Corporate Hiring under Covid-19:
Financial Constraints and the Nature of New Jobs

Internet Appendix

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Figure IA.1. Postings by O*NET Job Zone

This figure plots the share of total job postings in each O*NET job zone over the 2017–2019 (pre-pandemic) period. Job Zone 1 (5) represents the lowest (highest) skill levels.
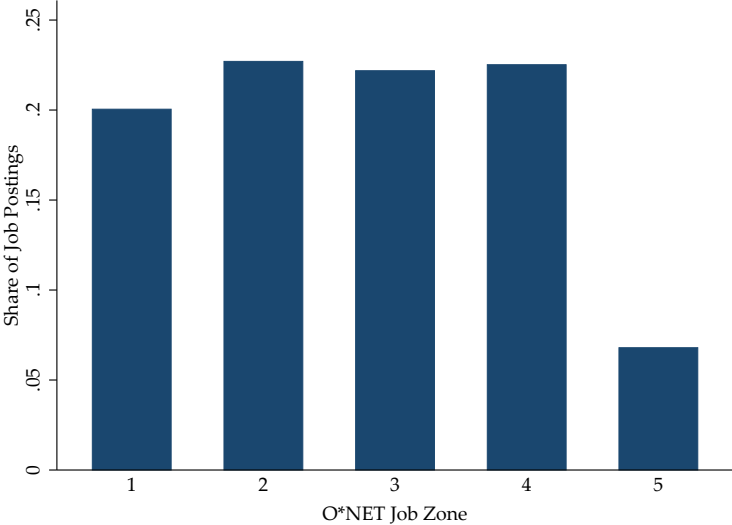
Table IA.1. Select List of Jobs by Skill Zone

This table reports a select list of representative low-skill jobs with O*NET occupation codes corresponding to Job Zone 1 and a select list of representative high-skill jobs corresponding to Job Zone 5.

Low-Skill Occupations (Zone 1)	High-Skill Occupations (Zone 5)
Cooks, Fast Food	Chief Executives
Food Preparation Workers	Treasurers and Controllers
Combined Food Preparation and Serving Workers	Architectural and Engineering Managers
Counter Attendants, Cafeteria, and Food Concession	Investment Fund Managers
Food Servers, Nonrestaurant	Management Analysts
Dining Room and Cafeteria Attendants	Financial Quantitative Analysts
Dishwashers	Computer and Information Research Scientists
Landscaping and Groundskeeping Workers	Mathematicians
Amusement and Recreation Attendants	Operations Research Analysts
Models	Statisticians
Door-To-Door Sales, News, Street Vendors	Microsystems Engineers
Graders and Sorters, Agricultural Products	Biologists
Agricultural Equipment Operators	Biochemists and Biophysicists
Farmworkers and Laborers	Geneticists
Fishers and Related Fishing Workers	Astronomers
Hunters and Trappers	Physicists
Logging Equipment Operators	Materials Scientists
Cement Masons and Concrete Finishers	Economists
Septic Tank Servicers and Sewer Pipe Cleaners	Survey Researchers
Rock Splitters	Neuropsychologists and Clinical Neuropsychologists
Fabric Menders	Sociologists
Meat, Poultry, and Fish Cutters	Anthropologists
Laundry and Dry-Cleaning Workers	Geographers
Sewing Machine Operators	Historians
Grinding and Polishing Workers	Political Scientists
Cutters and Trimmers	Rehabilitation Counselors
Painting, Coating, and Decorating Workers	Healthcare Social Workers
Bridge and Lock Tenders	Lawyers
Conveyor Operators and Tenders	Judges, Magistrate Judges, and Magistrates
Fallers	Urban and Regional Planners
Plasterers and Stucco Masons	Dentists
Derrick Operators	Pharmacists
Roustabouts	Archivists and Curators
Pressers	Education Administrators
Baristas	Environmental Engineers

Table IA.2. List of 3-Digit NAICS Industries

This table reports the list of 3-digit NAICS codes belonging to each industry.

