creation on the intensive margin (within a group) and extensive margin (new start-up). The contribution of the extensive margin and intensive margin to total firm creation is roughly even before COVID, but after COVID lockdown begins firm creation on the intensive margin contributes roughly 80% to total firm creation. The finding suggests that the growth in firm creation is due to nimble incumbent groups restructuring to meet COVID demands, rather than home-workers switching to entrepreneurship. This finding mitigates concerns that the COVID-19 firm creation boom is an artificial phenomenon, caused by casual 'furlough entrepreneurs', without the usual positive

¹Online retail represent a little less than 2% of all active firms in January 2020, but 20% of the increase in firm creation over March 2020-September 2021 relative to March 2018-September 2019. See Appendix A2 for more details.

effects of firm creation. And, to support this our evidence suggests that new firms are just as likely to post jobs as in normal times, and they post jobs quicker after being created. This could be because of incumbent groups' existing hiring experience. More broadly, this result adds a new factor to growing research that emphasises the importance of firm characteristics on start-up for future employment (Sterk and Sedláček 2017; Sterk, Sedláček, and Pugsley 2021). To the best of our knowledge, our paper is the first to stress that the margin of entry responds to the business cycle and has a bearing on future employment outcomes.

The resilience of firm creation during COVID-19 in the UK has already been put forward in the literature. Dinlersoz, Dunne, Haltiwanger, and Penciakova (2021) present evidence for the US and OECD (2021) provide evidence for OECD countries.² Additionally, our finding that entry is concentrated in online retail is consistent with most US registrations being in non-store retail (Haltiwanger 2021). None of these papers though observed the the real impacts of these new businesses being created. Benedetti Fasil, Sedlacek, and Sterk (2021) show that the initial sharp falls in firm creation in France, Germany, Italy and Spain could have persistent negative effects on employment due to fewer high-growth startups. Our results focus rather on the surge in firm creation following this initial decline, but suggests that these new firms contribute to the recovery in employment already.

The remainder of the paper is structured as follows: Section 2 describes our data; Section 3 presents motivating facts on firm creation during the COVID-19 pandemic; Section 4 analyses the relationship between firm creation and footfall; and Section 5 studies the effects of firm creation on employment.

2 Data

We use data from Companies House and Bureau van Dijk (FAME) to construct entry statistics and ownership information. We use Google mobility data to measure retail footfall in an area. We use data from Indeed to measure job postings by new firms.

2.1 Business registrations (Companies House & FAME)

We construct data on firm creation from the UK business register provided by Companies House.³ We only use Companies House data directly for the most recent years (2020 and 2021). For earlier year (2005-2019) we use the Financial Analysis Made Easy (FAME) dataset provided by Bureau van Dijk (BvD) that keeps track of historical Companies House data.⁴ The Companies House register records all *incorporated*

²Duncan, Galanakis, León-Ledesma, and Savagar (2021) present early-evidence on the aggregate and sectoral effects of the COVID-19 crisis on UK firm creation.

³New entries on the register are automated so there are no concerns about administrative lags that might have arisen during the pandemic.

⁴We check that our historical series from BvD is consistent with firm creation statistics that Companies House provide over a longer time period but at a lower frequency (annual). See also Appendix A1 for a comparison with other firm-level data sources in the UK.

companies in the UK of which the main component is private limited companies. The data does not include sole traders.

Each company on the register has a unique company number, registration date, address, legal status and industry (5-digit SIC). This allows us to measure daily company registrations by local authority and sector of activity. BvD also provides the ownership information for the company and identifier of the ultimate owner (with a 2-month lag on average). We restrict legal status to private limited companies which represent 93% of all companies on the register. We follow the [ONS](#) and exclude post codes with more than 500 registrations in a single day.⁵ We aggregate the daily registrations to a weekly level and categorize them at the local authority level using the Office for National Statistics (ONS) post-code lookup tool.

2.2 Retail footfall (Google Mobility)

We use regional retail footfall figures from Google LLC (2021). Specifically, we use mobility trends for 'retail and recreation' which represents places such as restaurants, cafés, shopping centres, theme parks, museums, libraries and cinemas. Hence we refer to 'visits to retail and recreation' as *footfall*. The data shows how visitors to these retail and recreation locations changed compared to a baseline. The baseline is the median value from the 5-week period Jan 3 – Feb 6, 2020 for a specific day of the week. For example, a value of -10% on a Monday in June 2020 in Leicestershire would represent 10% fewer visits to retail and recreation places than the median value for Mondays in Leicestershire over the baseline period. The series begins Feb 6 2020 and has run continuously since then.

Our aim is to compare changes in retail footfall in an area to firm creation in an area. Therefore we need to match footfall data in an area to firm creation in an area. The Google mobility data is divided into 381 local authorities. We map from Google's specific regions to local authority measures using an ONS tool ([ONS region look-up tool](#)) as in Fetzner (2020).

2.3 Online job postings (Indeed)

Our aim is to determine whether a new firm incorporation in the Companies House data ever results in an online job posting. In order to do this we need to match data on new firm creations to online job postings based on the name used to register a company and the name used to post a job online.

We use data from Indeed to measure online job postings. These data include both vacancies posted on Indeed and on companies' websites aggregated by Indeed.⁶ The data records about 20 million online job postings from January 2018 to September 2021. Each record consists of a company name, job title and

⁵This is because multiple registrations at a single postcode most often reflect registrations by management and personal service companies or are tax motivated, with little economic impact. See [ONS](#) article for more details.

⁶See hiringlab.org/indeed-data-faq for a description of the data.

posting date. We match Indeed data with Companies House data using a string-matching algorithm applied to the company name variable in each data set.⁷ We drop a match if the company posts a job before it incorporates assuming that's a faulty match.

Of the 20 million job posted between January 2018 and September 2021, we match 15 million to firms in the Companies House register⁸, representing about 400,00 firms in total (about 10% of the total number of active firms on the register in January 2020). We identify about 20,000 of these firms as having been incorporated in the post-COVID period (since March 2021). 20,000 represents about 2% of all firm incorporated over the COVID period. Unsurprisingly, companies incorporated more recently (i.e. younger firms) are less likely to be posting jobs and be in Indeed data.

3 Facts

3.1 The cyclicity and composition of entry

It is well-documented that firm entry is procyclical: it rises in booms and declines in recessions (Lee and Mukoyama 2015; Tian 2018). However, our evidence for the UK (Figure 1) shows that in 'extreme event' recessions, such as wartime and the COVID-19 pandemic, entry is countercyclical. It increases during the crisis. These 'extreme event' recessions share the feature that the economy restructures to severe restrictions that shift consumer demand and producer supply. For example, in a wartime economy, imported goods shift to domestic production, and certain industries thrive on wartime needs.

⁷Similar to Van Dijke, Buckmann, Turrell, and Key 2021, we match unique names based on the cosine similarity of 3 n-grams, using the Python string-grouper package, and after an initial clean of names excluding all special characters and most common words (such as llc, limited, and, etc.) We keep matches with a similarity score larger than 80%.

⁸The remaining being mostly composed of public sector job postings, such as postings by the NHS or the Royal Mail.

