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Cahier 09-2020

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Evidence from Vacancy Postings and UI Claims*

Lisa Kahn, Fabian Lange and David Wiczer

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Labor Demand in the time of COVID-19: Evidence from vacancy postings and UI claims

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Abstract

We use job vacancy data collected in real time by Burning Glass Technologies, as well as initial unemployment insurance (UI) claims data to study the impact of COVID-19 on the labor market. Our data allow us to track postings at disaggregated geography and by detailed occupation and industry. We find that job vacancies collapsed in the second half of March and are now 30% lower than their level at the beginning of the year. To a first approximation, this collapse was broad based, hitting all U.S. states, regardless of the intensity of the initial virus spread or timing of stay-at-home policies. UI claims also largely match these patterns. Nearly all industries and occupations saw contraction in postings and spikes in UI claims, regardless of whether they are deemed essential and whether they have work-from-home capability. The only major exceptions are in essential retail and nursing, the “front line” jobs most in-demand during the current crisis.

1 Introduction

As one of the few real time indicators of the state of the labor market, initial Unemployment Insurance (UI) claims have received substantial attention of late. The picture that emerges is not pretty: 22 million initial unemployment insurance claims have been processed in the 4 weeks between March 15th and April 11th.

UI claims data however is highly aggregated. Only a small set of states report UI claims disaggregated across industries. As such, UI claims provide a very coarse filter through which to assess the state of the labor market. We supplement the data on UI claims using data on vacancy postings. Thanks to Burning Glass Technologies (BGT), a company that scrapes, cleans, and codes job vacancies posted on the internet at a daily frequency, we have a real time measure of employer demand.

*We thank Dan Restuccia, Matt Sigelman, and Bledi Taska for providing the Burning Glass Technologies data, as well as Shiwani Chitroda, Nathan Maves-Moore and Fan Xia for excellent research assistance. This research was undertaken, in part, thanks to funding from the Canada Research Chairs program.

UI claims data and vacancy data measure fundamentally distinct phenomena. The former give an indication of how many matches in the labor market have become unsustainable over a given period.¹ By contrast, vacancies provide a forward looking measure as firms post vacancies to establish new employment relationships.

In this report, we analyse both UI claims data and vacancy data from Burning Glass Technologies to provide a more detailed account of how the labor market evolved over the last weeks. In particular, we ask how broad-based the deterioration in market conditions over the second half of March and the first half of April was.

We find:

1. Vacancy postings collapsed at the same time as initial claims spiked, declining by 30% of the level at the beginning of the year. The observed decline in vacancies posted is roughly two-thirds of that observed in the U.S. during the Great Recession.
2. To a first approximation, the labor market collapsed at the same time across the U.S. irrespective of the state-level policies imposed. There is very little evidence that labor markets in states that were hit more heavily by the epidemic or that imposed stay-at-home orders earlier were differentially affected.
3. The labor market is in broad retreat across almost all industries, whether they are deemed essential or non-essential. The main exception is for frontline jobs such as those in nursing and essential retail, which saw no decline in postings and smaller, though still pronounced, spikes in claims. As a result, these areas will see substantial labor reallocation.
4. The labor market collapsed across occupations, regardless of work conditions. Occupations that lend themselves to working from home did see a slightly smaller spike in UI claims, but experienced an even larger decline in job postings, compared to jobs where working from home is likely not possible.

We show the labor market is currently experiencing unprecedented weakness. The broad based nature of the collapse in vacancy postings and spikes in UI claims suggest the current damage is not solely caused by stay-at-home orders. Instead, the deterioration of the labor market is a national phenomenon driven by a national crisis. Furthermore, sectors are experiencing similar collapses whether they are directly restricted or only indirectly affected. We therefore conclude that the damage to the economy is unlikely to be undone simply by lifting stay-at-home orders.

¹Claims data, will however, only measure cases in which a job is dissolved and the employee is eligible for benefits. Workers who move directly to another job or out of the labor force, and those who are fired for cause are ineligible and will not show up in the claims data.

2 The Spread of COVID-19 - a Timeline

By now, the time-line of the spread of COVID-19 in the US is fairly well established. The first case of COVID-19 was confirmed on January 20th, 2020 in a man returning from China. The first known case of community-spread was confirmed on February 23rd. There were 100 cases by March 4, 2020, 1000 cases by March 10, 10,000 cases by March 18, and 100,000 cases by March 27.² .

The epidemic hit the US relatively late. Parts of China were put under quarantine order by the end of January and large parts of East Asia shutdown much of public life in February. In Europe, Italy began instituting quarantine orders on March 8th in affected regions in the North and soon after throughout the country.

Washington was the first state to issue a state of emergency on February 29, with New York and California following the next week. Many states banned large gatherings and closed schools over the next few weeks. California was the first to issue a state-wide stay-at-home order on March 19, asking all those not engaged in essential activities to stay at home. In the next 3 days, New York, New Jersey, and Illinois issued similar directives. By March 30, 29 more states had similar directives.

This timeline illustrates that employers could have been worried about COVID-19 at the beginning of the year. However, the bulk of cases and the harshest policy restrictions did not begin until the second half of March and were staggered across states.

3 Data and Methods

Burning Glass Job Postings

We obtain data on job vacancy postings from Burning Glass Technologies (BGT), an employment analytics and labor market information firm. BGT scrapes, parses and codes electronic postings from over 40,000 online job boards and company websites to obtain what they believe is the near-universe of jobs that were posted online. The ad-level data were first used by Hershbein and Kahn [2018] to show that the Great Recession accelerated adoption of labor-replacing technologies.

The major advantages of the BGT data are its richness and timeliness. Currently BGT are producing ad-level data at only a day or two lag. Further, they characterize over 70 possible standardized fields per vacancy, including the location, industry, and occupation of the job posting. This combination of factors allow for unparalleled richness in analyzing labor market data during the COVID-19 crisis.

The major downside of the data are that they only cover jobs posted to online sources. While online vacancies are increasingly common, they do overrepresent higher skilled occupations and industries. Reassuringly, Dalton et al. [2020] link BGT job ads to the Job Openings and Labor Turnover Survey at the establishment level and find a great deal of alignment across the two datasets.

²Source: CDC <https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/cases-in-us.html>.

