

Economic Impact Evaluation of the City of Minneapolis's Minimum Wage Ordinance

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Principal Investigators: Loukas Karabarbounis, Jeremy Lise, Anusha Nath

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1 Executive Summary

Purpose of the study. The City of Minneapolis commissioned a study of the economic impacts of the minimum wage ordinance passed in 2017.¹ The principal investigators of the study, hosted by the Federal Reserve Bank of Minneapolis, are providing to the City of Minneapolis the economic impact evaluation for the period 2018-2020.

Scope of the study. This report examines the aggregate labor market effects of minimum wage increases in Minneapolis. We document the effects on the average hourly wage, total jobs, total hours worked, and total worker earnings.

Data. We obtained administrative data from the Department of Employment and Economic Development (DEED) on firms, establishments, and workers. The dataset merges quarterly gross wage earnings and paid hours worked for employees from wage reports of the Unemployment Insurance (UI) data with industry and establishment location data from the Quarterly Census of Employment and Wages (QCEW).

Methods. The key to analyzing the impact of a policy change such as a minimum wage increase is the credible estimation of what would have happened in Minneapolis in the absence of the minimum wage increase (the "counterfactual"). The difference between the actual outcomes in Minneapolis in the presence of the minimum wage increase ("treatment") and the counterfactual outcomes in its absence is interpreted as the causal effect of the minimum wage increase on outcomes. To construct counterfactuals, we use synthetic difference-in-differences methods.

Results from impact analysis of 2018 and 2019 minimum wage increases. Table 1 presents the effects of minimum wage increases on aggregate labor market outcomes for low-wage sectors and separately for restaurant industries as requested by the City. The analysis includes data up to 2020(1). Estimates that are statistically significant at the 5 percent level are presented in bold numbers and colored in grey. The other estimates cannot be statistically

¹Minneapolis, Minn. Code of Ordinances, ch. 40 §320 (2017).

distinguished from zero.

Table 1: Effects of 2018-2019 Minimum Wage Increases (Percent Changes)

	Employment Share	Hourly Wages	Total Jobs	Total Hours	Worker Earnings
Retail Trade (44)	5	6	1	1	7
Administration and Support (56)	6	7	9	-11	5
Health Care and Social Assistance (62)	17	-1	6	6	5
Accommodation and Food Services (72)	8	0	5	3	9
Other Services (81)	3	6	5	-1	8
<i>Average (Weighted by Employment Shares)</i>		2	6	2	6
Full-Service Restaurants (722511)	4	4	-12	-6	-8
Limited-Service Restaurants (722513)	2	9	-18	-2	-11

Notes: Estimates that are statistically significant at the 5 percent level are presented in bold numbers and colored in grey. Average hourly wages exclude the top 10 percent of the distribution.

Preliminary results from 2020 analysis. We committed to deliver to the City results for the 2020 minimum wage increase with the same methodology we used for the impact effects of the minimum wage increase following the 2018-2019 minimum wage increases. Further employment declines and wage increases were observed in 2020, but the analysis using 2020 data should be interpreted with caution because this period coincides with the pandemic and civil unrest. In future reports, we will further examine the 2020 period using additional data and additional sources of variation to disentangle the effects of the pandemic and civil unrest from the effects of the minimum wage increase.

2 Purpose of the Study

The City of Minneapolis commissioned a study of the economic impacts of the minimum wage ordinance passed in 2017. The phased implementation of the minimum wage ordinance began in 2018 and is scheduled to reach 15 dollars in July 2022 for large firms and in July 2024 for small firms. The principal investigators of the study, hosted by the Federal Reserve Bank of Minneapolis, are providing to the City of Minneapolis the impact evaluation results for the 2018 and 2019 minimum wage increases. Our analysis presents results for these increases for the period before the COVID pandemic. We are also providing preliminary results for the 2020 minimum wage increases.

Minnesota first introduced a statewide minimum wage in 1974 and has since updated the wage floor periodically. In the period of our study (2000-2020), the latest policy-driven increase in the state minimum wage was in August 2014. The minimum wage rate was set to increase in stages beginning in August 2014 to 6.5 dollars for small firms and youth employees and to 8 dollars for large firms. Small firms are defined as ones earning an annual revenue less than 500,000 dollars, and large firms are ones that earn an annual revenue higher than this threshold. The rates were set to eventually reach 7.75 and 9.5 dollars per hour by 2016 for small and large firms, respectively.² Beginning in 2018, the rate was indexed to the price deflator for personal consumption expenditure, with annual increases capped at 2.5 percent of the previous rate. Table 2 provides the details of these changes over time.

After the 2014 increase in the statewide minimum wage, the City of Minneapolis began discussing raising the city minimum wage to 15 dollars per hour. In 2016, the mayor announced support for a city-wide minimum wage hike, the first major step towards a policy change. In 2017, the Minneapolis City Council passed a minimum wage ordinance that aimed to increase the minimum wage rate to 15 dollars. This increase was set to be implemented in phases starting in 2018 to reach 15 dollars in July 2022 for large firms and in July 2024

²Gratuities are not applied to the minimum wage, implying that employers have to pay their employees a wage rate above minimum wage before tips. The Minneapolis minimum wage ordinance adopted a similar policy with respect to gratuities.

Table 2: Minimum Wage Changes in Minnesota 2000-2020 (Dollars)

(Annual Revenue in Dollars)	Youth	Small Firms ($< 500,000$)	Large Firms ($\geq 500,000$)
2000-2005	4.25	4.90	5.15
2006-2013	4.90	5.25	6.15
2014	6.50	6.50	8.00
2015	7.25	7.25	9.00
2016	7.75	7.75	9.50
2017	7.75	7.75	9.50
2018	7.87	7.87	9.65
2019	8.04	8.04	9.86
2020	8.15	8.15	10.00
2021	8.21*	8.21*	10.08*

Notes: * denotes that the minimum wage is scheduled to increase every year according to the price deflator for personal consumption expenditures produced by the Bureau of Economic Analysis.

for small firms. Unlike the definition of firm size used by the state of Minnesota, which is based on revenues, the Minneapolis ordinance's definition is based on employment. A firm is defined to be "small" if it employs fewer than 100 persons and "large" if it employs 100 or more. The details of the phased implementation of the ordinance, which began in January 2018, are presented in Table 3, and the details of the timeline leading up to the ordinance being passed are described in Table A.1 in the Appendix.

The minimum wage will be indexed to inflation once the target level of 15 dollars per hour is reached. This make the changes both large and permanent. Our analysis will examine the economic impact of these minimum wage increases in Minneapolis since 2018. Throughout our period of study, the state minimum wage applies to all cities in Minnesota outside of the Twin Cities, and we will consider these cities as potential controls.

Table 3: Minimum Wage Policy Change in Minneapolis (Dollars)

Date	Small Firms (<100 Employees)	Large Firms (100+ Employees)
2018 (Jan)		10.00
2018 (July)	10.25	11.25
2019 (July)	11.00	12.25
2020 (July)	11.75	13.25
2021 (July)	12.50	14.25
2022 (July)	13.50	15.00*
2023 (July)	14.50	
2024 (July)	Equal to large firms	

Notes: * denotes that the minimum wage is scheduled to increase every year according to the price deflator for personal consumption expenditures produced by the Bureau of Economic Analysis.

