Figures

Figure 1: Firm Age and Remote Work
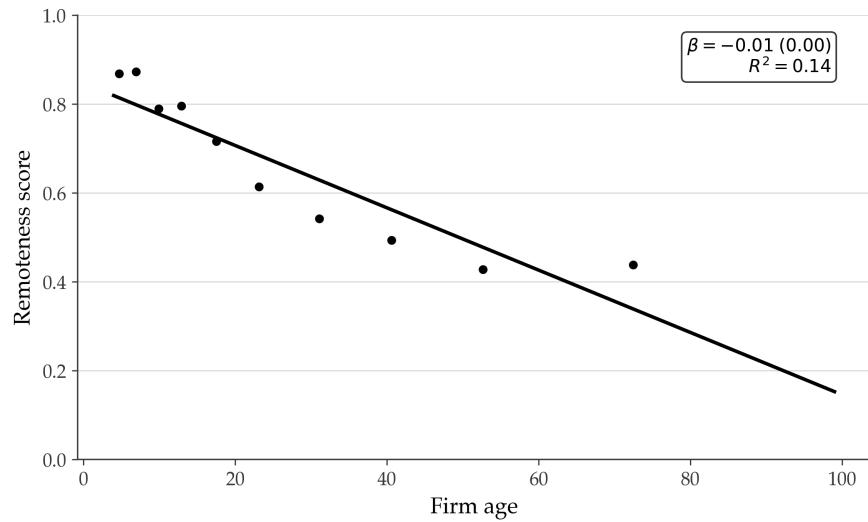

Figure 2: Telework Index and Remote Work
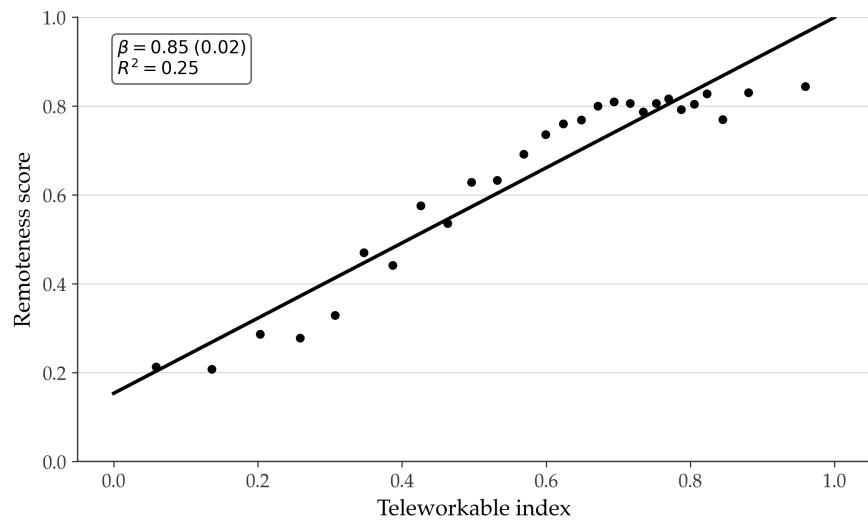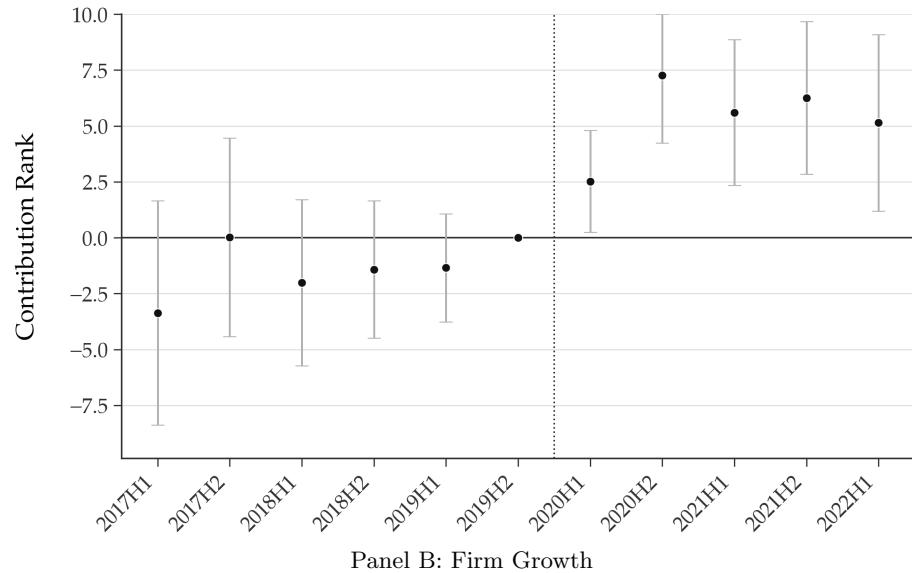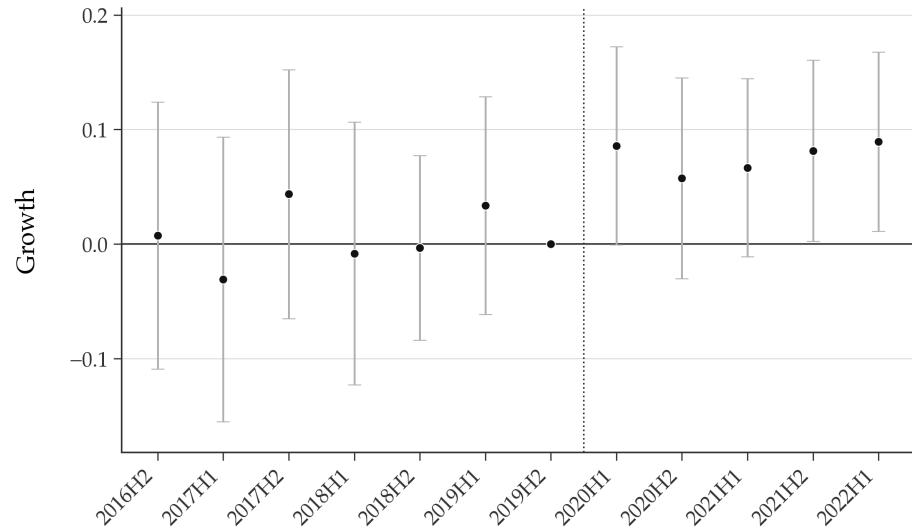
Figure 3: Event Study of Key Outcomes