Industry Category	3-Digit NAICS Codes
Agriculture	111,112,115
Mining, Oil & Gas	211,212,213
Utilities	221
Construction	236,237,238
Food	311,722
Beverage & Tobacco Manufacturing	312
Textile Manufacturing	313,314,315,316
Wood Product Manufacturing	321
Printing & Paper	322,323
Chemicals	324,325,326
Metals & Machinery	327,331,332,333
Computer & Electronic Manufacturing	334
Electrical Equipment Manufacturing	335
Transportation Equipment Manufacturing	336
Furniture Product Manufacturing	337
Wholesalers	423,424,425
Retail Trade	441,442,443,444,445,446,447,448,451,452,453,454
Transportation & Warehousing	481,482,483,484,485,486,487,488,492,493
Publishing Industries	511
Telecom & Information Services	512,515,517,518,519
Financial Services	522,523,524,525
Real Estate	531,532,533
Professional, Scientific & Technical Services	541
Management Services	551
Administrative & Support Services	561
Waste Management & Remediation	562
Educational Services	611
Ambulatory Health Care Services	621
Hospitals	622
Nursing & Residential Care Facilities	623
Social Assistance	624
Amusement, Gambling & Recreation	713
Accommodation	721
Repair & Maintenance	811
Personal & Laundry Service	812

Table IA.3. Baseline Impact of Covid-19 on Job Postings: Monthly Aggregation

This table reports output from equations (4) and (5). The dependent variables are NEW_JOB_POSTINGS and HIGH_TO_LOW_SKILL_RATIO. The unit of observation is a firm–ZIP–month, where ZIP is the three-digit ZIP-code of a job posting. Variable definitions are as provided in Appendix Table A.1. All regressions are estimated over a sample of public firms over the January, 2017 to September, 2020 period. In each specification, state and firm controls are included as indicated. Firm–, ZIP–, industry×month–, and week–fixed effects are included as indicated. Robust standard errors, reported in parentheses, are dual–clustered by firm and month.

	NEW_JOB_POSTINGS		HIGH_TO_LOW_SKILL_RATIO	
	1	2	3	4
COVID	−0.052***		−0.098***	
	(0.012)		(0.021)	
COVID × HIGH_EXPOSURE		−0.088***		−0.056***
		(0.026)		(0.007)
Controls				
State	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes
Fixed Effects				
Firm	Yes	Yes	Yes	Yes
ZIP	Yes	Yes	Yes	Yes
Industry × Month	No	Yes	No	Yes
Observations	3,174,349	2,125,892	44,687	29,742
R-squared	0.288	0.271	0.547	0.518

Statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table IA.4. The Impact of Covid-19 on Job Postings: Covid-19 Exposure Robustness

This table reports output from equation (5). The dependent variables are NEW_JOB_POSTINGS and HIGH_TO_LOW_SKILL_RATIO. The unit of observation is a firm–ZIP–week, where ZIP is the three-digit ZIP-code of a job posting. Variable definitions are as provided in Appendix Table A.1. CASES is the log of one plus the number of confirmed Covid cases per capita in each county-week. HIGH_EXPOSURE_QUARTILES is an indicator variable that takes the value of 1 for each county-week belonging to the highest quartile of the number of confirmed Covid cases per capita and 0 for each county-week belonging to the lowest quartile of the number of confirmed Covid cases per capita. HIGH_EXPOSURE_QUINTILES and HIGH_EXPOSURE_DECILES are analogously defined. All regressions are estimated over a sample of public firms over the January, 2017 to September, 2020 period. In each specification, state and firm controls are included as indicated. Firm×month–, ZIP–, and week–fixed effects are included as indicated. Robust standard errors, reported in parentheses, are dual–clustered by firm and week.

