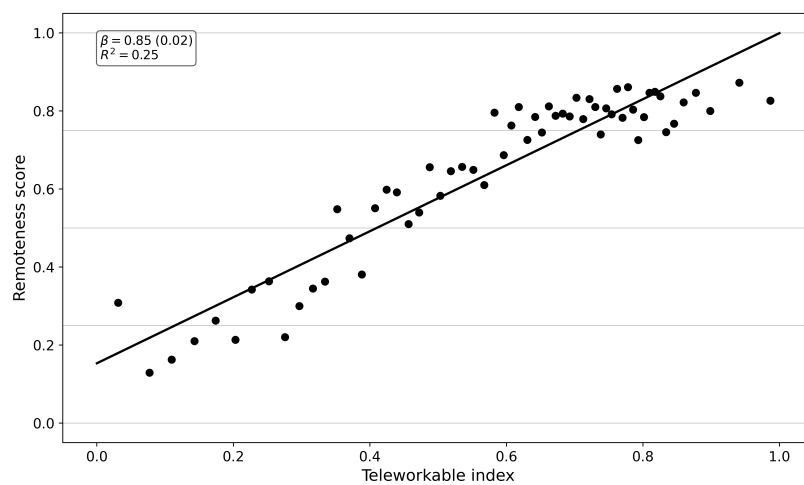# 1 Figures



$\beta = 0.85 \ (0.02)$
$R^2 = 0.25$

Figure 1: Remote v. Teleworkabe Scores
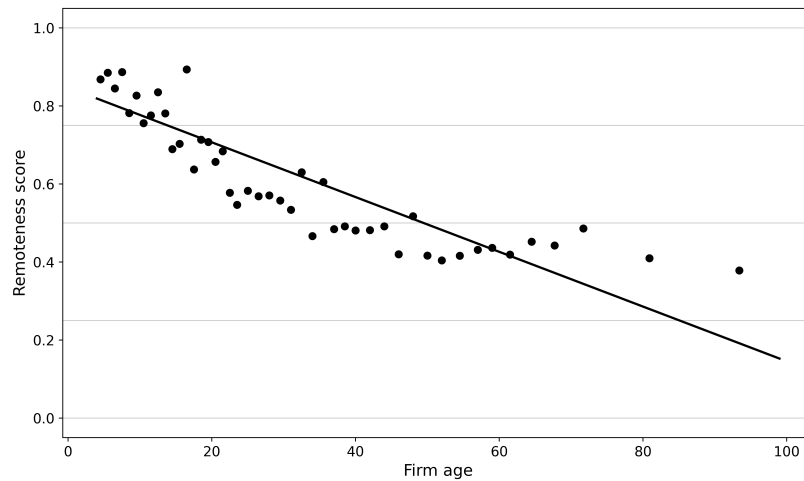


Figure 2: Remote v. Firm Age

# 2 Table of Means

Table 1: Table of Means

|  | Startup | Incumbent | All Firms |
|---|---|---|---|
| **Panel A: Firm-level** | | | |
| Growth | 0.20 | 0.06 | 0.09 |
|  | (0.31) | (0.16) | (0.22) |
| Leave | 0.26 | 0.21 | 0.22 |
|  | (0.31) | (0.28) | (0.29) |
| Join | 0.35 | 0.17 | 0.22 |
|  | (0.32) | (0.18) | (0.24) |
| Teleworkable Score (0–1) | 0.67 | 0.54 | 0.57 |
|  | (0.18) | (0.25) | (0.24) |
| Remote Score (0–1) | 0.85 | 0.57 | 0.64 |
|  | (0.30) | (0.41) | (0.40) |
| Employees (Count) | 271 | 2740 | 2126 |
|  | (1432) | (9555) | (8380) |
| Age | 7 | 43 | 34 |
|  | (2) | (34) | (33) |
| Rent ($/sq ft) | 49 | 37 | 40 |
|  | (21) | (19) | (20) |
| Centrality Score | 1419 | 949 | 1066 |
|  | (1830) | (1309) | (1470) |
| Seniority Levels (Count) | 3.62 | 3.86 | 3.80 |
|  | (0.77) | (0.50) | (0.59) |
| Number of firms | 878 | 2630 | 3508 |
| Observations | 10450 | 31530 | 41980 |
| **Panel B: User-level** | | | |
| Total Contributions | 526.52 | 311.88 | 355.99 |
|  | (932.95) | (470.01) | (601.57) |
| Restricted Contributions | 468.96 | 231.83 | 280.56 |
|  | (887.00) | (407.75) | (550.40) |
| Number of firms | 379 | 759 | 1138 |
| Number of users | 1210 | 4051 | 4820 |
| Observations | 10896 | 42124 | 53020 |