3 Scope of the Study

This report examines the aggregate labor market effects of the minimum wage increases in Minneapolis. We document the effects on average hourly wage, total jobs, total hours worked, and total worker earnings. This analysis is based on data received from Department of Employment and Economic Development (DEED). This is the first of a series of annual reports we will be providing to the City of Minneapolis up until 2028. The future reports will use additional data we will be receiving from Department of Human Resources (DHS) and Department of Revenue (DOR). Our ability to merge the DEED-DHS-DOR datasets will allow us to examine several outcomes at a disaggregated level, including worker turnover, effect on workers by demographic characteristics, effect on social benefits received by workers, firms' capital-labor substitution decisions, firms' employee-contractor substitutions, firm profits, and prices inferred from firm-level data.

4 Data Sources

We use two main sources of data on workers and firms for our analyses of the effects of the minimum wage increase. Both sources are administrative and non-publicly-available data that were made available to us by Minnesota’s Department of Employment and Economic Development (DEED). The first data source is individual-level data of workers from Unemployment Insurance (UI). Minnesota requires most employers to file quarterly unemployment wage detail reports for the purpose of estimating the amount of unemployment insurance tax they owe. These reports provide us with data on quarterly earnings and hours worked for each worker. We calculate hourly wages for each worker by dividing total quarterly earnings by quarterly hours.³ Minnesota collects these data for each employee of a firm at the level of the establishment where they work. This feature of the data is especially important in studying the minimum wage effects, as a large part of employment is generated in multi-establishment firms.

The UI data do not contain information on the location of the establishments, which is necessary in order to identify which establishments were affected by the minimum wage increase. To overcome this problem, we merge the UI data with establishment-level data from the Quarterly Census of Employment and Wages (QCEW). The QCEW records jobs that account for roughly 97 percent of employment in the state of Minnesota. From these data, we observe the six-digit North American Industry Classification System code for the industry that the establishment operates in, the location of the establishment, and the firm to which the establishment belongs. The location data consist of both the city and the zip code in which the establishment operates.⁴

The merged data result in a quarterly dataset between 2001(1) and 2020(4). Our geographic unit of analysis is a zip code within a city. This allows the same zip code to be

³For calculating hourly wages, we exclude roughly 5 percent of observations that reported zero hours worked. We keep these observations for calculating other outcomes.

⁴The raw data do not have location information for around 4 percent of observations. In addition, we exclude observations for which the city name and zip codes are contradictory. Such contradictions are rare and constitute roughly 0.1 percent of the total establishments.

affected differently by the treatment if the zip code belongs to two different cities. It also allows for multiple treated units within a city that faces an increase in its minimum wage. For each industry, we calculate average wages, aggregate number of jobs (sum of full-time and part-time jobs), aggregate hours, and aggregate worker earnings paid within geographic units for each quarter. Finally, we aggregate all units that have fewer than 50 full-time equivalent jobs to one unit, separately for each industry and for treatment or control groups.

To summarize, by merging the worker-level UI data with the establishment-level QCEW data, we are able to create a dataset on workers' hours and wages, as well as the establishments at which they are employed, by industry, zip code, and city. Our dataset improves measurement relative to previous studies along three dimensions. First, using administrative sources, we provide estimates for the effects of a minimum wage increase on hours worked.⁵ Second, Minnesota is unique in that it records employee hours worked at the establishment level within firms. Thus, we include in our analyses firms with multiple establishments across city borders. Finally, we leverage detailed location data at the zip code level to increase the precision of our estimates.

Table 4 reports the industry distribution of employment shares and the fraction of workers earning below 15 dollars in 2017 by industry.⁶ We focus our baseline analyses on the two-digit industries in which 30 percent or more of workers earn below 15 dollars per hour. The six industries that satisfy this criterion are retail trade (44); administrative services (56); health care and social assistance (62); arts, entertainment, and recreation (71); accommodation and food services (72); and other services (81).⁷ In addition, we present separate results for full-service and limited-service restaurants, as requested by the City. Restaurants account for 6

⁵Oregon, Rhode Island, and Washington are the three other states in the U.S. that collect hours worked in the matched employer-employee administrative data.

⁶The shares of employment do not add up to 100 percent, as some industries have been excluded due to confidentiality concerns based on the presence of few establishments. The excluded industries are Agriculture, Forestry, Fishing, and Hunting (11); Mining, Quarrying, and Oil and Gas Extraction (21); Construction (23); Information (51); Real Estate and Rental and Leasing (53); and Public Administration (92).

⁷"Other services" consists of repair and maintenance shops, personal and laundry services, and various civic, professional, and religious organizations.

Table 4: Employment Shares and Fraction of Workers Earning below 15 Dollars

(2017)	Share of Employment		Fraction of Workers	
	(percent)		Earning Below 15 Dollars	
	MPLS	Other MN	MPLS	Other MN
Manufacturing (31)	4	12	14	17
Wholesale Trade (42)	3	4	11	15
Retail Trade (44)	5	12	59	65
Transportation (48)	2	3	20	23
Finance and Insurance (52)	11	4	5	13
Professional Services (54)	11	4	5	12
Management of Companies (55)	5	3	15	12
Administration and Support (56)	6	5	58	48
Educational Services (61)	13	8	22	23
Health Care and Social Assistance (62)	17	17	30	34
Arts, Entertainment, and Recreation (71)	2	2	42	61
Accommodation and Food Services (72)	8	9	54	71
Other Services (81)	3	3	40	49
Restaurant Industries				
Full-Service Restaurants (722511)	4	3	46	56
Limited-Service Restaurants (722513)	2	3	80	90

Note: "SP" denotes Saint Paul and "Other MN" denotes the sum of all other cities in Minnesota except for Minneapolis and Saint Paul.

percent of total employment and have a high fraction of potentially impacted workers.⁸

⁸The fraction of workers earning below 15 dollars reported in Table 4 for the restaurant industries is a lower bound for the fraction of workers who are affected by the minimum wage increase. This is because the wages reported to DEED include tips and the minimum wage ordinance excludes tips.

5 Methodology

At the core of any policy evaluation lies the fundamental problem of causal inference. The minimum wage increase was implemented on January 1, 2018. We observe economic outcomes, such as wages, employment, hours, and worker earnings, in Minneapolis before and after the minimum wage increase. However, researchers do not observe the counterfactual of what the economic outcomes in Minneapolis after the minimum wage increase would have been *in the absence* of an increase in the minimum wage. To answer the question of what the effect of the minimum wage increase is, one needs to know the difference between the actual outcomes (which are observed) and the counterfactual outcomes (which are not observed). The key to evaluating the policy is to construct counterfactual outcomes in a credible manner.