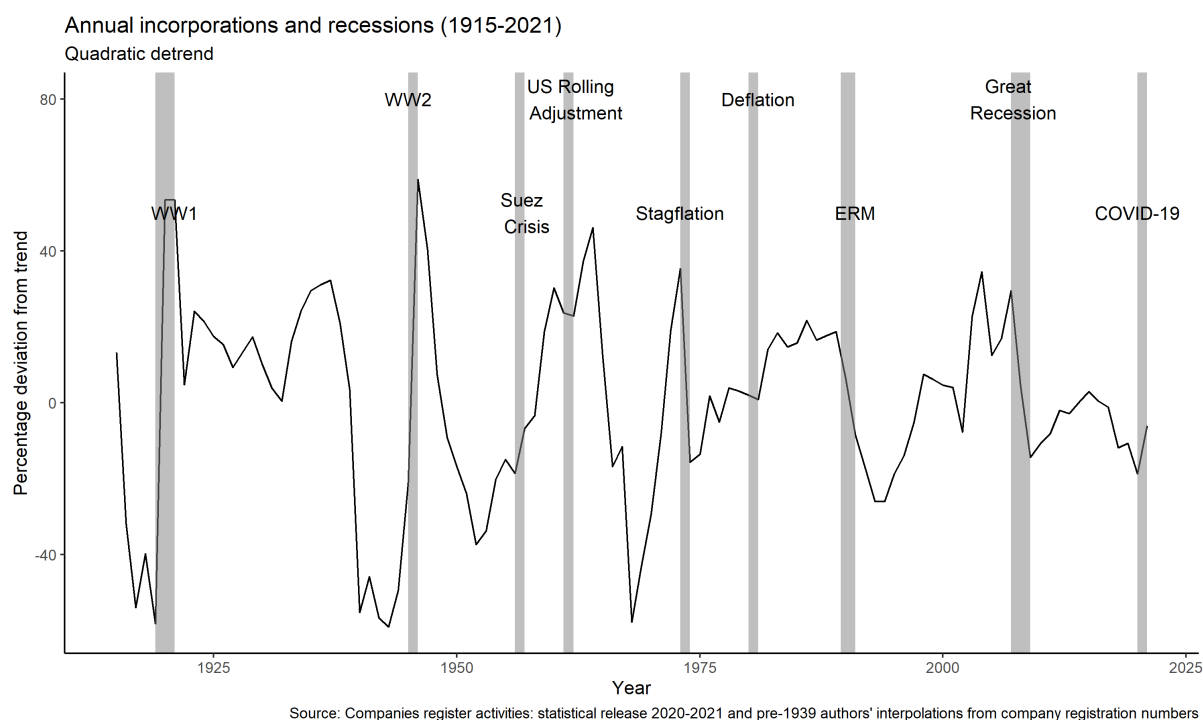


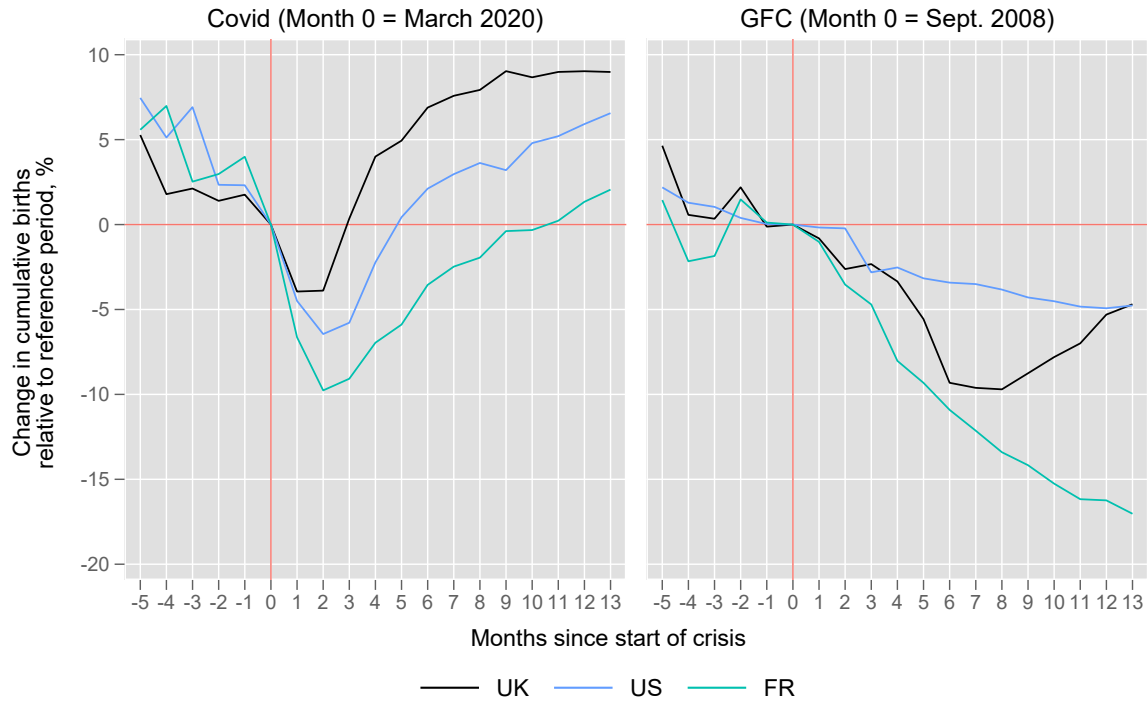
Figure 1: Cyclicalities of firm entry in the UK

Figure 2 compares firm creation in the Global Financial Crisis (GFC) and COVID-19 recessions. We extend the evidence of Dinlersoz, Dunne, Haltiwanger, and Penciakova (2021) for the US (US Census) to France (INSEE) and the UK (Companies House). We use the same methodology as in Dinlersoz, Dunne, Haltiwanger, and Penciakova (2021) and show cumulative registrations from the start of the crisis relative to a reference period. The reference period is the same month in 2006 for the Great Recession and in 2018 for the COVID-19 pandemic. Our evidence confirms that rising firm creation is common to all three countries in the COVID-19 recession and this differs markedly from the GFC which exhibits declining (procyclical) firm creation in all countries.⁹ In the COVID-19 pandemic the initial fall in creation is much sharper but bottoms-out after three months. After twelve months, all three economies have cumulative firm creation greater than over the same twelve months in 2018. For example, the UK has 9% more firm creation. Conversely, in the Great Recession cumulative firm registrations fall steadily for twelve months following the onset of the crisis. For the UK and US, 5% fewer firms are created over the twelve months following the onset of the crisis, whereas in France the figure is 17% fewer firms created than the same twelve months in 2006.¹⁰

⁹The slow recovery of the US economy from the GFC has been attributed to a slow recovery in firm creation (Clementi and Palazzo 2016).

¹⁰OECD (2021) show that the sharp fall in firm creation followed by a rebound is common to the majority of 18 OECD countries that they study with data up to September 2020.

Figure 2: Cumulative business creation, COVID vs. GFC



Source: authors' calculations using Companies House, US Census and INSEE.
Births of corporations or equivalent. Reference period: similar month of 2018 for Covid, 2006 for the GFC.

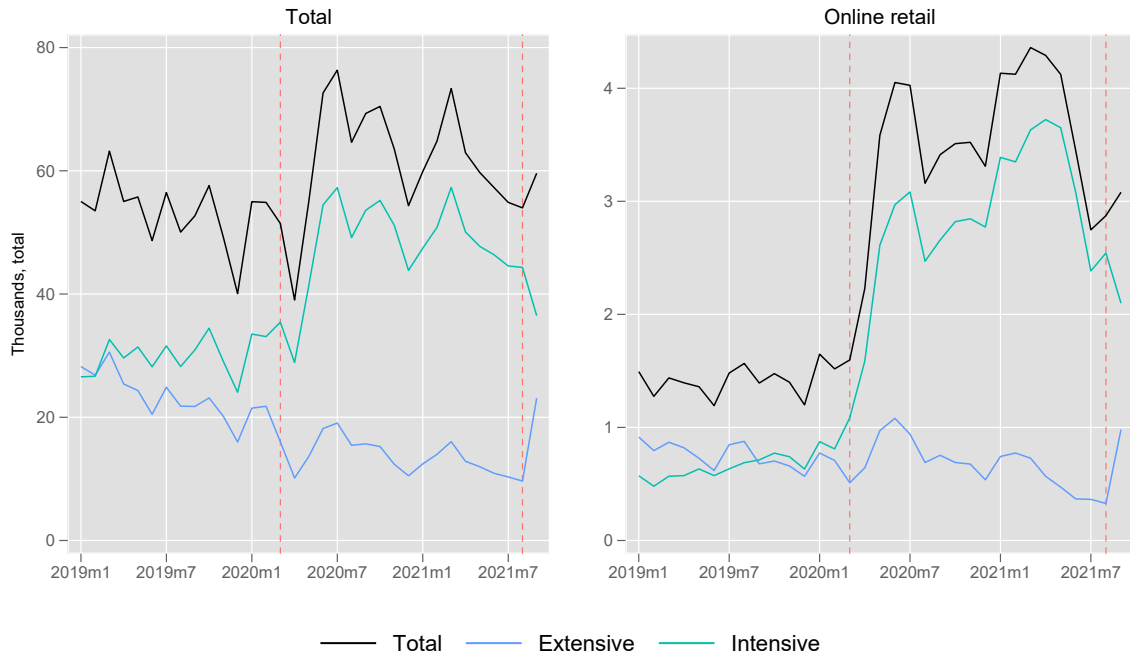
3.2 The intensive and extensive margin of entry

Figures 3 decompose total firm entry (black line) into an intensive margin component (creation by existing groups, green line) and an extensive margin component (creation by new start-ups, blue line). This figure shows that the intensive margin of firm creation grows in importance after the crisis. That is, existing business groups are responsible for relatively more firm creation than prior to the crisis. This trend can be seen by the narrowing of the gap after the onset of the crisis between the total firm registration and registrations from companies that are part of a group. This trend is even starker for firm creation in online retail. Before the crisis the amount of entry from companies that are part of a group and companies that are not part of a group is even. However, following the onset of the crisis the intensive margin creation typically accounts for over 80% of firm creation, and in the immediate aftermath of the crisis the figure is much higher.

4 Mechanisms

To understand the mechanisms behind the rise in entry, particularly the rise in online retail stores, we investigate the relationship between firm creation and retail footfall in an area. Footfall is a good indicator

Figure 3: Monthly firm creation, 2019m1 to 2021m9

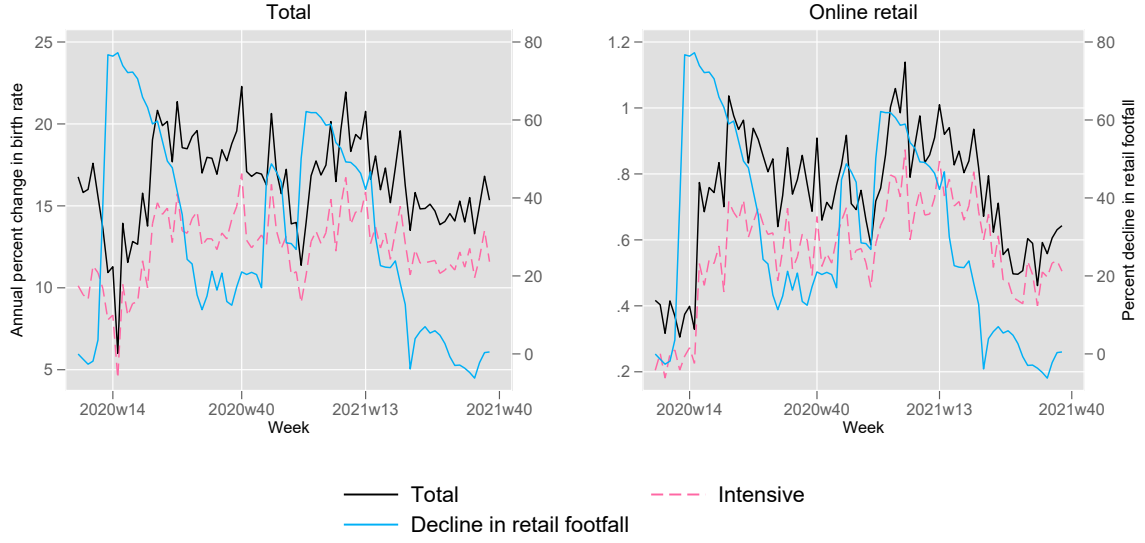


Source: authors' calculations using Companies House and FAME-BvD.
The first vertical line denotes the start of the first lockdown (March 2020), the second denotes the lag for BvD to populate ownership information.

of the lockdown stringency and reflects the exogenous changes in lockdown policies (see Appendix A3). We find that the entry and footfall are closely related. A decline in retail footfall in an area leads to a rise in firm creation in the area. The effect is strongest in online retail.