*Notes*: Panel A is on firm–period observations. Its bottom rows ("Number of firms" and "Observations") define the sample; above are mean (SD) across firm–periods. Panel B is based on worker–period observations and ends with three rows: "Number of firms", "Number of users", and "N" (worker–period observations). *Growth*, *Leave*, and *Join* rates are fractions between 0 and 1. *Teleworkable* and *Remote* scores are index values between 0 and 1. The sample period spans 2016 H2–2022 H1 at the firm level and 2017 H1–2022 H1 at the user level.

# 3 Mechanisms

We begin with the "base" specification:

$$y_{it} = \alpha + \beta_1 \left(remote_i \times covid_t\right) + \beta_2 \left(remote_i \times covid_t \times startup_i\right)$$
$$+ \delta \left(covid_t \times startup_i\right) + \mathrm{FE}_{it} + \varepsilon_{it},$$

which captures how the outcome responds to remote work during COVID and whether that effect differs in young firms.

In the **rent** "mirror" model we add two additional channels:

$$y_{it} = \alpha + \beta_1 \left(remote_i \times covid_t\right) + \beta_2 \left(remote_i \times covid_t \times startup_i\right)$$
$$+ \delta \left(covid_t \times startup_i\right) + \gamma_1 \left(covid_t \times rent_i\right) + \gamma_2 \left(remote_i \times covid_t \times rent_i\right)$$
$$+ \mathrm{FE}_{it} + \varepsilon_{it},$$

so that $\gamma_1$ and $\gamma_2$ capture how both the baseline COVID effect and the remote-work premium vary with local office rents.

Likewise, the **centrality** (HHI) model adds:

$$y_{it} = \alpha + \beta_1 \left(remote_i \times covid_t\right) + \beta_2 \left(remote_i \times covid_t \times startup_i\right)$$
$$+ \delta \left(covid_t \times startup_i\right) + \gamma_1 \left(covid_t \times hhi_i\right) + \gamma_2 \left(remote_i \times covid_t \times hhi_i\right)$$
$$+ \mathrm{FE}_{it} + \varepsilon_{it}.$$

By turning on each check-mark (rent, centrality, seniority) one at a time—and then in combination—we "mirror" the base COVID×Remote specification through different mechanisms.

