Pandemic Layoffs and the Role of Stay-At-Home Orders *

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Abstract

We compile a novel high-frequency, detailed geographic dataset on mass layoffs from U.S. state labor departments. Using recent advances in difference-in-difference estimation with staggered treatment, we find that locally-mandated stay-at-home orders issued March 16–22, 2020 triggered mass layoffs equal to half a percent of the population in just one week. Our findings contribute to explanations for why job loss in 2020 was synchronous and catastrophic, yet temporary.

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Keywords: Pandemic. Mass Layoffs. Unemployment. Recovery.

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1 Introduction

The beginning of the 2020 pandemic in the U.S. was accompanied by layoffs of catastrophic proportions. Between February and April, the unemployment rate shot up from 3.5% to 14.7%. Not only was the level of unemployment unprecedented, so was the speed of its increase. Local governments issued stay-at-home or shelter-in-place orders (which we refer to as SAH orders), advising residents, with an exception of those employed in essential occupations, to remain home. The orders triggered shutdowns of in-person production facilities, regardless of whether firms experienced less demand.

We study whether the timing of stay-at-home orders, caused by the epidemiological situation of the pandemic, triggered mass layoffs in the pandemic. Two aspects of the stay-at-home orders are important for the analysis. First, the orders were local: some counties and cities imposed SAH orders before state-wide orders. Ignoring local SAH orders might bias results toward concluding layoffs occurred prior to orders. Second, the timing of the orders across localities was staggered: analyzing their effect on layoffs requires proper selection of a control group. Ignoring the staggered nature of SAH orders might bias results towards zero.

Given the local and abrupt nature of SAH orders, measuring their effect on the labor market requires data that is both geographically granular and high-frequency. We compile a novel dataset made possible by the 1988 Federal Worker Adjustment and Retraining Notification Act (WARN) containing the date and location of mass layoff events. Following recent advances in difference-in-difference estimation with time-varying treatment (Goodman-Bacon and Marcus (2020), and Callaway and Sant'Anna (2021)), we compare localities that recently issued a SAH order to localities that had not yet issued a SAH order.

2 Data

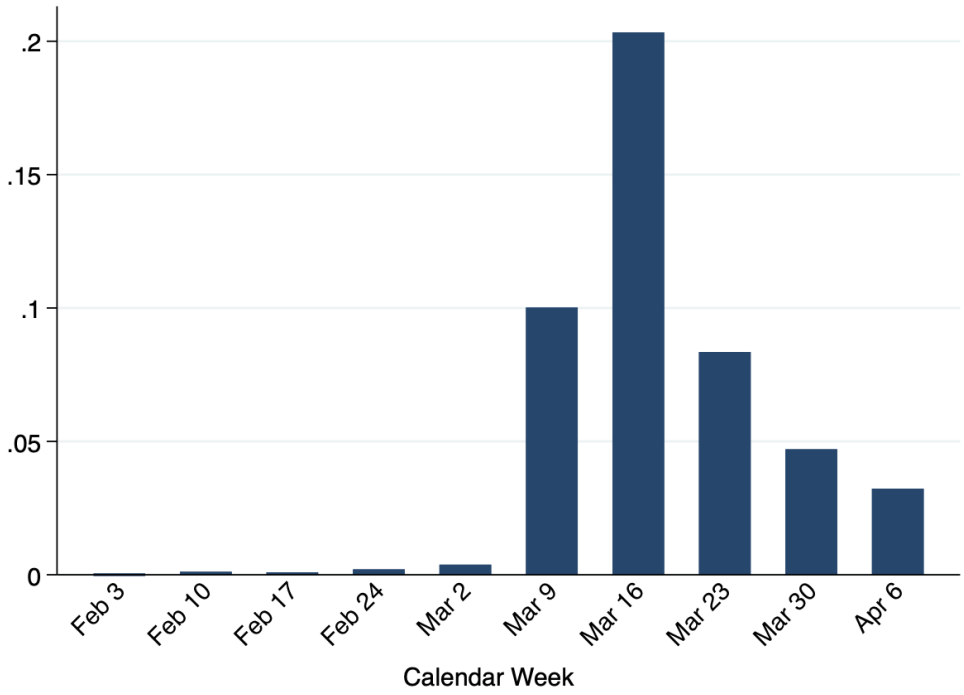
To comply with WARN, state labor departments collect data on mass layoff events and post this data to varying levels of detail on their websites. We scrape data for 21 states that publish the number of workers laid off, the date the layoff event took effect, and the location (either address, county, or city) of the plant or establishment where the layoff occurred.[1].

