The Effect of Minimum Wage Policies on the Wage and Occupational Structure of Establishments

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Abstract

Minimum wage increases often result in spillovers above the strict minimum wage cutoff, however the mechanism behind these spillovers is not well understood. Using establishment-level panel data from the Occupational Employment and Wage Statistics program, I estimate the effect of minimum wage increases implemented by 10 states in 2014 and 2015 on establishment wage and occupational structures. I show that minimum wage increases lead to wage spillovers within establishments. I find no evidence that minimum wage increases induce establishments to reorganize their occupational structure across major occupational groups, however I find it does lead to a 1% increase in reallocation within 2 digit occupations. I investigate opening and closing establishments, and find that minimum wage increases induce closures by establishments with a larger share of employment in clerical, production, and service occupations and a smaller share in professional and computer-related occupations. However, opening and closing establishments do not exhibit any selection on wage structure or establishment size. Finally, I find that minimum wage increases propagate up the management hierarchy, leading to increased wages for supervisors. Nonetheless, I find overall wage inequality decreases within establishments after minimum wage increases.

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1 Introduction

A striking regularity in the literature studying the effect of minimum wage laws is that the minimum wage often increases wages above precise statutory minimum. Autor, Manning, and Smith (2016) find strong evidence of spillovers, while Cengiz, Dube, Lindner, and Zipperer (2019) find state-level minimum wage increases lead to wage increases up to three dollars above the threshold. However, the mechanism behind these spillovers is not well understood. In this paper, I establish wage spillovers occur within establishments using a nationally representative survey of establishments, and then investigate two potential channels for these spillovers: occupational restructuring and the propagation of wage changes within the establishment.

First, it could be that establishments respond to minimum wage increases by restructuring production to replace unskilled labor with capital and skilled labor. Consistent with this, two recent papers (Harasztosi and Lindner (2019), Chen et al. (2019)) find establishments increase capital expenditures in response to minimum wage increases, while Aaronson and Phelan (2017) and Lordan and Neumark (2018) also find aggregate evidence that minimum wage increases change the distribution of employment at the expense of more automatable occupations. If these restructurings result in relatively more employment of higher wage workers, this could result in increased wages within establishments above the minimum wage threshold.

Alternatively, it could be that employers choose to increase wages for other workers in the establishment. Cengiz et al. (2019) use the fact that wage spillovers are driven by incumbent workers to argue that such spillovers are due to employers increasing coworker wages to address equity concerns. Similarly, models of optimal incentives within a hierarchy such as Lazear and Rosen (1981) or MacLeod and Malcomson (1988) can generate similar mechanisms, as employers maintain the spread of wages to preserve incentives.

Using establishment-level data from the Occupational Employment and Wage Statistics (OEWS) program, I examine the effect of substantive minimum wage increases in ten states

in 2014 and 2015. The OEWS has a unique data structure, collecting establishment-level employment counts for each of over 800 occupations in 12 different wage bins. I use several empirical strategies, including difference and differences, triple differences, and matching methods. By comparing wages and employment in establishments in states that raised the state minimum wage with establishments in 22 states that did not change their minimum wage between 2009 and 2016, I show establishments decrease employment in the smallest wage bin (up to $9.25 an hour) and increase employment in the second wage bin ($9.25 to $11.74 an hour). As the maximum minimum wage in the sample is $9 per hour, this represents wage increases beyond the level necessary to comply with the regulation. Further, for establishments operating in industries with a high fraction of low-wage workers or establishments with many low-wage workers in the pre-period, I find employment increases in wage bins up to $18.24 an hour. These results confirm that spillovers from the minimum wage occur *within* establishments.

Next, I turn to the occupational structure of establishments. Across methodologies and samples, I find no evidence that continuing establishments change the broad distribution of occupational employment, such as decreasing employment in service occupations or increasing employment in technology-related occupations. However, I do find evidence of fine-tuned occupational reallocations, with a 1% increase in reallocations within two-digit occupations.

Overall, it does not appear to be the case that firms responded to these minimum wage increases by substantially restructuring production. This is consistent with Aaronson, French, Sorkin, and To (2018), who argue that establishments are unable to easily adjust the capital-labor intensity in response to policy changes, and thus aggregate adjustments are driven by establishment entry and exit. To address this, I examine whether establishments that exit after a minimum wage increase are selected differently from the set of continuing establishments in a state compared with those that exit in states that did not increase the minimum wage. While I do find some evidence that firms that exit after a minimum wage increases have relatively more employment in service, production, and clerical occupations and rel-

atively less employment in professional and computer-related occupations, there does not appear to be any direct selection on the wage structure of establishments, nor the size of establishments.

I also measure whether establishments that enter after a minimum wage increase differ systematically from continuing establishments, again controlling for the difference in characteristics of between entering and continuing establishments in states that did not increase the minimum wage. I find that establishments entering after a minimum wage increase have a similar wage and occupational structure to continuing establishments. In complementary analysis using CPS data, I find no evidence that these particular minimum wage increases impacted aggregate employment or hours, however confidence intervals are relatively wide.

I then examine how the minimum wage increases spread throughout the establishment. Although few supervisors are employed in the lowest wage bin (up to $9.25), I find a decrease of employment of supervisors in the second wage bin ($9.26 to $11.74) and an increase in employment in the third wage bin ($11.75 to $14.74). A triple-difference strategy reveals that this response is only present in establishments with employment in the smallest wage bin in the pre-period. Thus, I conclude that one channel by which minimum wages spread through an establishment is due to wage spillovers within supervisory relationships. The fact that we see variation based on exposure to near-minimum wage workers within the establishment indicates this response is at the establishment level, rather than driven by outside options or other market-wide dynamics.

In addition, I do not find equivalent wage increases for other higher pay occupational groups, e.g. professional occupations. Thus, it appears that this spillover dynamic is driven via reporting relationships, rather than wider concerns about wage compression by the employer. Consistent with this, I find the minimum wage increases result in decreased wage inequality within establishments. While individual firms may pursue different payroll strategies in response to a minimum wage increase, on average establishments do not increase wages symmetrically throughout the establishment.

This paper contributes to the literature in three ways. First, there is a well-established literature that the minimum wage increases wages above the strict minimum wage threshold. Several papers have convincingly documented that minimum wage increases can shift up the wage distribution, beginning with Lee (1999) and including Autor et al. (2016), Fortin, Lemieux, and Lloyd (2021), and Cengiz et al. (2019).

Beginning with at least Grossman (1983), a smaller literature has documented that minimum wages can spillover to other workers.[1] Katz and Krueger (1992) document that restaurants that already paid wages above the minimum wage planned to increase wages in response to a minimum wage increase, and Dube, Giuliano, and Leonard (2019) report in detail the wage policies of a large firm to increase wages for workers earning above the minimum wage in response to a minimum wage increase. In the closest related paper, Gopalan, Hamilton, Kalda, and Sovich (2021) use Equifax data to show spillovers within firms of up to $2.50 above the new minimum wage. My paper contributes to this literature by using nationally representative establishment-level survey data to show these spillovers occur within establishments. In addition, by examining occupational data, I am able to provide the first systematic evidence on how these wage spillovers spread through the organizational and occupational structure.

Second, I contribute to the literature on how the minimum wage changes the production process. Lordan and Neumark (2018) and Aaronson and Phelan (2017) find that increases in the minimum wage change the aggregate occupational structure, with employment shifting away from automatable low-wage occupations. I am able to show that occupational restructuring within continuing establishments is narrow in scope, however minimum wage increases induce selective exit among establishments with a smaller share of professional and IT employment. Other papers focus on the production process within particular industries. In the manufacturing sector, Chen et al. (2019) finding minimum wages lead to more capital investments, and Baek, Lee, and Park (2019) find new entrants are more capital intensive.

[1] See Brown (1999) for a detailed history.

In contrast, Ashenfelter and Jurajda (2022) finds no effect of recent minimum wage increases on the use of customer ordering kiosks at McDonalds restaurants. A key contribution of my approach is to use the occupational structure within establishments, which gives a new way of measuring changes in the production process within establishments across all industries. I have previously used this approach in Forsythe (2019).

Finally, I contribute to a literature on whether minimum wage increases induce establishment entry or exit. Dustmann, Lindner, Schönberg, Umkehrer, and Vom Berge (2022) and Chava, Oettl, and Singh (2019) both find higher minimum wages increase exits by small firms. However, Dustmann et al. (2022) is also able to show that minimum wage increases induce workers to move to higher productivity establishments. Similarly, Luca and Luca (2019) find that minimum wages induce exit by poor performing restaurants (as measured by yelp scores). In contrast, Ashenfelter and Jurajda (2022) finds no evidence of entry or exit in response to minimum wage increases. I do not find any systematic evidence that the minimum wage increase induced exit among establishments with a larger share of low-wage employment, nor do I find excess exit based on establishment size. However, the fact that I do find excess exit among establishments that employ a lower share of professional and information technology professionals indicates that minimum wage laws induce exit based on the production structure, rather than wage structure.

2 Methodology

2.1 OEWS Data

The Occupational Employment and Wage Statistics (OEWS) is a semi-annual survey of establishments conducted by the Bureau of Labor Statistics. Approximately 400,000 establishments are surveyed each year and establishments are surveyed at most every three years. Half of establishments are surveyed in the second quarter (reporting data from May) and the other half in the fourth quarter (reporting data from November). The purpose of

the survey is to produce high-quality wage estimates for detailed occupations by geography, industry, and establishment size. Although not formally designed as a panel, the sampling procedure results in a random subset of establishments repeatedly responding to the survey. I take advantage of this structure to examine the longitudinal structure of establishments.

In particular, the OEWS is a stratified random sample of the population of establishments included in the Quarterly Census of Employment and Wages (QCEW). The OEWS stratifies establishments based on geography (Metropolitan Statistical Areas and rural Balance of State Areas), industry codes (NAICS), and establishment size. Larger establishments within a stratum are sampled with certainty every three years, while smaller establishments are sampled with probability based on the number of establishments within the stratum, weighted by establishment employment. In addition, if there are fewer than four establishments within a stratum, each establishment is sampled with certainty once every three years. Crucially, since the OEWS assigns a permanent random number to each establishment, the probability of selection is correlated over time, even among establishments in strata with many other establishments. This results in a stratified-random sample among which many establishments can be matched across time.[2] Since the sample is stratified, estimates in this paper use sampling weights to be representative of the underlying population of establishments.

When surveyed, the establishment reports a grid of the employment count for each six-digit SOC occupation in each of twelve wage bins. The wage bins change periodically, however from 2009 through 2018, the lowest bin does not change (up to $9.25). In 2014 the larger bins increased, but this was implemented nationwide. Table 2 shows the exact dollar cutoffs by year. Reported wages include tips and bonuses, but exclude overtime and other extra pay. In addition, I use information collected by the QCEW, including industry and the date the establishment was opened or closed.

Although the data is very rich, there are several limitations. First, there is no information

[2]See Dey and Handwerker (2016) for more information on the longitudinal features of the OEWS survey.

on the workers beyond the occupation and wage bin. Thus, it is not possible to measure changes in worker characteristics. In particular, since I cannot observe education, I am unable to capture changes in skill demand within occupations, as in Clemens, Kahn, and Meer (2021). Second, the survey does not collect information on hours worked, thus the number of workers in each cell may include a mix of full-time and part-time workers.[3] This means that I am unable to observe whether or not employers change the number of hours in response to minimum wage changes. In Appendix B I provide complementary individual-level analysis using the Current Population Survey, finding consistent results using hours-adjusted employment.

Occupations are classified using the 2010 Standard Occupational Classification (SOC) codes. This consists of 840 detailed occupations, which are grouped into 23 major groups. To evaluate whether there are major changes in the occupational structure of establishments, I combine occupations into five mutually exclusive occupational categories: management (SOC codes 11, plus supervisors from each other category), professional (SOC codes 13-29), clerical and sales (SOC codes 41-43), production (SOC codes 45-53), and service (SOC codes 31-39). For some specifications, I distinguish between supervisors and management occupations. In addition, to capture occupations that may be related to technological change, I construct a measure of information technology (IT) related occupations (15-11xx) which include occupations such as computer analysts, database administrators, and support specialists.

To evaluate whether minimum wage increases induce more subtle changes in occupational structure, I also construct a dissimilarity index:

$$Index_{ijt} = \frac{1}{2}\sum_{i=1}^{N}\left(\frac{emp_{ijt}}{emp_{jt}} - \frac{emp_{ijt-1}}{emp_{jt-1}}\right) \tag{1}$$

where emp_{ijt} is the employment in 6-digit occupation i in establishment j in period t, and

[3]Wages are reported at the hourly level for part time employees and either hourly or annual for full time employees. OEWS translates annual salaries into hourly wages.

emp_{jt} is the total employment in establishment j in period t. This provides a measure of what percent of employment is reallocated across 6-digit occupational categories between two points in time. In addition, I construct the same index within 2-digit occupations, to measure the degree of finer reallocation within broader occupational categories.

In order to capture the wage structure of establishments, I construct several variables. Most simply, I measure the share of establishment employment in each of the 12 bins. However, most employment is in the lower bins, especially for establishments in low-wage industries. Thus, for each establishment, I also calculate the 10th, 50th, and 90th percentile log real wages, using the BLS constructed interpolated average wage within each wage bin.[4] Wages are deflated using CPI-U. I use these percentiles to calculate various wage ratios, including the 90/10, 90/50, and 50/10.

2.2 State Minimum Wage Policy Changes

I focus on 10 states that increased minimum wages substantively in 2014 and 2015 but had not increased their minimum wage since the federal minimum wage increase in 2009. See Figure 1 for a map of these states and Table 1 for a description of the state policies. I focus on these states for three reasons. First, the criterion of no previous minimum wage change since 2009 allows for a reasonable pre-period before the state minimum wage change. In addition, the pre-period is sufficiently after the Great Recession to reduce contamination from recessionary shocks. Second, because many states increased the minimum wage in 2014 and 2015, there is good cross-sectional variation. Third, by focusing on substantive minimum wage increases, defined as more than a 5% increase, I drop indexed increases that are less likely to be large enough to be salient to employers. The control group is defined as states that did not increase their minimum wage in the 2009 to 2016 period, all of which were bound by the federal minimum wage during this time period. This results in 22 control states, also marked on Figure 1.

[4]See https://www.bls.gov/oes/methods_18.pdf for more details on how these average wages are constructed.

In addition, as a robustness check, I also restrict the set of treated states to those that increased the minimum wage from the federal level: New Jersey, New York, Alaska, Hawaii, Nebraska, South Dakota, and West Virginia. This ensures these states are more similar to the control states, that also were bound by the federal minimum wage in the pre-period.