## 3.1 User Productivity Mechanisms

Table 2: User Productivity Mechanisms

| Specification | Total Contributions | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Baseline | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Rent | | ✓ | | ✓ | | ✓ | | ✓ |
| HHI | | | ✓ | ✓ | | | ✓ | ✓ |
| Seniority | | | | | ✓ | ✓ | ✓ | ✓ |
| **Panel A: OLS** | | | | | | | | |
| Remote × $\mathbb{1}$(Post) | -2.66*** | 0.18 | -2.52* | 1.14 | 12.69 | 14.73 | 16.23 | 19.07 |
| | (0.99) | (2.33) | (1.30) | (2.45) | (11.42) | (11.41) | (11.83) | (11.83) |
| Remote × $\mathbb{1}$(Post) × Startup | 9.18*** | 8.50*** | 8.33*** | 8.47*** | 8.09*** | 7.93*** | 7.60*** | 7.75*** |
| | (2.69) | (2.74) | (2.92) | (2.92) | (2.76) | (2.79) | (2.95) | (2.95) |
| N | 52,995 | 51,392 | 51,392 | 51,392 | 51,392 | 51,392 | 51,392 | 51,392 |
| **Panel B: IV** | | | | | | | | |
| Remote × $\mathbb{1}$(Post) | -17.36** | -662.28 | 123.22 | -312.49 | -21312.51 | 160.32 | 957.68 | -267.63 |
| | (8.72) | (1258.52) | (577.60) | (1438.40) | (66029.30) | (922.16) | (3030.76) | (3882.03) |
| Remote × $\mathbb{1}$(Post) × Startup | 31.85*** | 117.04 | 211.08 | 238.68 | -47.81 | 70.47 | -107.21 | 227.12 |
| | (12.28) | (170.78) | (709.68) | (398.71) | (427.16) | (66.79) | (379.62) | (1235.02) |
| N | 52,995 | 47,771 | 47,771 | 47,771 | 47,771 | 47,771 | 47,771 | 47,771 |
| KP rk Wald F | 26.05 | 0.09 | 0.02 | 0.04 | 0.03 | 0.08 | 0.05 | 0.00 |

## 3.2 Firm Mechanisms

Table 3: Firm Scaling Mechanisms

| | Growth | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Specification | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Baseline | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Rent | | ✓ | | ✓ | | ✓ | | ✓ |
| HHI | | | ✓ | ✓ | | | ✓ | ✓ |
| Seniority | | | | | ✓ | ✓ | ✓ | ✓ |
| **Panel A: OLS** | | | | | | | | |
| Remote $\times$ $\mathbb{1}$(Post) | 0.00 | 0.01 | -0.02*** | -0.02 | 0.03 | 0.03 | -0.02 | -0.02 |
| | (0.00) | (0.01) | (0.01) | (0.01) | (0.02) | (0.02) | (0.03) | (0.03) |
| Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup | 0.07*** | 0.07*** | 0.06** | 0.06** | 0.07*** | 0.07*** | 0.06*** | 0.06** |
| | (0.02) | (0.03) | (0.02) | (0.03) | (0.02) | (0.02) | (0.02) | (0.02) |
| N | 41,980 | 38,760 | 38,760 | 38,760 | 38,760 | 38,760 | 38,760 | 38,760 |
| **Panel B: IV** | | | | | | | | |
| Remote $\times$ $\mathbb{1}$(Post) | 0.01 | -0.13*** | -0.05* | -0.17*** | -0.01 | -0.14* | -0.15** | -0.27*** |
| | (0.01) | (0.05) | (0.03) | (0.05) | (0.07) | (0.08) | (0.07) | (0.08) |
| Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup | 0.21** | 0.20* | 0.08 | 0.07 | 0.17 | 0.16 | 0.09 | 0.09 |
| | (0.10) | (0.11) | (0.11) | (0.11) | (0.10) | (0.10) | (0.11) | (0.11) |
| N | 41,980 | 38,760 | 38,760 | 38,760 | 38,760 | 38,760 | 38,760 | 38,760 |
| KP rk Wald F | 16.53 | 10.68 | 10.28 | 8.00 | 9.25 | 8.00 | 7.75 | 6.33 |

# 4 Firm Scaling

## 4.1 OLS

Table 4: Firm Scaling OLS

**Panel A: FE Variants**

|  | Growth | | | |
|---|---|---|---|---|
|  | (1) | (2) | (3) | (4) |
| Remote $\times$ $\mathbb{1}$(Post) | 0.00 | 0.00 | 0.00 | 0.00 |
|  | (0.00) | (0.00) | (0.00) | (0.00) |
| Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup | 0.07*** | 0.07*** | 0.07*** | 0.07*** |
|  | (0.02) | (0.02) | (0.02) | (0.02) |
| Time FE |  |  | ✓ | ✓ |
| Firm FE |  | ✓ |  | ✓ |
| N | 41,980 | 41,980 | 41,980 | 41,980 |