Initial Unemployment Insurance Claims

We obtain initial unemployment insurance (UI) claims data from the U.S. Department of Labor, the FRED database as well as states' own department of labor websites.

UI claims data are advantageous in that they should include the universe of claims processed. However, because the microdata is confidential, they are available at much less detail than BGT job postings. Perhaps more importantly, they are somewhat distorted because overloaded state systems could not process as many claims as the number attempting to file. This backlog will likely mean a more gradual rise in claims numbers, relative to the actual timing of displacements.

For a small number of states, Washington, Iowa, Nebraska and Texas, we are able to obtain timely claims at aggregated industry and occupation levels and we report this information where applicable.

Variable Definitions

We measure the per capita change in postings and UI claims across U.S. states, relative to the beginning of the year. That is, we subtract the weekly average of posts/claims over the period January 19-February 29, 2020 from the number in each week (or the average over a specified set of weeks) and divide by the state population.

When we can observe initial claims data at the industry or occupation level, we report the change in claims from the beginning-of-year period divided by state-level employment in the industry or occupation. For Burning Glass, we report the change in postings as a ratio of postings in a given week or period divided by postings in January 19-February 29, 2020.³

We define essential industries as in Kahn et al. [2020], which follows as closely as possible the New York State definition.⁴ We find that 60% of employment is in essential industries. Because industries are available at only a higher aggregation in the UI claims data, we assign essentialness at the broad sector level.⁵

We use the recent classification of Dingel and Neiman [2020] when we explore how initial claims and job postings varied by whether the occupation lends itself to working from home.⁶

Finally, we obtain state-level COVID cases and the date of state-level stay-at-home policies

³We do not normalize by employment because it is difficult to obtain accurate employment numbers at such disaggregated levels (state-by-industry-by-occupation). Using the ratio, instead of the difference, for UI claims data does not make sense since claims were at near 0 at the beginning of the year.

⁴We use Governor Cuomo's list of essential industries for New York State as of March 22, 2020. <https://www.governor.ny.gov/news/governor-cuomo-issues-guidance-essential-services-under-new-york-state-pause-executive-order>.

⁵For retail, we define essential as NAICS codes 444, 445, 446, 447, 454, and 452. Otherwise, we classify as essential agriculture (naics code 11), utilities (22), construction (23), wholesale (42), transportation and warehousing (48-49), information (51), finance (52), administrative support (56), food and accommodation (72), and public administration (92). Health (62) is essential but usually broken out separately.

⁶Dingel and Neiman [2020] use O*NET to classify occupations where telework is very likely not possible. They use a range of criteria including work contexts and activities that involve physical movement, risk of injury, use of protective equipment, operating or repairing machines or equipment, etc. We find similar results when we simply use the O*NET occupation score on whether physical proximity is required.

from the *New York Times*.⁷

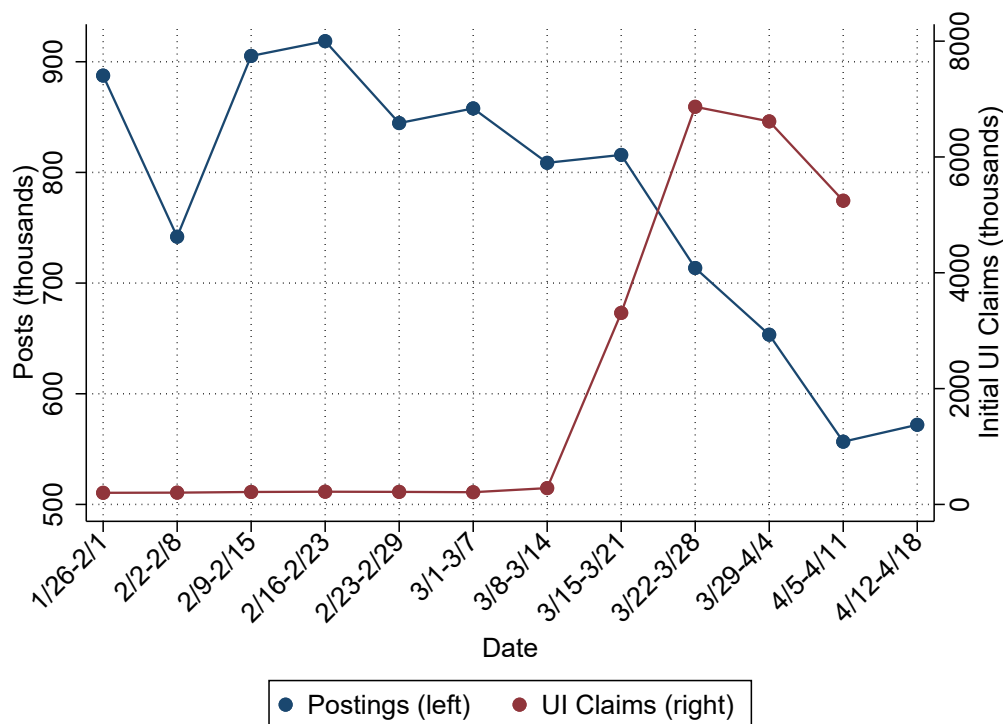
4 Findings

Fact 1: Firms have dramatically reduced job vacancies

Figure 1 shows the total number of postings and initial unemployment insurance claims, by week. To be sure, BGT postings fluctuate week-to-week. However, until the middle of March, vacancy postings did not decline substantially relative to their value earlier in the year. During the second half of March, however, the U.S. saw a steep steady decline in the number of vacancies posted. This decline occurred at the same time as the surge in UI claims plotted on the right axis.

As of the second week in April, there were 30% fewer postings, compared to the beginning of the year. To put this number in perspective, over the Great Recession, the total number of vacancies in the U.S. declined by 50% in the 1.5 year time interval from recessionary peak to trough.

Figure 1: Postings and UI claims through April 11, 2020



Note: Job postings are the total number of new vacancies each week in the Burning Glass Technologies' online postings database. Unemployment insurance initial claims data are obtained from FRED and the Bureau of Labor Statistics. The last week of BGT postings does not include Saturday, April 18.