Panel A: User Productivity

Panel B: Firm Growth

Tables

Table 1: Summary Statistics

	Startup	Established	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: Individual-level			
Total Contributions	362.95	192.73	225.70
	(817.44)	(522.28)	(594.89)
Restricted Contributions	320.05	139.96	174.84
	(746.65)	(359.56)	(466.14)
Number of firms	721	1503	2224
Number of individuals	8338	31993	37186
Observations	44801	186504	231305

Notes:

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Table 2: Remote Work and Individual Productivity – OLS

	Contribution Rank			Total
	(1)	(2)	(3)	(4)
Panel A: OLS				
Remote $\times$ $\mathbb{1}$(Post)	-0.28	-1.03**	-1.23**	-19.74***
	(0.44)	(0.48)	(0.50)	(4.66)
Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup	–	5.18***	6.21***	59.23***
		(1.24)	(1.27)	(14.22)
Pre-Covid Mean	49.92	49.92	49.92	184.71
N	229,862	229,862	224,708	224,708
Fixed Effects				
Time	✓	✓	✓	✓
Firm	✓	✓		
Individual	✓	✓		
Firm $\times$ Individual			✓	✓

Notes:

Table 3: Remote Work and Individual Productivity – IV

	Contribution Rank			Total
	(1)	(2)	(3)	(4)
Panel B: IV				
Remote $\times$ $\mathbb{1}$(Post)	-3.61	-7.15*	-9.26**	-124.39***
	(2.82)	(3.90)	(4.01)	(33.82)
Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup	–	9.94*	12.45**	130.92**
		(5.37)	(5.39)	(55.14)
Pre-Covid Mean	49.92	49.92	49.92	184.71
KP rk Wald F	543.26	140.60	123.43	123.43
N	229,862	229,862	224,708	224,708
Fixed Effects				
Time	✓	✓	✓	✓
Firm	✓	✓		
Individual	✓	✓		
Firm $\times$ Individual			✓	✓

Notes:

4

Table 4: Firm Scaling

	Growth		Join	Leave
	(1)	(2)	(3)	(4)
Panel A: OLS				
Remote $\times$ $\mathbb{1}$(Post)	0.01**	0.00	0.01**	0.02***
	(0.01)	(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)
Pre-Covid Mean	0.11	0.11	0.24	0.14
N	41,980	41,980	41,980	41,980
Panel B: IV				
Remote $\times$ $\mathbb{1}$(Post)	0.02*	0.01	0.04***	0.05***
	(0.01)	(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)
KP rk Wald F	839.65	16.53	16.53	16.53
N	41,980	41,980	41,980	41,980
Fixed Effects				
Time	✓	✓	✓	✓
Firm	✓	✓	✓	✓

Notes:

Table 5: Job Posting Outcomes

	Postings	Hires/ Posting	Any Postings
	(1)	(2)	(3)
Panel A: OLS			
Remote × 𝟙(Post)	-0.91***	0.09	0.06***
	(0.23)	(0.08)	(0.01)
Remote × 𝟙(Post) × Startup	0.63**	0.37*	-0.02
	(0.27)	(0.22)	(0.04)
Pre-Covid Mean	0.50	2.15	0.76
N	37,681	27,790	37,681
Panel B: IV			
Remote × 𝟙(Post)	-3.58***	0.38**	0.06**
	(0.61)	(0.17)	(0.02)
Remote × 𝟙(Post) × Startup	1.60*	2.16**	0.23
	(0.96)	(1.09)	(0.18)
KP rk Wald F	10.66	9.04	10.66
N	37,681	27,790	37,681
Fixed Effects			
Time	✓	✓	✓
Firm	✓	✓	✓

Notes:

Table 6: Individual Productivity Mechanisms

	Contribution Rank					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: OLS						
Remote $\times$ $\mathbb{1}$(Post)	-1.21**	-1.23**	-0.95*	-1.22**	-1.19**	-0.91*
	(0.50)	(0.50)	(0.51)	(0.50)	(0.50)	(0.52)
Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup	6.24***	6.21***	4.03***	6.39***	6.15***	4.21***
	(1.29)	(1.27)	(1.26)	(1.28)	(1.28)	(1.29)
N	224,708	224,708	218,112	224,596	224,708	218,032
Panel B: IV						
Remote $\times$ $\mathbb{1}$(Post)	-3.68	-9.26**	-9.23*	-9.72**	-9.28**	-10.13**
	(3.88)	(4.01)	(4.87)	(3.93)	(4.12)	(5.14)
Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup	6.88	12.45**	11.76*	14.94***	12.30**	14.97**
	(5.65)	(5.39)	(6.15)	(5.62)	(5.52)	(6.91)
N	224,708	224,708	218,112	224,596	224,708	218,032
KP rk Wald F	134.89	123.43	81.62	130.14	117.48	74.32
Fixed Effects						
Time	✓	✓	✓	✓	✓	✓
Firm $\times$ Individual	✓	✓	✓	✓	✓	✓
Controls						
Rent			✓			✓
HHI				✓		✓
Seniority					✓	✓
Firm Growth	✓					

Notes:

Table 7: Fully Remote Versus Hybrid Productivity

Sample Filter	Contribution Rank			
	Hybrid		Hybrid / In-Person	
	(1)	(2)	(3)	(4)
Panel A: OLS				
$\mathbb{1}(\text{Remote}) \times \mathbb{1}(\text{Post})$	-0.97***	-0.76**	-0.86***	-0.67**
	(0.32)	(0.31)	(0.31)	(0.30)
$\mathbb{1}(\text{Remote}) \times \mathbb{1}(\text{Post}) \times \text{Startup}$	2.97***	2.44***	3.39***	2.81***
	(0.72)	(0.71)	(0.71)	(0.69)
Pre-Covid Mean	50.04	50.04	49.92	49.92
N	210,721	215,332	224,708	229,862
Panel B: IV				
$\mathbb{1}(\text{Remote}) \times \mathbb{1}(\text{Post})$	-3.72**	-2.71*	-4.11**	-3.09*
	(1.74)	(1.64)	(1.77)	(1.68)
$\mathbb{1}(\text{Remote}) \times \mathbb{1}(\text{Post}) \times \text{Startup}$	4.37*	3.39	5.61**	4.38*
	(2.50)	(2.45)	(2.45)	(2.41)
KP rk Wald F	292.85	351.60	311.51	371.38
N	210,721	215,332	224,708	229,862
Fixed Effects				
Time	✓	✓	✓	✓
Firm		✓		✓
Individual		✓		✓
Firm × Individual	✓		✓	

Notes:

Table 8: Remote Work and Imputed Wages: Fixed-Effect Variants

	Log salary		
	(1)	(2)	(3)
Panel A: OLS			
Remote $\times \mathbb{1}$(Post)	-0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
Remote $\times \mathbb{1}$(Post) $\times$ Startup	-0.00	-0.02**	-0.00
	(0.01)	(0.01)	(0.01)
Pre-Covid Mean	11.49	11.49	11.49
N	229,862	224,708	222,531
Panel B: IV			
Remote $\times \mathbb{1}$(Post)	-0.01	0.03	0.08***
	(0.02)	(0.02)	(0.01)
Remote $\times \mathbb{1}$(Post) $\times$ Startup	-0.04	-0.05*	-0.08***
	(0.03)	(0.03)	(0.02)
KP rk Wald F	140.60	123.43	127.26
N	229,862	224,708	222,531
Fixed Effects			
Time	✓	✓	✓
Firm	✓		
Individual	✓		
Firm $\times$ Individual		✓	✓
Title			✓

Notes:

Table 9: Remote Work and Top CSA Filters (Firm×Individual FE)

	Keep CSAs Ranked 1–5	Keep CSAs Ranked 1–10	Drop CSAs Ranked 1–5	Drop CSAs Ranked 1–10
	(1)	(2)	(3)	(4)
Panel A: OLS				
Remote × $\mathbb{1}$(Post)	-1.54**	-1.34**	-0.58	-1.48
	(0.68)	(0.57)	(0.75)	(1.00)
Remote × $\mathbb{1}$(Post) × Startup	5.59***	5.50***	7.44***	8.62***
	(1.64)	(1.45)	(2.16)	(2.73)
Pre-Covid Mean	49.73	50.50	50.28	48.03
N	151,831	174,809	71,906	49,211
Panel B: IV				
Remote × $\mathbb{1}$(Post)	-4.43	-7.52	-14.02*	-7.81**
	(5.20)	(9.92)	(7.52)	(3.45)
Remote × $\mathbb{1}$(Post) × Startup	-10.35	8.43	22.97***	13.06**
	(15.95)	(10.91)	(8.74)	(5.47)
Pre-Covid Mean	49.73	50.50	50.28	48.03
KP rk Wald F	9.60	20.76	26.29	185.42
N	151,831	174,809	71,906	49,211
Fixed Effects				
Time	✓	✓	✓	✓
Firm × Individual	✓	✓	✓	✓

Notes: Reports the firm×individual fixed-effect regressions from Tables 2–3 after filtering on firms' primary CBSA (the Scoop-identified location with the most employment spells in each half-year). The top-CSAs refer to the fourteen large software hubs in the CSA list we distribute with the data appendix. Column (1) keeps CSAs ranked 1–5; column (2) keeps CSAs ranked 6–14; column (3) drops CSAs ranked 1–5; column (4) drops CSAs ranked 1–14. Panels A and B present the OLS and IV coefficients (instrumenting the remote interactions with their teleworkability counterparts). Every specification absorbs half-year fixed effects, keeps the post×startup main effect, and clusters standard errors by worker.

Table 10: Productivity Heterogeneity by Worker Traits

	Contribution Rank	
	(1)	(2)
Panel A: OLS		
Remote $\times$ $\mathbb{1}$(Post)	-1.03**	-1.23**
	(0.48)	(0.50)
Remote $\times$ $\mathbb{1}$(Post) $\times$ Female	-2.54***	-2.18***
	(0.62)	(0.66)
Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup	5.18***	6.21***
	(1.24)	(1.27)
Remote $\times$ $\mathbb{1}$(Post) $\times$ Female $\times$ Startup	3.49	6.42*
	(3.41)	(3.85)
Panel B: IV		
Remote $\times$ $\mathbb{1}$(Post)	-7.15*	-9.26**
	(3.90)	(4.01)
Remote $\times$ $\mathbb{1}$(Post) $\times$ Female	-2.75***	-2.37***
	(0.72)	(0.77)
Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup	9.94*	12.45**
	(5.37)	(5.39)
Remote $\times$ $\mathbb{1}$(Post) $\times$ Female $\times$ Startup	5.67	21.98*
	(10.98)	(11.66)
Fixed Effects		
Time	✓	✓
Firm	✓	
Individual	✓	
Firm $\times$ Individual		✓

Notes:

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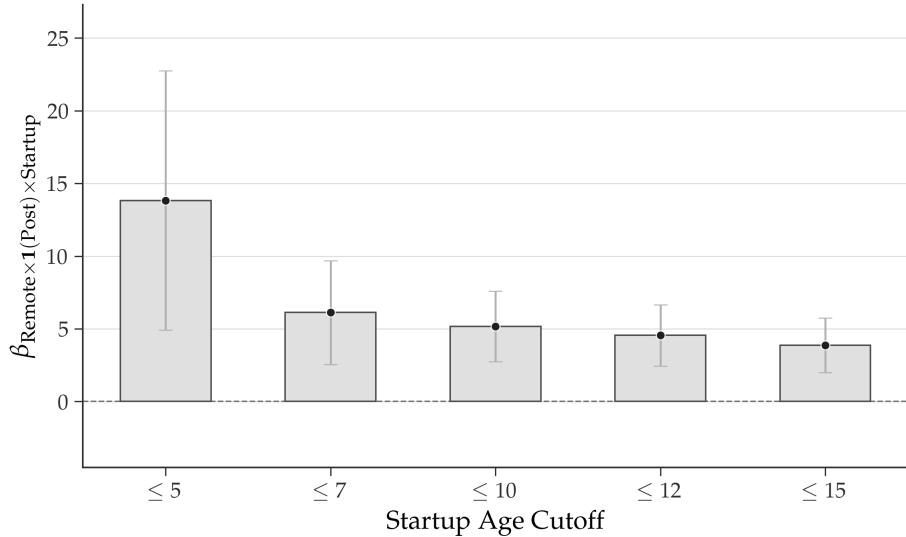
Table 11: Remote Work Outside Software and Hub Markets