WARN layoffs events are where: (1) the plant closure or job loss is large enough to trigger WARN and (2) the firm doing the layoffs is large enough to be subject to WARN.[2] Although

[1]States include: AK, AL, CA, CO, FL, GA, ID, IL, MI, MO, MS, NC, NM, NY, OR, PA, RI, SC, TN, TX, WA

[2]Typically, this includes employers with at least 100 employees. See Appendix A for more detail.

Figure 1: Weekly WARN Layoffs during Onset of 2020 Pandemic, As Share of Population %



WARN layoffs are not representative of the average employment loss event, they do capture the severity and abruptness of the pandemic recession.[3,4]

To account for the geographic unit for which a SAH order binds, we collect data from The New York Times (and corroborated with government websites and local news sources) on the date of all SAH orders at the state, county, and city level that occurred within the 21 states. [5] We define a locality as an geographic area with a binding SAH order. For example, the state of Alaska imposed a SAH order on March 28, but the city of Anchorage imposed a SAH order a week earlier on March 22. There were no other SAH orders in Alaska relevant for our layoff data. We therefore define Anchorage as one locality and Alaska minus Anchorage as another locality. We have 207 unique localities.

We aggregate the data by calendar week, where the first day of the week is Monday and the last day is Sunday. Figure 1 plots the average layoff rate for each locality and calendar

[3]See Appendix B.

[4]In a comprehensive analysis, Krolikowski and Lunsford (2024) scrape and aggregate monthly WARN data from 33 states. We require a higher level of detail, namely, the exact date and location.

[5]`https://www.nytimes.com/interactive/2020/us/coronavirus-stay-at-home-order.html`

week in our sample. Mass layoffs in February and the first week of March were close to zero. This was an expansionary period for the U.S. labor market. However, starting the week of March 9, mass layoffs spiked to a tenth of a percent even though no SAH order had been imposed. The first SAH orders went into effect Tuesday, March 17. Seven counties in California imposed a SAH order two days before the state order on March 19. Many more cities, counties, and states followed in the days after.

For controls, we include the number of current covid cases and deaths as a share of the population. Health data are from John Hopkins Center for Systems Science and Engineering and population data is from the Census Bureau. Appendix C provides summary statistics for the variables in our sample.

2.1 Empirical Strategy

We estimate the following dynamic two-way fixed effects model:

$$Y_{i,t} = \alpha_i + \phi_t + \sum_{j \neq -3} \beta_j \mathbb{1}[SAH_{i,t} = j] + \gamma X_{i,t} + \epsilon_{i,t}, \tag{1}$$

where $Y_{i,t}$ is the share of the population experiencing a WARN layoff at locality i during calendar week t. Parameter α_i represents locality fixed effects and ϕ_t represents calendar week fixed effects. $SAH_{i,t} = t - SAHweek_i$ is the week relative to treatment. To allow for anticipation up to two weeks before treatment, three weeks before the SAH order is left out of the summation. The coefficients of interest, β_j, indicate how the layoff rate in any given week differs from three weeks before the SAH order. $X_{i,t}$ is a vector of controls including covid case rates and death rates during calendar week t, and $\epsilon_{i,t}$ is the residual.

Following Callaway and Sant'Anna (2021), our control group only consists of not-yet and never treated localities. This is in contrast with standard event study techniques where the control group consists of observations that are not treated in that period but might have already been treated in the past. The problem with the latter approach for our analysis is that it would group localities that already had a SAH order in the control group. This is not the group we are interested in comparing the treated localities to because these localities might still be experiencing layoffs related to their SAH order. Instead, we want to compare the treated (localities with a SAH order this week) to the not-yet and never treated (localities without a SAH order to date).

While communities in the early SAH localities may, in fact, have been surprised, it is difficult to argue that communities in the late SAH localities did not anticipate one coming.

Therefore, we split the sample by the calendar week of their SAH order. From March 16–22, 27 localities imposed a SAH order; from March 23–29, 147 localities imposed a SAH order; and from March 30–April 5, 34 localities imposed a SAH order. The rest of the sample includes Missouri and South Carolina, which both imposed a SAH order on April 6, and Iowa, which never imposed a SAH order.[6]

3 Results and Discussion

Figure 2 plots the estimated effects. Panel A shows that for early adopting localities, mass layoffs increased the week before the SAH order. Firms laid off workers either because they anticipated a SAH order or because they were concerned about health or economic conditions related to the virus. That said, the magnitude of the increase one week before is dwarfed by mass layoffs spiking to half a percent of the population during the week of the order, suggesting local SAH orders triggered mass layoffs. Layoffs remained elevated one and two weeks after the SAH order before returning to previous levels.