2.3 Specifications

For the main within-establishment specifications, I restrict analysis to establishments that were surveyed at least twice: once in the second quarter of 2013 through the second quarter 2014, and once in the fourth quarter of 2015 through the fourth quarter of 2016. This results in 45,297 establishments in the treatment states and 84,430 in the control states. In addition, I construct several more limited samples. First, I restrict this set of twice-sampled establishments to limited service restaurants, which have been widely studied in the minimum wage literature due to intensively employing low-wage workers.[5] In addition, I construct several samples restricted to industries that had more than 10%, 20%, or 33% of employment, respectively, in the smallest wage bin in 2003. This allows me to identify establishments that are likely to be impacted by the minimum wage increase, without conditioning on the actual wage structure of the affected establishments. I refer to the sample of industries with over 33% low-wage as the high-exposure sample, and the 20% and 10% samples as medium- and low-exposure samples, respectively. Note that these samples are cumulative, so the low-exposure sample includes establishments in both the medium- and high-exposure samples. See Appendix Table A.1 for a list of industries included in each group.

I estimate several related specifications. I begin by running a difference in differences:

$$Y_{it} = \beta_0 + \beta_1 * Treated + \beta_2 * Post + \beta_3 * Treated * Post + \epsilon_{it} \tag{2}$$

where $Treated$ is an indicator for states that increased the minimum wage in the post period,

[5] See for instance Katz and Krueger (1992), Card and Krueger (1994), and Powers (2009).

which is defined as the fourth quarter of 2015 through the fourth quarter of 2016, and *Post* is an indicator for the post period. Since there are up to 1.5 year differences in sampling periods, I also include half-year fixed effects. I cluster standard errors at the state level and weight specifications using sampling weights. Summary statistics are described in Table 3.

In addition, I also estimate a triple difference specification, in which I separate establishments based on their exposure to the minimum wage increase, which I define as the share of employees in the smallest wage bin during the pre-period. In particular, I define five exposure groups: no employment in Bin 1 in the pre-period, 0- 25%, 25-50%, 50-75%, and over 75% employment in Bin 1 in the pre-period. I then estimate the following

$$Y_{it} = \alpha + \sum_{E_j} Treated * Post * E_j \beta + \epsilon_{it} \tag{3}$$

in which E_j is an indicator for the exposure fraction for establishment i in the pre-period. I include half-year fixed effects, cluster the standard errors at the state level, and weight using sampling weights.

One might be concerned that establishment characteristics are different between treatment and control states. Thus, as an alternative, I also estimate nearest-neighbor match specifications. For each establishment in the treatment states, I identify a matched establishment from the control states that has the same exact characteristics on the following pre-period dimensions: 6-digit NAICS industry code, the half-year the establishment was sampled, and the share of employment in the smallest wage bin (using 5 categories: 0, 0-25%, 25-50%, 50-75% and over 75%). I then estimate a first differenced equation:

$$\Delta Y_i = \beta_0 + \beta_1 Treated_i + \epsilon_i \tag{4}$$

in which the omitted category is establishments in the matched set. I bias adjust for large-sample bias using the same characteristics I used to identify matches. I drop the small number of establishments in the treatment group with no exact matches.

Finally, in order to estimate the effect on the wage and occupational distribution for the state labor market as a whole, I run state by group level regressions. This is similar to the specifications in Cengiz et al. (2019), and takes advantage of the fact that at the state level, there should be little effect of the minimum wage on the largest wage bins. Thus, I use these bins to control for the aggregate changes in employment at the state level, in order to identify the effect of the minimum wage on the smaller wage bins. In particular, I aggregate employment by wage bin to the state by year level and estimate:

$$Y_{st} = \alpha + \sum_{Bin_j} Treated * Post * Bin_j \beta + \epsilon_{st} \tag{5}$$

where Bin_j are individual wage bins, excluding bins 10 through 12, and s is the state. Collapsed data is weighted using sampling weights. I include data from 2011 through 2018, and Treated and Post are defined as before. These state-level specifications are estimated on a larger set of underlying establishments, since it is not necessary to restrict analysis to establishments surveyed more than once. Estimates include state and year fixed effects. In addition, I estimate the corresponding event study specification where 'Post' is replaced by each year.

3 Results

3.1 Compliance and Wage Spillovers

I begin by examining the effect of the minimum wage increases on the wage structure of establishments. In Table 4, I report the difference-in-differences estimate, that is, the differential change in employment in each wage bin after the minimum wage increase for treated states compared with the control states. Here we see that, for the full sample, employment in the smallest bin (up to \$9.25) decreased by 2.8 percentage points more in the treated states. We also see that employment increased in Bin 2 (up to \$11.49) by 2.6

percentage points, suggesting that the primary effect of the minimum wage increase was to move individuals from Bin 1 to Bin 2. Nonetheless, since the maximal minimum wage in the sample is $9.00, this reflects a spillover beyond the statutory minimum wage.

I then restrict the sample to industries that are especially dependent on low-wage labor. For these samples, I estimate both the difference in difference from Equation 2 and the nearest-neighbor match from Equation 4. I first focus on limited service restaurants. Here we see the difference-in-difference estimates show employment in Bin 1 decreases by 33 percentage points, while employment increases by 28 percentage points in Bin 2, 5 percentage points in Bin 3 (up to $14.49), and 1 percentage points in Bin D and above (over $14.50). In the matched specification, we see nearly identical point estimates.

Appendix Table A.2 reports the change in employment share for each of the 12 wage bins, and shows statistically significant employment increases up to Bin 4 ($14.50 to 18.24) for limited service restaurants. Thus, for limited service restaurants, minimum wage increases appear to increase employment in bins more than five dollars above the statutory minimum wage. Figure 2 illustrates the difference-in-difference estimates of the change in employment by bin reported in Appendix Table A.2 for the full sample and limited service restaurants. The line illustrates the cumulative change in employment shares, which returns to positive by the third or fourth wage bin, depending on the sample.

In the rest of Table 4, I repeat the analysis for establishments in industries with different predicted exposure to the minimum wage. Here we see that as the sample becomes less restrictive, the magnitude of the point estimates decrease. However, even among the set of industries with at least 10% of employment in Bin 1 in 2003, there is between a 10 and 15 percentage point decline in employment in Bin 1, and an equivalent increase in employment in large bins.

In Table 5, I examine how the change in the wage distribution differs based on the share of employment in Bin 1 in the pre-period via a triple difference specification. The omitted category is establishments with no employment in Bin 1 in the pre-period. Here we see that

the intensity of the decrease in employment share in Bin 1 grows with the ex ante share in Bin 1, and similarly, the increase in employment share in Bin 2 also increases with the share of employment in Bin 1 in the pre-period. Thus, the growth in employment in Bin 2 is in exactly the establishments that were most likely to be exposed to a binding minimum wage increase, due to employing a large share of employment close to the minimum wage. In addition, we see the employment share in Bin 3 also increases with the ex ante employment share in Bin 1. In Appendix Table A.3, I show results are similar if I restrict the set of treated states to states that were at the federal minimum wage before the state minimum wage increase.

As an alternative approach, I next turn to the bin-by-state level specification, described by Equation 5. Instead of measuring changes within establishments, this specification measures the average effect across all establishments. In Table 6, we see that the minimum wage increases led to a decrease in the share of employment in Bin 1 at the state level of 2.6 percentage points, which is very similar to what we saw in the panel difference-in-differences results. In addition, we see that the share of employment in Bin 2 increased by 1.37 percentage points, which is somewhat smaller than the 2.3 percentage point estimate from the panel difference-in-difference sample. Overall, we again see that employment increases above the cutoff at the state level. In Appendix B, I show results are consistent, but with smaller point estimates, in CPS data.[6]

Figure 3 illustrates the time series version of Equation 5 estimated for limited service restaurants. Here we see trends are parallel for treated and control states from 2012 through 2014 for employment in both Bin 1 and Bin 2, but in 2015 employment falls in Bin 1 and rises in Bin 2 for treated states. By 2016 the differential trends have stabilized and remain roughly constant through 2018.

Thus, across a variety of specifications and samples, I have shown that establishments comply with minimum wage increases. Further, employment grows in wage bins above the

[6]The CPS wage data has substantially more measurement error, which attenuates estimates of movements between wage bins.

strict minimum wage cutoff, indicating that either employers are increasing individual wages more than necessary to be strictly compliant with the law, or the minimum wage is spilling over to other employees within the establishment. In the next sections, I examine evidence of these spillovers.

3.2 Occupational Structure

I next turn to the occupational structure of establishments. The distribution of occupations present in an establishment provides insight into how the establishment produces. As an example, consider a fast food restaurant. In recent years, some establishments have adopted ordering via app or kiosk. This can reduce the number of cashiers necessary produce the same level of sales. However, the use of this technology additionally requires either an employee with the skills to maintain the ordering technology or managerial time to manage outsourced labor and contracts. Thus, two establishments producing similar food can operate in different ways, resulting in a different structure of occupational employment.

An increase in the minimum wage can make it relatively more expensive to produce using low-wage labor, which may induce employers to switch to a more capital intensive production process. If this is the case, we would expect to see a decline in employment in the occupations that are heaviest hit by the minimum wage, and potentially an increase in employment in occupations that are necessary for the capital adoption (such as information technology related occupations, professional occupations, or managerial occupations).

I begin by examining the occupational distribution at an aggregated level. I focus on five mutually exclusive occupational groups: managers and supervisors, clerical, production, service, and professional. In Appendix Table A.4, I show that service occupations are most affected by the minimum wage increase, with a smaller effect on production and clerical workers, but no direct effect on management or professional occupations.[7]

In order to evaluate whether employment shifts between occupations, I begin at the

[7]This is consistent with worker-level data from the CPS, in which 75% of minimum wage workers are in service sector occupations. See *Characteristics of minimum wage workers* (2018).

state level. In particular, I estimate a specification similar to Equation 5, however now the bins are five mutually exclusive occupational groups: managers and supervisors, clerical, production, and service, with the professional bin omitted. Thus, estimates for occupation x are a triple difference of the change in employment in occupation x, controlling for growth in employment in professional occupations as well as growth in employment in occupation x in the control states.

In Table 7 I report estimates from this specification, for each of the industry-based sample restrictions. Across all samples, we see that the point estimates are small and not statistically significant. The largest magnitude point estimates are for service occupations, but the estimate is around 1% and positive. These estimates rule out a decrease in service occupation employment larger than 1.5% in limited service restaurants, and a decrease larger than 0.14% for the full sample. Appendix Table A.6 shows similar results for treatment states that increased their minimum wage from the federal level. In addition, in Appendix Table B.4 I run an equivalent specification using CPS data, which also shows no evidence of aggregate occupational restructuring. Thus, it does not appear that the increase in the minimum wage leads to a broad shift in the occupational structure within states.

I next turn to within-establishment results, to investigate whether the aggregate results may mask occupational reallocation occurring within establishments. In Table 8, I investigate whether the employment share within different occupational categories changed in response to minimum wage increases. I estimate difference-in-difference and nearest neighbor match specifications for the different industry samples. Here we again see there is little evidence that the occupational structure changed after minimum wage increases. Across the samples, all the estimated magnitudes are small and not statistically significant. In Appendix Table A.9, I show similar results for the remaining industry samples.

Thus, across broad occupational categories, firms do not appear to be substituting employment between broad occupational categories. There is no evidence that establishments reduce employment in service occupations, even among establishments that are most likely

to have a large share of employees for whom the minimum wage binds. Note that, while all specifications are in terms of the share of employment, in the last column of Table 8 I show there is little systematic evidence that continuing establishments shrink on average in response to minimum wage increases, however confidence intervals are wide. In Appendix Table B.3, I show point estimates for the state employment rate and hours per population in the CPS are also statistically insignificant but imprecise.

In order to more fully examine whether establishments make any narrower changes in occupational structure, I next construct the reallocation index described in Equation 1 which measures what percent of employment is shifted between 6-digit occupations. This provides a within-establishment measure of reallocation. Table 9 reports difference-in-difference and nearest neighbor match estimates for limited service restaurants, the high-exposure sample, and all establishments. The other samples are reported in Appendix Table A.10. In Column 1 of Table 9 I show that across samples, between 0.5% to 1% of employment is reallocated across 6-digit occupations in establishments that experience a minimum wage increase.

In Table 8, I showed that there was no reallocation between broad occupational groupings, thus these fine reallocations must be occurring within these broad groupings. In the rest of Table 9 I investigate which occupational groups experience the most within-group reallocation. Here we see almost 2% of management occupations are reallocated within management across specifications, and up to 2% of supervisor positions are reallocated, with some variation across samples. Interestingly, this reallocation rate does not shrink as we move from the more impacted samples to the full sample, indicating that even establishments with a lower shares of minimum wage workers are affected by this volatility in occupational structure. Similarly, for professional and clerical occupations, we see little impact for establishments in industries with high shares of minimum wage workers, but the point estimates increase as the samples become less restricted.

In contrast, for service occupations, we see a 2-3% increase in reallocation rates for limited service restaurants and the high-exposure sample, but the point estimates falls to

0.3% for the full sample. This suggests the increased reallocation among service sector occupations is concentrated in industries that are more directly impacted by the minimum wage increase. Finally, we see little increase in reallocation for production occupations and IT related occupations.

What can these results tell us about how establishments changed production in response to minimum wage increases? First, if establishments were substituting capital for labor, we would expect to see a decline in total employment and a reduction in employment that is heavily hit by the minimum wage increase, which I do not find. Second, if employers were substantially changing how they produce, we would expect to see a change in the distribution of employment, in particular, with more employment in managerial, professional, or technology related occupations. However, the small level of reallocation within major occupational categories suggests that the minimum wage increase does induce narrow changes in the production process.

These results indicate that, at least in the year and a half following a minimum wage increase, establishments do not find it optimal to substantially restructure the production process. This could be for a few reasons. First, the time horizon could be too short to observe restructuring.[8] Second, employers may deem that alternative production arrangements would be less profitable than accepting the higher wage bill from the higher minimum wage. Third, this may be an example of the putty-clay hypothesis, in that continuing employers find it prohibitively expensive or difficult to change the production process. I will test this more directly in Section 3.5, when I examine opening and closing establishments.

3.3 Propagation through the Hierarchy

I next investigate how minimum wage changes propagate through the management hierarchy. When a minimum wage law is enacted, employers have to decide how to adjust their internal pay scale. Dube et al. (2019) document how a large firm implemented a nation-wide

[8] See Clemens (2021) for a discussion of longer-run dynamics.

rule to increase wages throughout the wage distribution in response to a minimum wage increase. Knudsen (2018) provides qualitative research on how restaurant owners responded to an increase in the minimum wage and finds a variety of strategies, ranging from only raising wages for workers directly covered by the minimum wage legislation, to providing the same dollar raise to all workers, to something in between. Knudsen (2018) found employers were concerned about employee perceptions of fairness and status and believed that wage compression would lead to morale issues for workers who were paid above the previous minimum wage. Consistent with mangers perceptions, workers at restaurants that did not maintain pay hierarchies reported feeling undervalued. This is in line with laboratory experiments that find minimum wages influence workers' reservation wages (Falk, Fehr, & Zehnder, 2006). Card, Mas, Moretti, and Saez (2012) find employees that learn they are underpaid relative to their peers have lower job satisfaction and are more likely to search for work and Dube et al. (2019) find quits increase in response to wage disparities among peers. Finally, wage hierarchies can provide incentives throughout the organization as workers compete for promotions. If firms only raise wages for workers that are covered by the minimum wage, this will compress the pay hierarchy and may reduce incentives (Grossman, 1983).