To construct counterfactuals, we use synthetic control methods ([Abadie and Gardeazabal \(2003\)](#), [Abadie et al. \(2015\)](#)) as augmented by [Arkhangelsky et al. \(2019\)](#) with fixed effects. The synthetic control approach takes a weighted average of the geographical units outside Minneapolis to construct the counterfactual. The statistical tool chooses weights such that the synthetic control looks like Minneapolis (in a statistical sense) in terms of outcome variables before 2018. For example, weights would be found so that the time series before 2018 for the synthetic control for the economic outcome matches as closely as possible the same time series in Minneapolis. The counterfactual is built from other geographical regions, but they are averaged in such a way that they approximate as closely as possible Minneapolis before 2018 on the observable dimensions that are relevant for the analysis. This method produces a counterfactual that responds to economic shocks in a way similar to how Minneapolis does in the period before the minimum wage increase. We note that the period after the minimum wage increase partly overlaps with the pandemic recession and thus the method should be interpreted with caution when applied to the period that includes the pandemic recession.⁹

⁹To infer the statistical significance of the estimated impact effects, we use the “placebo method.” The method takes all non-treated units and estimates the treatment effect in these samples, with each sample generated under a placebo treatment of a subset of non-treated units. Since we should be estimating a zero treatment effect in the absence of a treatment, the distribution of treatment effects under the placebo method gives us the distribution of noise inherent in the data. See Algorithm 4 in [Arkhangelsky et al. \(2019\)](#) for exact implementation details to construct the placebo standard errors.

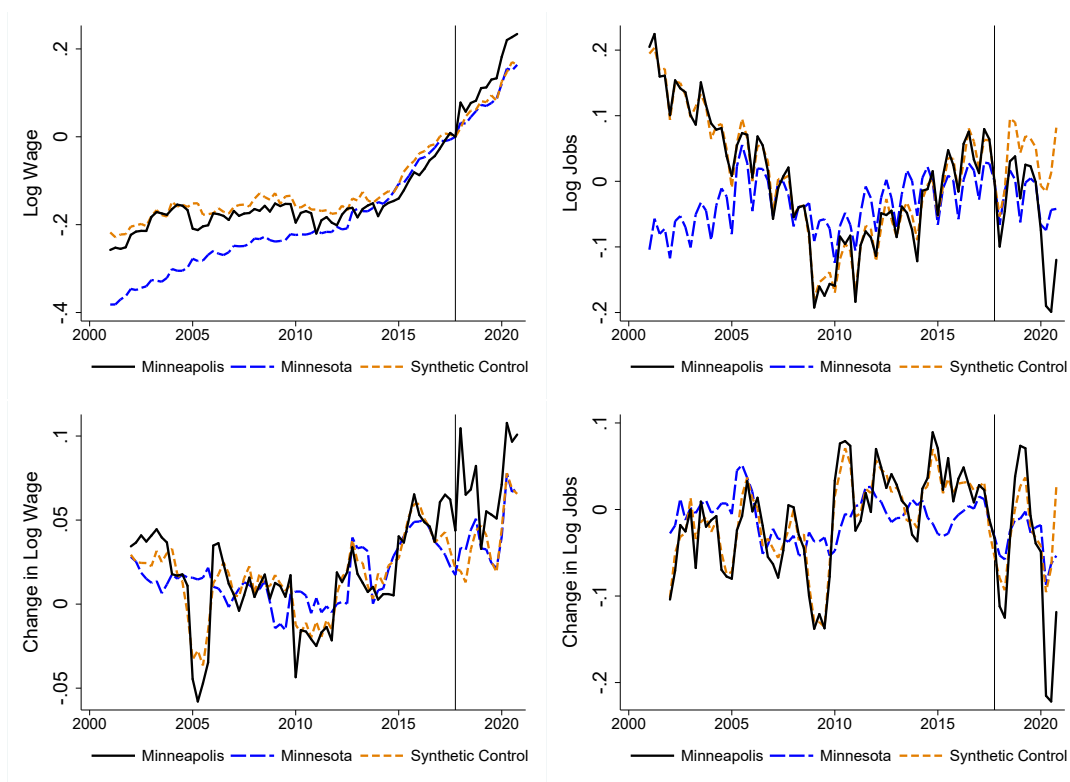


Figure 1: Illustration of the Synthetic Control Method

Figure 1 illustrates this method in the context of the retail industry as an example. The upper panels of the figure plot quarterly time series of the average hourly wage and the total number of jobs for the retail trade industry during the period with data coverage between 2001(1) and 2020(4). All series are in logs and normalized to 0 in 2017(4), which is the last quarter before the minimum wage increased in Minneapolis. The solid lines show that retail in Minneapolis experienced an increase in wages over time, whereas the number of jobs declined in the 2000s and then increased in the 2010s.

The long-dashed blue lines show the evolution of wages and jobs for the average of all cities in Minnesota besides Minneapolis and Saint Paul. This average represents the control group in a difference-in-differences specification. This specification would estimate the effect of a minimum wage increase by comparing the changes in outcomes over time between Minneapolis and the average of other cities. The trends before 2018 are significantly different between Minneapolis and other cities in Minnesota.

The dashed orange line shows the evolution of wages and jobs for the synthetic control of Minneapolis, which is the weighted average of cities in Minnesota other than Minneapolis and Saint Paul.¹⁰ By design, the methodology weights more heavily cities with similar pre-treatment trends and less heavily cities with different pre-treatment trends. As seen in the figure, the time series for the synthetic control reproduce very closely the time series of wages and jobs in Minneapolis in the pre-treatment period, including the decline in retail jobs the city experienced in the 2000s. Using synthetic difference-in-differences, we can visualize the treatment effect of the minimum wage increase as the difference between the dashed orange line and the solid line in the post-2018 period. The changes observed in 2020 should be interpreted with caution because this period coincides with the pandemic and civil unrest.

The empirical estimates presented in Section 6 will focus on outcome variables that are expressed in yearly growth rates.¹¹ The lower panels of Figure 1 demonstrate that retail wages and jobs growth are substantially more volatile in Minneapolis than in the rest of Minnesota. For the synthetic control, we reestimate the weights in the growth specification of the outcome variable. Similar to the levels specification, the fit during the pre-treatment period is significantly improved relative to the unweighted average that underlies the difference-in-differences specification.

5.1 Performance of Synthetic Control in the Pre-treatment Period

Before presenting the impacts of the minimum wage increase, we pause to discuss the performance of the synthetic control method in accounting for the time series of Minneapolis in the period before the minimum wage increase. Table 5 presents R-squared coefficients from regressions of outcome variables in Minneapolis on the outcome variables of the synthetic

¹⁰We exclude Saint Paul from the construction of the synthetic control of Minneapolis because Saint Paul began discussing a minimum wage increase in 2018 and implemented the increase in 2020.

¹¹There are two reasons why we prefer a specification in growth rates to a specification in levels. First, using a unit fixed effect in a growth specification removes heterogeneity in average growth rates that may be correlated with the treatment of increasing the minimum wage. Second, using yearly growth rates allows us to remove quarterly seasonal variation, thus improving the efficiency of our estimates.