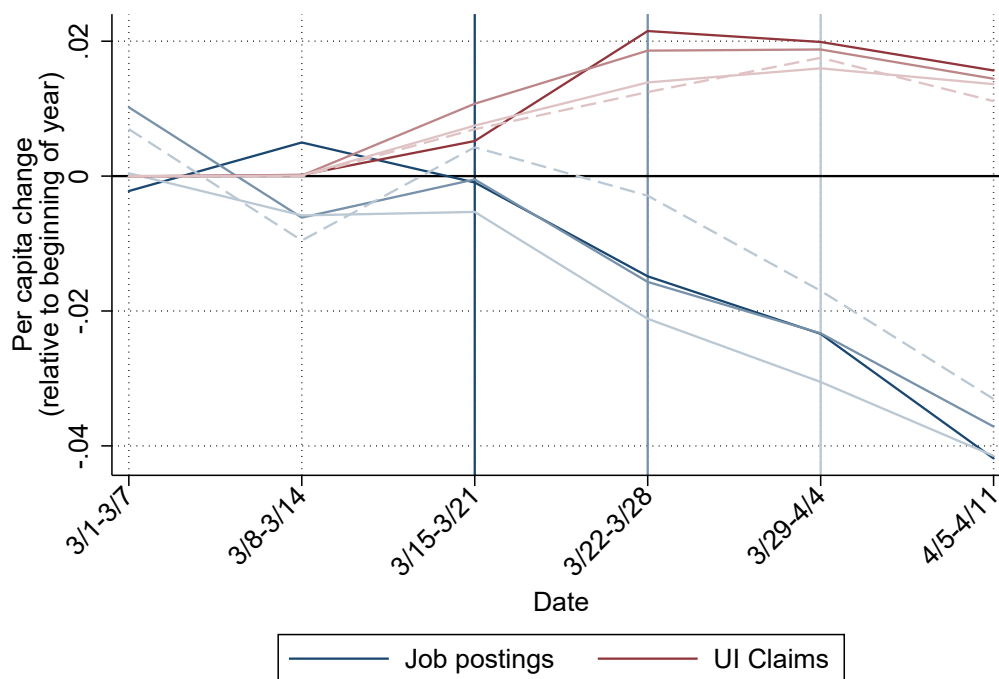
⁷Stay-at-home policies: <https://www.nytimes.com/interactive/2020/us/coronavirus-stay-at-home-order.html>. COVID data: <https://github.com/nytimes/covid-19-data>.

Fact 2: The labor market deteriorated broadly across states

Figure 2 shows the time series of postings (blue) and claims (red), separately by state groups defined by the timing of state-issued stay-at-home orders.

The darkest blue and red line depict first group of states to issue state-at-home orders, having done so by March 22 (California, Illinois, New York, and New Jersey). The next darkest line includes the vast majority of states, those issuing stay-at-home orders between March 23 and 30, and the lighter lines show the states issuing stay-at-home orders most recently (from March 31). The dashed lines show the five states with no such order as of this writing (Arkansas, Iowa, Nebraska, North Dakota, and South Dakota). Depicted are per capita changes in postings or claims from the state group-specific mean at the beginning of the year. The color coordinated vertical lines indicate the week in which the first stay-at-home order in the state policy group was given.

Figure 2: Job Postings by State Policy



Darker color indicates states with earlier stay-at-home policy adoption.

Note: Vertical lines indicate the first date of stay-at-home orders in the state group, by color. The darkest line includes the first group of states to issue state-at-home orders, having done so by March 22 (California, Illinois, New York, and New Jersey). The next darkest line includes the vast majority of states, those issuing stay-at-home orders between March 23 and 30, and the lighter line includes states issuing stay-at-home orders most recently (from March 31). The dashed line shows the five states with no such order as of this writing (Arkansas, Iowa, Nebraska, North Dakota, and South Dakota). Postings and UI claims are the per capita change in postings from the state group-specific average over January 19-Feb 29, 2020.

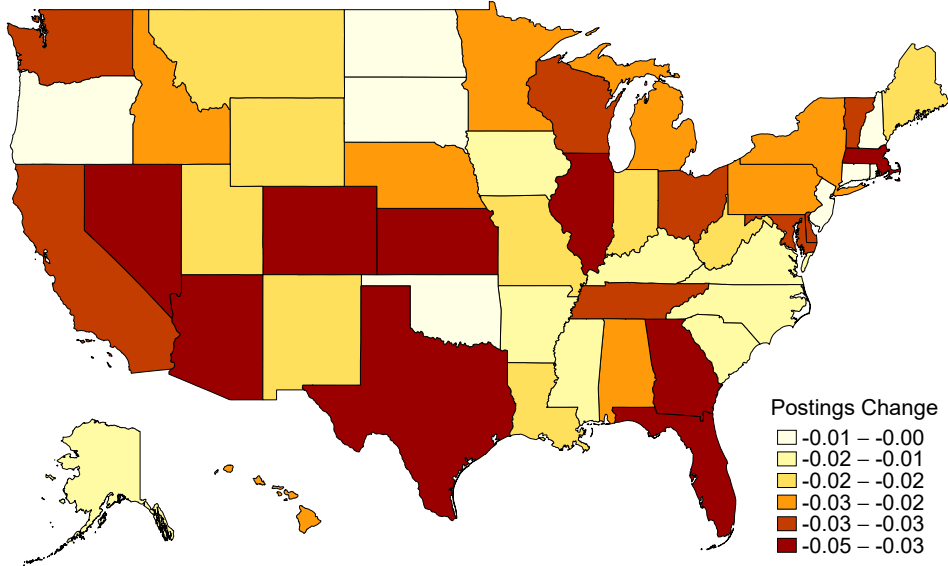
Interestingly, the differences in timing and magnitude of the labor market response are similar across states that differed by how late they imposed strict social distancing measures as proxied

by stay-at-home orders. If anything, vacancies among late adopters (3/31 or later) fall by slightly more in the first few weeks of the crisis. We do see that claims increased by slightly more during the first two weeks of April in those states that implemented orders later, but the difference is small compared to the overall increase in UI claims. Overall, based on both UI claims and job postings, we conclude that the collapse of the labor market was sudden and severe and that it displayed a high degree of synchronicity across states.