| | Contribution Rank | | |
| | Drop NAICS | Drop SOC | Drop CA/NY |
Sample Filter	(1)	(2)	(3)
Panel A: OLS			
Remote $\times$ $\mathbb{1}$(Post)	-1.16**	-0.58	-0.85
	(0.52)	(0.70)	(0.69)
Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup	7.08***	6.47***	6.47***
	(1.38)	(1.89)	(2.08)
Pre-Covid Mean	49.11	48.47	49.01
N	207,857	123,122	109,314
Panel B: IV			
Remote $\times$ $\mathbb{1}$(Post)	-10.47**	-2.58	-12.70**
	(4.25)	(5.17)	(5.18)
Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup	13.07**	7.78	30.95***
	(5.63)	(7.45)	(10.98)
KP rk Wald F	111.33	70.48	72.09
N	207,857	123,122	109,314
Fixed Effects			
Time	✓	✓	✓
Firm $\times$ Individual	✓	✓	✓

Notes:

Figure A1: Startup Cutoff Visualization

Panel A: Contribution Rank (Total)

Panel B: Firm Growth Rate
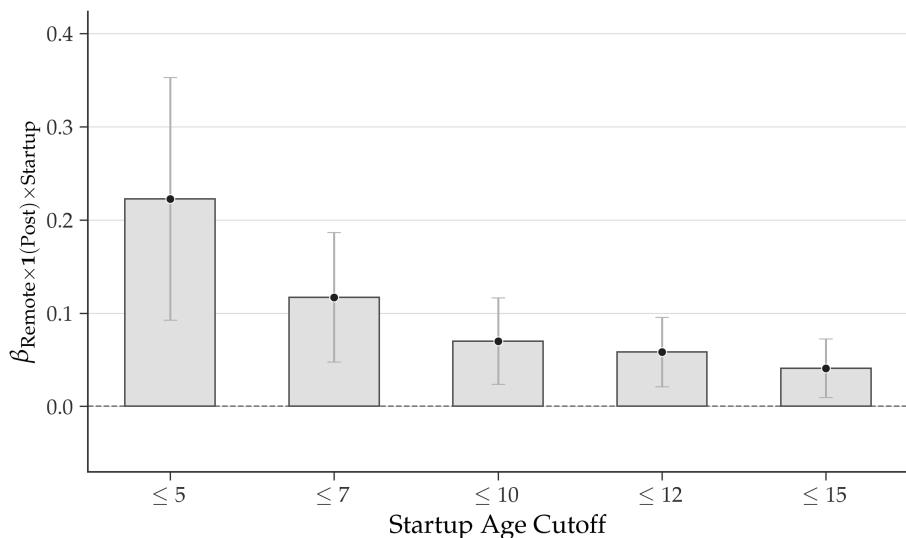
Table A1: First-Stage Diagnostics

	Remote $\times \mathbb{1}(\text{Post})$		Remote $\times \mathbb{1}(\text{Post})$ $\times$ Startup	
Panel A: Individual-level				
Teleworkable $\times \mathbb{1}(\text{Post})$	0.23***	0.24***	-0.00*	-0.00***
	(0.01)	(0.02)	(0.00)	(0.00)
Teleworkable $\times \mathbb{1}(\text{Post}) \times$ Startup	0.16***	0.16***	0.39***	0.40***
	(0.02)	(0.03)	(0.02)	(0.02)
$\mathbb{1}(\text{Post}) \times$ Startup	0.09***	0.09***	0.60***	0.59***
	(0.02)	(0.02)	(0.01)	(0.01)
Fixed Effects				
Time	✓	✓	✓	✓
Firm	✓		✓	
Individual	✓		✓	
Firm $\times$ Individual		✓		✓
Partial F	325.46	295.11	186.55	175.46
KP rk Wald F	140.60	123.43	140.60	123.43
N	229,862	224,708	229,862	224,708
Panel B: Firm-level				
Teleworkable $\times \mathbb{1}(\text{Post})$	0.83***	–	-0.00	–
	(0.03)		(0.00)	
Teleworkable $\times \mathbb{1}(\text{Post}) \times$ Startup	-0.41***	–	0.41***	–
	(0.08)		(0.07)	
$\mathbb{1}(\text{Post}) \times$ Startup	0.46***	–	0.58***	–
	(0.06)		(0.05)	
Fixed Effects				
Time	✓		✓	
Firm	✓		✓	
Partial F	437.86	–	16.54	–
KP rk Wald F	16.53	–	16.53	–
N	41,980	–	41,980	–

Notes:

Table A2: Remote Work and Restricted Contributions

	Contribution Rank			Total
	(1)	(2)	(3)	(4)
Panel A: OLS				
Remote × 𝟙(Post)	-0.51	-1.44***	-1.48***	-17.33***
	(0.46)	(0.50)	(0.52)	(3.91)
Remote × 𝟙(Post) × Startup	–	6.37***	7.31***	55.41***
		(1.24)	(1.27)	(12.74)
Pre-Covid Mean	48.48	48.48	48.48	138.15
N	229,862	229,862	224,708	224,708
Panel B: IV				
Remote × 𝟙(Post)	-3.36	-6.60	-6.75	-105.59***
	(2.91)	(4.08)	(4.19)	(28.11)
Remote × 𝟙(Post) × Startup	–	9.07*	10.52*	108.20**
		(5.43)	(5.42)	(48.92)
KP rk Wald F	543.26	140.60	123.43	123.43
N	229,862	229,862	224,708	224,708
Fixed Effects				
Time	✓	✓	✓	✓
Firm	✓	✓		
Individual	✓	✓		
Firm × Individual			✓	✓