Table 5: Pre-treatment Fit: Synthetic Control versus Difference-in-Differences

(R-squared, percent)	Wage ^a		Wage ^b		Jobs		Hours		Earnings	
	SC	DD	SC	DD	SC	DD	SC	DD	SC	DD
Retail Trade (44)	84	25	82	26	92	8	89	0	75	12
Administration and Support (56)	53	3	66	7	90	20	82	15	80	18
Health Care, Social Assistance (62)	94	27	95	52	86	0	91	12	86	5
Arts, Entertainment, Recreation (71)	30	5	29	3	54	21	50	30	53	15
Accommodation, Food Services (72)	82	41	83	49	92	34	93	27	94	39
Other Services (81)	61	0	46	0	80	3	83	3	89	9
Full-Service Restaurants (722511)	62	25	78	30	90	22	89	35	89	20
Limited-Service Restaurants (722513)	67	10	67	46	55	10	56	7	59	10

(a) Average hourly wage, excluding the highest-paying 10 percent of jobs. (b) Average hourly wage, excluding the highest-paying 25 percent of jobs. SC: synthetic control. DD: difference-in-differences.

control. For comparison, we also present the R-squared coefficients when using the outcome variables of the unweighted average of all other zip codes within cities in Minnesota.

The table shows that for five out of the six low-wage industries identified previously in Section 4 and separately for restaurants, the synthetic control accounts for a substantial fraction of the variation of the time series of Minneapolis before the minimum wage increase. To give an example from a key industry that we elaborate upon below, for full-service restaurants during the pre-treatment period, the synthetic control accounts for 90 percent of the time series variation of jobs growth in Minneapolis. The control average of all other units in Minnesota accounts for only 22 percent. Despite the overall success in accounting for a substantial variation of the pre-treatment time series, the synthetic control does not perform equally well in all industries. The most notable lack of fit is for the arts, entertainment, and recreation industry. Thus, we drop this industry from our analyses.

6 Results

This section first provides the results of the impact evaluation results for the 2018 and 2019 minimum wage increases during the pre-pandemic sample that covers the period up to 2020(1). We then provide preliminary results for the 2020 minimum wage increases, which adds the period 2020(2) to 2020(4) to the analysis.

6.1 Impact Analysis in the Pre-pandemic Sample

Table 6: Effects of the Minneapolis Minimum Wage Increase: Pre-pandemic Sample

	Wage ^a	Wage ^b	Jobs	Hours	Earnings
Retail Trade (44)	6.1 (0.0)	7.5 (0.0)	1.4 (65.7)	0.5 (99.7)	7.1 (8.8)
Administration and Support (56)	7.4 (0.2)	8.6 (0.0)	8.5 (38.8)	-11.0 (13.2)	5.4 (50.7)
Health Care and Social Assistance (62)	-1.2 (25.8)	-0.4 (53.5)	6.2 (14.4)	5.9 (33.8)	5.1 (53.1)
Accommodation and Food Services (72)	0.4 (87.3)	0.3 (88.7)	4.9 (33.0)	3.2 (62.7)	8.6 (8.6)
Other Services (81)	5.5 (0.0)	4.2 (0.0)	4.7 (21.8)	-0.8 (97.9)	8.3 (4.6)
Full-Service Restaurants (722511)	3.5 (0.0)	1.7 (9.6)	-12.1 (0.4)	-5.5 (37.4)	-8.0 (15.0)
Limited-Service Restaurants (722513)	8.8 (0.6)	7.6 (18.6)	-18.3 (3.8)	-2.3 (55.9)	-10.6 (29.8)

Notes: (a) Average hourly wage, excluding the highest-paying 10 percent of jobs. (b) Average hourly wage, excluding the highest-paying 25 percent of jobs. The estimates are in log points, multiplied by 100. Entries in parentheses are *p*-values using the placebo method.

Table 6 presents results for the low-wage industries identified previously and separately for restaurants. Entries are multiplied by 100 and equal the log point change in outcomes

in 2020(1) due to the minimum wage increase. The columns present different outcome variables. To give an example, the first row says that the increase in the minimum wage in Minneapolis caused a roughly 1.4 log points (roughly 1.4 percent) increase in the number of retail jobs, relative to the counterfactual in which the minimum wage had not increased. Note that the estimate is the cumulative effect of minimum wage increases between 2018(1) and 2020(1). Each entry in parentheses is the p -value associated with the estimated treatment effect – that is, the probability of obtaining a treatment effect as extreme as the point estimate under the null hypothesis that the treatment effect is zero. Continuing the example, we see that the placebo method produces a p -value of 65.7 percent, and thus we conclude that the treatment effect of 1.4 is imprecisely estimated and cannot be statistically distinguished from zero at 5 percent level of significance.¹²

We estimate wage increases at the 5 percent level of significance for retail, administrative and support services, other services, and restaurants. For industries with statistically significant increases, we document increases that range between 4 and 9 log points. In 2020(1), the difference between the minimum wage in Minneapolis and the control cities is 25 log points. However, many workers are not close to the minimum wage, even among low-wage industries, and thus the estimated effects of the minimum wage increase on wages are expected to be smaller than the change in the minimum wage.

Turning to the estimated effects on jobs in the third column, we find no statistically significant changes in jobs except for those in the restaurant industry. Jobs in full-service restaurants declined by 12 log points, and jobs in limited-service restaurants declined by 18 log points, with both declines being significant at levels below 5 percent.¹³ Repeating our estimates for

¹²We have multiple treated units, as our geographic unit of analysis is a zip code within a city. Thus, we construct placebo estimates by assigning a treatment status to 999 random subsamples of zip codes, with each subsample having a size equal to the number of treated units in Minneapolis. We use the formula $p = 2 \min\{p_H, p_L\}$ to calculate the p -value for a point estimate for Minneapolis, where p_H is the fraction of placebo samples with point estimates that are higher than the estimate of Minneapolis in 2020(1) and p_L is the fraction of placebo samples with point estimates that are lower than the estimate of Minneapolis in 2020(1). Similar calculations underlie our p -values and confidence intervals in other tables.

¹³The results we obtain for restaurants are significantly different from the results we obtain for accommodation and food services (72) that includes restaurants. While we cannot exclude the possibility that workers reallocated from restaurants to accommodation, we note that the results for accommodation and food services

total hours in the fourth column changes some of our conclusions. While we still find declines in the restaurant industry, the hours declines are smaller than the jobs declines and they are not statistically significant.

The final column of the table presents the estimated effects on total worker earnings. The point estimates show increases in worker earnings in all industries except for restaurants, for which we find declines. However, with the exception of other services, changes in worker earnings cannot be distinguished statistically from zero at a 5 percent level of significance.

Placebo in Time

So far, we have provided estimates of pre-pandemic effects of minimum wage increases on aggregate labor market outcomes. To assess whether these results are indeed driven by the minimum wage increases, we conduct a placebo test that stops the sample in 2015(4) and excludes all subsequent quarters when the minimum wage increase was in active discussion. Next, we assign a placebo treatment date of 2013(4) for Minneapolis. Since the period between 2013 and 2015 predates even the discussion of increasing the city-level minimum wage, we should not find treatment effects for this placebo treatment.

Table 7 summarizes the results of this exercise for jobs. Using the placebo treatment, we fail to find statistically significant negative jobs effects in any industry. This includes the industries for which we previously found significant job declines following the treatment of the minimum wage increase.