Figure 4 shows the relationship between retail footfall and the annualized birth rate since the onset of the crisis in late March 2020. The footfall indicator is expressed as changes relative to the first five weeks of 2020, and the birth rate measured as entry relative to the stock of firms in January 2020 (we use the same denominator of any type of entry –total, intensive or in online retail). Initially, there is a sharp decline in the birth rate but this recovers by June. This annualized birth rate stabilizes around 15% after June 2021 (2021w23), is mostly driven by intensive entry (a 12p.p. contribution to this 15%) and the effect is stronger in online retail. All of these birth rates comove and follow closely movements in the footfall indicator, with a few weeks of lag.

Figure 4: Birth rate and decline in footfall



Source: authors' calculations using BvD, Companies House and Google mobility data. Note: the birth rate is defined in section 4.1. The footfall indicators is expressed in deviation to the median corresponding day of the week during the five week period Jan 3–Feb 6, 2020; we then take the weekly average of these growth rates. Decline in footfall is the negative of the of the mobility trends for places like cafés, restaurants, shopping centers, theme parks, museums, libraries, and movie theaters.

4.1 Local projections analysis

We use local projections (Jordà 2005) to estimate the dynamic effect on firm creation of a shock to footfall.

We estimate the following equation:

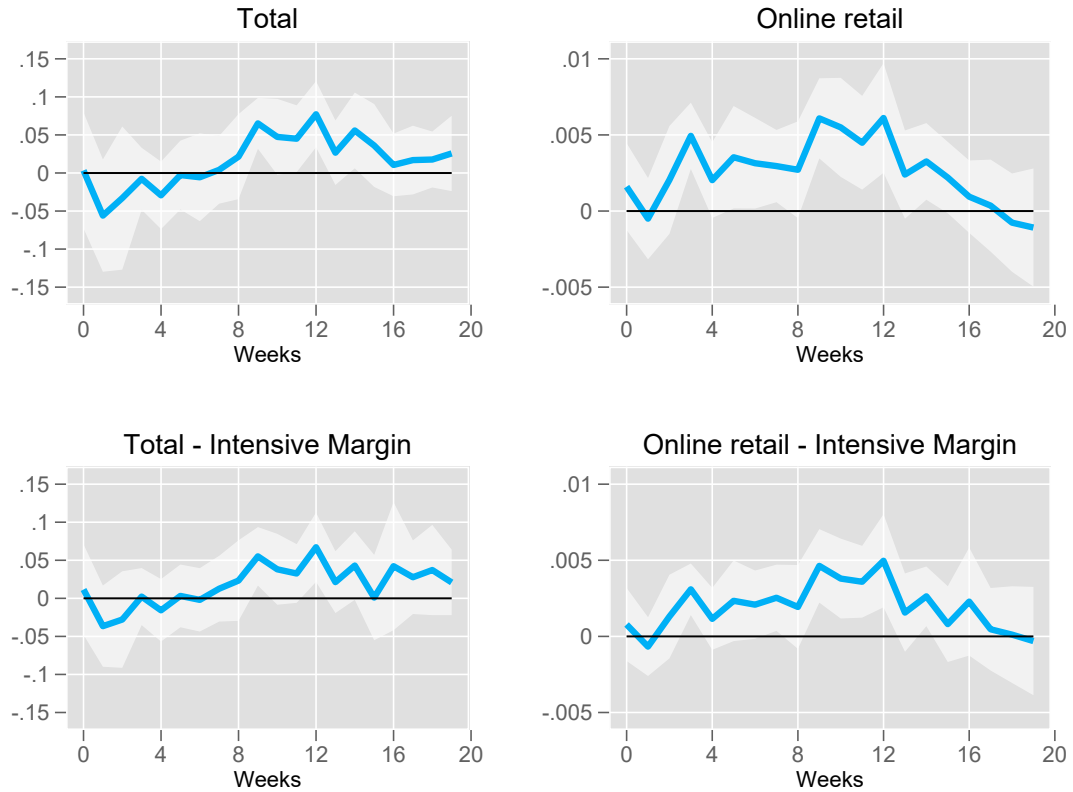
$$\text{Birth rate}_{k,w+h} = \sum_{j=0}^4 \gamma_j^h \text{Footfall}_{k,w-j} + \sum_{j=1}^4 \eta_j^h \text{Birth rate}_{k,w-j} + FE_k + \text{error}_{k,w}.$$

Subscripts represent region (k), week (w) and time horizon (h). The explanatory variable of interest is $\text{footfall}_{k,w}$. As above, it is defined as the percentage deviation of visits to retail and recreation locations versus the baseline calculated over Jan 3 – Feb 6, 2020. The dependent variable is birth rate in a region, defined as

$$\text{Birth rate}_{k,w} \equiv \frac{\text{Entry}_{k,w}}{\text{Total firms in Jan 2020}_k}.$$

The definition of $\text{Entry}_{k,w}$ depends on the classification of firm (online retail, part of a group etc.). For example, it could measure the number of entrants in location k in week w that are in online retail and the member of a business group. We hold the definition of the denominator fixed as the regional total across all firm types, this is for comparability and to not overweight regions with small initial levels of certain types of firms.

Figure 5: Local projection of entry on retail footfall



Note: standard errors are clustered at the county and week level. The light shaded area shows the 90% confidence interval.

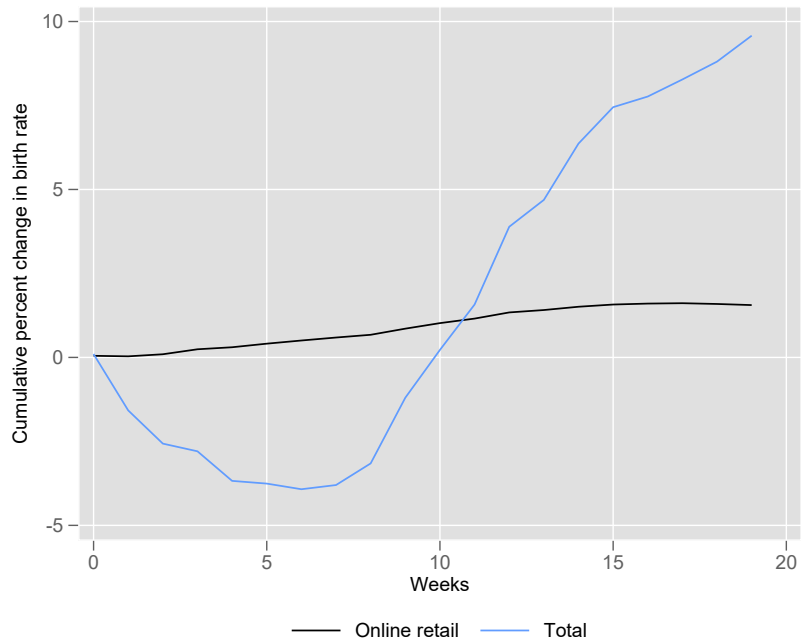
Note: local projection of retail footfall on the change in birth rate. Regressions at the week and county level, including county fixed effects.

Figure 5 presents the impulse response functions for different entry classifications following a shock to footfall. The top-left panel shows that following a 1% decrease in footfall, the firm birth rate takes 9 weeks to have a significant positive effect with a peak of 0.075% after 12 weeks. The top-right panel shows that the reaction of Online Retail is faster, and at the peak new entrants in Online Retail explain about a tenth (0.005 out of 0.05) of the increase in the total birth rate, despite accounting for 2% of the pre-pandemic stock. The lower panels demonstrate that the vast majority of the new firms are created on the intensive margin (within existing groups), this is both for total entry and in the online retail sector.¹¹

Using these estimates Figure 6 presents the cumulative increase in firm births over the COVID period following a 30% decline in footfall – the average weekly decrease in footfall over the sample period (February 2020–September 2021). The cumulative response reveals an initial dip in births but after 20 weeks new

¹¹Appendix A4 presents results of local projections exploiting regional rather than aggregate shocks to retail footfall. Qualitatively, the results are similar but the shock takes a longer time to propagate to birth rates when only regional variation is used.

Figure 6: Cumulative increase in firm birth following a 30% decline in footfall



Note: Cumulative impulse responses extracted from local projections of retail footfall on the change in birth rate. Regressions at the week and country level, including county fixed effects.

firms equivalent to 10% of the initial stock enter. Approximately one-fifth of these firms are in the online retail sector, and this sector does not observe any cumulative loss of firms over the entire period.