	NEW_JOB_POSTINGS				HIGH_TO_LOW_SKILL_RATIO			
	1	2	3	4	5	6	7	8
COVID × CASES	-0.003***				-0.004**			
	(0.001)				(0.002)			
COVID × HIGH_EXPOSURE_QUARTILES		-0.061***				-0.053**		
		(0.012)				(0.019)		
COVID × HIGH_EXPOSURE_QUINTILES			-0.069***				-0.055***	
			(0.008)				(0.016)	
COVID × HIGH_EXPOSURE_DECILES				-0.074***				-0.061***
				(0.015)				(0.009)
Controls								
State	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects								
Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ZIP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Month	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,203,560	8,632,483	6,810,972	2,851,645	241,258	108,996	85,205	33,296
R-squared	0.339	0.280	0.282	0.279	0.572	0.587	0.564	0.644

Statistical significance is indicated as follows: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table IA.5. The Impact of Covid-19 on Job Postings: Poisson Fixed Effects Robustness

This table reports output from equations (4) and (5), estimated using a Poisson Fixed Effects model (see Cohn et al. (2022)). The dependent variable is NEW_JOB_POSTINGS. The unit of observation is a firm–ZIP–week. Variable definitions are as provided in Appendix Table A.1. All regressions are estimated over a sample of public firms over the January, 2017 to September, 2020 period. In each specification, state and firm controls are included as indicated. Firm–, ZIP–, and week–fixed effects are included as indicated. Robust standard errors, reported in parentheses, are dual–clustered by firm and week.

	NEW_JOB_POSTINGS	
	1	2
COVID	−0.043***	
	(0.009)	
COVID × HIGH_EXPOSURE		−0.072***
		(0.012)
Controls		
State	Yes	Yes
Firm	Yes	Yes
Fixed Effects		
Firm	Yes	Yes
ZIP	Yes	Yes
Week	Yes	Yes
Observations	17,203,560	11,433,098
Pseudo R-squared	0.298	0.313

Statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table IA.6. The Impact of Covid-19 on Job Postings: Firm-ZIP–Fixed Effects Robustness

This table reports output from equations (4) and (5). The dependent variables are NEW_JOB_POSTINGS and HIGH_TO_LOW_SKILL_RATIO. The unit of observation is a firm–ZIP–week. Variable definitions are as provided in Appendix Table A.1. All regressions are estimated over a sample of public firms over the January, 2017 to September, 2020 period. In each specification, state and firm controls are included as indicated. Firm×ZIP– and month–fixed effects are included as indicated. Robust standard errors, reported in parentheses, are dual–clustered by firm and month.

	NEW_JOB_POSTINGS		HIGH_TO_LOW_SKILL_RATIO	
	1	2	3	4
COVID	−0.025***		−0.026***	
	(0.005)		(0.007)	
COVID × HIGH_EXPOSURE		−0.062***		−0.048***
		(0.015)		(0.012)
Controls				
State	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes
Fixed Effects				
Firm × ZIP	Yes	Yes	Yes	Yes
Week	Yes	Yes	Yes	Yes
Observations	17,203,560	11,433,098	241,258	160,609
R-squared	0.412	0.388	0.346	0.405

Statistical significance is indicated as follows: *** $p <0.01$, ** $p <0.05$, * $p <0.1$.

Table IA.7. The Impact of Covid-19 on Job Postings: Worker Skills Robustness

This table reports output from equations (4) and (5). The dependent variables are HIGH_45_TO_LOW_12_SKILLS_RATIO, HIGH_5_TO_LOW_12_SKILLS_RATIO, and HIGH_45_TO_LOW_1_SKILLS_RATIO. The unit of observation is a firm–ZIP–week, where ZIP is the three-digit ZIP-code of a job posting. HIGH_45_TO_LOW_12_SKILLS_RATIO is the total number of job postings created for occupations with O*NET occupation codes corresponding to Job Zones 4 and 5 divided by the total number of job postings created for occupations with O*NET occupation codes corresponding to Job Zones 1 and 2. HIGH_5_TO_LOW_12_SKILLS_RATIO is the total number of job postings created for occupations with O*NET occupation codes corresponding to Job Zone 5 divided by the total number of job postings created for occupations with O*NET occupation codes corresponding to Job Zones 1 and 2. HIGH_45_TO_LOW_1_SKILLS_RATIO is the total number of job postings created for occupations with O*NET occupation codes corresponding to Job Zones 4 and 5 divided by the total number of job postings created for occupations with O*NET occupation codes corresponding to Job Zone 1. Other Variables are defined in Appendix Table A.1. All regressions are estimated over a sample of public firms over the January, 2017 to September, 2020 period. In each specification, state and firm controls are included as indicated. Firm–, ZIP–, firm×month–, and week–fixed effects are included as indicated. Robust standard errors, reported in parentheses, are dual–clustered by firm and week.