**Panel B: Base Specification**

|  | Outcome | | |
|---|---|---|---|
|  | Growth | Join | Leave |
| Remote $\times$ $\mathbb{1}$(Post) | 0.00 | 0.01** | 0.02*** |
|  | (0.00) | (0.00) | (0.00) |
| Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup | 0.07*** | 0.05* | -0.01 |
|  | (0.02) | (0.03) | (0.01) |
| N | 41,980 | 41,980 | 41,980 |

## 4.2 Instrumental Variables

Table 5: Firm Scaling IV

**Panel A: FE Variants**

| | Growth | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Remote $\times$ $\mathbb{1}$(Post) | 0.01 | 0.01 | 0.01 | 0.01 |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup | 0.20 | 0.21** | 0.20** | 0.21** |
| | (0.10) | (0.10) | (0.10) | (0.10) |
| Time FE | | | ✓ | ✓ |
| Firm FE | | ✓ | | ✓ |
| N | 41,980 | 41,980 | 41,980 | 41,980 |
| KP rk Wald F | 8.26 | 16.53 | 8.26 | 16.53 |

**Panel B: Base Specification**

| | Outcome | | |
|---|---|---|---|
| | Growth | Join | Leave |
| Remote $\times$ $\mathbb{1}$(Post) | 0.01 | 0.04*** | 0.05*** |
| | (0.01) | (0.01) | (0.01) |
| Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup | 0.21** | 0.23** | 0.09 |
| | (0.10) | (0.11) | (0.06) |
| N | 41,980 | 41,980 | 41,980 |
| KP rk Wald F | 16.53 | 16.53 | 16.53 |

## 4.3 First Stage

Table 6: First-Stage Estimates – Firm Scaling

| | Remote $\times$ $\mathbb{1}$(Post) | Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup |
|---|---|---|
| Teleworkable $\times$ $\mathbb{1}$(Post) | 0.826*** | -0.000 |
| | (0.028) | (0.000) |
| Teleworkable $\times$ $\mathbb{1}$(Post) $\times$ Startup | -0.412*** | 0.414*** |
| | (0.077) | (0.072) |
| $\mathbb{1}$(Post) $\times$ Startup | 0.455*** | 0.575*** |
| | (0.055) | (0.052) |
| Time FE | ✓ | ✓ |
| Firm FE | ✓ | ✓ |
| Partial F | 437.86 | 16.54 |
| N | 41,980 | 41,980 |

# 5 User Productivity

## 5.1 OLS

Table 7: User Productivity – OLS

**Panel A: FE Variants**

| | Total Contributions | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Remote × $\mathbb{1}$(Post) | -1.29 (1.05) | -2.38** (1.01) | -1.29 (1.05) | -2.38** (1.01) | -2.66*** (0.99) | -2.79*** (0.99) |
| Remote × $\mathbb{1}$(Post) × Startup | 2.74 (2.92) | 6.19** (2.82) | 2.75 (2.92) | 6.20** (2.82) | 9.18*** (2.69) | 9.77*** (2.68) |
| Time FE | | | ✓ | ✓ | ✓ | ✓ |
| Firm FE | | ✓ | | ✓ | ✓ | |
| User FE | | | | | ✓ | |
| Firm × User FE | | | | | | ✓ |
| N | 53,020 | 52,995 | 53,020 | 52,995 | 52,995 | 52,718 |

**Panel B: Base Specification**

| | Outcome | |
|---|---|---|
| | Total | Restricted |
| Remote × $\mathbb{1}$(Post) | -2.66*** (0.99) | -1.96** (0.99) |
| Remote × $\mathbb{1}$(Post) × Startup | 9.18*** (2.69) | 8.30*** (2.62) |
| N | 52,995 | 52,995 |