5 Impact

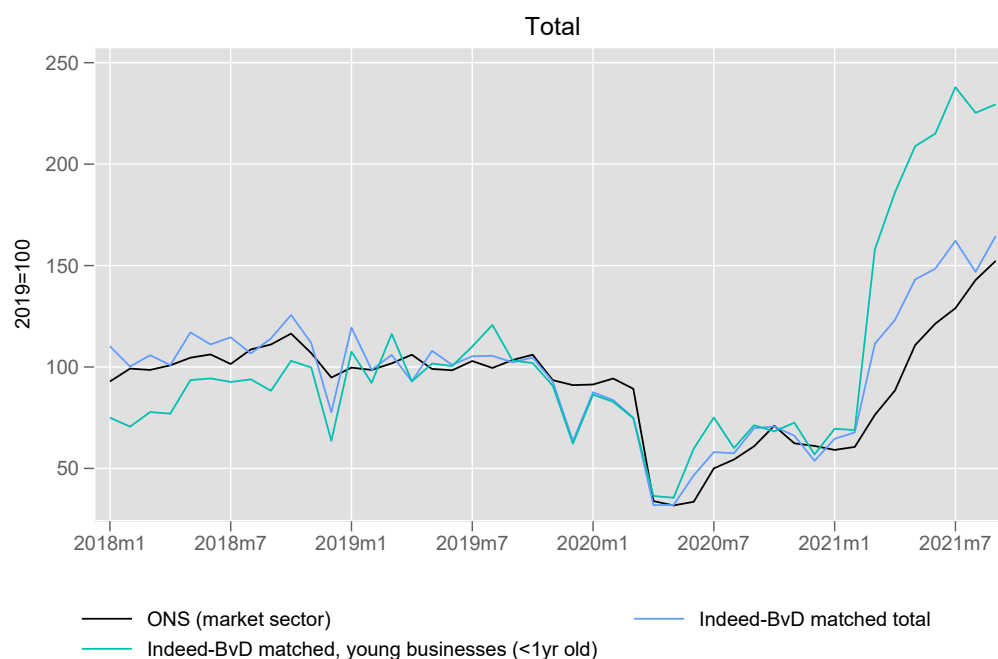
We have established the unusual increase in firm creation during the COVID recession and the close relationship to declining retail footfall and rising creation of online firms. Next we ask what are the impacts of this rising firm creation? Our finding is that these new companies do post jobs and tend to do so faster than in non-COVID times.

As explained in the data section, we match our Companies House firm creation data with job posting data from Indeed.¹² Figure A.7 shows that our Indeed data on job postings follows a similar trend to vacancies in the ONS Vacancy Survey.¹³ Overall the data shows a sharp decline in job postings from the onset of the pandemic in the first quarter of 2020, and a recovery from Spring 2021. Note that the recovery is stronger in Indeed data relative to the ONS Vacancy Survey. This partly reflects the fact that ONS Vacancy Survey

¹² Job postings differ from measures of job vacancies as a firm can post a single posting for multiple vacancies and intend to fill the vacancy at a later date. It however is a good signal of the firm's intention to become an employer-firm.

¹³ This figure shows vacancies for the sub-sample of Indeed postings that we are able to match with new firm creations in Companies House. It follows a trend that is consistent with the full sample of Indeed data. This reassures us that our matching algorithm is consistent over time.

Figure 7: ONS vacancies vs. Indeed job postings, by posting date, 2019=100



Source: Authors' calculations using Indeed and ONS Vacancy Survey data monthly experimental data.

doesn't include newly incorporated firms, and, as we can see on the figure, the recovery in job postings was strongest for young businesses in Indeed (incorporated within the year of posting the vacancy).¹⁴

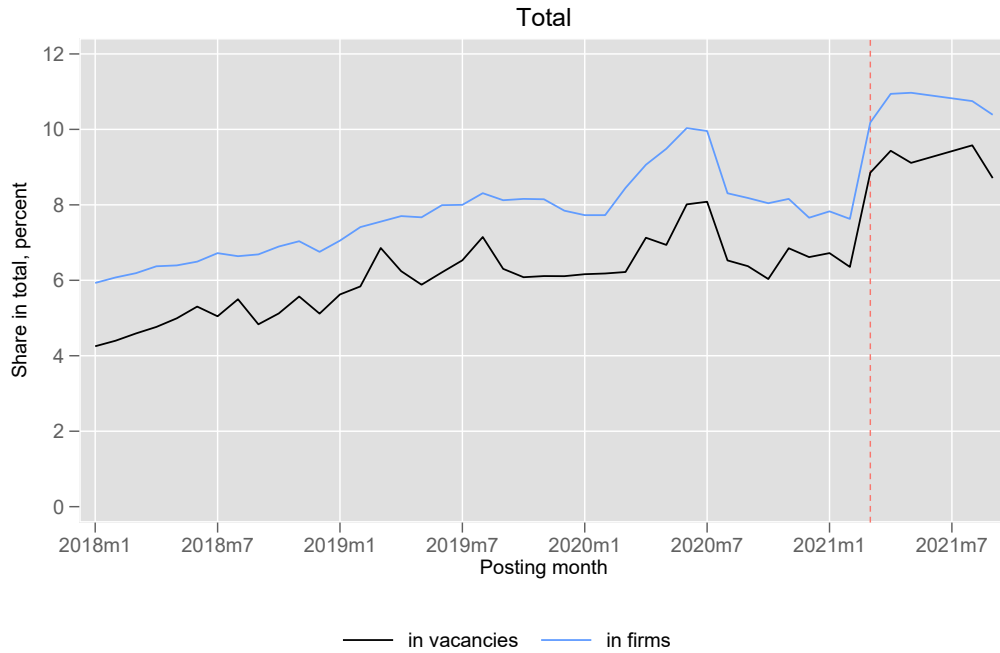
5.1 Contribution of young businesses to vacancy postings

How much do these young firms contribute to the recovery? Figure A.8 shows that there has been a recent increase in the share of job postings accounted for by young firms (firms of less than a year old, black line) as well as an increase in the share of young businesses in all firms posting vacancies (blue line). This is most noticeable from March 2021 where we observe that the share of total job postings accounted for firms under a year-old raises from 8% to 11% of total firms or 6% to 9% of total vacancies.¹⁵ This shows that the cohort of firms that would have been created in the post-COVID boom go on to have a significant effect on the composition of total job postings. This effect is also visible in the retail sector (see Appendix A.5).

¹⁴Appendix A.5 presents Indeed results for the retail sector. We compare vacancy postings in Indeed and ONS for the broad retail rather than online retail because the ONS does not provide more granular sector definitions for their measure of vacancies. Interestingly, the contribution of young businesses to vacancy postings is even sharper for the retail sector.

¹⁵Note the jump in March to June 2020, that corresponds to the sharp collapse in vacancies documented in Figure A.7, suggesting this collapse was sharpest for older firms.

Figure 8: Share of young businesses in total vacancies posted and total firms posting vacancies, by posting month



Source: authors' calculations using matched Indeed and BvD-FAME data. Note: firms on the right of the red vertical line were born during COVID-19 (post march 2020).

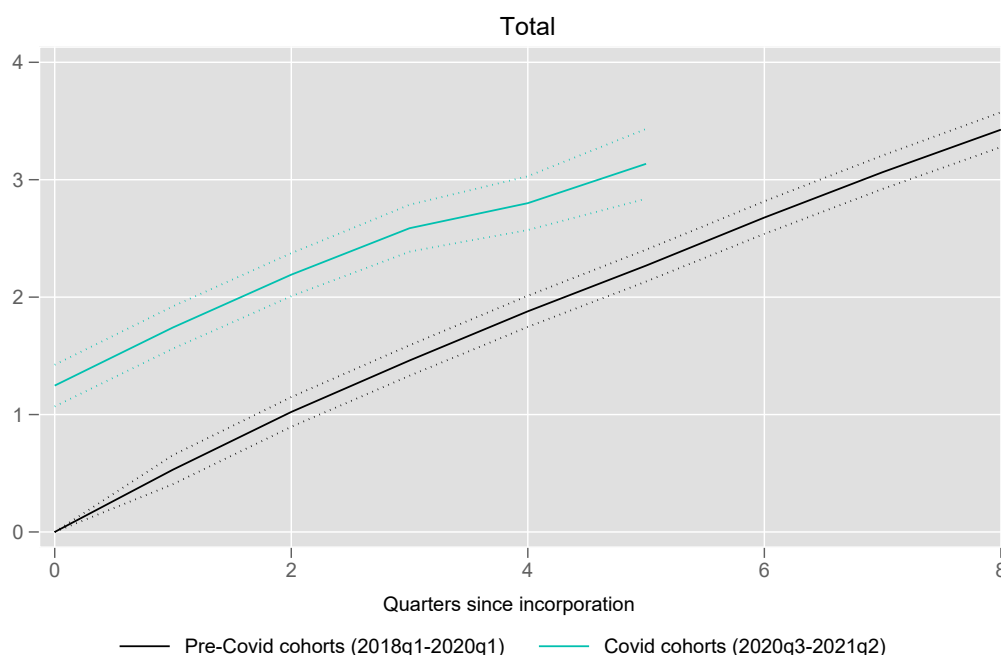
5.2 Speed of job posting after firm creation