Thus, establishments may institute compensation policies to mitigate these spillover effects from the wage compression induced by the minimum wage. For both incentives and status concerns, it is important that employees are aware of the wage structure. In addition, for promotion incentives, it is necessary that there is a promotion pathway between the positions. So for instance, there is often little job mobility between service and professional occupations. Thus, while pay compression between service and professional occupations may affect professional workers' morale, it should not affect performance incentives for the service workers.

In order to capture wage spillovers, I focus on spillovers across occupational categories. In particular, managerial occupations and professional occupations have very little direct exposure to the minimum wage. Thus, any changes in the wage distribution for these groups

in response to minimum wage increases will primarily be due to spillovers. I focus on two levels of management: supervisors and managers. Supervisors are occupations that have close contact with their direct reports, and may even split time between supervising front line workers and directly helping them. In addition, supervisors are often promoted from front line positions. Managers are coded in the management major occupation category (11) and may be more removed from the direct operations than supervisors. Supervisors in particular are likely to be well aware of the wages of the individuals they supervise, and thus equity and status concerns are likely to be quite salient.

In Table 10, I measure the effect of the minimum wage increases on the share of supervisory or managerial employment in each of the bottom three wage bins, and across all of the top nine wage bins. In the top of Table 10, I begin by examining supervisors in limited service restaurants. We see a decline in supervisory employment in the second bin of 14 pp in the difference-in-differences specification, and 12 pp in the matched specification. For both specifications we find a 6 pp increase in employment in the third bin and an 8 pp increase in employment in bins 4 and higher. For the high-exposure sample, we see a similar pattern, with a 9 pp decrease in employment in bin 2 and increased employment in bins 3 and 4 and above for both the difference-in-differences and matched specifications. Thus, although there is little direct impact of the minimum wage on supervisors for these establishments in industries that are likely to be highly impacted by the minimum wage increase, there is a substantial decline in the share of supervisors earning between $9.25 and 11.50, and a substantial increase in employment for individuals earning between $11.50 and $14.50 as well as those earning above $14.50. Finally, when we examine the full sample, we see a much more muted pattern suggesting this is primarily driven by establishments with direct exposure to the minimum wage.[9] In Appendix Table A.13, I show consistent results in a triple difference specification, with the largest shifts in supervisory employment from bins 2 to bins 3 and above occurring in establishments with large shares of bin 1 employment in

[9]In Appendix Table A.12 I show consistent patterns for the medium- and low-exposure samples, with point estimates falling between the high-exposure sample and the full sample.

the pre-period. Appendix Table A.14 shows consistent results when the sample is restricted to establishments in states that raised the minimum wage from the federal minimum.

In Panel B of Table 10, I focus on managers, which can range from general managers to CEOs. However, for establishments that employ a large share of low-wage workers, there are typically very few managers, making it difficult to measure changes in employment across wage bins. When we examine the spillover effect of the minimum wage on managers, there is no discernible pattern. Results are similar for the triple difference specification in Appendix Table A.13. Thus, while minimum wages may spill up the management hierarchy beyond supervisors, this establishment-level sample is not well-suited to measure such movements.

In Appendix tables A.15 and A.16, I show that this spillover pattern is unique to supervisors, and does not hold for professional occupations. In particular, despite also being higher paid occupations, there is no evidence of a decline in employment in the second or third wage bin or an increase in employment in higher wage bins. However, the wage bin structure of the data means there may be narrower instances of spillovers that I am unable to observe.

Overall, I conclude one mechanism for minimum wage increases in establishments is through the management hierarchy, with wages increasing for the direct supervisors of minimum wage workers. This could be driven by explicit wage policies with establishments to propagate minimum wage increases throughout the hierarchy (as in Dube et al. (2019)), or could be driven by individual workers negotiating with employers for higher wages. However, the fact that these spillovers are clearly observed for supervisors but not other occupations provides some suggestive evidence on the mechanism. Supervisors are an occupation for which relative pay differentials to minimum wage workers are likely to be particularly salient, and supervisory positions are frequently staffed via promotion from low-wage positions. Thus, increasing wages for supervisors likely addresses fairness concerns while also improving incentives for minimum wage workers.

3.4 Within-Establishment Wage Inequality

So far I have focused on the effect of minimum wage increases by wage bin, however, the median employee at the average establishment is employed in Bin 3 and the 90th percentile employee at the average establishment is employed in Bin 4. This is in contrast to the economy-wide percentiles, with the median employee in Bin 4 and the 90th percentile employee in Bin 8. This is due to low-wage workers clustering at small establishments. Thus, at the establishment-level, the effect of the minimum wage is concentrated.

In Table 11, I show that the minimum wage increased wages through the 90th percentile for all samples, however wages increased at a decreasing rate, leading to falling wage inequality across samples. For the full sample, the 90/10 wage inequality fell by 4%, while for limited service restaurants it fell by around 10%. For both limited service restaurants and the high-exposure sample, 90/50 wage inequality decreased substantially more than the 50/10 wage inequality, leading wage compression to rise in the top half of the wage distribution for these establishments.[10]

Thus, although I have shown that wages increase above the strict minimum wage threshold and wages spill over to supervisors, these effects fade out at the top of the wage distribution. What are the consequences of such wage compression? It depends on how salient the wage increases at the bottom are for these higher-paid workers and whether there are promotion pathways for the lower-wage workers. If the higher-wage workers perceive the wage compression as a reduction in their value or status, this could lead to increased dissatisfaction or turnover, or spur negotiations for higher wages. Similarly, if there are promotion pathways from the near-minimum wage jobs to the higher-pay jobs, increased wage compression could reduce incentives and effort. However, if higher wages at the bottom themselves improve effort due to efficiency wages (Shapiro & Stiglitz, 1984) or gift-exchange (Akerlof, 1982), this may outweigh any disincentives from pay compression within the promotion hierarchy.

[10] In Appendix Table A.17 I show results are similar for the medium- and high-exposure samples.

3.5 Opening and Closing Establishments

So far I have focused on how minimum wage changes affect wage and occupational distributions within establishments and across establishments within states. In this section I turn to establishments that open or close after the minimum wage increase. As discussed earlier, one potential reason for minimal restructuring in response to minimum wage increases could be because capital decisions have putty-clay properties. In this case, it is difficult for continuing establishments to restructure production, but new establishments will choose a production process that uses less low-wage labor in exchange for more capital and more higher-skill labor. Further, if this is the case, establishments that intensively used minimum wage labor before the wage increase are more likely to exit the market. Consistent with this, Aaronson et al. (2018) found an increase in both openings and closings of restaurants in response to minimum wage increases. By using OEWS data, I can directly test how minimum wage increases affect the selection of closing establishments and the characteristics of opening establishments.

To measure closing establishments, I focus on establishments that were surveyed in the fourth quarter of 2011 through the fourth quarter of 2014 and closed in or after the fourth quarter of 2015, indicating they were open through the minimum wage increase and closed shortly thereafter. This yields 16,345 closed establishments. For opening establishments, I instead measure establishments that first open in the fourth quarter of 2015 through the second quarter 2018. This yields 19,934 newly opened establishments.

In order to evaluate whether minimum wage increases affect the characteristics of opening and closing establishments, I estimate the following specification comparing establishments in the period *before* the minimum wage increases (e.g. data from the fourth quarter of 2011 to the fourth quarter of 2014):

$$Y_{it} = \beta_0 + \beta_1 * Treated_{it} + \beta_2 * Close_{it} + \beta_3 * Treated_{it} * Close_{it} + \epsilon_{it} \tag{6}$$

where Treated indicates establishments are those in states that increased the minimum wage, and Close indicates establishments that closed in or after the fourth quarter of 2015, in both treatment and control states. I include half-year fixed effects, cluster the standard errors at the state level, and weight using sampling weights. This specification controls for differences in establishments in treated and control states, as well as general trends in characteristics of closing establishments.

I run an equivalent specification for establishments that open during or after the fourth quarter of 2015. In this case, I compare establishments observed in the period of the fourth quarter of 2015 through the second quarter of 2018, after the minimum wage increases were enacted.

In Table 12, I examine the effect of the minimum wage increase on the wage structure of closing and opening establishments. In the top panel, we see that across samples, there is little evidence that the minimum wage increase induced differential establishment closure across treatment and control states. The only statistically significant point estimates are for the full sample, where establishments that closed in minimum wage states had about 1 percentage point more employment in bins 2 and 3, however both bins are above the minimum wage threshold. In addition, I examine whether total employment differed between closing establishments in treatment and control states. Across samples, we consistently see negative but generally insignificant point estimates. In the bottom panel, we turn to opening establishments. Here we again see little difference in the wage structure, but consistently positive and insignificant point estimates for establishment size.

In Table 13, I investigate the change in employment share in each occupational category. In the top panel, I show results for closing establishments. Here we do see an effect of the minimum wage increases on the selection of closing establishments. Closing establishments in minimum wage states employed a disproportionately low share of professional employment and information technology employment, for all samples except for the limited service restaurants and the full sample. In addition, closing establishments in minimum wage states

employed substantially more workers in supervised positions (e.g. non-supervisory clerical, production, and service occupations). This ranges from 1.4 pp for the high-exposure sample to 3.9 pp in the low-exposure industry sample.

In the bottom panel of Table 13, I instead show differences in the characteristics of opening establishments. Here we see little evidence of systematic differences between opening establishments in treated and control states, compared to continuing establishments in those states. However, since these establishments are observed in the post-minimum-wage-increase period, this indicates that new entrants are not different from the establishments who survived the minimum wage increase, which we saw in the top panel were selected differently in minimum wage increasing states.

What do these results imply for the putty-clay hypothesis? There was no evidence that closing establishments in minimum wage states were more likely to employ workers in the wage bin that was directly impacted by the minimum wage increases. However, the occupational results indicate that closing establishments were more likely to employ a larger fraction of employment in lower-wage 'supervised' occupations and a smaller fraction in professional and IT occupations, which are more cognitive and technology-adjacent occupations. This is consistent with other evidence in the literature that minimum wage increases lead to employment shifts away from automatable occupations (Aaronson & Phelan, 2017; Lordan & Neumark, 2018), with the caveat that I do not find evidence of this occupational selection in the aggregate state-level specifications. Although opening establishments do not appear to be different on average from continuing establishments, this process of selected-exit results in employment in establishments in minimum wage increasing states becoming more skilled.

However, the fact that we do not see any differential selection based on the wage structure of establishments indicates the direct wage bill impact of the minimum wage policy cannot explain the selection of closing establishments based on occupational structure. What then can explain why closing establishments in minimum wage increasing states employ a smaller share of professional and information technology occupations? First, it could be that these

workers help establishments to be more flexible, and perhaps are able to find other margins of adjustment to counteract the wage bill increase. Second, it could be that establishments with a relatively smaller share of supervised employment are able to contain wage spillovers (for instance, due to peer comparisons), and thus have a smaller total impact of the minimum wage on their wage bill. Overall, I find no evidence that minimum wage increases induce exit among establishments that are most heavily directly impacted by the wage bill increase.

4 Conclusions

In this paper, I have investigated the effect of minimum wage increases on the wage and occupational structure of establishments. I find that minimum wage increases lead to spillovers, with wage increases up to several dollars an hour above the minimum wage cutoff. I show that little of this can be attributed to occupational restructuring within continuing establishments. However, the wage spillovers can partially be explained by wage increases within the supervisory structure. These are precisely the workers that are most likely to be aware of relative wages compared with low-wage workers. Further, given promotion pathways, increasing supervisory wages maintains career incentives for the low-wage workers for whom wages were increased by the minimum wage. Despite these spillovers, I show that wage compression increases within affected establishments, with particular compression in the top half of the wage distribution.

When examining the selection of establishments that close after the minimum wage increase, I find no evidence of selection based on establishment size or exposure to the minimum wage increase. Nonetheless, I do find minimum wage increases lead to exits by establishments with a lower share of employment in professional and information technology occupations and a larger share of employment in supervised positions. However, these differences in establishment exit are not large enough to measurably change the aggregate occupational structure within states.

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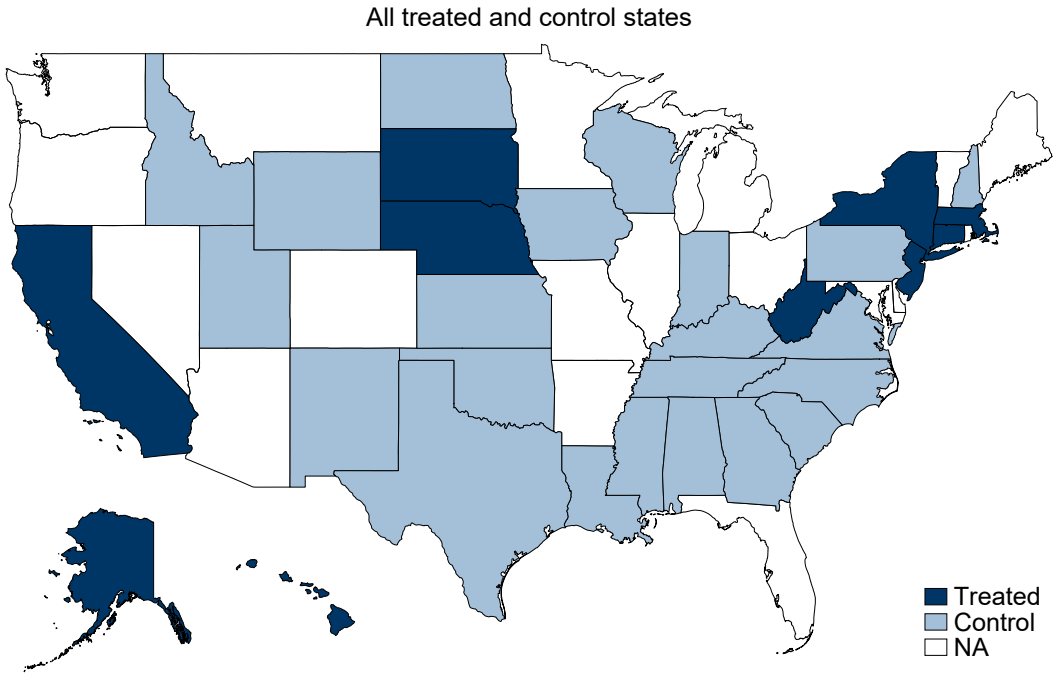

Figure 1: Map of minimum wage increasing states (treatment states) and states that were at the federal minimum wage between 2009-2016 (control states).