## 5.2 Instrumental Variables

Table 8: User Productivity – IV

**Panel A: FE Variants**

| | Total Contributions | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Remote $\times \mathbb{1}$(Post) | -306.40 (246.93) | -18.75** (9.01) | -306.96 (247.32) | -18.76** (9.01) | -17.36** (8.72) | -19.30** (8.79) |
| Remote $\times \mathbb{1}$(Post) $\times$ Startup | 2265.39 (4881.21) | 38.28*** (13.01) | 2264.90 (4882.69) | 38.30*** (13.02) | 31.85*** (12.28) | 33.67*** (12.32) |
| Time FE | | | ✓ | ✓ | ✓ | ✓ |
| Firm FE | | ✓ | | ✓ | ✓ | |
| User FE | | | | | ✓ | |
| Firm $\times$ User FE | | | | | | ✓ |
| N | 49,287 | 52,995 | 49,287 | 52,995 | 52,995 | 52,718 |
| KP rk Wald F | 0.04 | 27.41 | 0.04 | 27.41 | 26.05 | 25.60 |

**Panel B: Base Specification**

| | Outcome | |
| --- | --- | --- |
| | Total | Restricted |
| Remote $\times \mathbb{1}$(Post) | -17.36** (8.72) | -19.25** (8.88) |
| Remote $\times \mathbb{1}$(Post) $\times$ Startup | 31.85*** (12.28) | 34.94*** (12.13) |
| N | 52,995 | 52,995 |
| KP rk Wald F | 26.05 | 26.05 |

## 5.3 First Stage

Table 9: First-Stage Estimates – User Productivity

| | Remote $\times$ $\mathbb{1}$(Post) | Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup |
|---|---|---|
| Teleworkable $\times$ $\mathbb{1}$(Post) | 0.25*** | 0.00*** |
| | (0.03) | (0.00) |
| Teleworkable $\times$ $\mathbb{1}$(Post) $\times$ Startup | 0.09 | 0.34*** |
| | (0.05) | (0.04) |
| $\mathbb{1}$(Post) $\times$ Startup | 0.14*** | 0.65*** |
| | (0.04) | (0.03) |
| Time FE | ✓ | ✓ |
| Firm FE | ✓ | ✓ |
| User FE | ✓ | ✓ |
| Partial F | 60.08 | 36.85 |
| N | 52,995 | 52,995 |