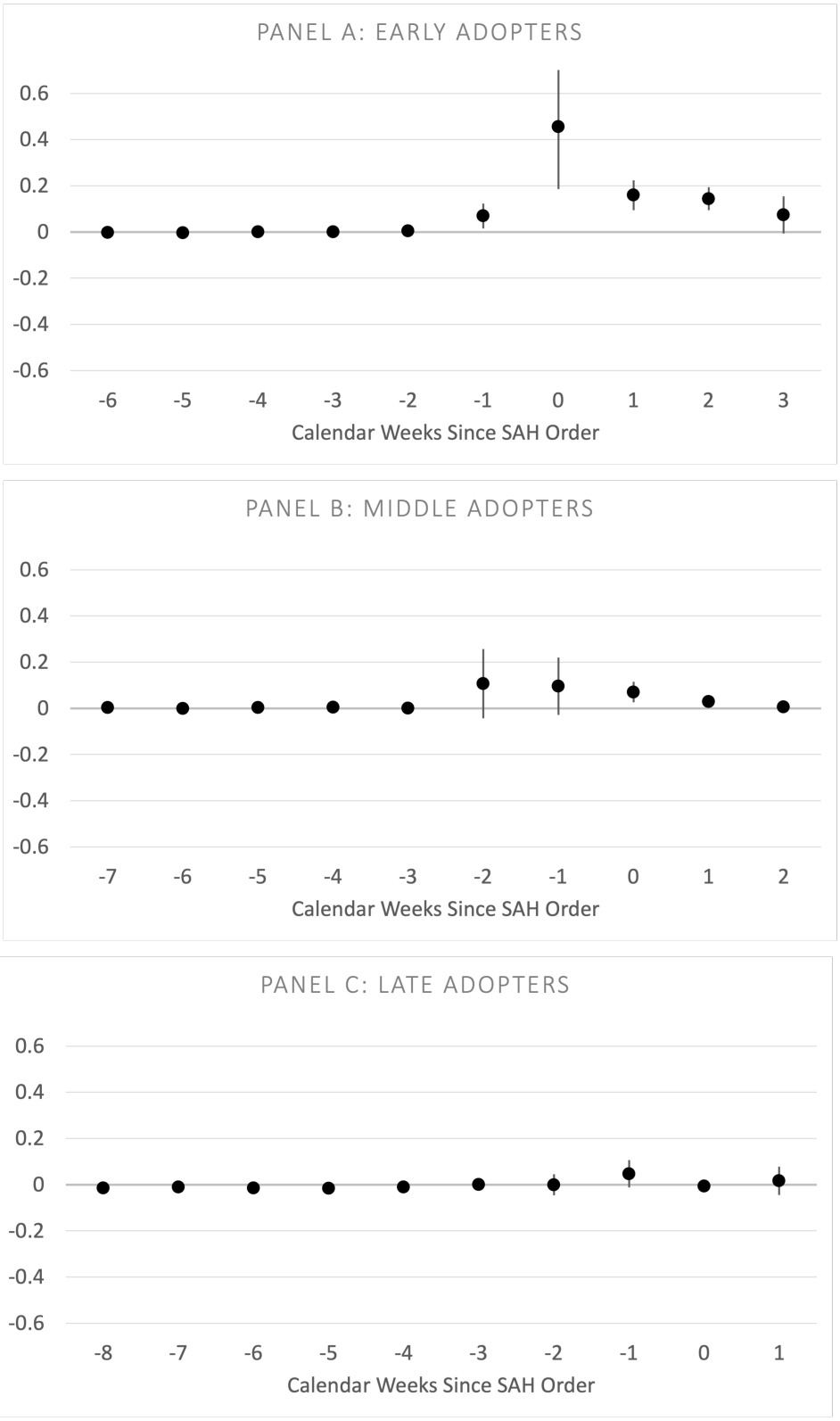
Panel B shows that for middle adopting localities, mass layoffs may have also increased before the SAH order. According to point estimates, mass layoffs increased a tenth of a percent of the population one and two weeks before the SAH order, but the 95 percent confidence bands are large and include zero. Panel B also shows that mass layoffs experienced a statistically significant increase the week of the order and the week after the order, yet, relative to Panel A, effects are small.

Panel C shows that for late adopting localities, layoffs may have slightly increased the week before the SAH order, but the relationship is statistically insignificant.