(72) are very noisy. For example, the 95 percent confidence interval of jobs estimates for accommodation and food services (72) ranges between -3.9 and 13.2 . This interval overlaps with the 95 percent confidence intervals for full-service restaurants, -21.2 to -2.9 , and for limited-service restaurants, -39.3 to -1.1 .

Table 7: Placebo Jobs Effects of Minimum Wage Increases in 2013(4)

Industry	Minneapolis
Retail Trade (44)	10.4 (0.8)
Admin. and Support (56)	15.4 (16.4)
Health Care and Social Assistance (62)	-1.7 (80.7)
Accommodation and Food Services (72)	13.8 (2.8)
Other Services (81)	4.6 (20.4)
Full-Service Restaurants (722511)	-1.9 (97.9)
Limited-Service Restaurants (722513)	51.1 (0.0)

Notes: These placebo estimates use data from 2001(1) to 2015(4), before the discussions of raising the minimum wage. We assign a placebo treatment in 2013(4) to replicate the ratio of treated to total quarters in the full data with 3 years of treatment. The estimates are in log points, multiplied by 100. Entries in parentheses are p -values using the placebo method.

Placebo in High-Wage Industries

As an additional robustness check on the methodology, we conduct a placebo using the two industries with the lowest share of jobs paying less than 15 dollars per hour in 2017. Table 8 repeats our estimates for finance and insurance and professional services, both of which have fewer than 5 percent of low-wage jobs in Minneapolis. Because there are very few low-wage workers in these industries, we expect to find zero treatment effects. As the table illustrates, the estimates are mostly statistically insignificant at conventional levels.

Table 8: Minimum Wage Effects in High-Wage Industries: Pre-pandemic Sample

Minneapolis	Wage ^a	Wage ^b	Jobs	Hours	Earnings
Finance and Insurance (52)	0.5 (61.5)	0.2 (91.5)	15.6 (5.0)	1.9 (79.7)	-7.5 (40.8)
Professional Services (54)	3.3 (7.6)	5.1 (0.2)	-5.7 (24.6)	10.3 (11.0)	9.0 (18.6)

Notes: (a) Average hourly wage, excluding the highest-paying 10 percent of jobs. (b) Average hourly wage, excluding the highest-paying 25 percent of jobs. The estimates are in log points, multiplied by 100. Entries in parentheses are *p*-values using the placebo method.

6.2 Preliminary Results from 2020 Analysis

We committed to deliver to the City results for the 2020 minimum wage increase with the same methodology we used for the impact effects of the minimum wage increase following the 2018-2019 minimum wage increases. Table 9 presents our estimates when we include the post-pandemic period in our analyses. Specifically, the table presents cumulative changes in wages, jobs, hours, and worker earnings through 2020(4). The estimates in this table should be interpreted with caution because there are confounding factors which may interact with the

minimum wage increase. A key assumption of the synthetic difference-in-differences method is that in the post-policy period, treated units and the synthetic control units react similarly to economic shocks. Since lockdowns during the pandemic were more severe and the civil unrest was more intense in Minneapolis compared with other cities in Minnesota, the estimates from using only Minnesota data need to be interpreted with caution and are preliminary.

Table 9: Estimates when Including Post-pandemic Sample

Minneapolis	Wage ^a	Wage ^b	Jobs	Hours	Earnings
Retail Trade (44)	8.8 (0.0)	9.8 (0.0)	-9.1 (14.0)	-5.6 (24.4)	2.5 (62.5)
Administration and Support (56)	8.8 (0.0)	10.7 (0.0)	-3.4 (83.7)	-13.2 (20.4)	-4.1 (69.9)
Health Care and Social Assistance (62)	-3.3 (1.8)	-2.0 (4.2)	13.4 (1.4)	13.4 (2.8)	11.5 (14.6)
Accommodation and Food Services (72)	0.3 (98.1)	0.0 (79.1)	-22.6 (0.0)	-25.1 (0.0)	-17.8 (3.0)
Other Services (81)	10.7 (0.0)	8.0 (0.0)	0.4 (70.1)	-2.6 (75.5)	8.1 (14.2)
Full-Service Restaurants (722511)	4.0 (0.0)	3.7 (0.0)	-38.6 (0.0)	-39.6 (0.0)	-38.8 (0.0)
Limited-Service Restaurants (722513)	12.3 (0.8)	10.1 (22.8)	-37.2 (0.2)	-28.0 (2.8)	-28.5 (1.8)

Notes: (a) Average hourly wage, excluding the highest-paying 10 percent of jobs. (b) Average hourly wage, excluding the highest-paying 25 percent of jobs. The estimates are in log points, multiplied by 100. Entries in parentheses are *p*-values using the placebo method.

The difference between the minimum wage in Minneapolis and the control cities increases to 32 log points in 2020. In Table 9, estimates continue to show statistically significant increases in wages for retail; administrative and support services; other services; and restaurants.¹⁴ These industries coincide with the industries with wage increases in the pre-pandemic period. The wage increases are generally larger when the post-pandemic period is included,

¹⁴Entries in this table are multiplied by 100 and are the log point change in outcomes in 2020(4) and entries in parentheses show *p*-values associated with the estimated coefficients.

with increases that range between 4 and 12 log points among industries with statistically significant increases.¹⁵

Turning to the estimates on jobs in the third column, we document a 23 log points decline for accommodation and food.¹⁶ We find an almost 40 log points decline in jobs in both full-service and limited-service restaurants. We find an almost 10 log points decline in retail jobs, although this decline is not significant at the 5 percent level. Similarly, for all other industries except for health, we obtain imprecise estimates that cannot be statistically distinguished from zero at conventional levels of significance. For health, we find a 13 log points increase in jobs. In contrast to the pre-pandemic sample, our job estimates in the third column are more aligned with our hours estimates in the fourth column.

The final column of the tables present the estimated effects on total worker earnings. We fail to detect a statistically significant increase in earnings in all industries. For full-service restaurants, we estimate a statistically significant decline of roughly 40 log points in worker earnings. For limited-service restaurants, we estimate a statistically significant decline of roughly 30 log points in worker earnings.

We emphasize, again, that the estimates for cumulative changes through 2020(4) in Table 9 should be interpreted with caution because this period coincides with the pandemic and civil unrest. In future reports, we will further examine the 2020 period using additional data and additional sources of variation to disentangle the effects of the pandemic and civil unrest from the effects of the minimum wage increase.

¹⁵A difference between the two samples is that in the post-pandemic sample, the decrease in wages in the health industry becomes statistically significant.

¹⁶For arts, entertainment, and recreation, we find a statistically significant jobs declines of roughly 20 percent. However, as discussed previously, the synthetic control fits poorly the time series of Minneapolis for this industry. Thus, we do not find these estimates credible and omit them from the tables.