Finally, we investigate the speed at which firms post a vacancy in Indeed data after being created. To do so, we analyse the cumulative share of all firms incorporated in a quarter that post a vacancy by quarter since incorporation. We compare these shares for cohorts of firms incorporated during COVID (from 2020q3) and pre-COVID (since 2018). Figure A.9 plots the fixed effects coefficient $FE_{age,c}$ from the following regression

$$\text{Share of firms posting in Indeed}_{c,s,age} = FE_{age,c} + FE_{s,t}.$$

The subscripts represent sector (s), cohort (c), time (t) and age. The purpose is to ensure that the shares are not affected by the sectoral composition of entry or by aggregate trends in vacancy posting. The fixed effects are relative to age zero for the retail pre-COVID cohort. The interpretation of $FE_{age,c}$ is the probability of becoming an employer pre- and post COVID controlling for sector and time fixed effects. Figure A.9 shows that a higher share of firms from cohorts of firms incorporated during the COVID pandemic (green line) relative to pre-COVID (black line) tend to post vacancies in the first five quarters following their incorporation. This could be driven by the composition of entry since the pandemic, with more “intensive” entry, as firms at the intensive margins seem to post vacancies more and more quickly in Indeed than firms

Figure 9: Cumulative share of firms posting a vacancy by quarter since incorporation: cohort analysis pre/post COVID



Note: This figure plots the age-cohort fixed effects of a regression of the cumulative share of being an employer in Indeed in each quarter by 2-digit sector on a age-cohort and sector-time fixed effects. The base level is age zero for the pre-COVID retail cohort. Dotted lines plot the 90% confidence interval.

at the extensive margin (see Appendix A.5).

6 Conclusion

We study firm creation in the UK during the COVID-19 pandemic. We add to existing evidence for the US with evidence from France and the UK which confirms that firm entry has been countercyclical during the COVID crisis. This is at odds with nearly all recessions over the last century in the UK. Furthermore, we investigate the mechanisms through which this puzzling fact arises. The emerging picture is that firm creation has been concentrated in specific sectors like online retail, and of that most registrations come through existing business groups, rather than standalone start-ups. Finally, we show that this boom in firm creation has effects on the real economy. Using matched data from online job postings, we show that the newly registered firms go on to open vacancies and post jobs, and they do so quickly after initial setup. This provides initial evidence that booming firm creation has helped the rapid recovery in the UK economy.

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Appendix

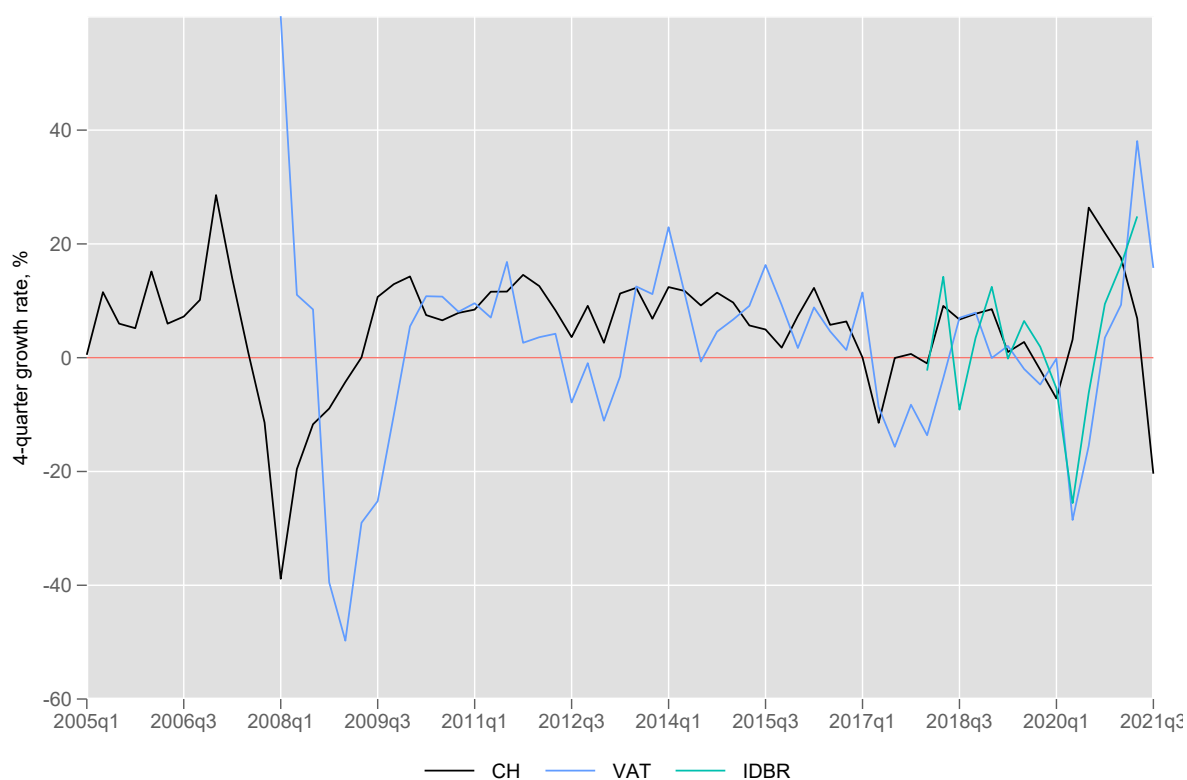
The Appendix is divided into the following sections:

- **A1. Companies House:** Details about Companies House data and coverage relative to other data sources (IDBR and VAT data).
- **A2. Sectoral composition of “excess” entry** during the pandemic.
- **A3. Google mobility indices:** details about the indices and relation to lockdown intensity.
- **A4. Alternative local projections results** of entry on the footfall indicator: focusing on regional shocks.
- **A5. Additional results using Indeed data:** results for the retail sector and cohort analysis for intensive vs. extensive margins pre and post COVID-19.

A.1 Companies House vs. IDBR and VAT data

Companies House dataset includes any firm incorporated in the UK. It differs from the ONS UK Census data (IDBR) as a firm will be included in the IDBR only if it already employs someone (uses PAYE) or if it pays VAT meaning it has a big enough turnover (larger than \$70,000 on an annual basis). For this reason, firm entry in the IDBR reflects entry of firms at a later stage of their life cycle. For this reason, entry in the IDBR or VAT data follows entry in Companies House but with a lag (see figure A.1).

Figure A.1: Entry by data source, 4-quarter growth rate 2005q1-2021q3, %



Source: author's calculations using Companies House, BvD and ONS.

A.2 Sector composition of entry during the pandemic

Online retail contributed to 40,000 new firm creation during COVID relative to pre-COVID, contributing to one-fifth of the total increase in firm creation over the period (150,000). By comparison, online retail represents less than 2% of total active firms in January 2020.

Figure A.2: Sector contributions to firm entry during COVID, relative to pre-COVID