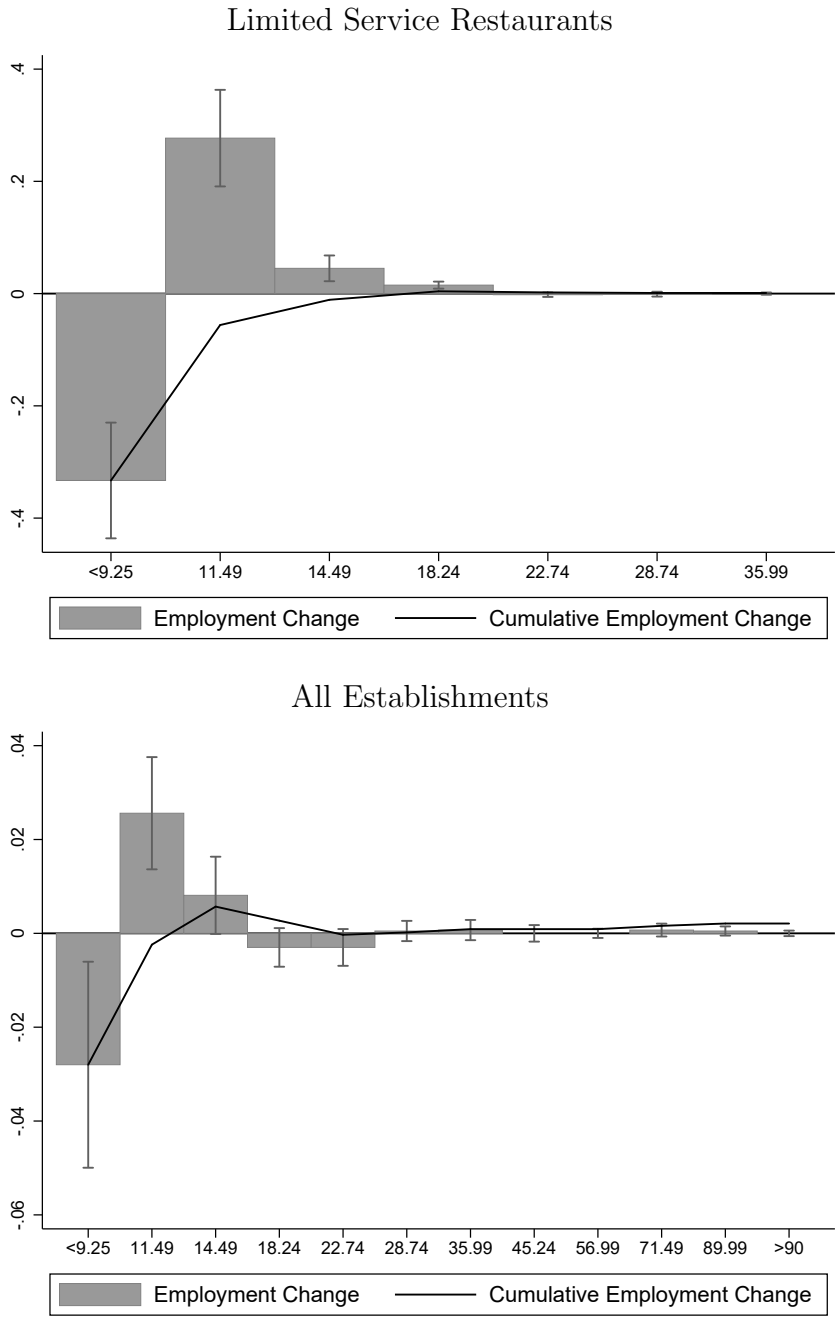

Figure 2: Each figure shows the estimated change in employment in each bin from the difference-in-differences specification (see Equation 2) with 95% confidence intervals. The top figure is restricted to limited service restaurants, the bottom figure shows all establishments. The black line measures the cumulative change in employment. See also Table 4.

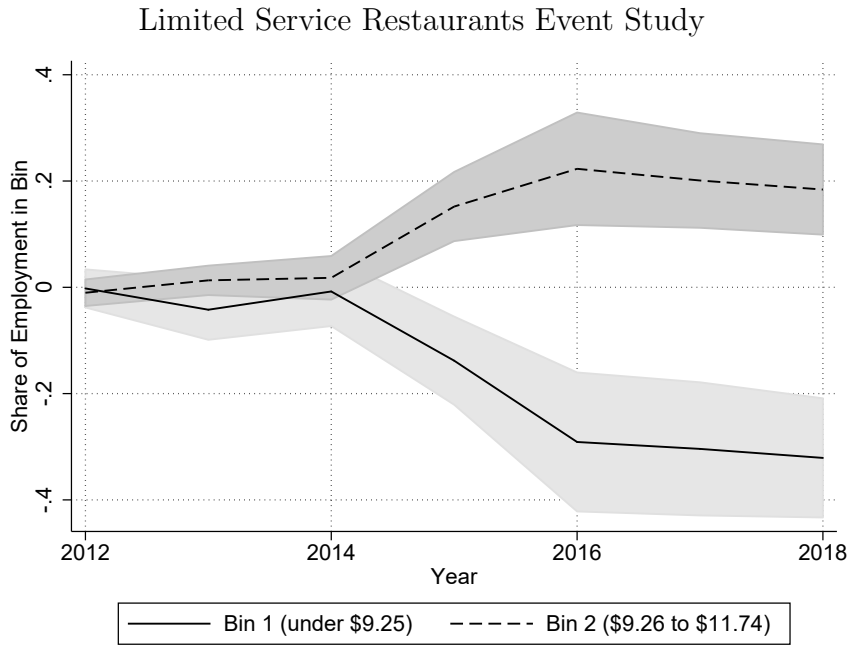

Figure 3: The lines plots the state-level change in the share of employment in Bins 1 (solid line) and 2 (dashed line), estimated from Equation 5. The grey areas plot 95% confidence intervals. State-level minimum wage increases occurred in 2014 and 2015. See also Table 6.

Table 1: States with Substantive Minimum Wage Increases in 2014 and 2015

State	Date	Previous Minimum	New Minimum	Increase	Increased from Federal Minimum
New York	December 31, 2013	7.25	8.00	0.75	X
Connecticut	January 1, 2014	8.25	8.70	0.45	
California	July 1, 2014	8.00	9.00	1.00	
New Jersey	July 1, 2014	7.25	8.25	1.00	X
West Virginia	December 31, 2014	7.25	8.00	0.75	X
Alaska	January 1, 2015	7.75	8.75	1.00	
Hawaii	January 1, 2015	7.25	7.75	0.50	X
Massachusetts	January 1, 2015	8.00	9.00	1.00	
Nebraska	January 1, 2015	7.25	8.00	0.75	X
South Dakota	January 1, 2015	7.25	8.50	1.25	X

Table 2: Wage Bin Definitions by Year

Bins:	1	2	3	4	5	6	7	8	9	10	11	12
2000-2005	≤ 6.75	8.49	10.74	13.49	16.99	21.49	27.24	34.49	43.74	55.49	69.99	≥ 70
2006-2008	≤ 7.5	9.49	11.99	15.24	19.24	24.49	30.99	39.24	49.79	63.24	79.99	≥ 80
2009-2013	≤ 9.25	11.49	14.49	18.24	22.74	28.74	35.99	45.24	56.99	71.49	89.99	≥ 90
2014-2018	≤ 9.25	11.74	14.74	18.74	23.99	30.24	38.49	48.99	61.99	78.74	99.99	≥ 100

Note: Cutoffs for wage bins by year in OEWS establishment wage data.

Table 3: Summary Statistics: Means of Key Variables

	Panel A: All Establishments Sample				
	Treated Pre	Treated Post	Control Pre	Control Post	Diff-in-Diff
Log Real Average Wage	3.15	3.20	2.99	3.03	0.01
Total Employment	109.53	116.72	87.87	92.83	2.23
Share Bin 1	0.11	0.05	0.17	0.13	-0.03
Share Bin 2	0.12	0.14	0.13	0.14	0.03
Share Bin 3	0.13	0.14	0.16	0.15	0.01
Share Bin 4+	0.64	0.67	0.54	0.58	-0.01
Share Mgmt	0.12	0.12	0.11	0.11	0.00
Share IT	0.03	0.03	0.02	0.02	0.00
Share Production	0.23	0.23	0.27	0.27	0.00
Share Professional	0.24	0.25	0.21	0.21	0.00
Share Service	0.13	0.13	0.13	0.12	0.00
Log Real 10th Ptile Wage	2.55	2.62	2.46	2.47	0.07
Log Real 25th Ptile Wage	2.63	2.70	2.54	2.56	0.06
Log Real Median Wage	2.78	2.84	2.68	2.69	0.05
Log Real 75th Ptile Wage	2.95	3.00	2.85	2.85	0.05
Log Real 90th Ptile Wage	3.13	3.17	3.04	3.04	0.05
50/10	1.33	1.30	1.31	1.30	-0.02
90/10	2.19	2.09	2.18	2.13	-0.04
90/50	1.58	1.54	1.60	1.57	0.00
Panel B: Limited Service Restaurants					
	Treated Pre	Treated Post	Control Pre	Control Post	Diff-in-Diff
Log Real Average Wage	2.38	2.51	2.29	2.32	0.10
Total Employment	39.78	43.36	41.66	43.88	1.36
Share Bin 1	0.64	0.22	0.77	0.69	-0.33
Share Bin 2	0.21	0.54	0.12	0.18	0.28
Share Bin 3	0.07	0.14	0.05	0.06	0.05
Share Bin 4+	0.08	0.10	0.06	0.06	0.01
Share Mgmt	0.12	0.12	0.12	0.12	-0.01
Share IT	0.00	0.00	0.00	0.00	0.00
Share Production	0.04	0.04	0.04	0.04	0.00
Share Professional	0.00	0.00	0.00	0.00	0.00
Share Service	0.80	0.80	0.78	0.78	0.01
Log Real 10th Ptile Wage	2.23	2.38	2.18	2.18	0.14
Log Real 25th Ptile Wage	2.24	2.39	2.18	2.18	0.14
Log Real Median Wage	2.26	2.40	2.19	2.20	0.14
Log Real 75th Ptile Wage	2.32	2.45	2.23	2.25	0.11
Log Real 90th Ptile Wage	2.46	2.55	2.38	2.40	0.07
50/10	1.03	1.02	1.02	1.02	-0.01
90/10	1.33	1.23	1.27	1.30	-0.12
90/50	1.29	1.20	1.25	1.26	-0.10

Note: Means of variables from the difference-in-differences samples for all establishments (Panel A) and limited-service restaurants (Panel B).

Table 4: Change in Employment by Wage Bin

DV: Share in Bin	$9.25 Bin 1	$11.49 Bin 2	$14.49 Bin 3	$18.24+ Bin 4 to 12
Sample: All Establishments, Diff-in-Diff				
T × Post	-0.0284*	0.0256***	0.00813	-0.00531*
	(0.0112)	(0.00613)	(0.00429)	(0.00252)
N	259454	259454	259454	259454
Sample: LS Restaurants, Diff-in-Diff				
T × Post	-0.333***	0.277***	0.0450***	0.0114**
	(0.0526)	(0.0439)	(0.0117)	(0.00388)
N	3986	3986	3986	3986
Sample: LS Restaurants, Matched				
T × Post	-0.334***	0.253***	0.0598***	0.0213***
	(0.00918)	(0.00905)	(0.00528)	(0.00355)
N	5285	5285	5285	5285
Sample: High-Exposure, Diff-in-Diff				
T × Post	-0.253***	0.179***	0.0516**	0.0224*
	(0.0448)	(0.0335)	(0.0163)	(0.00879)
N	8724	8724	8724	8724
Sample: High-Exposure, Matched				
T × Post	-0.293***	0.191***	0.0601***	0.0422***
	(0.00633)	(0.00605)	(0.00367)	(0.00350)
N	10728	10728	10728	10728
Sample: Medium-Exposure, Diff-in-Diff				
T × Post	-0.138***	0.106***	0.0307**	0.00147
	(0.0332)	(0.0210)	(0.0106)	(0.00426)
N	28774	28774	28774	28774
Sample: Medium-Exposure, Matched				
T × Post	-0.199***	0.128***	0.0441***	0.0272***
	(0.00347)	(0.00350)	(0.00245)	(0.00256)
N	27598	27598	27598	27598
Sample: Low-Exposure, Diff-in-Diff				
T × Post	-0.0947**	0.0711***	0.0197*	0.00387
	(0.0288)	(0.0176)	(0.00856)	(0.00395)
N	58954	58954	58954	58954
Sample: Low-Exposure, Matched				
T × Post	-0.151***	0.0898***	0.0353***	0.0257***
	(0.00234)	(0.00259)	(0.00198)	(0.00219)
N	52280	52280	52280	52280

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Standard errors clustered at the state-level. LS Restaurants indicates limited-service restaurants, and High-, Medium-, and Low-Exposure samples indicates industries with over 33%, 20%, or 10% employment, respectively, in the smallest wage bin in 2003. Diff-in-Diff refer to difference-in-difference specifications and matched use nearest neighbor matching. *** $p<0.001$, ** $p<0.01$, * $p<0.05$.

Table 5: Triple Difference Effect of Minimum Wage by Wage Bin

	$9.25	$11.49	$14.49	$18.24+
DV: Share in Bin	1	2	3	Share 4+
T × Post	-0.0243***	0.0119***	0.0104*	0.00198
	(0.00511)	(0.00297)	(0.00448)	(0.00442)
T × Post × (0 < Bin 1 ≤25%)	-0.00898	0.0120**	0.00292	-0.00591
	(0.00516)	(0.00339)	(0.00300)	(0.00598)
T × Post × (25%< Bin 1 ≤ 50%)	-0.0927**	0.0788***	0.0103	0.00362
	(0.0267)	(0.0125)	(0.00648)	(0.0144)
T × Post × (50%< Bin 1 ≤75%)	-0.168***	0.130***	0.0179*	0.0194
	(0.0455)	(0.0312)	(0.00677)	(0.0135)
T × Post × Bin 1 ≥ 75%	-0.244**	0.203**	0.0181*	0.0233
	(0.0846)	(0.0668)	(0.00829)	(0.0155)
N	259454	259454	259454	259454

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Bin 1 indicates the share of employment in the establishment in the smallest wage bin in the pre-period. Standard errors clustered at the state-level. *** p<0.001, ** p<0.01, * p<0.05.

Table 6: State by Wage Bin Level Specification

DV: Change in Employment by Bin	(1)	(2)
T × Post × Bin 1	-0.0258**	-0.0233**
	(0.00719)	(0.00762)
T × Post × Bin 2	0.0137*	0.0109
	(0.00525)	(0.00537)
T × Post × Bin 3	0.00720	0.00439
	(0.00361)	(0.00335)
T × Post × Bin 4	-0.00441	-0.00381
	(0.00391)	(0.00526)
T × Post × Bin 5	-0.00116	0.0000392
	(0.00218)	(0.00278)
T × Post × Bin 6	-0.00138	-0.00143
	(0.00202)	(0.00261)
T × Post × Bin 7	0.00115	0.00162
	(0.00166)	(0.00191)
T × Post × Bin 8	-0.000532	-0.000725
	(0.00127)	(0.00169)
T × Post × Bin 9	0.000360	0.000293
	(0.000698)	(0.000888)
Observations	3072	2784
Set of Treatment States	Full	Restricted
State and year FE	Yes	Yes

Notes: State-level specification with state and year fixed effects. Bins refer to the 12 wage bins. Bins 10 through 12 are omitted. T indicates treatment state, Post indicates after the minimum wage increase. Full sample includes all treatment states, restricted sample includes only states that increased their minimum wage from the federal level. *** $p<0.001$, ** $p<0.01$, * $p<0.05$.