Notes:

Table A3: Remote Work and Log Contributions

	Contribution Rank	
	Log(total)	Log(1+total)
	(1)	(2)
Panel A: OLS		
Remote $\times$ $\mathbb{1}$(Post)	-0.06*	-0.05
	(0.03)	(0.03)
Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup	0.28***	0.36***
	(0.08)	(0.09)
Pre-Covid Mean	4.14	3.86
N	205,225	229,862
Panel B: IV		
Remote $\times$ $\mathbb{1}$(Post)	-0.72***	-0.38
	(0.27)	(0.28)
Remote $\times$ $\mathbb{1}$(Post) $\times$ Startup	0.73**	0.64*
	(0.35)	(0.38)
KP rk Wald F	130.74	140.60
N	205,225	229,862
Fixed Effects		
Time	✓	✓
Firm	✓	✓
Individual	✓	✓

Notes:
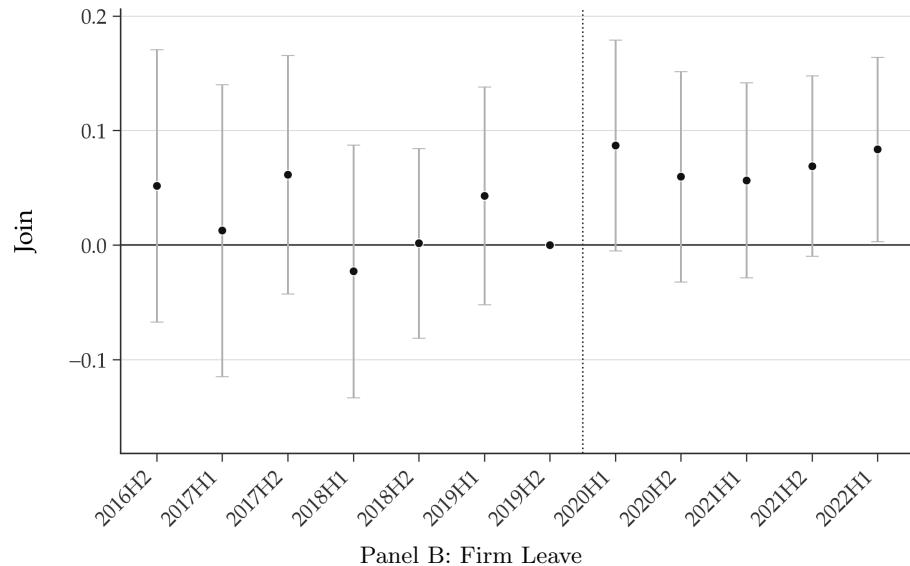
Table A4: Remote Work: Stayers (Boundary Sample)

	Contribution Rank		Total
	(1)	(2)	(3)
Panel A: OLS			
Remote × 𝟙(Post)	-0.32	-1.22**	-19.67***
	(0.46)	(0.50)	(4.71)
Remote × 𝟙(Post) × Startup	–	6.27***	59.56***
		(1.28)	(14.35)
Pre-Covid Mean	52.74	52.74	210.76
N	172,056	172,056	172,056
Panel B: IV			
Remote × 𝟙(Post)	-4.92*	-9.87**	-130.65***
	(2.88)	(4.05)	(34.25)
Remote × 𝟙(Post) × Startup	–	13.52**	140.75**
		(5.44)	(55.67)
KP rk Wald F	479.37	121.28	121.28
N	172,056	172,056	172,056
Fixed Effects			
Time	✓	✓	✓
Firm	✓	✓	✓
Individual	✓	✓	✓

Notes:

Figure A2: Event Study of Labor Market Flows

Panel A: Firm Join

Panel B: Firm Leave

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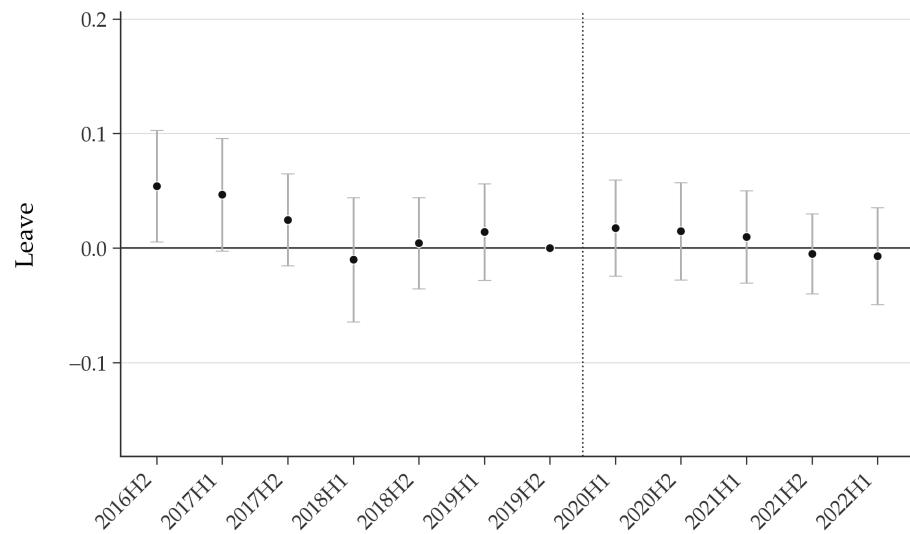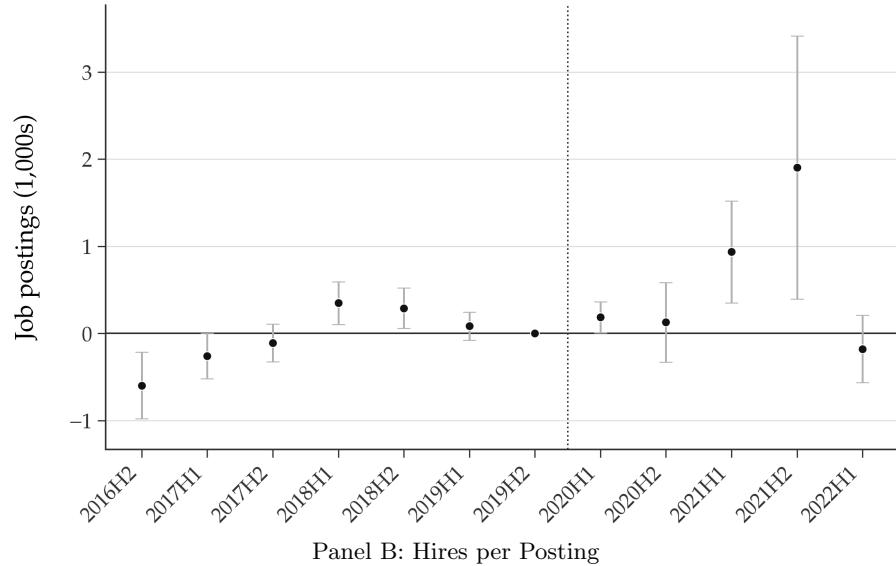
Figure A3: Event Study of Job Postings and Fill Rates