Figure 3 provides a state-by-state picture of the overall collapse of the labor market to date. Darker colored states saw a larger magnitude decline in postings in the recent period (March 22 through April 11) from the beginning of the year. Overall, we see that postings have declined across the board in all states. In general, we the decline in vacancy postings does not correlate with how severe the COVID-19 outbreak is or how quickly state-at-home orders were issued. For instance, we see large declines in postings in Illinois, a state that issued one of the earliest stay-at-home orders, but also in Florida, Georgia and Texas, where policy responses were among the slowest.

Figure 4 then presents the variation in UI claims across states. Again, no clear pattern emerges. Much of the map looks quite similar to the pattern for postings. Of notable exception are Florida and Texas – large population centers where policy was slow to respond to the virus, but clearly employers nevertheless pulled back from posting vacancies.

Figure 3: Decline in Job Postings by State

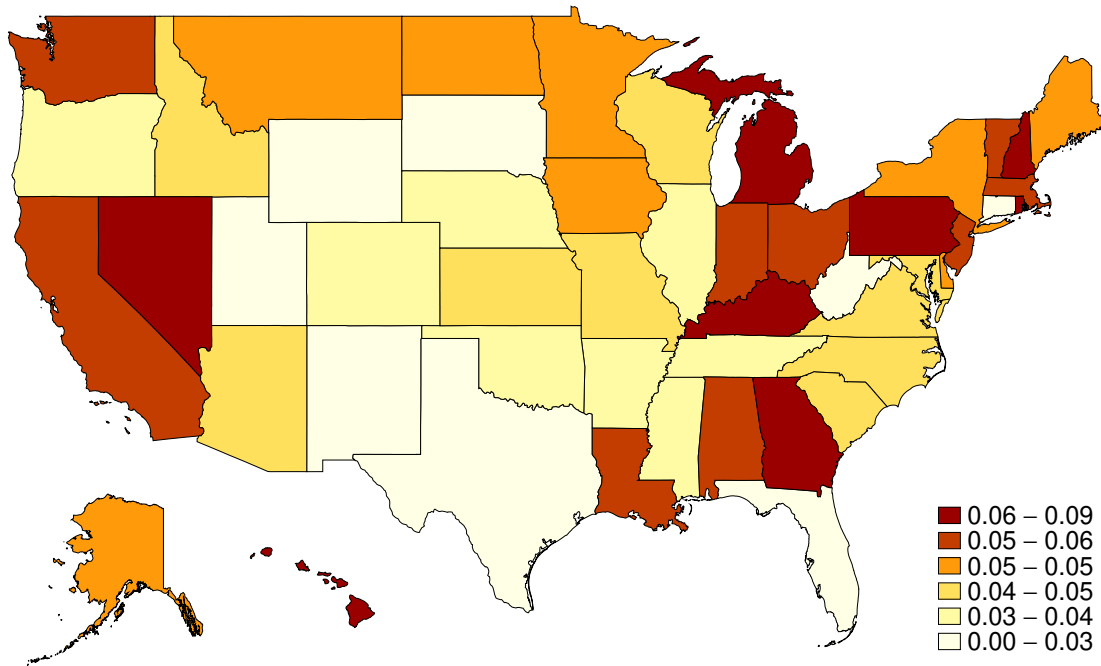


Note: We normalize postings per capita as the difference relative to the state average from January 19–Feb 29, 2020. We then plot the average difference in postings for March 22 to Apr 11, 2020.

Finally, we consider the relationship between the initial COVID-19 spread and the magnitude of the labor market decline across states. Figure 5 shows the relationship between job postings (left) or UI claims (right) and the cumulative number of cases in the week of March 8-14).⁸

⁸We choose postings in this week, before any policy responses might have impacted both the spread of COVID

Figure 4: Increase in UI Claims by State



Note: As in figure 3, we normalize claims as the per capita difference between total postings in March 22–April 11 and January 19–Feb 29, 2020.

Overall we find very little pattern. In states with more early COVID cases UI claims increased and postings declined by moderately larger amounts. But these patterns explain little of the overall variation across states. And the variation associated with the severity of the epidemic is much smaller than the overall decline in postings or increase in UI claims common to all states.

We conclude that the deterioration of the labor market is a national phenomenon driven by a national crisis. State-level variation in policies seems to have mattered less than the combination of increased uncertainty, disrupted supply chains, and the drop in demand for final goods.

Fact 3: Conditions in (nearly) all industries deteriorated similarly

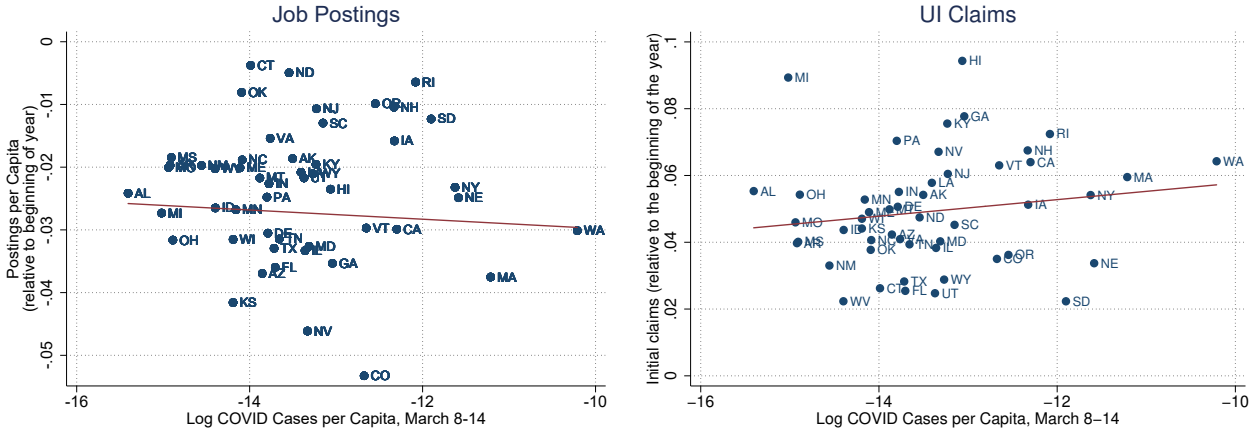
Figure 6 shows the time pattern for job postings by sector. We separate out “front line” jobs such as those in essential retail and nursing. We also show patterns separately for health industries, and other types of essential industries.