	HIGH_45_TO_LOW_12_SKILLS_RATIO		HIGH_45_TO_LOW_1_SKILLS_RATIO		HIGH_5_TO_LOW_12_SKILLS_RATIO	
	1	2	3	4	5	6
COVID	-0.039***		-0.066***		-0.018***	
	(0.005)		(0.018)		(0.005)	
COVID × HIGH_EXPOSURE		-0.070***		-0.074***		-0.071***
		(0.013)		(0.016)		(0.017)
Controls						
State	Yes	Yes	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects						
Firm	Yes	Yes	Yes	Yes	Yes	Yes
ZIP	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Month	No	Yes	No	Yes	No	Yes
Week	No	Yes	No	Yes	No	Yes
Observations	3,067,662	2,050,639	314,683	208,730	3,067,662	2,050,639
R-squared	0.148	0.143	0.588	0.209	0.214	0.353

Statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table IA.8. The Impact of Covid-19 on Job Postings: Commuting Zones Robustness

This table reports output from equations (4) and (5). The dependent variables are NEW_JOB_POSTINGS and HIGH_TO_LOW_SKILL_RATIO. The unit of observation is a firm–Commuting Zone (CZ)–week. Variable definitions are as provided in Appendix Table A.1. All regressions are estimated over a sample of public firms over the January, 2017 to September, 2020 period. In each specification, state and firm controls are included as indicated. Firm–, ZIP–, firm×month–, and week–fixed effects are included as indicated. Robust standard errors, reported in parentheses, are dual–clustered by firm and week.

	NEW_JOB_POSTINGS		HIGH_TO_LOW_SKILL_RATIO	
	1	2	3	4
COVID	−0.022***		−0.078***	
	(0.006)		(0.017)	
COVID × HIGH_EXPOSURE		−0.026***		−0.119***
		(0.007)		(0.024)
Controls				
State	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes
Fixed Effects				
Firm	Yes	Yes	Yes	Yes
ZIP	Yes	Yes	Yes	Yes
Industry × Month	No	Yes	No	Yes
Week	No	Yes	No	Yes
Observations	12,730,634	8,460,492	178,531	118,850
R-squared	0.317	0.3226	0.585	0.614

Statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table IA.9. The Impact of Covid-19 on Job Postings: Firm-Level Robustness

This table reports output from equations (4) and (5). The dependent variables are NEW_JOB_POSTINGS and HIGH_TO_LOW_SKILL_RATIO. The unit of observation is a firm–week. Variable definitions are as provided in Appendix Table A.1. State controls are defined based on firms' headquarters state. All regressions are estimated over a sample of public firms over the January, 2017 to September, 2020 period. In each specification, state and firm controls are included as indicated. Firm–, ZIP– (based of firms' headquarters ZIP), industry × month–, and week–fixed effects are included as indicated. Robust standard errors, reported in parentheses, are dual–clustered by firm and week.

	NEW_JOB_POSTINGS		HIGH_TO_LOW_SKILL_RATIO	
	1	2	3	4
COVID	−0.173***		−0.355***	
	(0.009)		(0.036)	
COVID × HIGH_EXPOSURE		−0.179***		−0.611***
		(0.008)		(0.047)
Controls				
State	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes
Fixed Effects				
Firm	Yes	Yes	Yes	Yes
ZIP	Yes	Yes	Yes	Yes
Industry × Month	No	Yes	No	Yes
Week	No	Yes	No	Yes
Observations	457,674	374,747	18,060	13,404
R-squared	0.732	0.729	0.288	0.262

Statistical significance is indicated as follows: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

References

Cohn, Jonathan, Zack Liu, and Malcolm Wardlaw, 2022, Count (and Count-like) Data in Finance, *Journal of Financial Economics* 146, 529–551.