Panel A: Job Postings

Panel B: Hires per Posting
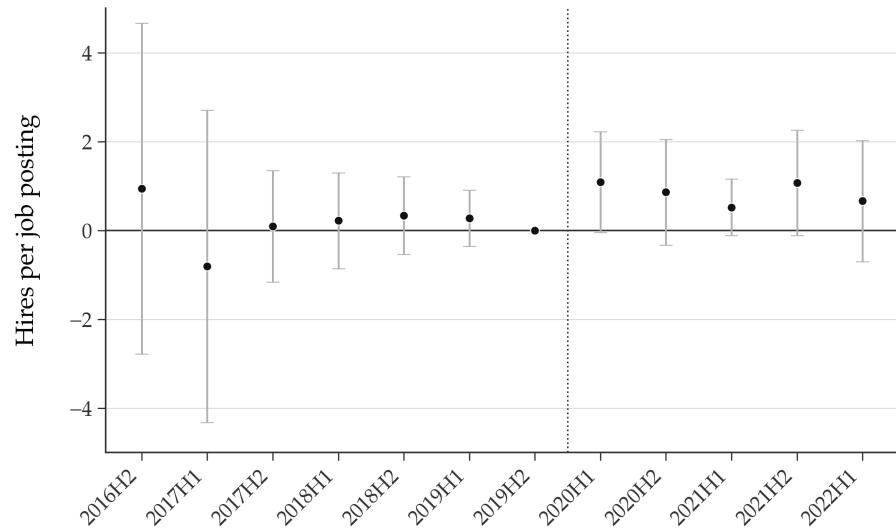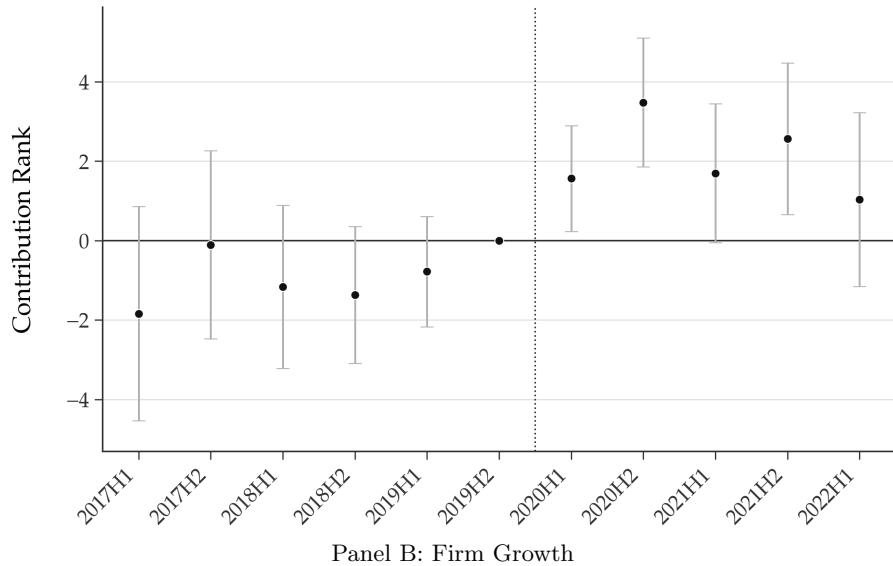
Figure A4: Event Study of Fully Remote Key Outcomes