Table 7: State-Level Changes in Occupational Structure

DV: Change in Employment by Occ.	LS Restaurants	High-Exposure	Medium-Exposure	Low-Exposure	All
Managers and Supervisors	-0.00512	-0.00446	-0.000338	-0.00333	-0.00135
	(0.00832)	(0.00403)	(0.00481)	(0.00363)	(0.00332)
Clerical	0.000442	-0.00300	-0.00906	-0.0208***	-0.00940
	(0.00915)	(0.00594)	(0.00472)	(0.00503)	(0.00495)
Production	-0.00702	-0.00232	-0.00375	-0.00224	-0.00386
	(0.00695)	(0.00410)	(0.00404)	(0.00417)	(0.00579)
Service	0.0113	0.0101	0.0163	0.0158*	0.00642
	(0.0137)	(0.0101)	(0.00967)	(0.00773)	(0.00397)
N	1280	1280	1280	1280	1280

Notes: State-level specification with state and year fixed effects. Professional occupations omitted. T indicates treatment state, Post indicates after the minimum wage increase. LS Restaurants indicates limited-service restaurants, and High-, Medium-, and Low-Exposure samples indicates industries with over 33%, 20%, or 10% employment, respectively, in the smallest wage bin in 2003. *** p<0.001, ** p<0.01, * p<0.05.

Table 8: Change in Employment by Occupation

DV: Share in Occ.	Mgmt.	Prof.	Clerical	Prod.	Service	IT	Total Emp.
Sample: LS Restaurants, DD							
T × Post	-0.00678	-0.000596	-0.00117	-0.00113	0.00968	-0.0000137	1.373
	(0.00616)	(0.000825)	(0.00790)	(0.00447)	(0.0122)	(0.0000336)	(3.505)
N	3986	3986	3986	3986	3986	3986	3986
Sample: LS Restaurants, Matched							
T × Post	0.000148	0.000540	0.00494	0.00432	-0.00995	-0.0000212	-1.947*
	(0.00344)	(0.000893)	(0.00498)	(0.00443)	(0.00763)	(0.0000384)	(0.815)
N	5042	5042	5042	5042	5042	5042	5042
Sample: High-Exposure, DD							
T × Post	-0.00525	-0.00158	-0.00507	-0.00129	0.0132	-0.000715	-0.306
	(0.00367)	(0.00165)	(0.00460)	(0.00281)	(0.00744)	(0.000372)	(2.769)
N	8724	8724	8724	8724	8724	8724	8724
Sample: High-Exposure, Matched							
T × Post	0.00241	0.000502	0.00118	0.00463	-0.00872	-0.0000945	-0.365
	(0.00224)	(0.000651)	(0.00300)	(0.00252)	(0.00456)	(0.0000539)	(0.641)
N	9624	9624	9624	9624	9624	9624	9624
Sample: All Establishments, DD							
T × Post	-0.00200	0.00131	-0.00277	0.00286	0.000604	0.000866	2.222
	(0.00296)	(0.00176)	(0.00203)	(0.00157)	(0.00125)	(0.000598)	(1.312)
N	259454	259454	259454	259454	259454	259454	259454

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Standard errors clustered at the state-level. LS Restaurants indicates limited-service restaurants, and High-Exposure samples indicates industries with over 33%, employment in the smallest wage bin in 2003. Mgmt. refers to management, Prof. refers to professional, Prod. refers to production, IT refers to Information Technology, and Total Emp. refers to total employment. *** p<0.001, ** p<0.01, * p<0.05.

Table 9: Occupational Reallocations within Establishment (6-digit)

	Reallocations within:							
	All	Mgmt	Sup.	Prof.	Clerical	Prod.	Service	IT
Sample: LS Restaurants, DD								
T × Post	0.00981	0.0114	0.00684**	0.000400	0.00187	-0.000977	0.0302	-0.000158
	(0.0140)	(0.0111)	(0.00224)	(0.000756)	(0.000942)	(0.000985)	(0.0184)	(0.000140)
	2076	2076	2076	2076	2076	2076	2076	2076
Sample: LS Restaurants, Matched								
T × Post	0.00154	0.00757	0.00104	0	-0.0000602	-0.000712*	0.0159***	0
	(0.00358)	(0.00391)	(0.00134)	(0)	(0.000467)	(0.000354)	(0.00383)	(0)
N	5042	5042	5042	5042	5042	5042	5042	5042
Sample: High-Exposure, DD								
T × Post	0.0148	0.0171*	0.0219***	0.00184	0.00726*	0.00206	0.0251*	0.000218
	(0.00792)	(0.00829)	(0.00294)	(0.00128)	(0.00278)	(0.00235)	(0.0102)	(0.000352)
	4480	4480	4480	4480	4480	4480	4480	4480
Sample: High-Exposure, Matched								
T × Post	0.00711**	0.00923**	0.0107***	0.000283	0.00248*	-0.0000908	0.0171***	0
	(0.00236)	(0.00295)	(0.00184)	(0.000236)	(0.000968)	(0.000363)	(0.00245)	(0)
N	9624	9624	9624	9624	9624	9624	9624	9624
Sample: All Establishments, DD								
T × Post	0.00818*	0.0177***	0.00633*	0.0124**	0.0114*	-0.00292	0.00337*	0.00718***
	(0.00347)	(0.00447)	(0.00272)	(0.00364)	(0.00504)	(0.00185)	(0.00132)	(0.00194)
	130259	130259	130259	130259	130259	130259	130259	130259

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Dependent variable is the percent reallocation between the pre- and post-period. Standard errors clustered at the state-level. LS Restaurants indicates limited-service restaurants, and High-Exposure samples indicates industries with over 33%, employment in the smallest wage bin in 2003. Mgmt. refers to management, Prof. refers to professional, Prod. refers to production, and IT refers to Information Technology. DD are difference-in-difference specifications and matched use nearest neighbor matching. *** p<0.001, ** p<0.01, * p<0.05.

Table 10: Employment Spillovers to Supervisors and Managers

	9.25	11.74	14.74	18.74+
DV: Share in Bin	1	2	3	4+
Panel A: Supervisors				
Sample: LS Restaurants, DD				
T × Post	-0.00409	-0.141***	0.0632	0.0819*
	(0.0204)	(0.0226)	(0.0380)	(0.0371)
N	3505	3505	3505	3505
Sample: LS Restaurants, Matched				
T × Post	-0.0254*	-0.118***	0.0622***	0.0810***
	(0.00990)	(0.0192)	(0.0187)	(0.0199)
N	4268	4268	4268	4268
Sample: High-Exposure, DD				
T × Post	-.0250411***	-.0914802***	.0372898**	.0792314***
	(.0066373)	(.0126081)	(.0127602)	(.0142535)
N	7,691	7,691	7,691	7,691
Sample: High-Exposure, Matched				
T × Post	-0.0131	-0.0906***	0.0441	0.0596*
	(0.0148)	(0.0173)	(0.0270)	(0.0235)
N	7010	7010	7010	7010
Sample: All Establishments, DD				
T × Post	0.000582	-0.00148	0.0119***	-0.0110*
	(0.00185)	(0.00239)	(0.00225)	(0.00422)
N	145018	145018	145018	145018
Panel B: Managers				
Sample: LS Restaurants, DD				
T × Post	-0.000674	0.0267*	0.00651	-0.0676
	(0.00771)	(0.0105)	(0.0245)	(0.0513)
N	1973	1973	1973	3986
Sample: LS Restaurants, Matched				
T × Post	-0.0042	0.007578	.0157508	-.0529089 **
	(0.0040312)	(.0101421)	(.0194999)	(.0196064)
N	1600	1600	1600	5,285
Sample: High-Exposure, DD				
T × Post	-.0004026	.0037366	.0068663	-.0039027
	(.0036615)	(.0054652)	(.0104575)	(.0128586)
N	3,595	3,595	3,595	10728
Sample: High-Exposure, Matched				
T × Post	0.00362	0.00948	0.0170	-0.0114
	(0.00643)	(0.00646)	(0.0140)	(0.0316)
N	4314	4314	4314	8724
Sample: All Establishments, DD				
T × Post	0.000561	0.00128*	0.00153	-0.00520
	(0.000888)	(0.000556)	(0.000992)	(0.0104)
N	151480	151480	151480	259454

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Standard errors clustered at the state-level. LS Restaurants indicates limited-service restaurants, and High-Exposure samples indicates industries with over 33%, employment in the smallest wage bin in 2003. DD are difference-in-difference specifications and matched use nearest neighbor matching. *** p<0.001, ** p<0.01, * p<0.05.

Table 11: Wage Percentiles and Inequality

Wage Ptile	10th	50th	90th	90/10	90/50	50/10
Sample: All Establishments, DD						
T × Post	0.0659***	0.0528***	0.0478*	-0.0412	-0.00454	-0.0191**
	(0.0137)	(0.0138)	(0.0179)	(0.0235)	(0.0112)	(0.00656)
N	259454	259451	259445	259454	259451	259454
Sample: LS Restaurants, DD						
T × Post	0.145***	0.135***	0.0683**	-0.119*	-0.104**	-0.0111
	(0.0185)	(0.0159)	(0.0219)	(0.0478)	(0.0340)	(0.0110)
N	3986	3985	3985	3986	3985	3986
Sample: LS Restaurants, Matched						
T × Post	0.135***	0.125***	0.0728***	-0.0996*	-0.0856***	-0.0114
	(0.0201)	(0.0152)	(0.0189)	(0.0384)	(0.0224)	(0.0101)
N	8724	8723	8723	8724	8723	8724
Sample: High-Exposure, DD						
T × Post	0.121***	0.123***	0.0656***	-0.0830***	-0.0841***	0.00190
	(0.00260)	(0.00346)	(0.00964)	(0.0164)	(0.0151)	(0.00302)
N	5285	5284	5284	5285	5284	5285
Sample: High-Exposure, Matched						
T × Post	0.119***	0.131***	0.0768***	-0.0655***	-0.0831***	0.0144***
	(0.00213)	(0.00360)	(0.00804)	(0.0141)	(0.0118)	(0.00390)
N	10728	10727	10727	10728	10727	10728

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Standard errors clustered at the state-level. LS Restaurants indicates limited-service restaurants, and High-Exposure samples indicates industries with over 33%, employment in the smallest wage bin in 2003. DD are difference-in-difference specifications and matched use nearest neighbor matching. *** p<0.001, ** p<0.01, * p<0.05.

Table 12: Wage Structure of Closing and Opening Establishments

DV: Share in Bin	$9.25	$11.49	$14.49	$18.24+	Tot. Emp.
Panel A: Closing Establishments					
Sample: LS Restaurants					
T × Closed	-0.0234	0.0149	0.00741	0.00101	-10.38
	(0.0415)	(0.0236)	(0.0145)	(0.0141)	(6.301)
N	8525	8525	8525	8525	8525
Sample: High-Exposure					
T × Closed	0.0284	0.00231	-0.00264	-0.0281	-10.59
	(0.0434)	(0.0182)	(0.0196)	(0.0197)	(5.336)
N	21664	21664	21664	21664	21664
Sample: Medium-Exposure					
T × Closed	0.0181	0.0136	0.00864	-0.0403	-12.50*
	(0.0363)	(0.0147)	(0.0122)	(0.0207)	(6.108)
N	76973	76973	76973	76968	76968
Sample: Low-Exposure					
T × Closed	0.0186	0.0123	0.00700	-0.0377	-2.838
	(0.0213)	(0.0130)	(0.00850)	(0.0195)	(8.165)
N	160946	160946	160946	160299	160299
Sample: All Establishments					
T × Closed	0.0101	0.0104*	0.00888*	-0.0292	-2.685
	(0.0121)	(0.00477)	(0.00334)	(0.0168)	(8.912)
N	640096	640096	640096	639417	639417
Panel B: Opening Establishments					
Sample: LS Restaurants					
T × Opened	0.0681	-0.0325	-0.0364*	0.000877	2.731
	(0.0417)	(0.0260)	(0.0141)	(0.0161)	(5.950)
N	7414	7414	7414	7414	7414
Sample: High-Exposure					
T × Opened	0.0204	-0.0310	0.0284	-0.0178	27.85
	(0.0433)	(0.0233)	(0.0333)	(0.0183)	(13.79)
N	18034	18034	18034	18034	18034
Sample: Medium-Exposure					
T × Opened	0.000766	-0.00638	0.0101	-0.00446	24.19
	(0.0391)	(0.0128)	(0.0243)	(0.0195)	(19.58)
N	64003	64003	64003	64003	64003
Sample: Low-Exposure					
T × Opened	-0.0131	0.0296	0.00468	-0.0212	19.33
	(0.0270)	(0.0177)	(0.0159)	(0.0177)	(20.70)
N	135649	135649	135649	135649	135649
Sample: All Establishments					
T × Opened	-0.00193	0.0189	0.00357	-0.0206	10.88
	(0.0134)	(0.00943)	(0.00312)	(0.0166)	(18.38)
N	542491	542491	542491	542491	542491

Note: Establishment-level difference-in-difference specifications, including half-year fixed effects. Closed indicates establishments that closed after the minimum wage increase, Opened indicates establishment that entered after the minimum wage increase. T indicates treatment state. Standard errors clustered at the state-level. LS Restaurants indicates limited-service restaurants, and High-, Medium-, and Low-Exposure samples indicates industries with over 33%, 20%, or 10% employment, respectively, in the smallest wage bin in 2003. Tot. Emp. refers to total employment. *** p<0.001, ** p<0.01, * p<0.05.