Similar to Baek, McCrory, Messer and Mui (2021), we find that some of the pandemic labor market slack can be attributed to SAH orders. Our approach differs because our more granular data allows us to capture the effect of city- and county-issued SAH orders predating the state order. Baek et al. (2021) use unemployment claims to measure labor market slack which is only available at the state-level and therefore cannot fully capture the effect of a local SAH order. We also differentiate between localities that were the first to adopt SAH orders from localities that adopted SAH orders a week or two later. The first group of adaptors experienced an arguably unexpected shock. Late adopters likely anticipated their SAH order which would have influenced when they laid off workers.

[6]The Missouri locality excludes Cole County, Crawford County, and the city of Hannibal, and the South Carolina locality excludes the the city of Charleston and the city of Columbia, all of which had SAH orders before their state-issued order.

Figure 2: Estimated Local WARN Layoffs Since the Local Stay-at-Home Order



Note: The figure shows estimates of the mass layoffs in percent of the local population. Early adopters are the localities that adopted SAH orders in March 16–22. Middle adopters are the localities that adopted SAH orders in March 23–29. Late adopters are the localities that adopted SAH orders in March 30–April 5.

We only have data for 21 states for which WARN layoffs and their associated location and layoff date could be scrapped from government websites. Our sample of 207 localities is not large enough to estimate equation (1) using daily data so we aggregate to the calendar week. Apart from Iowa, our sample does not include states that never imposed a SAH order because these states do not post detailed WARN data. Lastly, our layoff data is not the universe of layoffs but rather layoff events and employers large enough to trigger WARN legislation. Despite its limitations, the WARN dataset we compile, to our knowledge, is the only daily, city-level, and direct measure of layoffs during the pandemic.

In a typical recession, most unemployment is from reasons other than temporary layoffs. However, during the pandemic, temporary layoffs were widespread. Appendix B shows that for four states that distinguish between temporary and permanent layoffs in their WARN data, the massive uptick in 2020 was from layoffs firms expected to be temporary. Moreover, our finding that SAH orders (and anticipation of SAH orders) contributed to mass layoffs is another reason this recession was different. Pandemic layoffs were temporary and synchronous allowing firms and workers to retain their match-specific capital and avoid the costly process of building new firm-worker relationships.[7] These unique features of the pandemic help explain why the labor market recovered so quickly.

4 Conclusion

After job loss of catastrophic proportions, the U.S. labor market recovered remarkably quickly in 2020. We find locally-mandated SAH orders for early adopters triggered WARN layoffs equal to half a percent of the population in just one week. While we find evidence that some layoffs preceded local SAH orders, their magnitudes were small in comparison.

[7]For example, Bartik et al. (2020), Cajner et al. (2020), Wolcott et al. (2020), Kudlyak and Wolcott (2020), and Forsynthe et al. (2022) study implications of temporary versus permanent layoffs for recovery from the pandemic.

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A WARN Data Appendix

The Federal Worker Adjustment and Retraining Notification Act (WARN) requires employers to notify workers and state and local governments 60 days before a plant closing or mass lay off. According to the US Department of Labor "Advance notice provides workers and their families some transition time to adjust to the prospective loss of employment, to seek and obtain alternative jobs and, if necessary, to enter skill training or retraining..." Advance notice to government officials allows state dislocated worker units time to provide assistance.[8]

Employers are covered by the Federal WARN Act if they have 100 or more employees, not counting employees who have worked less than 6 months in the last 12 months and not counting employees who work an average of less than 20 hours a week. The term *employment loss* means (1) an employment termination, other than a discharge for cause, voluntary departure, or retirement; (2) a layoff exceeding 6 months; or (3) a reduction in an employee's hours of work of more than 50 percent in each month of any 6-month period. A plant closing occurs if an employment site will be shut down, and the shutdown will result in an employment loss for 50 or more employees during any 30-day period. A mass layoff occurs without a plant closing if the layoff results in an employment loss at the employment site during any 30-day period for 500 or more employees, or for 50-499 employees if they make up at least 33 percent of the employer's active workforce.

Some states have their own, more restrictive WARN laws. For example, the New York WARN Act applies to establishments with 50 or more full-time workers and covers plant closings and layoffs of 25 or more full-time workers constituting at least 33 percent of all the workers at a site. Layoffs involving 250 or more full-time workers are covered regardless of percentage. The California WARN Act applies to establishments with at least 75 full- and part-time employees in California laying off 50 or more employees regardless of percentage of the workforce.