Panel A: User Productivity

Panel B: Firm Growth
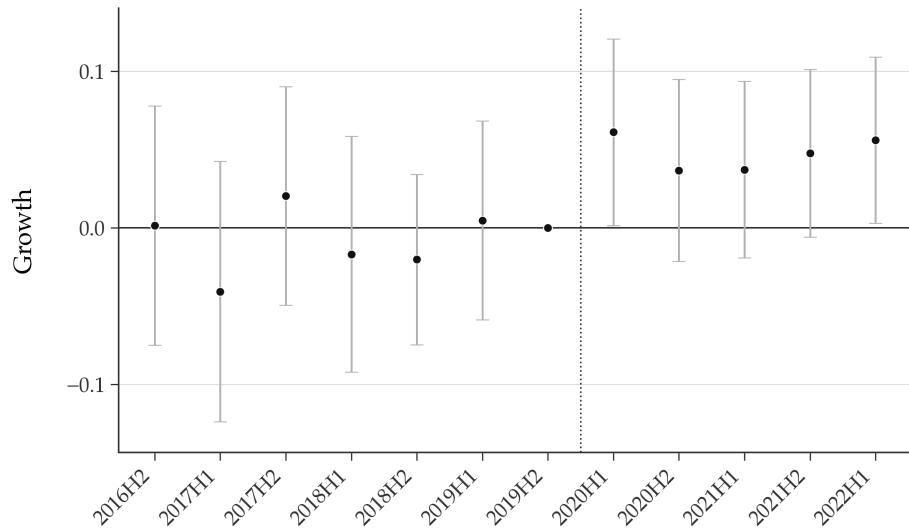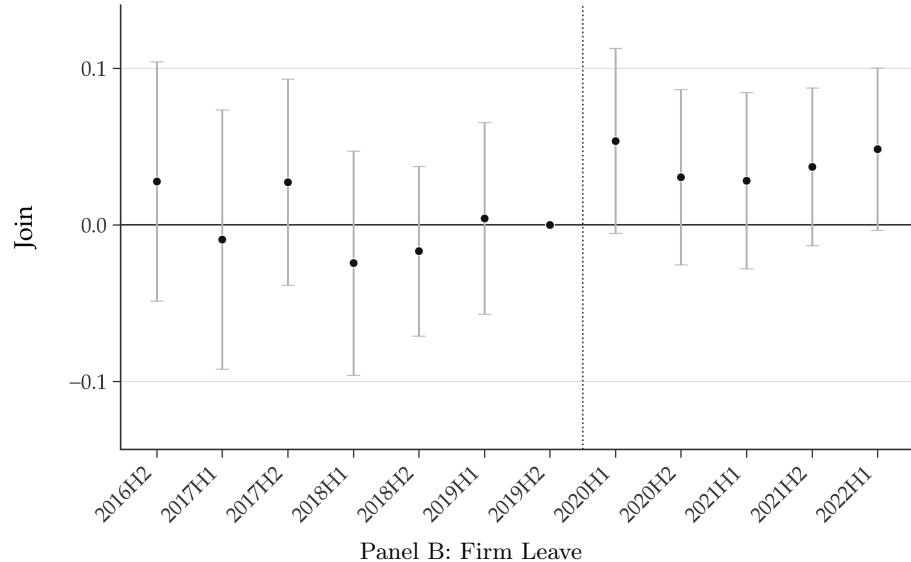
Figure A5: Event Study of Fully Remote Labor Flows

Panel A: Firm Join

Panel B: Firm Leave
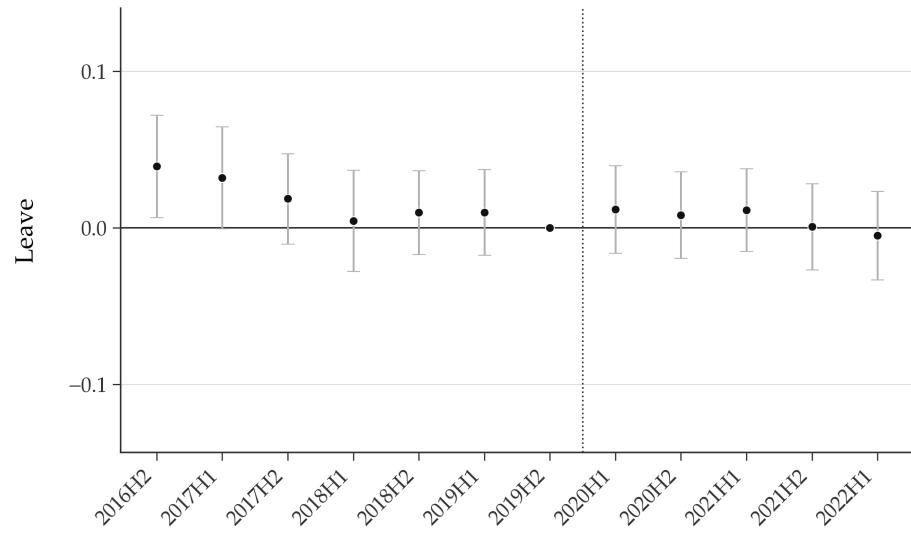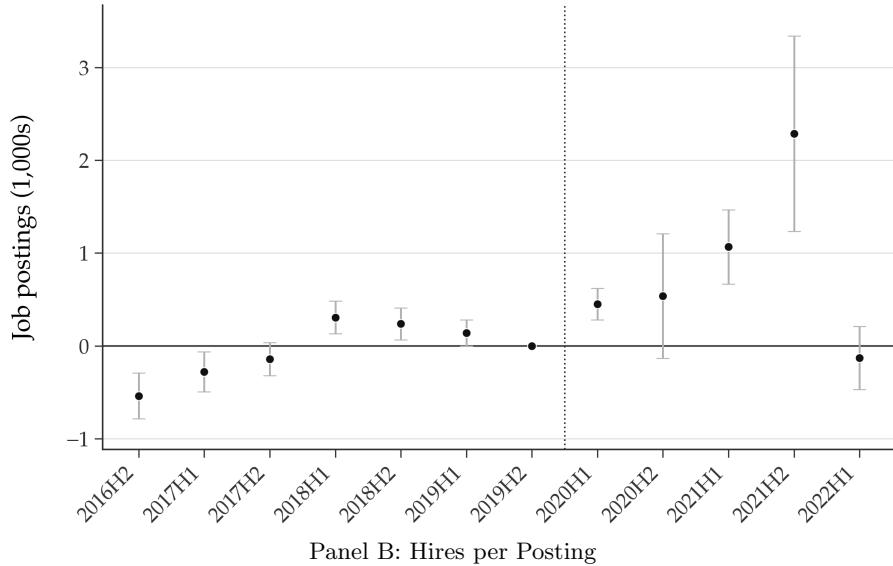
Figure A6: Event Study of Fully Remote Hiring Channels