Table 13: Occupational Structure of Closing and Opening Establishments

DV: Share in Occ.	Mgmt	Prof.	Clerical	Prod.	Service	IT	Supervisor	Supervised
Panel A: Closing Establishments								
Sample: LS Restaurants								
T × Closed	0.00457	-0.000394	0.0236	0.00875	-0.0365	0.0000892	0.00907	0.00512
	(0.0188)	(0.000466)	(0.0192)	(0.0135)	(0.0240)	(0.0000917)	(0.0160)	(0.00585)
N	8525	8525	8525	8525	8525	8525	8525	8525
Sample: High-Exposure								
T × Closed	-0.0103	-0.00416**	-0.0128	-0.0171	0.0443	-0.000675***	-0.00474	0.0142***
	(0.00826)	(0.00143)	(0.0229)	(0.0113)	(0.0308)	(0.000181)	(0.00646)	(0.00381)
N	21664	21664	21664	21664	21664	21664	21664	21664
Sample: Medium-Exposure								
T × Closed	-0.00855	-0.0141*	0.00130	-0.0100	0.0314	-0.000581***	-0.00665	0.0190**
	(0.00818)	(0.00549)	(0.0152)	(0.00812)	(0.0203)	(0.000157)	(0.00559)	(0.00666)
N	76968	76968	76968	76968	76968	76968	76968	76968
Sample: Low-Exposure								
T × Closed	-0.0114	-0.0307***	0.0216	0.0232**	-0.00269	-0.00116*	-0.00661	0.0385***
	(0.00738)	(0.00686)	(0.0133)	(0.00786)	(0.0130)	(0.000476)	(0.00419)	(0.00801)
N	160299	160299	160299	160299	160299	160299	160299	160299
Sample: All Establishments								
T × Closed	-0.00341	-0.0150	0.00602	0.00699	0.00541	0.000201	-0.00154	0.0163
	(0.00605)	(0.00860)	(0.00836)	(0.0155)	(0.00584)	(0.00278)	(0.00238)	(0.0109)
N	639417	639417	639417	639417	639417	639417	639417	639417
Panel B: Opening Establishments								
Sample: LS Restaurants								
T × Opened	0.00681	-0.00101	0.00159	0.000977	-0.00837	-0.000137	0.00815	0.00297
	(0.0161)	(0.00100)	(0.0117)	(0.0133)	(0.0205)	(0.000133)	(0.0129)	(0.00432)
N	7414	7414	7414	7414	7414	7414	7414	7414
Sample: High-Exposure								
T × Opened	-0.0122	0.00372	0.109	0.0127	-0.113	-0.000859*	-0.00647	-0.00209
	(0.00762)	(0.00262)	(0.0674)	(0.0154)	(0.0826)	(0.000409)	(0.00555)	(0.00365)
N	18034	18034	18034	18034	18034	18034	18034	18034
Sample: Medium–Exposure								
T × Opened	-0.0112	-0.00463	0.0113	0.00462	-0.000120	-0.000543*	-0.00804	0.00209
	(0.00632)	(0.00442)	(0.0155)	(0.00912)	(0.0161)	(0.000264)	(0.00412)	(0.00690)
N	64003	64003	64003	64003	64003	64003	64003	64003
Sample: Low-Exposure								
T × Opened	-0.0126	-0.0166	0.0270	0.00795	-0.00575	-0.000309	-0.00726*	0.0125
	(0.00652)	(0.0122)	(0.0204)	(0.0105)	(0.0148)	(0.000296)	(0.00335)	(0.0122)
N	135649	135649	135649	135649	135649	135649	135649	135649
Sample: All Establishments								
T × Opened	-0.00119	-0.0118	0.0132	0.00274	-0.00295	0.00196	-0.00169	0.00799
	(0.00621)	(0.00959)	(0.00974)	(0.0104)	(0.00674)	(0.00268)	(0.00203)	(0.0119)
N	542491	542491	542491	542491	542491	542491	542491	542491

Note: Establishment-level difference-in-difference specifications, including half-year fixed effects. Closed indicates establishments that closed after the minimum wage increase, Opened indicates establishment that entered after the minimum wage increase. T indicates treatment state. Standard errors clustered at the state-level. LS Restaurants indicates limited-service restaurants, and High-, Medium-, and Low-Exposure samples indicates industries with over 33%, 20%, or 10% employment, respectively, in the smallest wage bin in 2003. Mgmt. refers to management, Prof. refers to professional, Prod. refers to production, and IT refers to Information Technology. *** p<0.001, ** p<0.01, * p<0.05.

A Appendix Supplemental Tables and Figures

Table A.1: NAICS Codes of Industry Samples

Limited Service Restaurants	722513
Sample: High-Exposure (Limited Service Restaurants plus:)	
Silver Ore Mining	212222
Malt Manufacturing	311213
Cane Sugar Manufacturing	311314
News Dealers and Newsstands	451212
All Other General Merchandise Stores	452319
Urban Transit Systems	485110
Motion Picture Theaters (except Drive-Ins)	512131
Drive-In Motion Picture Theaters	512132
Commodity Contracts Dealing	523130
Other Gambling Industries	713290
Bowling Centers	713950
Mobile Food Services	722330
Drinking Places (Alcoholic Beverages)	722410
Full-Service Restaurants	722511
Cafeterias, Grill Buffets, and Buffets	722514
Footwear and Leather Goods Repair	811430
Coin-Operated Laundries and Drycleaners	812310

Medium-Exposure (Above +:)	115111, 311830, 315110, 325612, 423940, 424520, 445110, 445120, 445230, 445291, 445292, 445310, 446120, 446191, 447110, 447190, 448110, 448140, 448190, 448210, 448320, 451120, 451130, 451211, 453220, 453310, 485310, 485320, 485410, 512132, 531110, 532282, 541860, 621112, 624210, 624410, 711212, 713110, 713910, 713990, 721110, 721310, 722210, 722320, 722513, 722515, 811192, 812112, 812113, 812199, 812320, 813410, 813930
Low-Exposure (Above +:)	115114, 115115, 115210, 221310, 236117, 238171, 238191, 238291, 238350, 238910, 238990, 311340, 311352, 311520, 311611, 311710, 311811, 311812, 311821, 311824, 311911, 311919, 311991, 312113, 314120, 314999, 315190, 315220, 315990, 324191, 325320, 327110, 339115, 423140, 423520, 423990, 424410, 424930, 442291, 442299, 443142, 444130, 444220, 445210, 445220, 445299, 446110, 446130, 448120, 448130, 451110, 451140, 452210, 452311, 453110, 453910, 453930, 453991, 453998, 454390, 483212, 485113, 487110, 487990, 488390, 488410, 488991, 493130, 511110, 511140, 515112, 519120, 525990, 531130, 531190, 531210, 532111, 532112, 532210, 532284, 533110, 541921, 551111, 561421, 561612, 561720, 561910, 562119, 611620, 621610, 623312, 624120, 711110, 711120, 711130, 711219, 711310, 711320, 712110, 712130, 712190, 713120, 713210, 713940, 721120, 721191, 721199, 721211, 721214, 722310, 811112, 811198, 811411, 811412, 811420, 811490, 812111, 812320, 812331, 812332, 812910, 812921, 813110, 813319

Table A.2: Change in Employment by Wage Bin, All Bins

	$9.25	$11.49	$14.49	$18.24	$22.74	$28.74	$35.99	$45.24	$56.99	$71.49	$89.99	$90 +
DV: Share in Bin	Bin 1	Bin 2	Bin 3	Bin 4	Bin 5	Bin 6	Bin 7	Bin 8	Bin 9	Bin 10	Bin 11	Bin 12
Sample: LS Restaurants, Diff-in-Diff												
T × Post	-0.333***	0.277***	0.0450***	0.0151***	-0.00279	-0.00137	-0.000123	-0.000131	0.000371	-0.0000824	0.000190	0.000232
	(0.0526)	(0.0439)	(0.0117)	(0.00325)	(0.00204)	(0.00220)	(0.00107)	(0.000804)	(0.000283)	(0.000175)	(0.000341)	(0.000176)
N	3986	3986	3986	3986	3986	3986	3986	3986	3986	3986	3986	3986
Sample: LS Restaurants, Matched												
T × Post	-0.334***	0.253***	0.0598***	0.0161***	0.00303	0.00101	0.000672	-0.000174	0.000241	-0.000147	0.000324*	0.000289
	(0.00918)	(0.00905)	(0.00528)	(0.00234)	(0.00174)	(0.00112)	(0.000658)	(0.000328)	(0.000258)	(0.000221)	(0.000144)	(0.000155)
N	5285	5285	5285	5285	5285	5285	5285	5285	5285	5285	5285	5285
Sample: High-Exposure, Diff-in-Diff												
T × Post	-0.253***	0.179***	0.0516**	0.0166**	0.00360	-0.000332	0.00106	0.00124	0.000765	-0.000228	-0.000164	-0.000149
	(0.0448)	(0.0335)	(0.0163)	(0.00464)	(0.00402)	(0.00305)	(0.00219)	(0.000817)	(0.000493)	(0.000281)	(0.000273)	(0.000433)
N	8724	8724	8724	8724	8724	8724	8724	8724	8724	8724	8724	8724
Sample: High-Exposure, Matched												
T × Post	-0.293***	0.191***	0.0601***	0.0248***	0.00948***	0.00407***	0.00229***	0.000904**	0.000383	-0.0000171	0.000223*	0.0000560
	(0.00633)	(0.00605)	(0.00367)	(0.00240)	(0.00163)	(0.00114)	(0.000632)	(0.000339)	(0.000228)	(0.000160)	(0.000113)	(0.000175)
N	10728	10728	10728	10728	10728	10728	10728	10728	10728	10728	10728	10728
Sample: Medium-Exposure, Diff-in-Diff												
T × Post	-0.138***	0.106***	0.0307**	0.00387	-0.0000103	-0.000150	0.0000310	-0.00108	-0.000774	-0.0000998	-0.000261	-0.0000583
	(0.0332)	(0.0210)	(0.0106)	(0.00340)	(0.00156)	(0.00288)	(0.00205)	(0.00107)	(0.000780)	(0.000367)	(0.000291)	(0.000333)
N	28774	28774	28774	28774	28774	28774	28774	28774	28774	28774	28774	28774
Sample: Low-Exposure, Diff-in-Diff												
T × Post	-0.0947**	0.0711***	0.0197*	0.00330	-0.00151	0.00252	0.00133	-0.000788	-0.000629	0.000142	-0.000381	-0.0000998
	(0.0288)	(0.0176)	(0.00856)	(0.00259)	(0.00204)	(0.00165)	(0.00166)	(0.000640)	(0.000517)	(0.000592)	(0.000293)	(0.000368)
N	58954	58954	58954	58954	58954	58954	58954	58954	58954	58954	58954	58954
Sample: Restricted, Diff-in-Diff												
T × Post	-0.0118	0.0155***	0.00138	-0.00509	-0.00324	-0.00446*	-0.00120	0.00200	0.000271	-0.000798	0.00116*	0.00132*
	(0.00591)	(0.00385)	(0.00207)	(0.00381)	(0.00178)	(0.00205)	(0.00108)	(0.00131)	(0.000673)	(0.000645)	(0.000462)	(0.000508)
N	209438	209438	209438	209438	209438	209438	209438	209438	209438	209438	209438	209438
Sample: All Establishments, Diff-in-Diff												
T × Post	-0.0284*	0.0256***	0.00813	-0.00356	-0.00320	0.000596	0.000776	0.0000917	-0.000782	0.000714	0.000581	-0.000523
	(0.0112)	(0.00613)	(0.00429)	(0.00212)	(0.00206)	(0.00115)	(0.00114)	(0.000952)	(0.000535)	(0.000749)	(0.000516)	(0.000305)
N	259454	259454	259454	259454	259454	259454	259454	259454	259454	259454	259454	259454

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Standard errors clustered at the state-level. LS Restaurants indicates limited-service restaurants, and High-, Medium-, and Low-Exposure samples indicates industries with over 33%, 20%, or 10% employment, respectively, in the smallest wage bin in 2003. Diff-in-Diff refer to difference-in-difference specifications and matched use nearest neighbor matching. *** p<0.001, ** p<0.01, * p<0.05.

Table A.3: Triple Difference Effect of Minimum Wage by Wage Bin, Restricted State Sample

	$9.25	$11.49	$14.49	$18.24+
DV: Share in Bin	1	2	3	Share 4+
T × Post	-0.0138***	0.00612	0.00228	0.00539
	(0.00295)	(0.00338)	(0.00307)	(0.00608)
T × Post × (0 < Bin 1 ≤25%)	0.000632	0.00815	0.00584	-0.0146**
	(0.00385)	(0.00663)	(0.00389)	(0.00449)
T × Post × (25%<Bin 1≤ 50%)	-0.0416*	0.0551**	0.00136	-0.0148
	(0.0165)	(0.0173)	(0.00745)	(0.0125)
T × Post × (50%< Bin 1 ≤75%)	-0.0902***	0.0805***	0.0121	-0.00238
	(0.0208)	(0.0208)	(0.00659)	(0.0123)
T × Post × Bin 1 ≥ 75%	-0.0971*	0.0896**	0.00851	-0.00103
	(0.0406)	(0.0293)	(0.00957)	(0.0160)
N	209438	209438	209438	209438

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Bin 1 indicates the share of employment in the establishment in the smallest wage bin in the pre-period. Standard errors clustered at the state-level. Sample is limited to states with minimum wages at the federal level in the pre-period. *** p<0.001, ** p<0.01, * p<0.05.

Table A.4: State-Bin Level Specifications: Change in Employment by Occupation-Bin

	Service	Production	Clerical	Mgmt.	Prof.
Sample: All Establishments					
T × Post × Bin 1	-0.0975***	-0.0135	-0.0329	0.00564	0.000285
	(0.0230)	(0.0164)	(0.0182)	(0.00591)	(0.00624)
T × Post × Bin 2	0.0203	0.0156	0.00513	0.00531	0.000301
	(0.0180)	(0.0185)	(0.0164)	(0.00757)	(0.00741)
T × Post × Bin 3	-0.00710	0.0145	0.00682	0.00943	-0.00236
	(0.0143)	(0.0141)	(0.0130)	(0.00633)	(0.00805)
N	1024	1024	1024	1024	1024
Sample: Limited Service Restaurants					
T × Post × Bin 1	-0.252***	-0.142	-0.0808	0.0103	-0.0195
	(0.0506)	(0.0782)	(0.127)	(0.0370)	(0.165)
T × Post × Bin 2	0.174***	0.0417	0.127	-0.0332	0.107
	(0.0355)	(0.0827)	(0.100)	(0.0561)	(0.177)
T × Post × Bin 3	0.0240	-0.0480	0.0737	0.0476	0.0645
	(0.0195)	(0.0647)	(0.0707)	(0.0482)	(0.166)
N	1024	1024	992	1024	640
Sample: High-Exposure					
T × Post × Bin 1	-0.209***	-0.142**	-0.0944	-0.00984	-0.0919
	(0.0383)	(0.0452)	(0.0734)	(0.0206)	(0.115)
T × Post × Bin 2	0.0613*	0.0279	0.0469	-0.0474	0.0184
	(0.0229)	(0.0609)	(0.0457)	(0.0302)	(0.0718)
T × Post × Bin 3	-0.00532	-0.0171	0.0744	0.0160	-0.0541
	(0.0138)	(0.0561)	(0.0526)	(0.0283)	(0.0771)
N	1024	1024	1024	1024	992
Sample: Medium-Exposure					
T × Post × Bin 1	-0.186***	-0.0416	-0.0670*	0.00849	-0.0107
	(0.0324)	(0.0313)	(0.0258)	(0.0153)	(0.0319)
T × Post × Bin 2	0.0458	-0.00129	0.0465	-0.0107	-0.0698*
	(0.0226)	(0.0298)	(0.0249)	(0.0218)	(0.0300)
T × Post × Bin 3	-0.0122	-0.0106	0.0214	0.0203	-0.0792*
	(0.0158)	(0.0252)	(0.0174)	(0.0186)	(0.0292)
N	1024	1024	1024	1024	1024
Sample: Low-Exposure					
T × Post × Bin 1	-0.141***	-0.0534	-0.0583*	0.0176	0.00916
	(0.0295)	(0.0323)	(0.0230)	(0.0125)	(0.0167)
T × Post × Bin 2	0.0271	0.00870	0.0143	0.00854	-0.0103
	(0.0217)	(0.0300)	(0.0236)	(0.0176)	(0.0193)
T × Post × Bin 3	-0.00705	-0.00670	0.0165	0.0247	-0.0130
	(0.0154)	(0.0238)	(0.0158)	(0.0137)	(0.0163)
N	1024	1024	1024	1024	1024

Notes: State-by-occupation-level specification with state and year fixed effects. Bins refer to the 12 wage bins. Bins 4 through 12 are omitted. T indicates treatment state, Post indicates after the minimum wage increase. Samples includes all treatment states. LS Restaurants indicates limited-service restaurants, and High-, Medium-, and Low-Exposure samples indicates industries with over 33%, 20%, or 10% employment, respectively, in the smallest wage bin in 2003. Mgmt. refers to management and Prof. refers to professional. *** p<0.001, ** p<0.01, * p<0.05.