# 6   Dynamic Event-Study Evidence
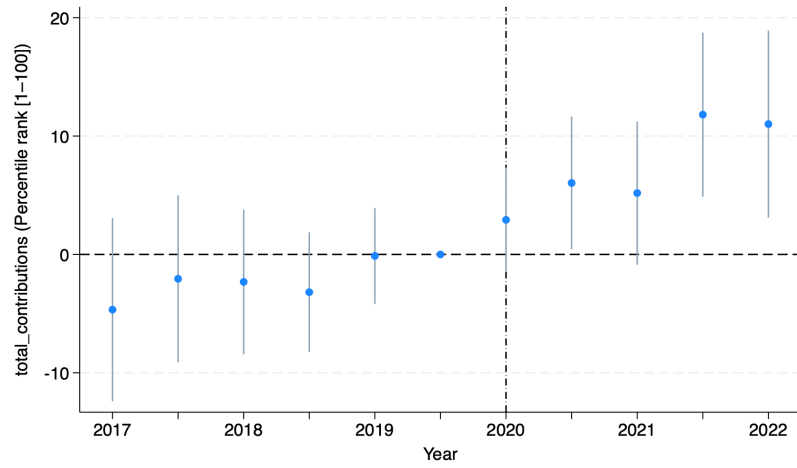


Figure 3: *
OLS – Total Contributions
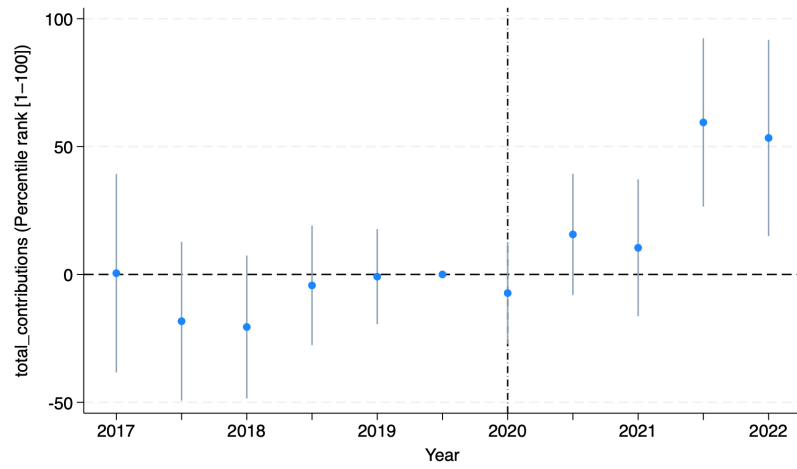


Figure 4: *
IV – Total Contributions

13
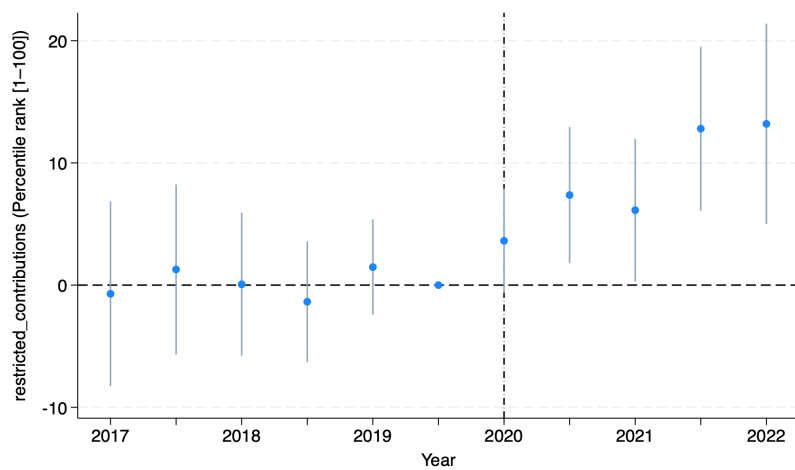
Figure 5: *
OLS – Restricted Contributions
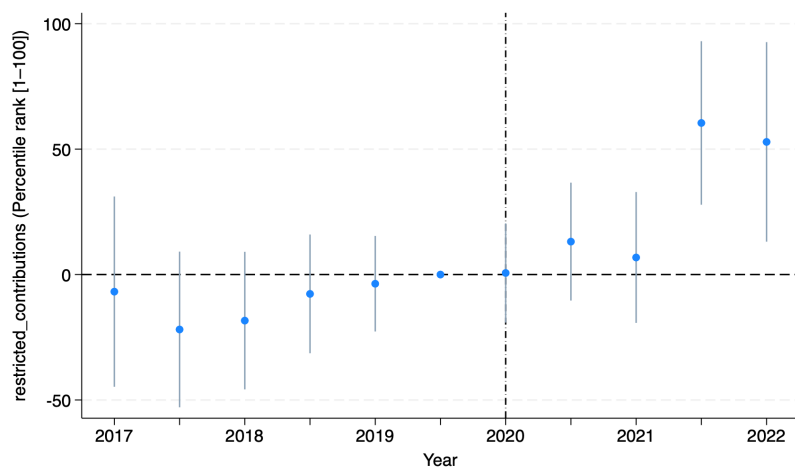