Panel A: Job Postings

Panel B: Hires per Posting
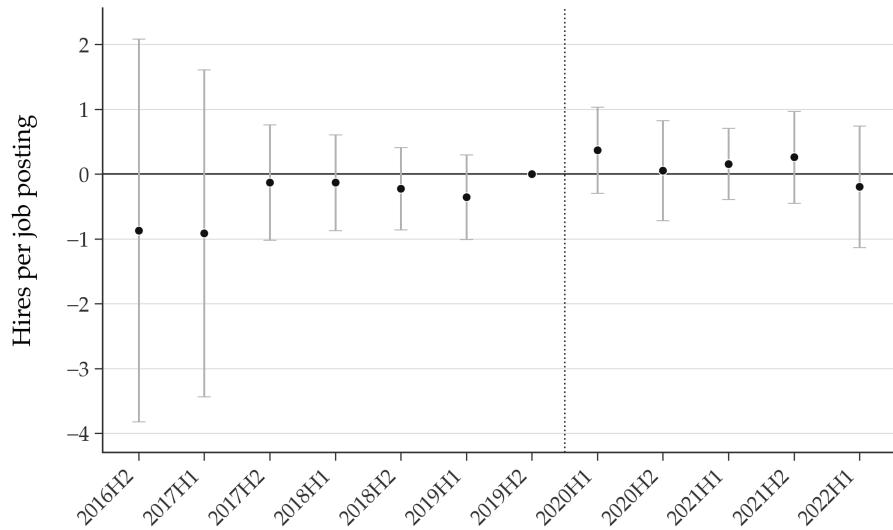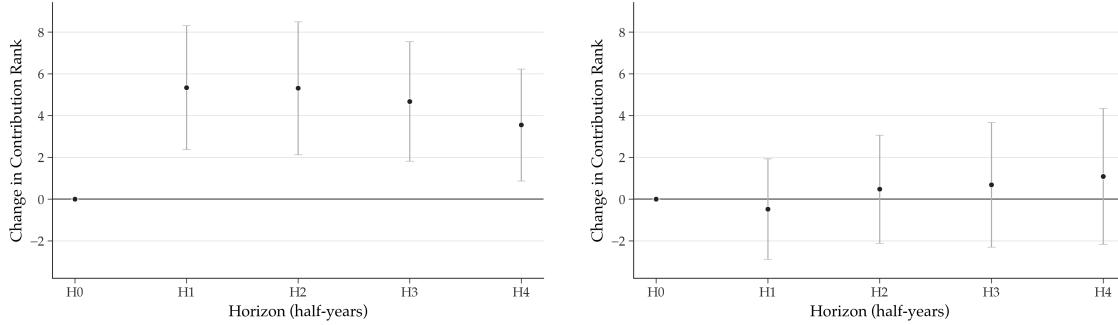
Figure A7: Hiring Shocks and Subsequent Productivity

Panel A: Hybrid/In-person

Panel B: Fully Remote
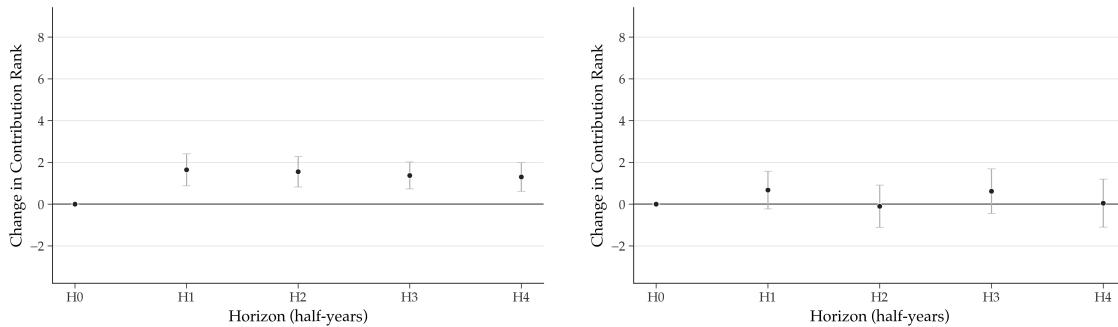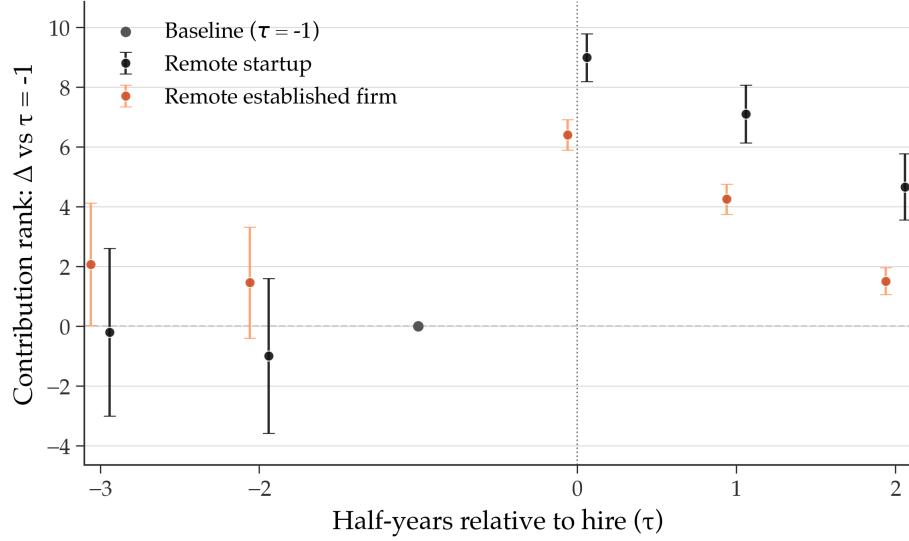
Figure A8: Event Study of Remote Hires: Contribution Rank

Notes: Notes: Outcome is contribution rank (percentile). Sample is workers whose *first fully-remote hire* occurs in the window; groups are destination remote startups vs remote non-startups. Regression: $y_{ift} = \sum_{\tau \neq -1} \beta_\tau^{S} \mathbb{1}[\tau] \times \mathbb{1}[\text{startup}] + \sum_{\tau \neq -1} \beta_\tau^{L} \mathbb{1}[\tau] \times \mathbb{1}[\text{non-startup}] + \alpha_i + \alpha_f + \alpha_t + \varepsilon_{ift}$, where τ is half-years relative to hire. Baseline $\tau = -1$ is omitted, so each point is a change vs the half-year before hire for that group. Window $\tau \in [-4, 3]$. Fixed effects: individual, firm, half-year; standard errors clustered by individual. Parallel-trend identifying assumption: absent the hire, pre-trends for $\tau < 0$ would continue similarly.