Table A.5: State-Bin Level Specifications: Change in Employment by Occupation-Bin, Restricted Sample

	Service	Production	Clerical	Mgmt	Prof
			Sample: All		
T × Post × Bin 1	-0.0830**	-0.00856	-0.0311	0.00701	-0.00286
	(0.0241)	(0.0157)	(0.0236)	(0.00668)	(0.00763)
T × Post × Bin 2	0.0189	0.00788	-0.00470	0.00919	-0.00261
	(0.0203)	(0.0250)	(0.0194)	(0.00859)	(0.00976)
T × Post × Bin 3	-0.0102	0.00692	0.00181	0.0102	-0.00726
	(0.0189)	(0.0183)	(0.0166)	(0.00675)	(0.0101)
N	928	928	928	928	928
			Sample: Limited Service Restaurants		
T × Post × Bin 1	-0.202**	-0.0487	0.0308	0.0413	0.0769
	(0.0586)	(0.0768)	(0.161)	(0.0419)	(0.158)
T × Post × Bin 2	0.154**	-0.0372	0.142	0.0312	0.189
	(0.0469)	(0.0826)	(0.142)	(0.0602)	(0.218)
T × Post × Bin 3	0.0246	-0.108	0.0858	0.0867	0.0990
	(0.0243)	(0.0763)	(0.100)	(0.0569)	(0.189)
N	928	928	896	928	576
			Sample: High-Exposure		
T × Post × Bin 1	-0.177***	-0.0900	-0.0365	0.00982	-0.0889
	(0.0382)	(0.0461)	(0.0922)	(0.0208)	(0.159)
T × Post × Bin 2	0.0518	-0.0540	0.0549	-0.0145	0.0424
	(0.0278)	(0.0517)	(0.0626)	(0.0306)	(0.0866)
T × Post × Bin 3	-0.00884	-0.0788	0.0990	0.0356	-0.0595
	(0.0145)	(0.0642)	(0.0685)	(0.0339)	(0.0967)
N	928	928	928	928	896
			Sample: Medium-Exposure		
T × Post × Bin 1	-0.202**	-0.0213	-0.0420	0.0178	0.00178
	(0.0586)	(0.0348)	(0.0283)	(0.0170)	(0.0343)
T × Post × Bin 2	0.154**	-0.0224	0.0447	0.00811	-0.0517
	(0.0469)	(0.0351)	(0.0330)	(0.0239)	(0.0300)
T × Post × Bin 3	0.0246	-0.0311	0.0170	0.0281	-0.0685*
	(0.0243)	(0.0314)	(0.0224)	(0.0215)	(0.0314)
N	928	928	928	928	928
			Sample: Low-Exposure		
T × Post × Bin 1	-0.115***	-0.0314	-0.0399	0.0248	0.00926
	(0.0304)	(0.0327)	(0.0272)	(0.0138)	(0.0198)
T × Post × Bin 2	0.0265	-0.00754	0.00542	0.0232	-0.00580
	(0.0262)	(0.0341)	(0.0308)	(0.0191)	(0.0228)
T × Post × Bin 3	-0.0135	-0.0184	0.0153	0.0320*	-0.0159
	(0.0201)	(0.0312)	(0.0213)	(0.0141)	(0.0199)
N	928	928	928	928	928

Notes: State-by-occupation-level specification with state and year fixed effects. Bins refer to the 12 wage bins. Bins 4 through 12 are omitted. T indicates treatment state, Post indicates after the minimum wage increase. Samples includes all treatment states. LS Restaurants indicates limited-service restaurants, and High-, Medium-, and Low-Exposure samples indicates industries with over 33%, 20%, or 10% employment, respectively, in the smallest wage bin in 2003. Mgmt. refers to management and Prof. refers to professional. Sample is limited to states with minimum wages at the federal level in the pre-period. *** p<0.001, ** p<0.01, * p<0.05.

Table A.6: State-Level Changes in Occupational Structure, Restricted Sample

DV: Change in Employment by Occ.	LS Restaurants	High-Exposure	Medium-Exposure	Low-Exposure	All
Managers and Supervisors	0.00192	-0.000387	0.00319	-0.000476	-0.00292
	(0.00903)	(0.00380)	(0.00582)	(0.00440)	(0.00406)
Clerical	-0.00224	-0.00479	-0.0104	-0.0172**	-0.00881
	(0.0115)	(0.00721)	(0.00547)	(0.00586)	(0.00578)
Production	-0.00715	-0.00277	-0.00461	-0.00299	-0.00694
	(0.00818)	(0.00520)	(0.00503)	(0.00493)	(0.00558)
Service	0.00739	0.0125	0.0203	0.0143	0.00500
	(0.0170)	(0.0123)	(0.0117)	(0.0101)	(0.00455)
N	1160	1160	1160	1160	1160

Notes: State-level specification with state and year fixed effects. Professional occupations omitted. LS Restaurants indicates limited-service restaurants, and High-, Medium-, and Low-Exposure samples indicates industries with over 33%, 20%, or 10% employment, respectively, in the smallest wage bin in 2003. Sample is limited to states with minimum wages at the federal level in the pre-period. *** p<0.001, ** p<0.01, * p<0.05.

Table A.7: State-Level Change in Wage Distribution within Occupations

	Service	Production	Clerical	Mgmt	Prof	IT
			Panel A: All Firms			
T × Post × Bin 1	-0.0830**	-0.00856	-0.0311	0.00701	-0.00286	-0.000381
	(0.0241)	(0.0157)	(0.0236)	(0.00668)	(0.00763)	(0.00664)
T × Post × Bin 2	0.0189	0.00788	-0.00470	0.00919	-0.00261	0.00135
	(0.0203)	(0.0250)	(0.0194)	(0.00859)	(0.00976)	(0.00766)
T × Post × Bin 3	-0.0102	0.00692	0.00181	0.0102	-0.00726	-0.00120
	(0.0189)	(0.0183)	(0.0166)	(0.00675)	(0.0101)	(0.00847)
N	928	928	928	928	928	928
			Panel B: Limited Service Restaurants			
T × Post × Bin 1	-0.202**	-0.0487	0.0308	0.0413	0.0769	0.0382*
	(0.0586)	(0.0768)	(0.161)	(0.0419)	(0.158)	(0.0127)
T × Post × Bin 2	0.154**	-0.0372	0.142	0.0312	0.189	0.0504
	(0.0469)	(0.0826)	(0.142)	(0.0602)	(0.218)	(0.0197)
T × Post × Bin 3	0.0246	-0.108	0.0858	0.0867	0.0990	0.0578*
	(0.0243)	(0.0763)	(0.100)	(0.0569)	(0.189)	(0.0147)
N	928	928	896	928	576	64
			Panel C: High-Exposure Sample			
T × Post × Bin 1	-0.177***	-0.0900	-0.0365	0.00982	-0.0889	0.295*
	(0.0382)	(0.0461)	(0.0922)	(0.0208)	(0.159)	(0.112)
T × Post × Bin 2	0.0518	-0.0540	0.0549	-0.0145	0.0424	0.317*
	(0.0278)	(0.0517)	(0.0626)	(0.0306)	(0.0866)	(0.125)
T × Post Bin 3	-0.00884	-0.0788	0.0990	0.0356	-0.0595	0.331
	(0.0145)	(0.0642)	(0.0685)	(0.0339)	(0.0967)	(0.161)
N	928	928	928	928	896	316

Notes: State-level specification with state and year fixed effects. Wage bins D-L omitted. T indicates treatment state, Post indicates after the minimum wage increase. Each column restricted to employment in the relevant occupation group. *** p<0.001, ** p<0.01, * p<0.05.

Table A.8: Change in Employment by Occupation

DV: Share in Occ	Mgmt	Prof.	Clerical	Prod.	Service	IT	Total Emp
Sample: LS Restaurants, Matched							
T × Post	0.000752	0.000538	0.00633	0.00579	-0.0134	-0.0000259	-0.641
	(0.00337)	(0.000872)	(0.00485)	(0.00434)	(0.00744)	(0.0000419)	(0.959)
N	5285	5285	5285	5285	5285	5285	5285
Sample: High-Exposure, Matched							
T × Post	0.00282	0.00108	0.000741	0.00425	-0.00889*	-0.000138*	-0.0865
	(0.00219)	(0.000719)	(0.00290)	(0.00238)	(0.00437)	(0.0000663)	(0.683)
N	10728	10728	10728	10728	10728	10728	10728

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Standard errors clustered at the state-level. Top panel is restricted to limited-service restaurants, bottom panel is restricted to industries with over 33% employment in the bottom wage bin in 2003. *** p<0.001, ** p<0.01, * p<0.05.

Table A.9: Change in Employment by Occupation, Additional Samples

DV: Share in Occ	Mgmt	Prof.	Clerical	Prod.	Service	IT	Total Emp
Sample 20							
T × Post	-0.00362	-0.00474	-0.00430	0.00466	0.00800	-0.000286	1.075
	(0.00294)	(0.00243)	(0.00335)	(0.00287)	(0.00418)	(0.000208)	(1.986)
N	28774	28774	28774	28774	28774	28774	28774
Sample: Medium-Exposure, Matched							
T × Post	0.00359*	-0.00241	-0.00292	0.00505**	-0.00331	-0.0000432	0.361
	(0.00147)	(0.00171)	(0.00222)	(0.00159)	(0.00279)	(0.000153)	(0.457)
N	27598	27598	27598	27598	27598	27598	27598
Sample 10							
T × Post	-0.00183	0.00144	0.000150	0.000725	-0.000491	-0.000250	2.139*
	(0.00241)	(0.00230)	(0.00304)	(0.00150)	(0.00342)	(0.000315)	(0.917)
N	58954	58954	58954	58954	58954	58954	58954
Sample: Low-Exposure, Matched							
T × Post	0.00362***	0.00203	-0.00238	0.00337**	-0.00665***	0.000176	2.620**
	(0.00109)	(0.00157)	(0.00172)	(0.00129)	(0.00201)	(0.000208)	(0.803)
N	52280	52280	52280	52280	52280	52280	52280
Sample: All Establishments, DD							
T × Post	-0.00200	0.00131	-0.00277	0.00286	0.000604	0.000866	2.222
	(0.00296)	(0.00176)	(0.00203)	(0.00157)	(0.00125)	(0.000598)	(1.312)
N	259454	259454	259454	259454	259454	259454	259454

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Standard errors clustered at the state-level. Full sample includes all establishments, LS Restaurants indicates limited-service restaurants, and Sample 10, 20, and 33 indicates industries with over 10%, 20%, or 33% employment in the bottom wage bin in 2003, respectively. *** p<0.001, ** p<0.01, * p<0.05.

Table A.10: Occupational Reallocations within Establishment (6-digit), Additional Samples

	Reallocations within:							
	All	Mgmt	Sup.	Prof.	Clerical	Prod.	Service	IT
Sample: Medium-Exposure, DD								
Treatment	0.00979*	0.0191***	0.0209***	0.00989***	0.0125*	0.00607*	0.0122**	0.00136*
	(0.00406)	(0.00521)	(0.00373)	(0.00263)	(0.00521)	(0.00294)	(0.00401)	(0.000564)
	14823	14823	14823	14823	14823	14823	14823	14823
Sample: Medium-Exposure, Matched								
Treatment	0.00432***	0.0150***	0.0127***	0.00164	0.00324**	0.00114	0.00975***	-0.0000685
	(0.00131)	(0.00157)	(0.00121)	(0.000862)	(0.00107)	(0.000910)	(0.00141)	(0.000161)
N	27598	27598	27598	27598	27598	27598	27598	27598
Sample: Low-Exposure, DD								
treatment	0.00949**	0.0188***	0.0159***	0.0120*	0.0143**	0.00434	0.00878**	0.00259*
	(0.00282)	(0.00388)	(0.00285)	(0.00460)	(0.00482)	(0.00215)	(0.00246)	(0.00111)
N	30529	30529	30529	30529	30529	30529	30529	30529
Sample: Low-Exposure, Matched								
Treatment	0.00631***	0.0165***	0.0116***	0.00488***	0.00642***	0.00123*	0.00792***	0.000464**
	(0.000999)	(0.00112)	(0.000844)	(0.000771)	(0.000925)	(0.000622)	(0.000950)	(0.000170)
N	52280	52280	52280	52280	52280	52280	52280	52280
Sample: All Establishments, DD								
Treatment	0.00818*	0.0177***	0.00633*	0.0124**	0.0114*	-0.00292	0.00337*	0.00718***
	(0.00347)	(0.00447)	(0.00272)	(0.00364)	(0.00504)	(0.00185)	(0.00132)	(0.00194)
	130259	130259	130259	130259	130259	130259	130259	130259

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Dependent variable is the percent reallocation between the pre- and post-period. Standard errors clustered at the state-level. Full sample includes all establishments, LS Restaurants indicates limited-service restaurants, and Sample 33 indicates industries with over 33% employment in the bottom wage bin in 2003. DD are difference-in-difference specifications and matched use nearest neighbor matching. *** p<0.001, ** p<0.01, * p<0.05.