In the three weeks following March 14, we observe that postings increased substantially in the essential retail sector and remained at their pre-period level in nursing.⁹ There was clearly an immediate need for services in these front line positions to respond to the crisis. All other industries however display rapid declines in postings. The steepest such decline is - not surprisingly- observed

and the labor market. We plot the log of COVID cases plus 1 divided by state population, so that states with 0 cases at that point still show up.

⁹It is possible that some states allocated or drafted staff into health care, bypassing the traditional hiring procedures. Thus, the numbers for nursing might not be fully representative in this period.

Figure 5: UI Claims and Job Postings by COVID Spread



Notes: Postings and claims are the per capita change in the state from January 19–February 29 and March 22–April 11, 2020. The best fit lines are population weighted. The X-axis is $\log(1 + \text{cases})$ divided by population so that 16 states with no cases as of March 14 are still included (AK, AL, AR, DE, ID, ME, MS, MT, ND, NM, WV, WY.)

for non-essential retail, which sat below 50% of its beginning-of-year postings level on April 11. However, we also observe declines in other essential and non-essential industries, each of which sit between 60 and 70% of their beginning-of-year postings level. Indeed, the decline in other essential industries exceeds that in non-essential industries outside of retail.

The UI claims data is not generally available by detailed industry for all states. However, Washington State, uniquely among large states, provides public access to detailed industry and occupation codes and so we will focus our attention there for claims breakdowns. Table 1 confirms that results are consistent using more aggregate industry categories for three additional states where such data are available (Iowa, Nebraska, and Texas).

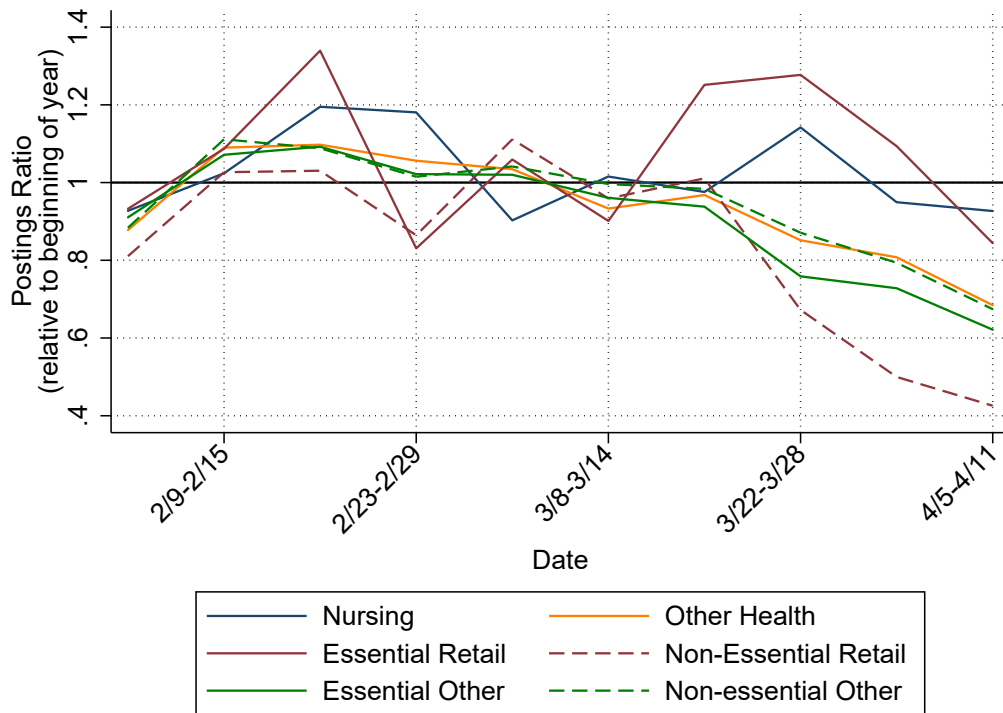
Figure 7 breaks down the rise in Washington’s initial UI claims by industries. Consistent with the findings reported using vacancy postings, UI claims in essential retail and nursing rose the least. Further, we see a more substantial deterioration in the non-essential industries (both retail and non-retail) compared to either essential grouping. Table 1 shows that Iowa, Nebraska, and Texas had similar experiences in that claims from non-essential industries increased by roughly twice as much as claims from essential industries (based on a more aggregated definition of essential).

It should be emphasized, however, that even nursing and essential retail saw claims increase by orders of magnitude, and these more modest increases are only a small fraction of the labor force. So despite meaningful differences across industries, overall, UI claims show broad-based increases in Washington, including essential and non-essential workers, as well as those in healthcare.

The large increase in initial claims in essential retail, along with the increase in postings suggests substantial reallocation. That is, essential retail likely saw a great deal of churn, with many workers being sent to unemployment even while employers desired to maintain hiring.

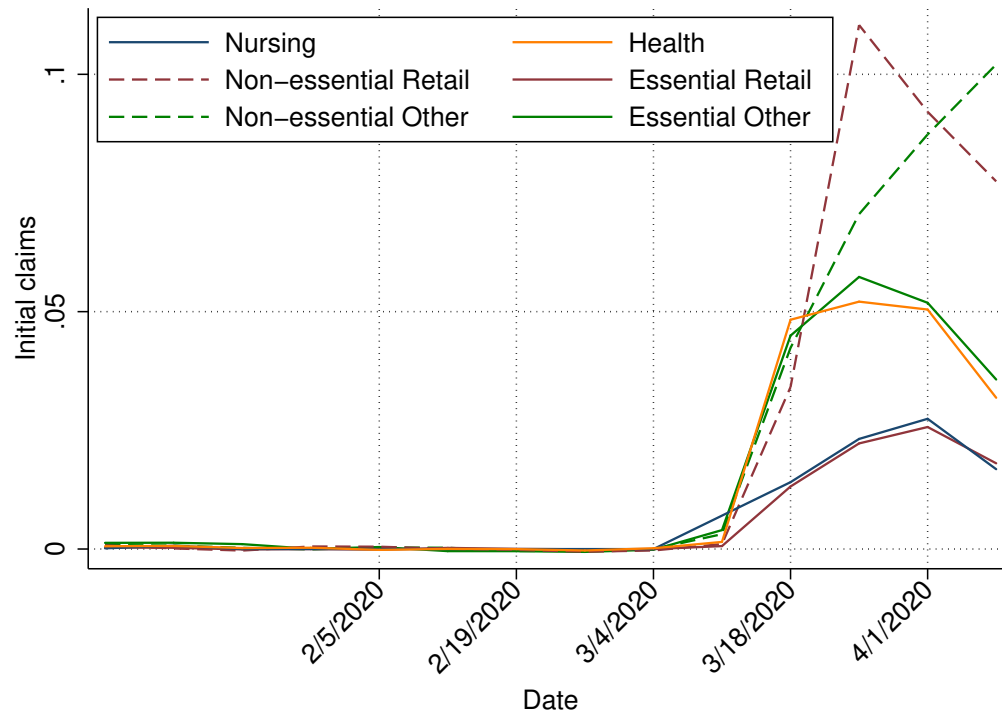
Figure 8 shows the increase in claims for the group that includes the self-employed and poten-