Figure 6: *
IV – Restricted Contributions

14
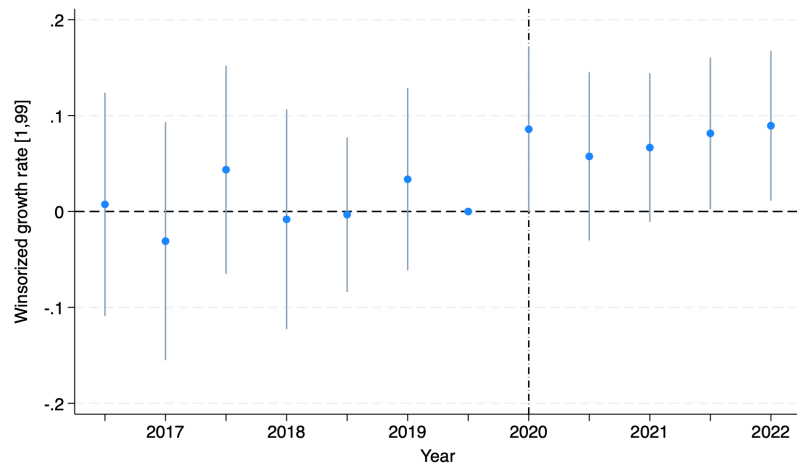
Figure 7: *
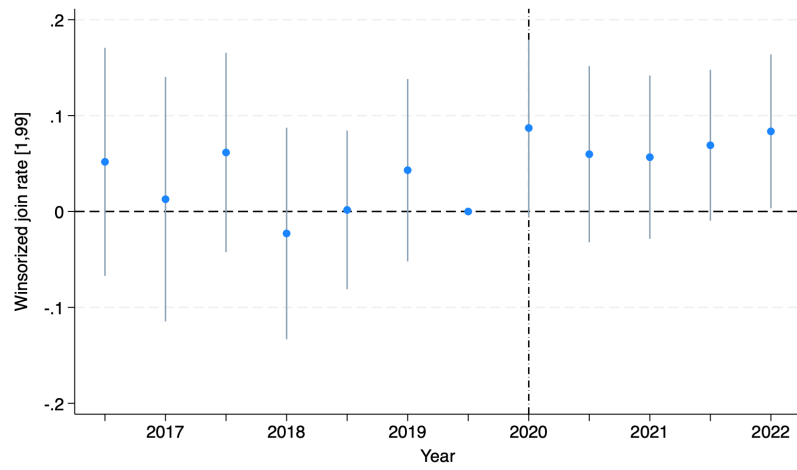OLS – Employment Growth
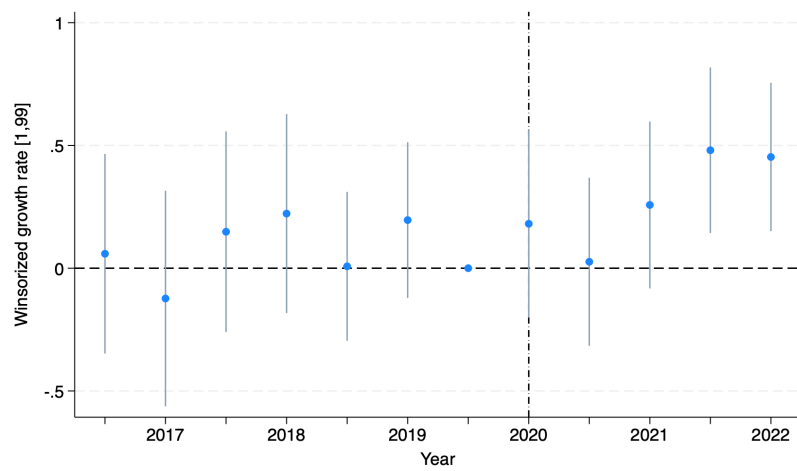