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B Additional Tables

Table A.1: Time Line For Minimum Wage Ordinance in Minneapolis

2014	Discussions about raising Minneapolis minimum wage to 15 dollars begin.
Sep. 2015	Minneapolis City Council approves funding to study impact of 12 dollars or 15 dollars minimum wage.
Feb. 2016	Advocacy group 15 Now Minnesota launches campaign to raise minimum wage to 15 dollars via ballot initiative.
July 2016	Minneapolis City Council blocks inclusion of minimum wage increase on ballot, despite petition reaching required number of signatures, citing City Attorney Susan Segal's opinion that ballot initiative did not meet legal requirements.
Oct. 2016	Report on potential impact of minimum wage increase released by Roy Wilkins Center for Human Resources and Social Justice at the University of Minnesota.
Dec. 2016	Minneapolis Mayor Betsy Hodges announces support for city minimum wage hike.
May 2016	Minneapolis City Council begins drafting ordinance.
July 2017	Minneapolis City Council passes ordinance raising minimum wage to 15 dollars by 2024.
Jan. 2018	First phase of Minneapolis minimum wage increases goes into effect.

C Additional Figures

In this appendix section, we plot the growth in the hourly wages and the total number of jobs between 2001(1) and 2020(4) for each of the low wage industries described in the paper. All series are expressed in yearly growth rates. The solid lines depict the series for Minneapolis. The long-dashed blue lines show the growth of wages and jobs for the average of all cities in Minnesota besides Minneapolis and Saint Paul. The dashed orange line shows the growth of wages and jobs for the synthetic control of Minneapolis, which is the *weighted* average of cities in Minnesota other than Minneapolis and Saint Paul. Using synthetic difference-in-differences, we can visualize the treatment effect of the minimum wage increase as the difference between the dashed orange line and the solid line in the post-2018 period. As mentioned before, the changes observed in 2020 should be interpreted with caution because this period coincides with the pandemic and civil unrest.

Figure 2: Retail Sector (44)

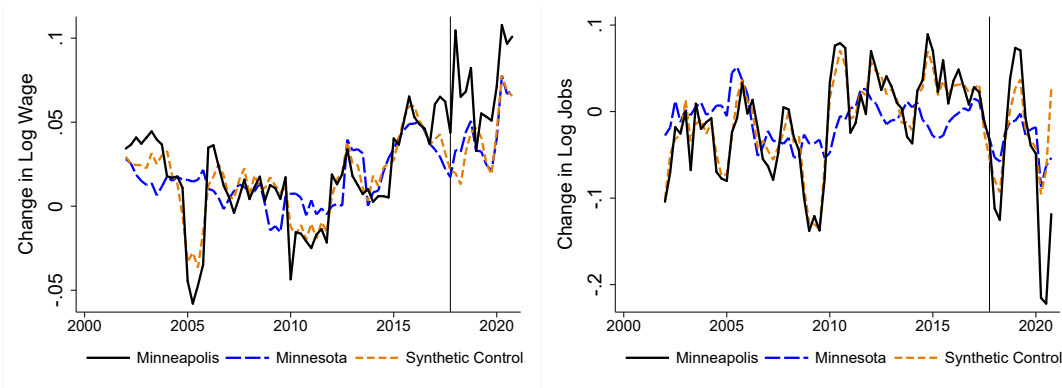


Figure 3: Administration and Support (56)

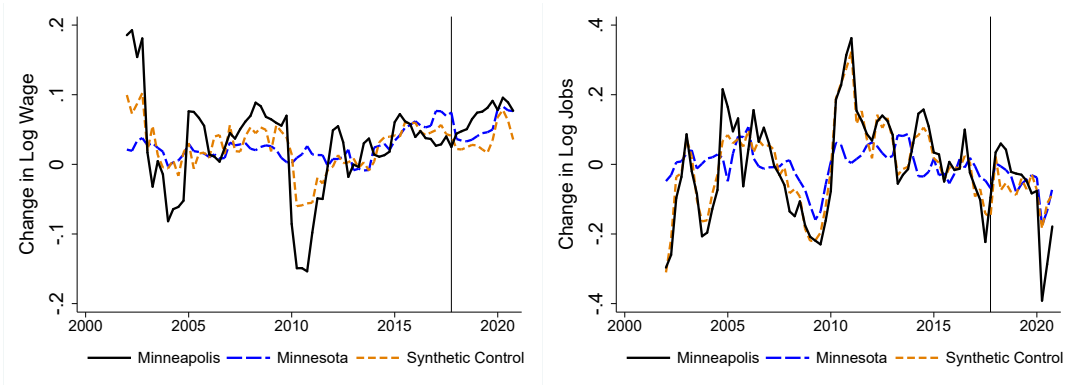


Figure 4: Health Care and Social Assistance (62)

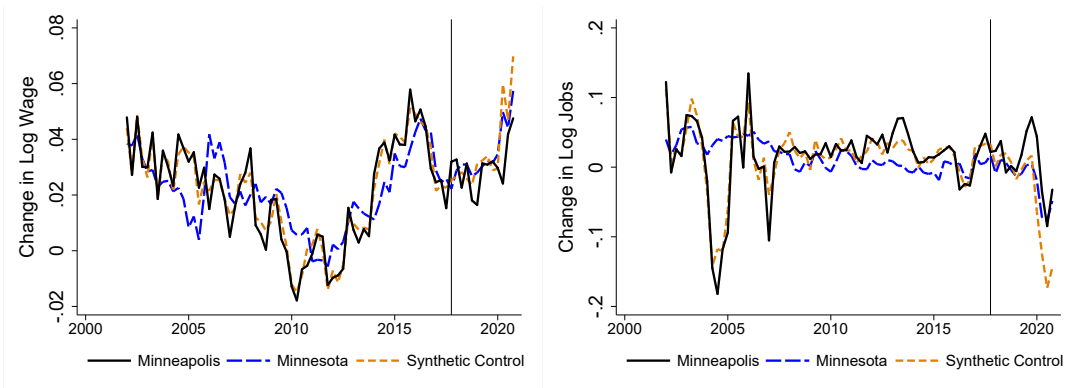


Figure 5: Other Services (81)

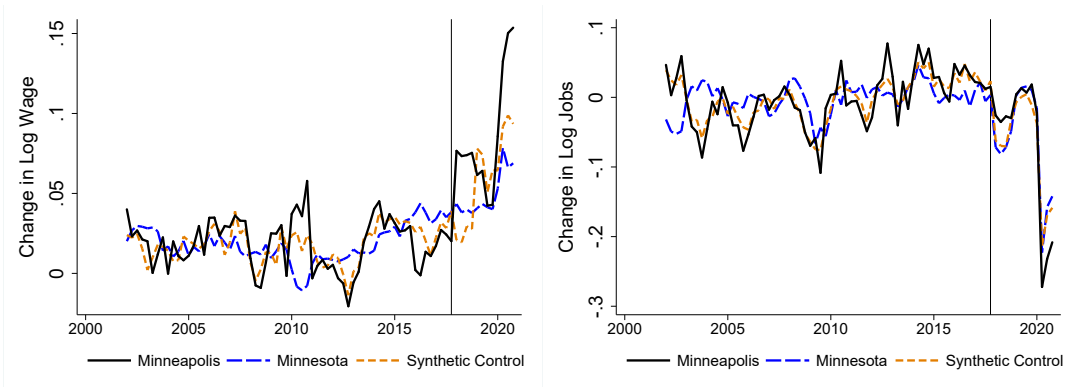


Figure 6: Accommodation and Food Services (72)