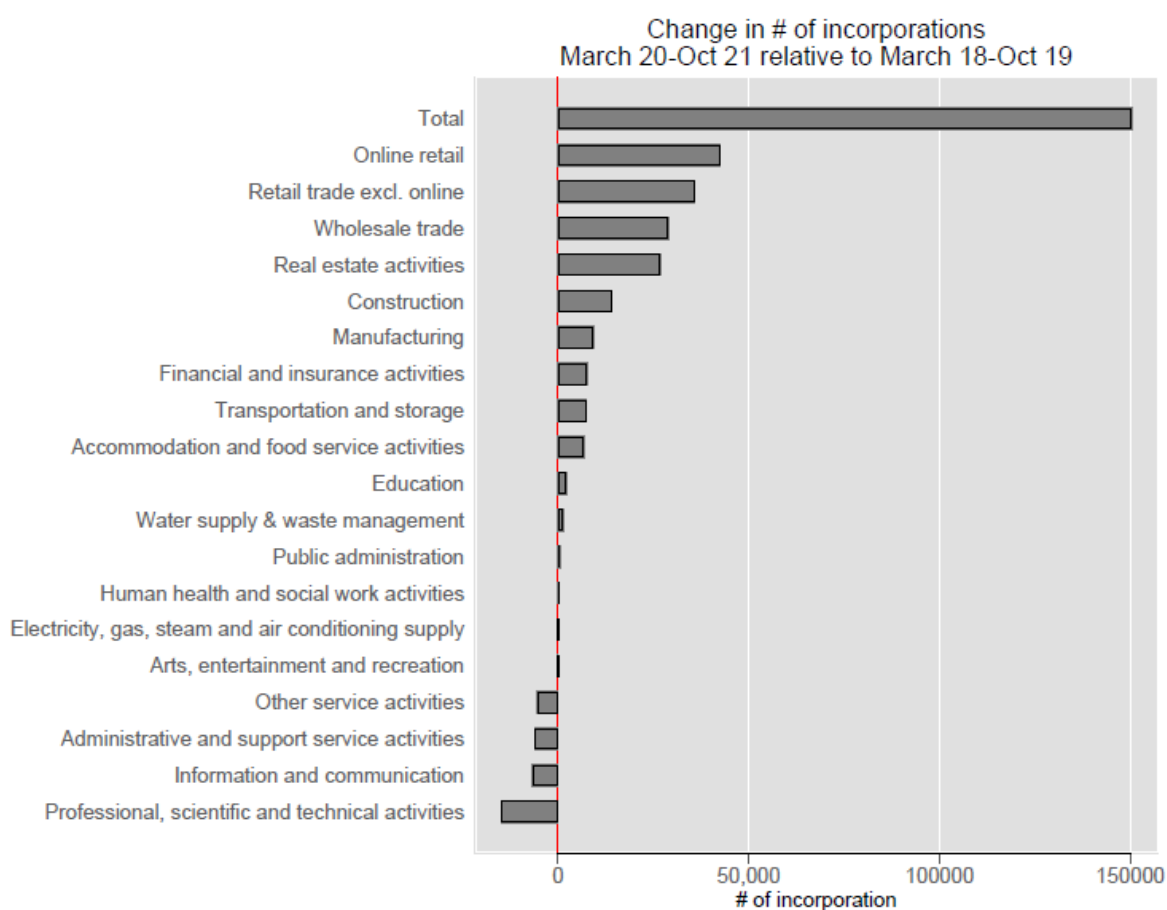
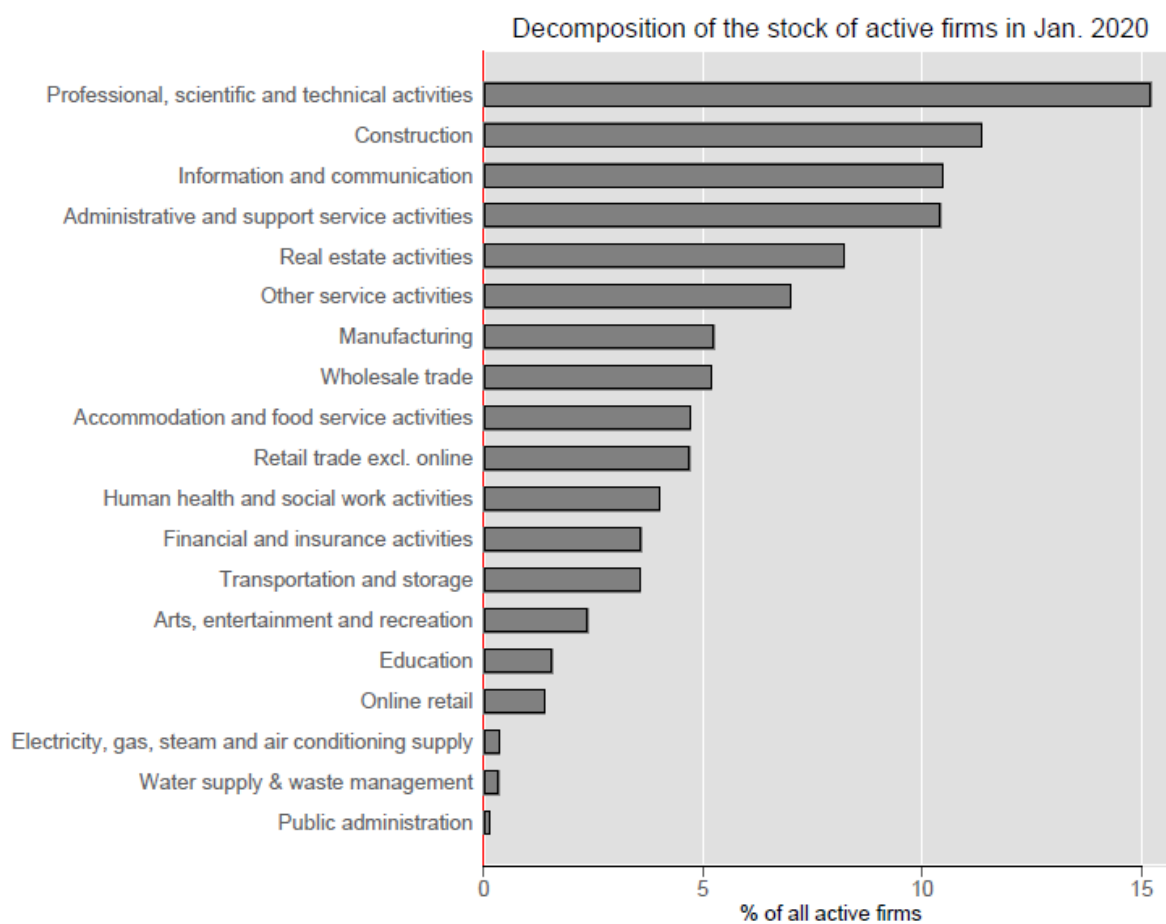


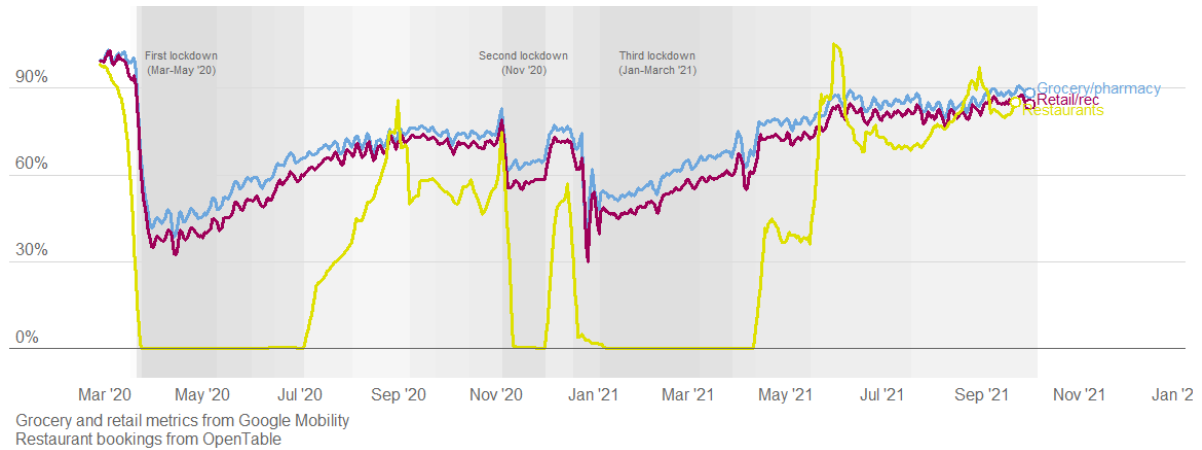
Figure A.3: Sector composition of all active firms on the Companies House register on January 2020



A.3 Google mobility data for retail footfall

Figure A.4 plots Google mobility data for an example region (London). Our measure of lockdown intensity is retail footfall which corresponds to the purple line in the figure. The response of retail footfall is closely correlated with lockdown periods that are indicated by shaded regions.

Figure A.4: Retail footfall as an indicator of lockdown intensity: London example



Source: Coronavirus (COVID-19) Mobility Report, Greater London Authority (GLA).

A.4 Alternative local projections results

Figure A.5 shows that the decline in retail footfall is unevenly distributed across regions. We exploit this variation in an alternative local projections analysis which shows that areas with higher declines in footfall experienced greater firm creation.

Figure A.5: Decline in footfall relative to the first 5 weeks of 2020, dispersion