Figure 8: *
IV – Employment Growth

Figure 9: *
OLS − Join Rate



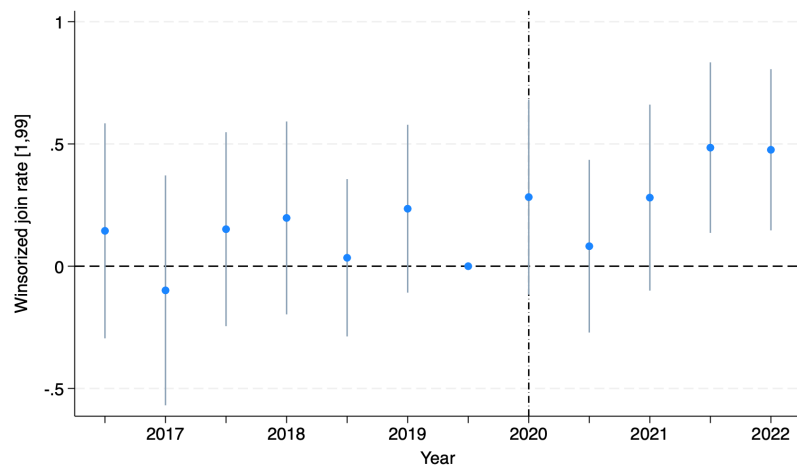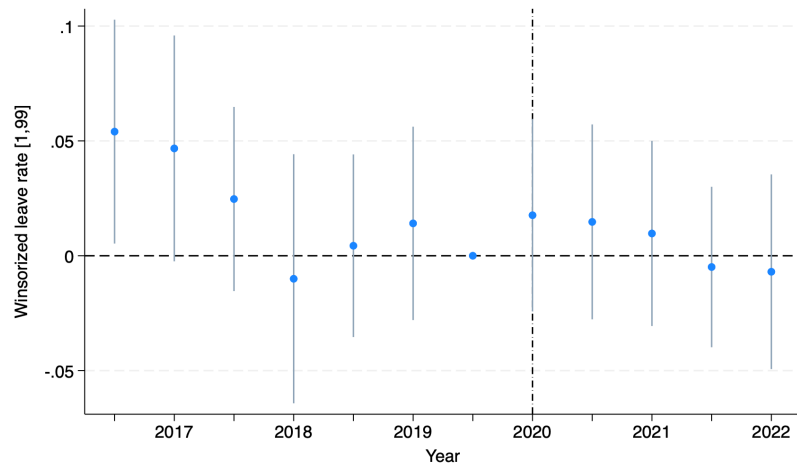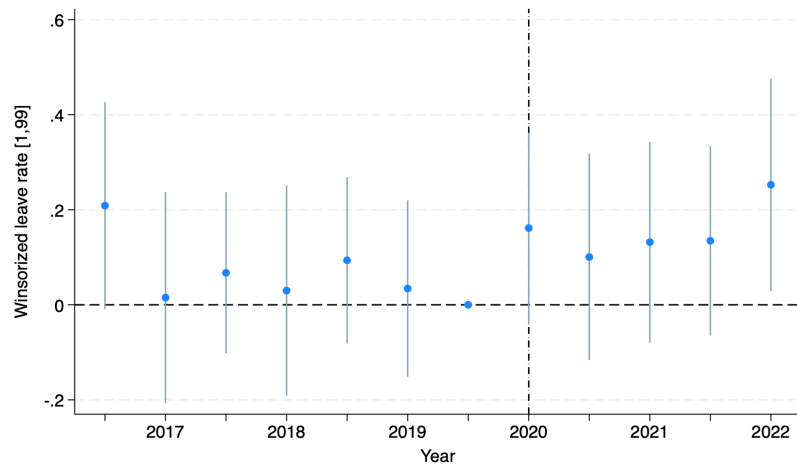Figure 10: *
IV − Join Rate

16

Figure 11: *
OLS – Leave Rate



Figure 12: *
IV – Leave Rate