Figure 6: Job Postings by Sector



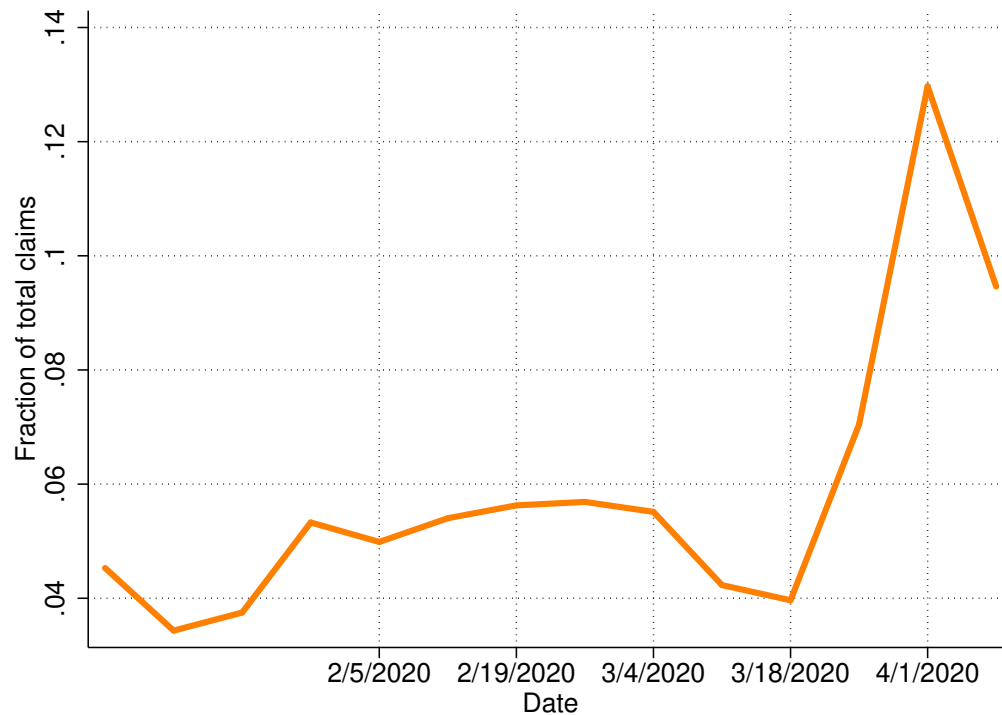
Notes: Postings are divided by the industry group-specific average from January 19–February 29, 2020. Categories are mutually exclusive and exhaustive. Nursing is occupation codes beginning in 291141. Health is NAICS industry code 62. Retail is NAICS code 44-45 and divided into our categorization of essential and non-essential based on New York State guidelines.

Figure 7: Washington State initial UI claims



Note: We normalize claims by industry or occupation-specific employment and take the difference relative to the state average from January 19–Feb 29, 2020. While the industries are mutually exclusive—Health, Retail and Other—Nursing is occupation SOC 291 and also contained in the other groups.

Figure 8: Washington State: share of claims to an unclassified industry



Note: Here we plot the fraction of Washington State claims where the industry is unclassified. This category includes the self-employed and now possibly gig workers.

tially gig-economy workers – initial claimants whose former industry cannot be identified.¹⁰ Early in the year, this group made up a small share of initial claims, at roughly 4%. Typically, many self-employed and independent contractors do not qualify for benefits. However, the Coronavirus Aid, Relief, and Economic Security Act (CARES) expanded coverage to many non-traditional workers. As such, the unclassified have tripled their representation to 13% of initial claimants.

Gig workers are an interesting and important group in the current crisis. In normal times, the gig economy has served as a self-insurance mechanism for job-loss to provide income in an interim period. A worker who loses his or her job could make up some extra earnings driving for Uber, for instance. However, this market has severely shrunk in recent weeks. Indeed figure 8 shows a large spike in relative claims for these unclassified workers. On a positive note, because the gig market is so flexible, this group might be among the fastest to rejoin the workforce once the immediate crisis abates.

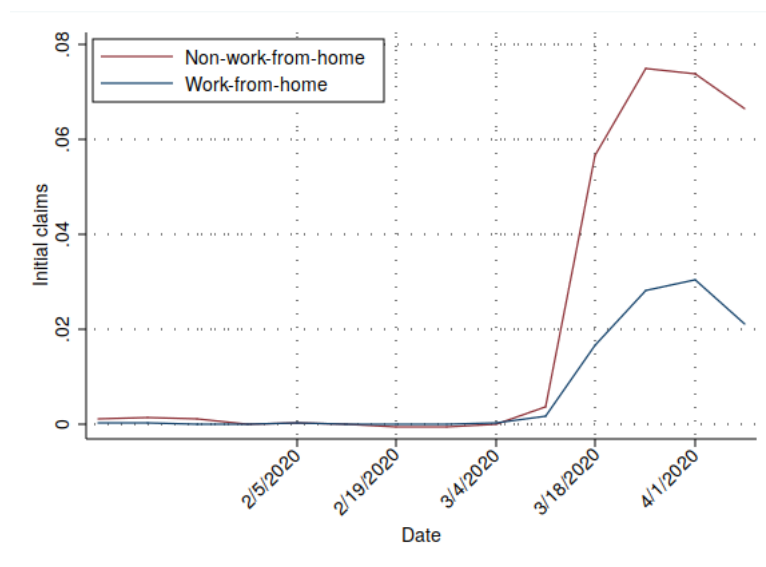
¹⁰This group includes all initial claims in Washington that cannot be attributed to an industry, which often happens among self-employed and non-standard work arrangements.