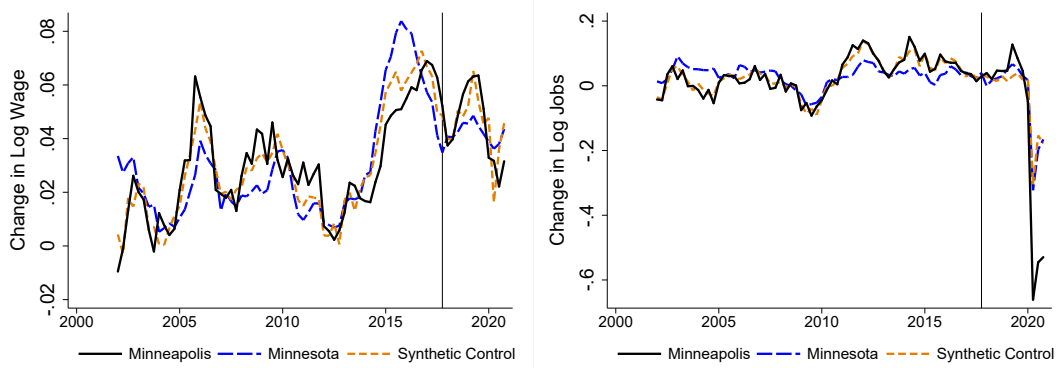


Figure 7: Full-Service Restaurants (722511)

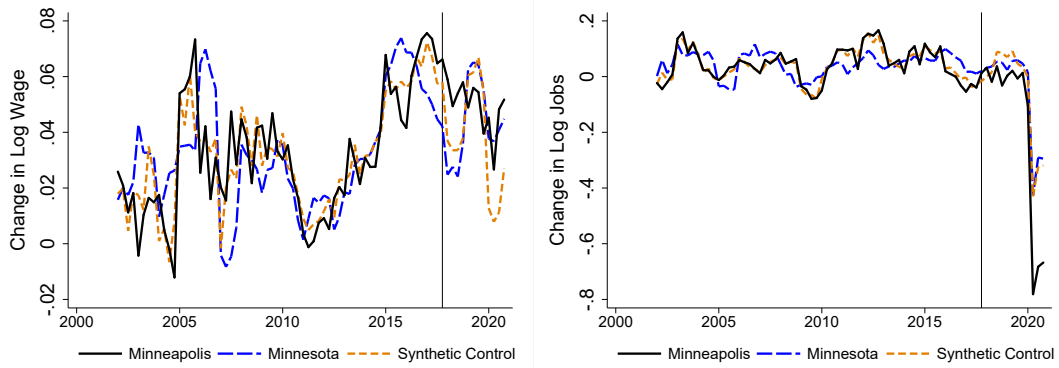
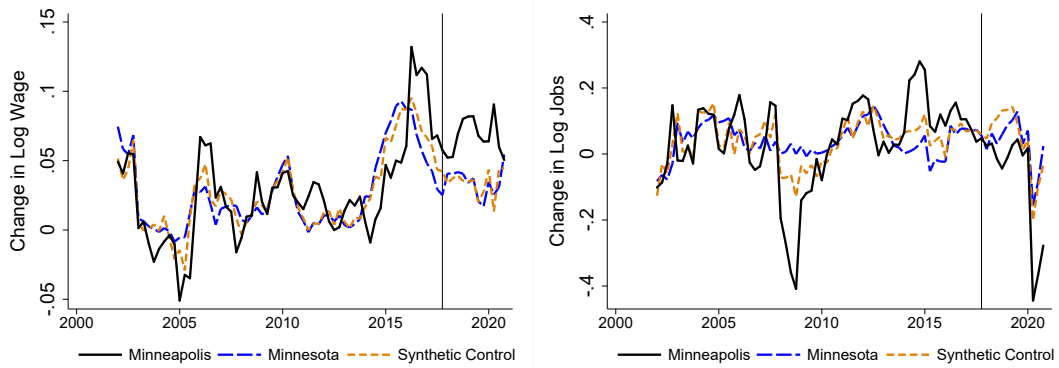


Figure 8: Limited-Service Restaurants (722513)



D Qualitative Interviews

The Federal Reserve Bank of Minneapolis conducted 15 interviews across employers, trade groups, and labor representatives in Minneapolis.¹⁷ These interviews focused on the city’s minimum wage increases in 2018 and 2019. The interviews allowed employers and worker representatives to describe their experience related to those increases.

This section highlights themes that arose during the interviews. Some of these explain the motivations, perceptions, and other factors that may have influenced the interviewed employers’ changes to their firms’ headcount, compensation, benefit provision, or payroll. Others relate to the ways labor market experiences of workers represented by labor interviewees may have changed. The themes presented here are not intended to be representative of the entirety of employer or worker experiences related to the minimum wage. Rather, the section is intended to complement the empirical analysis outlined in this report.

Interviewees and Interview Questions. The interviews were conducted in the summer of 2020. Because of COVID, they were conducted over the phone. Table 11 lists the organizations/persons interviewed¹⁸ and Table 12 lists the questions asked in the interviews.

Table 11: List of Interviewees

Employers	Labor Representatives/Other Organizations
Manufacturing Shop Owner (Large Employer)	Metro IBA
Record Store Owner (Small Employer)	SEIU Health Care
Restaurant Owner (Large Employer)	Minneapolis Chamber of Commerce
Restaurant Owner (Large Employer)	Minnesota Council of Nonprofits
Entertainment Venue Owner (Large Employer)	Minneapolis Downtown Council
Retail Shop Property Manager (Small Employers)	Minneapolis Regional Labor Federation
Hotel Owner (Large Employer)	UNITE HERE Local 17
	Cue the Accountant (Consulting firm for small businesses)

Increase in Labor Costs. Many employers reported that they were already planning for

¹⁷We thank Benjamin Horowitz for conducting these interviews and documenting the patterns described in this section.

¹⁸The survey team reached out to seven other organizations, which either did not reply or failed to show up for the interview at the scheduled time.

Table 12: Interview Questions

-
- 1 The first minimum wage increase in Minneapolis was implemented on January 1, 2018 for businesses with more than 100 employees, and July 1, 2018 for businesses with less than 100 employees. Do you recall how you first heard about the minimum wage ordinance, and your initial thoughts about the potential change?

For employees and union leaders

- 2 Thinking back to the time of the first minimum wage increase, did you (or your members) see your job duties change in significant ways? How about your hours or benefits?
- 3 Were you involved in any contract negotiations close to the implementation date? Did the conversation about a minimum wage increase impact those negotiations? How?
- 4 Did you (or your members) see your job duties change in significant ways after the wage increase went into effect? How about your hours or benefits?
- 5 Did your (or your members?) income change after the minimum wage increase? By income, I mean the total amount of money you earned, not just your hourly wage.
 - a. (If income increased) What did you do with the extra income?
 - b. (If income decreased) How did you make up for the lost income?
- 6 Did the minimum wage increase impact your plans to stay in your job or look for additional work?
- 7 Another minimum wage increase in Minneapolis was implemented on July 1, 2019 for all businesses. Did you notice any changes to your job duties or your income before or afterwards?
- 8 The next minimum wage increase is scheduled for July 1, 2020. Do you expect, or have you been informed about, any job changes that might occur as a result?
- 9 How has your job changed during the COVID-19 pandemic? Do you think the minimum wage change will have a different impact on your job as a result?