The Federal WARN Act exempts firms from filling in advance if a closure is due to "unforeseeable business circumstances."[9] States may modify this exemption. For example, the California WARN Act typically does not include this exemption and so on March 17, 2020, because of the pandemic, California suspended its advance notice requirement.[10] As a result, firms laid-off workers immediately without advanced notice and because of this stipulation, were not fined for doing so.

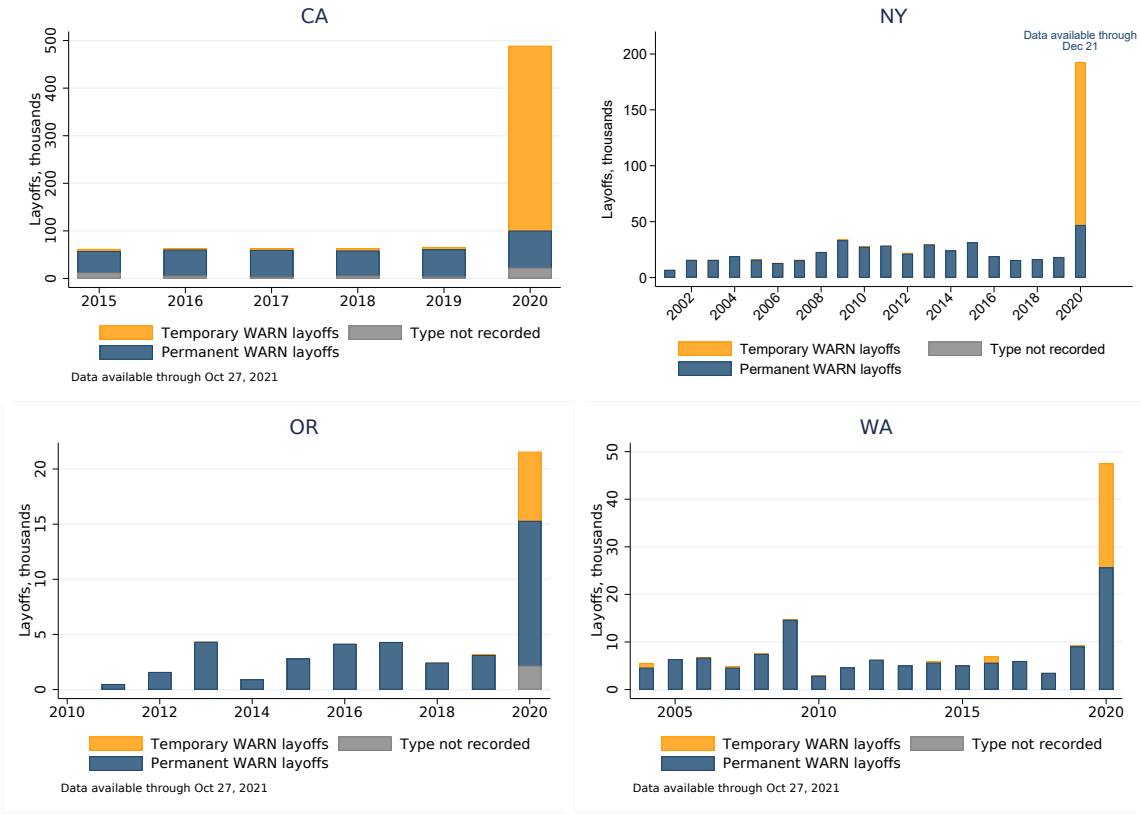
[8] https://www.govinfo.gov/content/pkg/CFR-1998-title20-vol3/pdf/CFR-1998-title20-vol3-part639.pdf

[9] https://www.edd.ca.gov/Jobs_and_Training/Layoff_Services_WARN.htm

[10] https://www.dir.ca.gov/dlse/WARN-FAQs.html

B Temporary vs. Permanent Layoffs

Mass Layoffs from Worker Adjustment and Retraining Notification Data



Note: Data from the state labor departments.

C Summary Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum	Observations
Layoff Rate	0.05	0.33	0	10.87	2,070
SAH Order Week	8.01	0.80	0	10	2,070
Covid Case Rate	0.01	0.03	0	0.54	2,070
Covid Death Rate	0.0003	0.002	0	0.05	2,070

Notes: Author's calculations using data from state labor departments, the Census Bureau, The New York Times corroborated with local sources, and the John Hopkins Center for Systems Science and Engineering. An observation is a locality in a given calendar week. There are 207 localities and 10 calendar weeks. Rates are in units of percentage points. SAH Order Week is the calendar week—where 1 indicates February 3–9, 2020 and 10 indicates April 6–12, 2020—that localities imposed a stay-at-home or shelter-in-place orders.