Fact 4: Occupations with work-from-home capabilities saw a sizable collapse in vacancies, but a somewhat smaller spike in UI claims

The stay-at-home directives make it nearly impossible for non-essential workers who cannot work from home to keep up their work. Researchers estimate that only about a third of workers have jobs where work from home is possible [Dingel and Neiman, 2020], and we find that this proportion is similar across essential and non-essential sectors, excluding health [Kahn et al., 2020].

Figure 9 shows that UI claims increased by more for those who are not able to work from home. Because the ability to work from home is defined using tasks, it is a feature of the occupation, and only a small subset of states provide this cut of the data, so again we provide analysis on Washington State. There, employees who were unable to work from home were laid off at a greater rate than those who could. Initial claims rose about two-thirds as much for occupations who are work from home capable. This is consistent with survey-level evidence from Adams-Prassl et al. [2020].

Figure 9: Washington State: Initial UI claims by Work From Home Capability

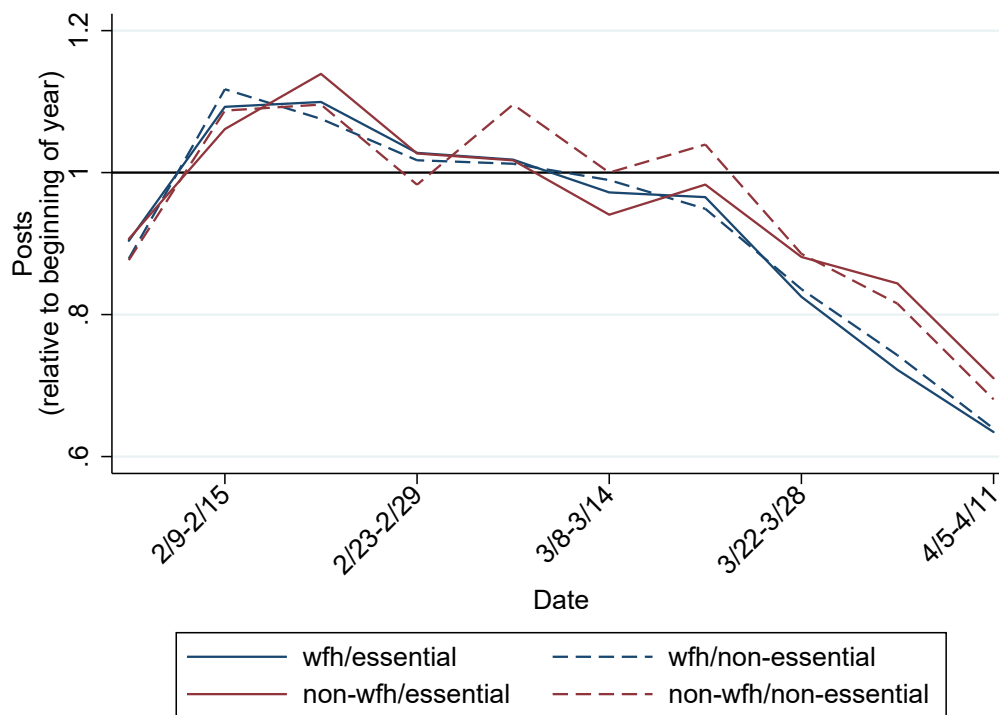


Note: Claims are computed as percent of employment in that occupation group and differenced from the group-specific average from January 19-Feb 29, 2020.

Interestingly, once we look at postings we find that the pattern is reversed compared to what we observe for claims. While employers seem to have shed many of those workers not able to work from home (according to UI claims in Washington), vacancy posting have actually declined by *more* in work-from-home (wfh) capable occupations (see Figure 10). This is true regardless of whether the sector is essential or not. To the extent that the reduction in vacancies will translate into reduced hires, we expect work-from-home occupations to show weakness in excess of that indicated by UI claims in the coming month—while the separation shock may have been less acute, the decline in

vacancies suggests that those occupations that do lend themselves to work-from-home will not add workers in coming months.

Figure 10: Job Postings by Work From Home Capability



Note: Postings are divided by group-specific average from January 19-February 29, 2020. Categories are mutually exclusive and exhaustive. Work-from-home (wfh) measures are assigned at the occupation level using Dingel and Neiman [2020].

Overall, we interpret this result as another sign that the deterioration in the labor market is broad based and affects all sectors, regardless of their exposure to direct restrictions on labor. UI claims suggest that work-from-home capability provides some shelter from job loss, but employment is likely to fall among these occupations as well, as separation rates in those occupations are still multiples higher than any previous recession and vacancy postings suggest hiring will contract.

The two findings illustrate the incredible labor reorganization occurring because of simultaneous supply and demand shocks. While occupations that are work-from-home capable may be insulated from some of the labor supply constraints imposed by stay-at-home orders, they still suffer from the negative aggregate demand shock stemming from the crisis. At the same time, occupations that cannot be done from home have a severe contraction in labor supply, even while demand has shifted towards some of these sectors, such as the front-line services of essential retail and healthcare.

Finally, we conclude with two tables splitting more industry level detail. In Table 2, we show how postings and UI claims declines both overall and for posting also broken down by whether or

not individuals can work from home. We can not provide this latter breakdown for the UI claims data because we do not see occupational breakdowns within industry. Table 1 presents a 2-digit NAICS-code breakdown of initial UI claims for a broader set of states.

5 Conclusion

We have presented statistics from UI claims and from vacancy postings obtained from Burning Glass Technologies on the evolution of the labor market over the course of the COVID-19 crisis. We plan to update this report as new data comes in.