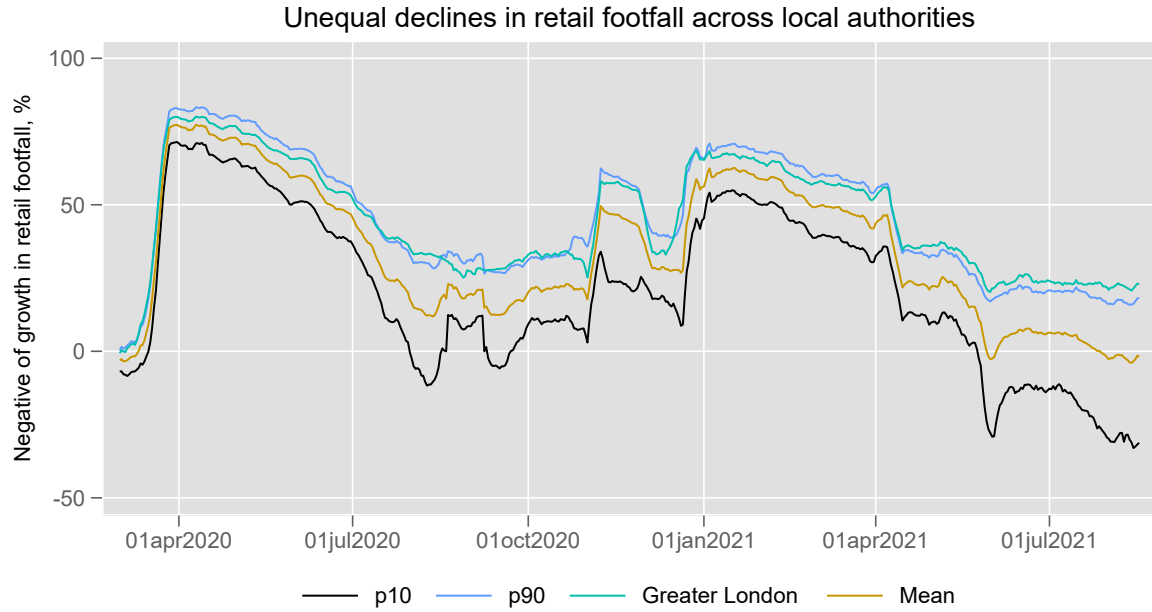
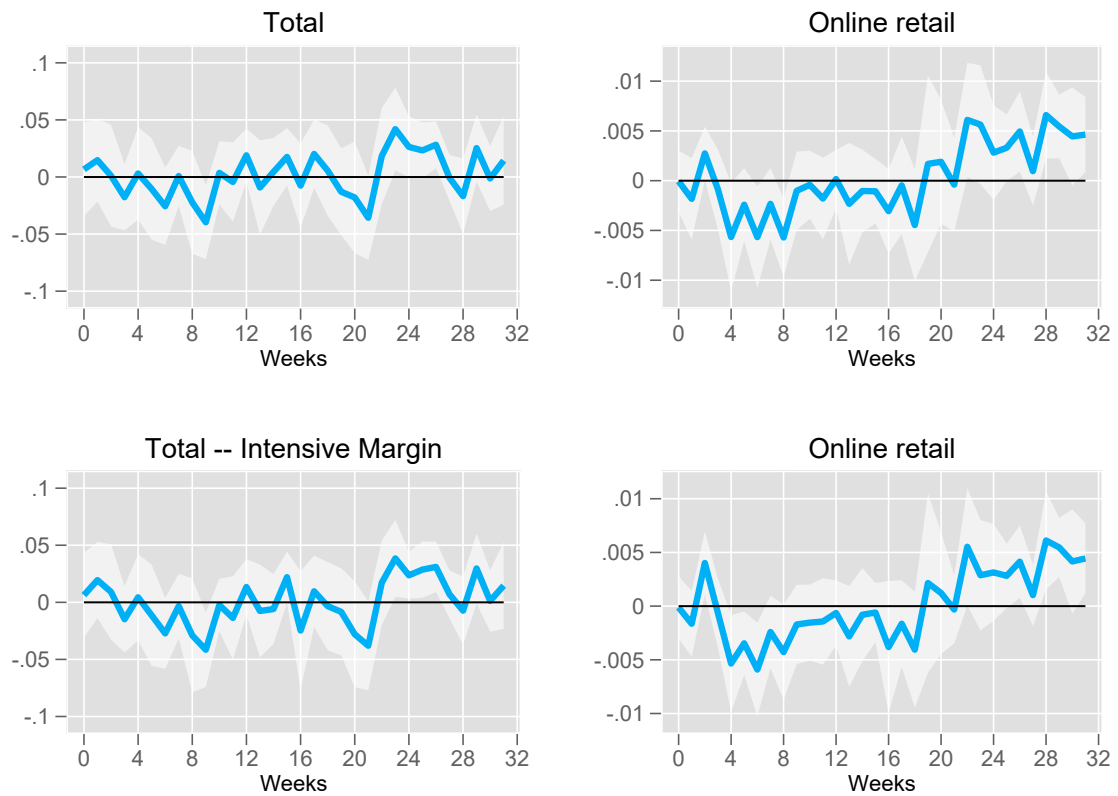


Figure A.6 shows the impulse responses from our local projection analysis when we include time fixed effects. Qualitatively, the results are similar but the shock takes a longer time to propagate to birth rates when only regional variation is used. One interpretation is that firms are faster to enter in response to national shocks to footfall, that have been absorbed by the fixed effect, then they are to idiosyncratic regional shocks.

Figure A.6: Local projection of entry on retail footfall

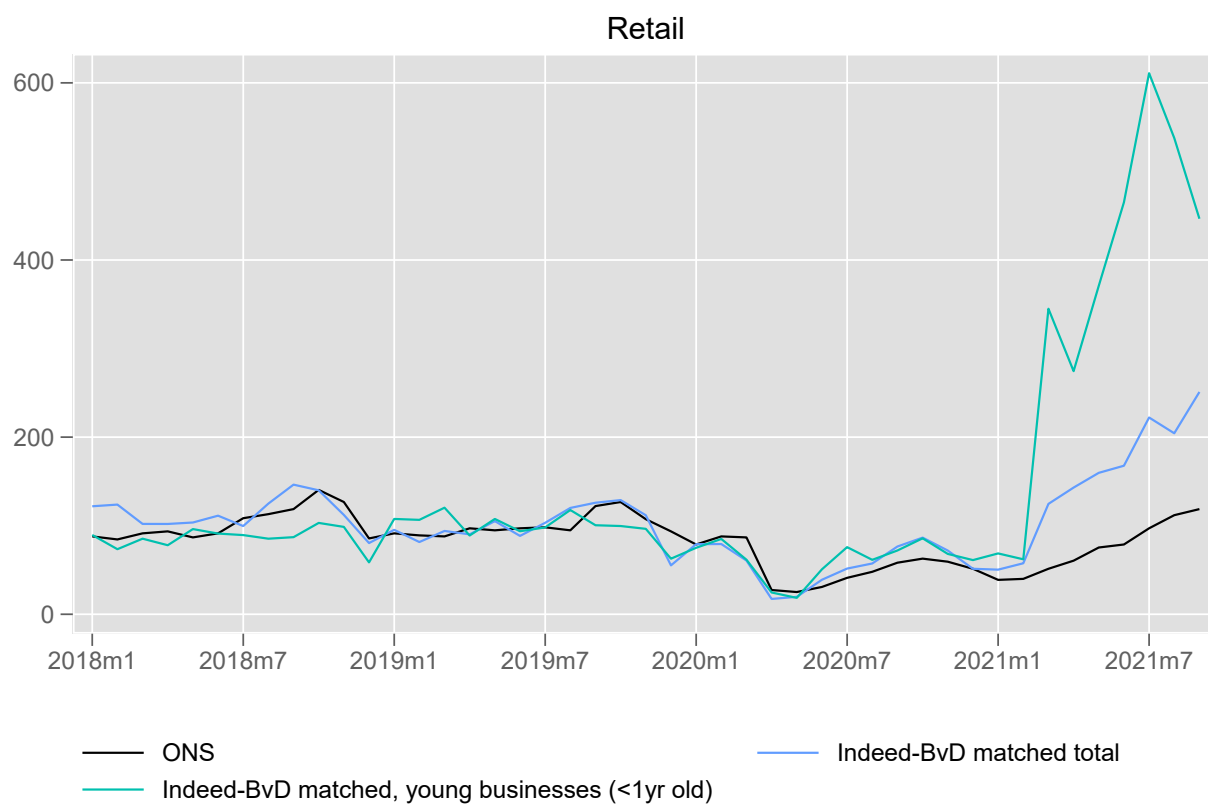


Note: standard errors are clustered at the county and week level. The light shaded area shows the 90% confidence interval.

Note: local projection of retail footfall on the change in birth rate. Regressions at the week and county level, including county and time fixed effects.

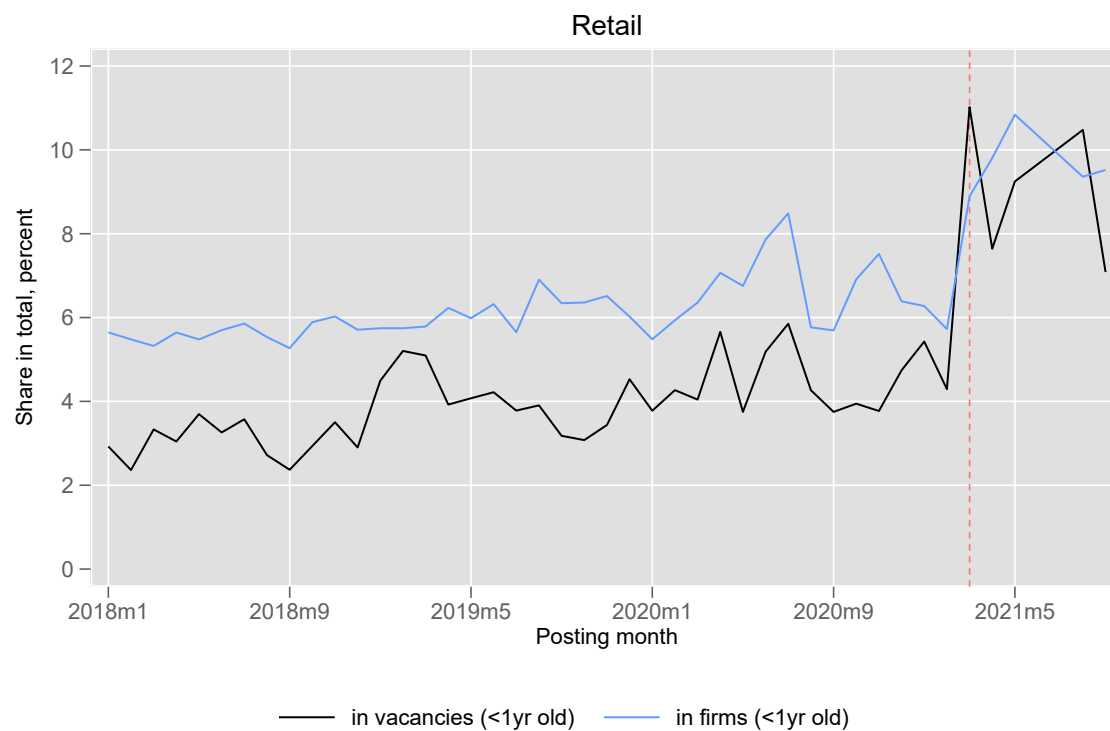
A.5 Additional results using Indeed data:

Figure A.7: Vacancies by data source and posting date, retail sector, 2019=100



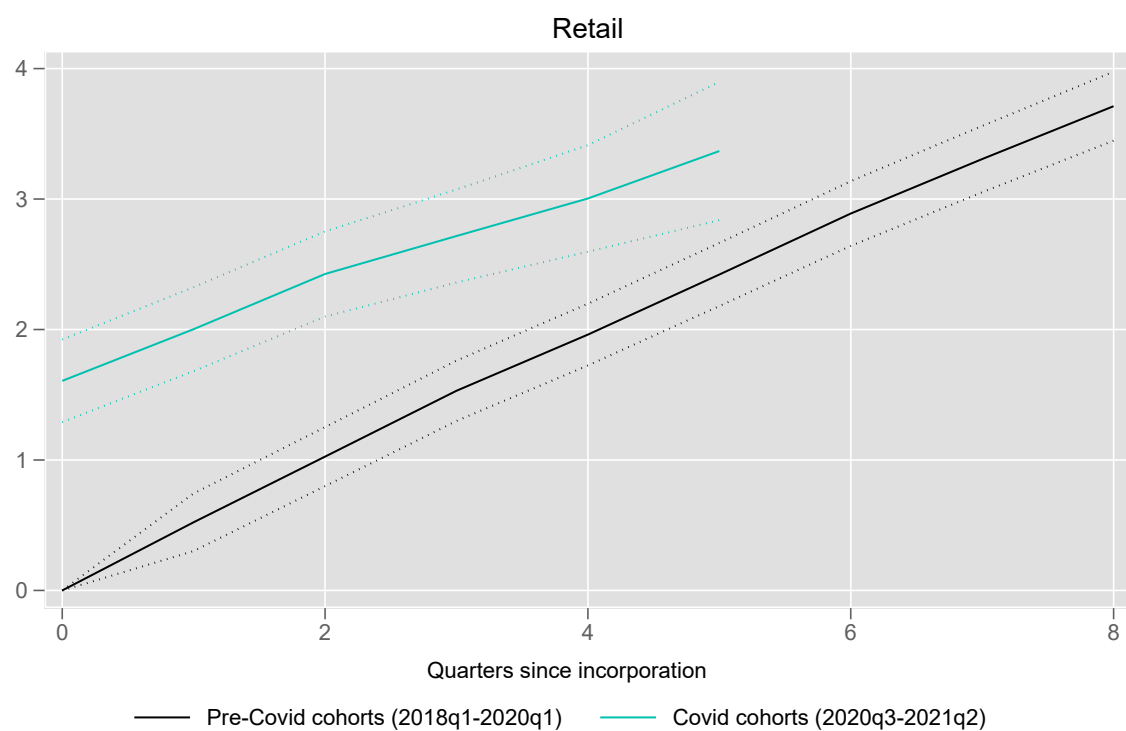
Source: Authors' calculations using Indeed and ONS Vacancy Survey data monthly experimental data.

Figure A.8: Share of young businesses in total vacancies and total firms posting vacancies, by posting month, retail sector



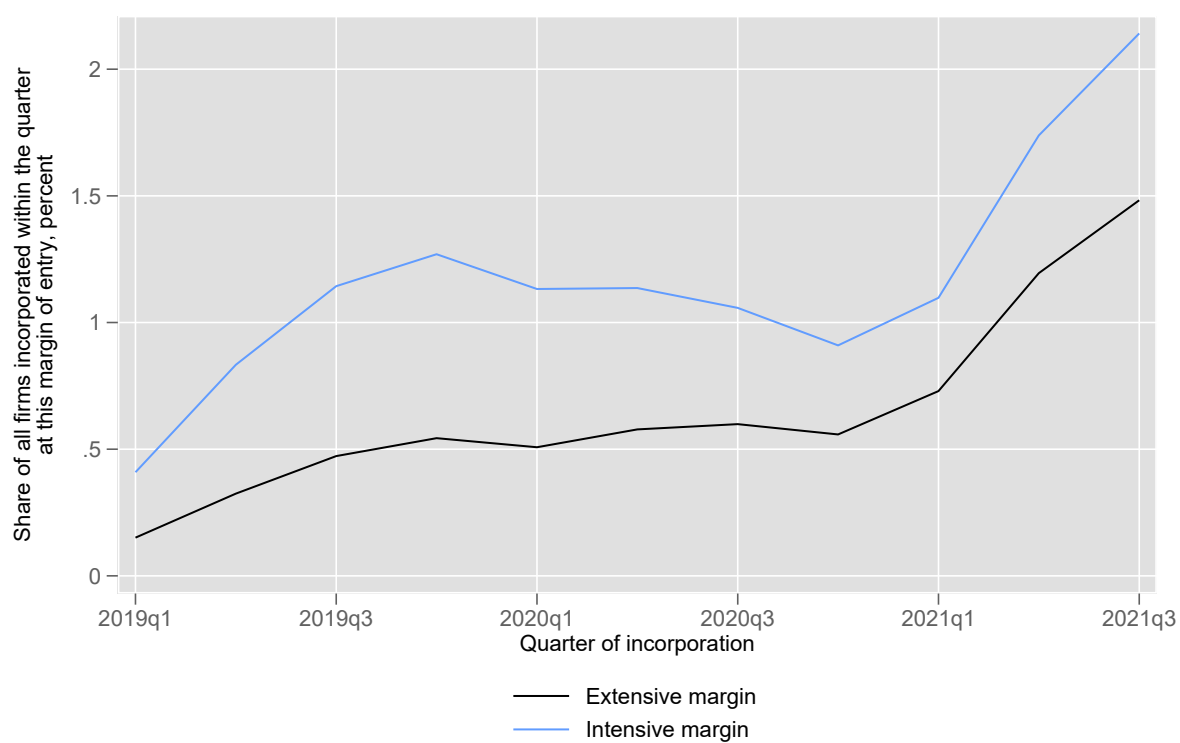
Source: authors' calculations using matched Indeed and BvD-FAME data. Note: firms on the right of the red vertical line were born during COVID-19 (post march 2020).

Figure A.9: Cumulative share of firms posting a vacancy by quarter since incorporation: cohort analysis pre/post COVID, retail sector



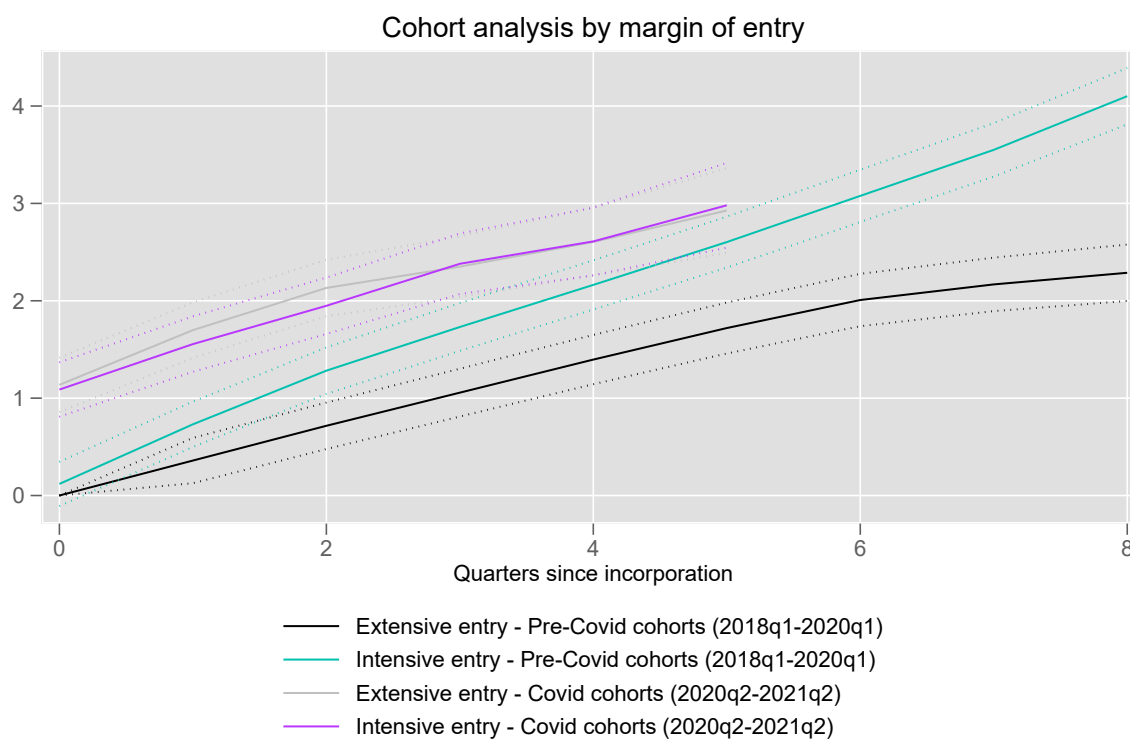
Note: This figure plots the age-cohort fixed effects of a regression of the cumulative share of being an employer in Indeed in each quarter on a age-cohort and time fixed effects. The base level is age zero for the pre-COVID cohort. Dotted lines plot the 90% confidence interval.

Figure A.10: Share of all firms incorporated posting a vacancy in Indeed, by quarter of incorporation and by margin of entry



Source: authors' calculations using BvD-Indeed matched dataset.

Figure A.11: Cumulative share of firms posting a vacancy by quarter since incorporation: cohort analysis pre/post COVID and at the intensive/extensive margins



Source: authors' calculations using BvD-Indeed matched dataset. Note: This figure plots the age-cohort fixed effects of a regression of the cumulative share of being an employer in Indeed in each quarter by 2-digit sector on a age-cohort and sector-time fixed effects. The base level is age zero for the pre-COVID retail cohort at the extensive margin.