For businesses and business organizations

- 10 Did you (or your members) plan to adapt your business model to those changes in 2018? How long was your planning process, and what did those plans look like?
 - 11 Did you hire any specialists to help you in your planning process? (If a business specialist is on the line: did you experience a change in the quantity or quality of services you provide?)
 - 12 Did you wind up implementing any or all of your planned changes to your business model after July 2018? Did you make any unplanned changes?
 - 13 Did you feel that the minimum wage increase impacted your ability to recruit or retain workers?
 - 14 Did you make any significant changes to the benefits you offered employees after July 1, 2018?
 - 15 Did you connect lower-wage employees access to any resources to manage their wage increase?
 - 16 Another minimum wage increase in Minneapolis was implemented on July 1, 2019 for all businesses. How did you (or your members/clients) adapt between the two minimum wage increases?
 - 17 Did you experience a change in your ability to recruit or retain employees?
 - 18 The next minimum wage increase is scheduled for July 1, 2020. How has your business or job changed during the COVID-19 pandemic?
 - 19 Do you think the minimum wage change will have a different impact on your business/job/services as a result of COVID-19?
-

increasing labor costs years before the implementation of Minneapolis's ordinance. They did so for three main reasons. First, Minnesota's minimum wage increased for many employers from 7.25 dollars in 2014 to 9.5 dollars in 2016 and is inflation-adjusted annually. Second, a public debate about city-specific minimum wage increases in Minneapolis preceded the actual ordinance. Third, Minneapolis passed an ordinance in May 2016 requiring employers to provide paid time off for employees.

Despite the increase in expected labor costs, some employers believed the 2019 minimum wage increase was more consequential for headcount decisions than prior increases were. Several interviewees believed that the 2019 minimum wage increase led to decreases in staffing levels for two reasons: First, employers had more time to adapt and deploy technology that allowed for a more efficient workforce. Second, for some firms, wage increase may have represented a "tipping point" regarding the cost of adopting such technology relative to the benefits it supplied. In other words, employers were not previously waiting for technology that could replace workers; they were waiting for the cost of such technology to become cheaper relative to hourly wages. Some interviewees in the hospitality sector believed the second increase was one such tipping point in their industries. An interviewee in the manufacturing sector believed those tipping points will soon arrive.

Wages and Benefits. The minimum wage increase disrupted employers' efforts to compensate workers based on experience and job function. For example, restaurateurs described a pre-increase wage hierarchy that paid higher hourly wages to kitchen staff relative to servers. The differential reflected servers' additional income-earning ability through tips. Restaurateurs reported that the servers' minimum wage increase precluded them from raising wages for kitchen staff without raising prices to levels perceived as uncompetitive. Other employers reported compressing wages, because the higher wages of new staff members would make the higher wages of more experienced workers less tenable. One interviewee noted that some large employers were hiring new staff at higher wages than their existing staff's wages, because the employer thought the higher minimum wage necessitated higher wages for recruiting (if not retaining) staff.

Labor representatives suggested that the minimum wage increase may have encouraged more jobs to be classified as managers or other positions exempt from the minimum wage. Before January 1, 2020, employees could be exempted from overtime and minimum wage rules if their job duties met certain conditions and were paid at least 455 dollars on a weekly basis. The weekly threshold is defined irrespective of hours worked; in other words, it func-

tions like a salary.¹⁹ The employers seem to have taken advantage of these thresholds to increasingly re-classify workers as exempt employees. Employee representatives also suggested that enforcement of the rules around minimum wage exemption is inconsistent because the regulations are not well advertised or explained to impacted workers, or because workers may feel their options for recourse or alternative employment are limited. The weekly pay threshold increased to 684 dollars per week on January 1, 2020.

The increase in minimum wage did not seem to have a significant impact on the labor representatives' bargaining conversations in the Twin Cities. Representatives believed that most employers recognized that wage increases would already be necessary to recruit and retain employees, especially in what most viewed as a relatively strong market for job seekers.

Employers factored in public benefits and non-wage compensation when responding to the minimum wage increase. Several employers noted that their employees may have advocated for fewer hours to avoid a benefits cliff. Others said that they reduced benefits like health care and paid time off to cover the costs of the minimum wage, reducing paid time off to the city's minimum and expecting employees to take advantage of the state's Medicaid and Basic Health Plan programs.

Changes to Business Practices. Perceptions about – and employers' decisions based upon – consumers' elasticity of demand were tied to employers' perceptions about their primary competitors or sources of revenue. Business owners set their prices based on research and assumptions about consumer preferences. For businesses in the retail or restaurant sector, those preferences may strongly relate to consumers' alternatives. A downtown restaurateur noted that tourists could opt to eat near their suburban hotel if restaurant prices in Minneapolis increase significantly. A retailer noted that their major competition comes from online merchants that are not subject to the minimum wage laws. Large health sector employers may have been less interested in their competition than in reimbursement rates provided un-

¹⁹For example, an employee classified as a manager could be asked to work for 40 or more hours for 455 dollars, equaling an hourly wage of about 11.35 dollars at 40 hours, with the equivalent wage rate decreasing as hours worked increase.

der contracts with the state, and they may have adjusted wages in anticipation of changes to those contracts.

The minimum wage was perceived as speeding up adoption of pre-existing technologies and business models. Examples include switching products within a kitchen from scratch-made to pre-made and automating check-in/check-out procedures in hotels. Both options were available before the ordinance, but employers were less compelled to see if they would result in better margins.

Most employers did not report receiving advice on how to adapt to the higher minimum wage. Some interviewees cited firms that provided data and recommendations based on business practices in other cities with higher minimum wages. Some firms working in Minneapolis also provided consultation services. Most interviewed employers and employer organizations reported that employers were largely on their own in navigating the changes required by the minimum wage increase.

Other Themes. Representatives of low-income workers provided anecdotal reports that the minimum wage increase had increased maltreatment of low-income workers, and increased illicit economic activity. Examples include wage theft, denial of benefits owed, trafficking of workers, and exploiting the vulnerability of undocumented people by hiring them under conditions impermissible under labor laws.

The small/large employer differential may have been less meaningful in a tight labor market. Small employers and nonprofits reported that recruiting employees would be difficult if they were paying less than large employers. In other words, a small retail store that paid minimum wage might raise its starting wages to match the large-employer minimum wage, because otherwise, it might not be able to keep or retain staff. This was often mentioned in the context of perceived tightness and shortages of workers in the labor market.

Interviewees noted that workers, particularly young ones, were often unclear or misin-

formed about the minimum wage ordinance. Employers said their staff (or potential new hires) often expected higher wages under an assumption that the minimum wage had already been raised to 15 dollars, adding to confusion about how the city's other ordinances worked (like the safe-and-sick time requirement). Labor representatives reported the same.