The labor market is currently experiencing unprecedented weakness evident in both the dramatic spike in UI claims and the steep contraction in vacancy postings. To a first approximation, this weakness is observed across all U.S. states, regardless of the initial spread of the coronavirus and the timing of stay-at-home orders. It also occurs across sectors regardless of whether they are deemed essential and across occupations regardless of whether they have work from home capabilities. Only essential retail and nursing stand out as exceptions to the broad-based retrenchment of the U.S. economy. Clearly, these jobs are in immediate demand to address the COVID-19 crisis.

Given the broad based nature of the retrenchment in the labor market, we speculate that the economic downturn will be lasting. There are similar effects on directly restricted and only indirectly affected sectors. This implies that the current damage done to the economy is not solely caused by the stay-at-home orders; it is too large and pervasive. Therefore it is unlikely to be undone simply by lifting these stay-at-home orders.

Table 1: **State-industry UI claims as a fraction of employment**

	UI claims per industry employment						
	IA	NE	TX	WA	Simple Avg	Wtd Avg	Emp Share
Non-essential	0.044	0.027	0.021	0.061	0.038	0.023	0.457
Essential	0.022	0.016	0.014	0.035	0.022	0.024	0.543
Agriculture (11)	0.004	0.005	0.0027	0.010	0.005	0.007	0.010
Mining (21)	0.024	0.007	0.0181	0.055	0.026	0.018	0.027
Utilities (22)	0.002	0.001	0.0013	0.020	0.006	0.002	0.007
Construction (23)	0.028	0.018	0.0133	0.087	0.036	0.028	0.065
Manufacturing (31-33)	0.087	0.012	0.0124	0.055	0.044	0.026	0.073
Wholesale Trade (42)	0.012	0.010	0.0114	0.033	0.016	0.015	0.049
Retail Trade (44-45)	0.035	0.024	0.0231	0.044	0.032	0.028	0.105
Transportation and Warehousing (48-49)	0.020	0.012	0.0110	0.034	0.019	0.015	0.044
Information (51)	0.021	0.014	0.0148	0.010	0.015	0.013	0.018
Finance and Insurance (52)	0.002	0.004	0.0035	0.008	0.004	0.004	0.043
Real Estate (53)	0.024	0.025	0.0178	0.035	0.026	0.022	0.019
Profesional, Sci and Tech Services (54)	0.015	0.012	0.0108	0.017	0.014	0.012	0.069
Management (55)	0.007	0.005	0.0074	0.003	0.006	0.006	0.012
Admin support, waste mgmt (56)	0.024	0.020	0.0227	0.038	0.026	0.025	0.068
Education Services (61)	0.062	0.008	0.0045	0.091	0.042	0.009	0.121
Health care/Social assistance (62)	0.031	0.019	0.0170	0.041	0.027	0.023	0.131
Arts, Entertainment, Rec (71)	0.055	0.051	0.0402	0.112	0.064	0.058	0.013
Accommodation and Food Services (72)	0.066	0.055	0.0411	0.080	0.061	0.050	0.099
Other Services (81)	0.046	0.078	0.0414	0.074	0.059	0.050	0.027

Notes: State-industry UI claims as a fraction of employment. Weighted average uses employment weights within state-industries to aggregate over states. The two-digit NAICS classification of essential groups all sub-industries as essential if at least 40% of the four-digit NAICS codes are essential.

Table 2: Postings Ratio by Industry and Work From Home Capability; UI Claims

Sector	Postings Ratio			Washington UI Claims
	Overall	Non-wfh	Wfh	Overall
Agriculture (11)	0.64	0.72	0.77	0.02
Mining (21)	0.57	0.65	0.71	0.11
Utilities (22)	0.54	0.62	0.71	0.05
Construction (23)	0.62	0.74	0.8	0.17
Manufacturing (31-33)	0.66	0.72	0.78	0.15
Wholesale Trade (42)	0.5	0.62	0.7	0.07
Retail Trade (44-45)	0.73	0.83	0.86	0.09
Transportation and Warehousing (48-49)	0.69	0.87	0.92	0.08
Information (51)	0.65	0.67	0.71	0.02
Finance and Insurance (52)	0.77	0.8	0.88	0.02
Real Estate (53)	0.59	0.64	0.68	0.07
Professional, Sci and Tech Services (54)	0.74	0.76	0.83	0.04
Management (55)	0.63	0.71	0.91	0.01
Admin support, waste mgmt (56)	0.65	0.74	0.88	0.08
Education Services (61)	0.69	0.69	0.67	0.14
Health care/Social assistance (62)	0.71	0.83	0.87	0.07
Arts, Entertainment, Rec (71)	0.45	0.42	0.40	0.22
Accommodation and Food Services (72)	0.40	0.43	0.44	0.10
Other Services (81)	0.52	0.54	0.55	0.11
Public Admin (92)	0.84	0.83	0.82	0.01
Missing industry	0.82	0.87	0.97	0.19
Overall mean	0.77	0.84	0.71	0.08

Notes: For postings, we give the ratio of postings from March 22 to April 11, 2020 to the average in the beginning of the year (January 19-Feb 29). Work from home (wfh) is defined at the occupation level in Dingel and Neiman (2020). For UI claims, we take total claims as a fraction of employment from March 22 to April 11, 2020 and difference it from claims per employee in January 19-Feb 29.

References

- Adams-Prassl, Abi, Teodora Boneva, Marta Golin, and Christopher Rauh**, “Inequality in the Impact of the Coronavirus Shock: Evidence from Real Time Surveys,” 2020. Unpublished Manuscript available at <https://drive.google.com/file/d/1JYI4bzQ5ytmmlVct8o-Zw7BqRsHKzsq/view>.
- Dalton, Michael R., Lisa B. Kahn, and Andreas I. Mueller**, “Do online job postings capture job vacancies? An analysis of matched online postings and vacancy survey data,” *Mimeo*, 2020.
- Dingel, Jonathan I. and Brent Neiman**, “How Many Jobs Can be Done at Home?,” Working Paper 26948, National Bureau of Economic Research April 2020.
- Hershbein, Brad and Lisa B. Kahn**, “Do Recessions Accelerate Routine-Biased Technological Change? Evidence from Vacancy Postings,” *American Economic Review*, July 2018, *108* (7), 1737–72.
- Kahn, Lisa B., Fabian Lange, and David Wiczer**, “Labor Supply In The Time of COVID19,” *mimeo*, 2020.

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