Table A.11: Triple Difference: Wage Percentiles and Inequality

	10th	50th	90th	90/10	90/50	50/10
Panel A: All Establishments Sample						
T × Post	0.0669***	0.0510**	0.0495	-0.0453	0.00255	-0.0246*
	(0.0138)	(0.0170)	(0.0247)	(0.0387)	(0.0177)	(0.0105)
T × Post × (0 < Bin 1 ≤ 25%)	0.0149	0.0372	0.0418	0.0625	0.00122	0.0331
	(0.0103)	(0.0194)	(0.0311)	(0.0573)	(0.0240)	(0.0172)
T × Post × (25%<Bin 1< 50%)	0.0231	0.0237	0.00319	-0.0516	-0.0356	0.00226
	(0.0150)	(0.0185)	(0.0274)	(0.0501)	(0.0295)	(0.0145)
T × Post × (50%< Bin 1 <75%)	0.0576**	0.0450**	0.0210	-0.0731*	-0.0563**	-0.0229
	(0.0160)	(0.0157)	(0.0225)	(0.0306)	(0.0202)	(0.0136)
T × Post × Bin 1 > 75%	0.0553**	0.0634**	0.0363	-0.0153	-0.0414	0.0113
	(0.0163)	(0.0200)	(0.0243)	(0.0342)	(0.0219)	(0.00946)
N	259454	259451	259445	259454	259451	259454
Panel B: Restricted Sample						
T × Post	0.0510***	0.0478*	0.0600*	0.0224	0.0273	-0.00355
	(0.0132)	(0.0185)	(0.0283)	(0.0414)	(0.0202)	(0.0116)
T × Post × (0 < Bin 1 ≤ 25%)	-0.00494	-0.00243	-0.0164	-0.0214	-0.0301	0.00226
	(0.0102)	(0.0169)	(0.0268)	(0.0425)	(0.0192)	(0.0165)
T × Post × (25%< Bin 1 < 50%)	-0.000308	-0.00448	-0.0363	-0.116**	-0.0617*	-0.00979
	(0.0126)	(0.0162)	(0.0212)	(0.0397)	(0.0258)	(0.0221)
T × Post × (50%< Bin 1 <75%)	0.0344**	0.0264	-0.00265	-0.108*	-0.0801**	-0.0198
	(0.0117)	(0.0178)	(0.0267)	(0.0458)	(0.0252)	(0.0183)
T × Post × Bin 1 > 75%	0.0283*	0.0290	0.000255	-0.0558	-0.0495	-0.000396
	(0.0128)	(0.0150)	(0.0208)	(0.0371)	(0.0301)	(0.0132)
N	209438	209435	209431	209438	209435	209438

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Bin 1 indicates the share of employment in the establishment in the smallest wage bin in the pre-period. Standard errors clustered at the state-level. The top panel is restricted to professional occupations, the bottom panel is restricted to service occupations. *** p<0.001, ** p<0.01, * p<0.05.

Table A.12: Employment Spillovers to Supervisors and Managers, Additional Samples

	9.25	11.74	14.74	18.74+
DV: Share in Bin	1	2	3	4+
Panel A: Supervisors				
Sample: Medium-Exposure, DD				
T × Post	0.00122	-0.0215*	0.0237	-0.00344
	(0.00704)	(0.00879)	(0.0130)	(0.0136)
N	20127	20127	20127	20127
Sample: Low-Exposure, DD				
T × Post	0.00215	-0.00914	0.0239*	-0.0169
	(0.00510)	(0.00637)	(0.00901)	(0.0106)
N	37097	37097	37097	37097
Panel B: Managers				
Sample: Medium-Exposure, DD				
T × Post	0.000127	0.00575	0.0154*	-0.00723
	(0.00286)	(0.00303)	(0.00683)	(0.0140)
N	14085	14085	14085	28774
Sample: Low-Exposure, DD				
T × Post	-0.000278	0.00533*	0.00543	-0.0147
	(0.00178)	(0.00227)	(0.00402)	(0.0128)
N	29735	29735	29735	58954

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Dependent variable is the percent reallocation between the pre- and post-period. Standard errors clustered at the state-level. Full sample includes all establishments, LS Restaurants indicates limited-service restaurants, and Sample 33 indicates industries with over 33% employment in the bottom wage bin in 2003. DD are difference-in-difference specifications and matched use nearest neighbor matching. *** p<0.001, ** p<0.01, * p<0.05.

Table A.13: Triple Difference: Employment Spillovers through Management Hierarchy

	1	2	3	4+
	9.25	11.74	14.74	18.74+
Panel A: Supervisors				
All Establishments Sample				
T × Post	-0.000518	0.00134	0.00250	-0.00332
	(0.000498)	(0.00135)	(0.00217)	(0.00291)
T × Post × (0 < Bin 1 ≤ 25%)	0.00110	0.000864	0.0110**	-0.0130**
	(0.00119)	(0.00182)	(0.00339)	(0.00398)
T × Post × (25%< Bin 1 < 50%)	-0.00195	-0.0114*	0.0242**	-0.0109
	(0.00407)	(0.00500)	(0.00755)	(0.00805)
T × Post × (50%< Bin 1 <75%)	-0.0112	0.00661	0.00853	-0.00390
	(0.00654)	(0.0119)	(0.0131)	(0.0197)
T × Post × Bin 1 > 75%	-0.0193	-0.0970***	0.0424	0.0739**
	(0.0144)	(0.0143)	(0.0210)	(0.0254)
	145018	145018	145018	145018
Panel B: Managers				
T × Post	-0.00217*	0.000231	0.000596	-0.00817
	(0.000811)	(0.000374)	(0.000975)	(0.0123)
T × Post × (0 < Bin 1 ≤ 25%)	0.00501**	0.000942	0.000358	0.0136
	(0.00159)	(0.000742)	(0.00127)	(0.00687)
T × Post × (25%< Bin 1 < 50%)	0.00283	-0.00107	0.00498	-0.0129
	(0.00373)	(0.00209)	(0.00345)	(0.0109)
T × Post × (50%< Bin 1 <75%)	0.00497	0.00359	0.00555	0.0195
	(0.00314)	(0.00348)	(0.00908)	(0.0123)
T × Post × Bin 1 > 75%	0.00572	0.0249*	-0.0146	0.0152
	(0.00787)	(0.00935)	(0.00974)	(0.0203)
N	151480	151480	151480	259454

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Bin 1 indicates the share of employment in the establishment in the smallest wage bin in the pre-period. Standard errors clustered at the state-level. The top panel is restricted to supervisor occupations, the bottom panel is restricted to management occupations. Full sample includes all treatment states, restricted sample includes only states that increased their minimum wage from the federal level. *** p<0.001, ** p<0.01, * p<0.05.

Table A.14: Triple Difference: Employment Spillovers through Management Hierarchy, Restricted Sample

	1	2	3	4+
	9.25	11.74	14.74	18.74+
Panel A: Supervisors				
Restricted Sample				
T × Post	-0.0000192	0.00248	0.00283	-0.00530
	(0.000660)	(0.00134)	(0.00237)	(0.00277)
T × Post × (0 < Bin 1 ≤ 25%)	0.00187	0.00212	0.00812*	-0.0121*
	(0.00170)	(0.00249)	(0.00370)	(0.00459)
T × Post × (25%< Bin 1 < 50%)	-0.00213	-0.00658	0.0193*	-0.0106
	(0.00517)	(0.00542)	(0.00877)	(0.00861)
T × Post × (50%< Bin 1 <75%)	-0.0125	0.00670	0.00321	0.00258
	(0.00777)	(0.0128)	(0.0149)	(0.0213)
T × Post × Bin 1 > 75%	-0.00786	-0.0975***	0.0379	0.0675
	(0.0138)	(0.0172)	(0.0312)	(0.0338)
	116396	116396	116396	116396
Panel B: Managers				
T × Post	-0.00196*	-0.0000899	-0.000639	-0.00260
	(0.000765)	(0.000379)	(0.000998)	(0.0104)
T × Post × (0 < Bin 1 ≤ 25%)	0.00538**	0.000548	0.000973	0.0175**
	(0.00161)	(0.000954)	(0.00139)	(0.00622)
T × Post × (25%< Bin 1 < 50%)	0.000798	-0.00292	0.00598	-0.0171
	(0.00408)	(0.00242)	(0.00461)	(0.00859)
T × Post × (50%< Bin 1 <75%)	0.00623	0.00646	0.0132	0.00338
	(0.00358)	(0.00357)	(0.00799)	(0.0141)
T × Post × Bin 1 > 75%	0.00741	0.0200	-0.0180	0.000740
	(0.0131)	(0.0160)	(0.0110)	(0.0129)
N	117401	117401	117401	209438

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Bin 1 indicates the share of employment in the establishment in the smallest wage bin in the pre-period. Standard errors clustered at the state-level. The top panel is restricted to supervisor occupations, the bottom panel is restricted to management occupations. Full sample includes all treatment states, restricted sample limited to states with minimum wages at the federal level in the pre-period. *** p<0.001, ** p<0.01, * p<0.05.

Table A.15: Employment Spillovers to Professional Occupations

	9.25	11.74	14.74	18.74+
DV: Share in Bin	1	2	3	4+
Sample: All Establishments, DD				
T × Post	-0.00286	0.00273	0.00322	-0.00309
	(0.00184)	(0.00137)	(0.00168)	(0.00293)
N	154194	154194	154194	154194
Sample: LS Restaurants, DD				
T × Post	.	0.169	-0.0658***	-0.103
	.	(0.121)	(0.0144)	(0.134)
N	125	125	125	125
Sample: High-Exposure, DD				
T × Post	0.0167	0.0212	-0.00443	-0.0335
	(0.0529)	(0.0462)	(0.0261)	(0.0718)
N	597	597	597	597
Sample 20, DD				
T × Post	0.00445	0.0157	-0.00115	-0.0190
	(0.0105)	(0.0112)	(0.00896)	(0.0154)
N	7678	7678	7678	7678
Sample 10, DD				
T × Post	-0.00497	0.0101	0.0105	-0.0156
	(0.00676)	(0.00591)	(0.00631)	(0.00972)
N	22685	22685	22685	22685

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Dependent variable is the percent reallocation between the pre- and post-period. Standard errors clustered at the state-level. Full sample includes all establishments, LS Restaurants indicates limited-service restaurants, and Sample 33 indicates industries with over 33% employment in the bottom wage bin in 2003. DD are difference-in-difference specifications and matched use nearest neighbor matching. *** p<0.001, ** p<0.01, * p<0.05.

Table A.16: Triple Difference: Wage Spillovers by Occupation

	1	2	3	4+
	9.25	11.74	14.74	18.74+
Panel A: Professional Occupations				
T × Post	-0.00684***	0.00208*	0.00130	0.00346
	(0.00156)	(0.00101)	(0.00195)	(0.00210)
T × Post × 0 < Bin 1 <25%	0.00226	-0.000461	0.00577*	-0.00757*
	(0.00118)	(0.00199)	(0.00256)	(0.00294)
T × Post × (25%< Bin 1 < 50%)	-0.0109*	0.0239*	0.00276	-0.0157
	(0.00498)	(0.00980)	(0.0114)	(0.0194)
T × Post × (50%< Bin 1 <75%)	-0.0394	0.0128	0.0139	0.0127
	(0.0208)	(0.0138)	(0.0121)	(0.0272)
T × Post × Bin 1 > 75%	-0.107	0.0535	-0.0136	0.0669
	(0.0838)	(0.0292)	(0.0316)	(0.0466)
	154194	154194	154194	154194
Panel B: Service Occupations				
T × Post	-0.0466***	0.0220	0.0335*	-0.00899
	(0.0102)	(0.0109)	(0.0128)	(0.00970)
T × Post × 0 < Bin 1 <25%	-0.0104	0.0215	-0.0226	0.0115
	(0.0138)	(0.0112)	(0.0116)	(0.0113)
T × Post × (25%< Bin 1 < 50%)	-0.132***	0.0796***	0.00931	0.0433*
	(0.0317)	(0.0155)	(0.0131)	(0.0167)
T × Post × (50%< Bin 1 <75%)	-0. 217***	0.167***	0.00563	0.0437**
	(0.0564)	(0.0401)	(0.0162)	(0.0140)
T × Post × Bin 1 > 75%	-0.301**	0.257***	0.00949	0.0343
	(0.0914)	(0.0686)	(0.0154)	(0.0176)
	81660	81660	81660	81660

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Bin 1 indicates the share of employment in the establishment in the smallest wage bin in the pre-period. Standard errors clustered at the state-level. The top panel is restricted to professional occupations, the bottom panel is restricted to service occupations. *** p<0.001, ** p<0.01, * p<0.05.

Table A.17: Wage Percentiles and Inequality, Additional Samples

Wage Ptile	10th	50th	90th	90/10	90/50	50/10
Sample: Medium-Exposure, DD						
T × Post	0.107***	0.0772***	0.0404*	-0.137***	-0.0635***	-0.0378***
	(0.0206)	(0.0172)	(0.0158)	(0.0258)	(0.0134)	(0.00896)
N	28774	28773	28772	28774	28773	28774
Sample: Low-Exposure, DD						
T × Post	0.0976***	0.0709***	0.0482*	-0.121***	-0.0454***	-0.0365***
	(0.0208)	(0.0189)	(0.0213)	(0.0221)	(0.0116)	(0.00643)
N	58954	58953	58952	58954	58953	58954

Note: Establishment-level specifications, include establishment and half-year fixed effects. T indicates treatment state, Post indicates after the minimum wage increase. Dependent variable is the percent reallocation between the pre- and post-period. Standard errors clustered at the state-level. Full sample includes all establishments, LS Restaurants indicates limited-service restaurants, and Sample 33 indicates industries with over 33% employment in the bottom wage bin in 2003. DD are difference-in-difference specifications and matched use nearest neighbor matching. *** p<0.001, ** p<0.01, * p<0.05.

B Robustness Check: CPS Data

In this Appendix I replicate the state-level results using Current Population Survey (CPS) data, retrieved from IPUMS (Flood, King, Rodgers, Ruggles, & Warren, 2018). The CPS provides nationally-representative individual-level data on employment and wages. Although it is not possible to measure changes within establishments in the CPS data, I am able to replicate all of the state-level specifications from the main text.

I use data from 2011 through 2018, which includes data from up to 4 years prior to the minimum wage increase and up to 4 years after. The sample is restricted to individuals 16 and older who are employed in either the control or treatment states with valid wage information. This results in 1,785,810 observations.

Wages are hourly wages for individuals who are paid hourly, and weekly wages divided by usual weekly hours for individuals who are paid weekly. I drop individuals with allocated wages or allocated hours for the individuals paid weekly. This follows the procedure used by Cengiz et al. (2019) ensures wages are as accurate as possible. Nonetheless, self-reported wages will be noisier than the establishment-provided wages from the OEWS. Individuals are assigned to wage bins following the annual wage bin structure used by the OEWS. In addition, I construct an alternative set of wage bins, holding the wage bins constant at the 2013 cutoffs. This allows me to examine whether changing wage bins play a role in the state-level results.

In Table B.1, I replicate the state by wage bin level specification from the OEWS in Table 6. In Column 1 and 2 I estimate the main specification, with and without state by bin fixed effects. Here we see the point estimates are similar across specifications, but the CPS sample is underpowered when the fixed effects are included. Both specifications show a decline of employment in the smallest bin of 1.4 pp, which is about half the magnitude of the 2.6 pp effect in Table 6. Similarly, we see a 1 pp increase in employment in the second bin, which is a bit smaller than the 1.4 pp effect from Table 6. Estimates are likely attenuated due to the noisy nature of the self-reported wages in the CPS data.

A benefit of the CPS data is we can explore other cuts of the data that are not possible in the OEWS data. In Column (4) of Table B.1, I use the fixed in time bins, and show estimates are similar to Column (2), indicating changing bin cutoffs over time are unlikely to be affecting results in the OEWS sample. In Column (5) I restrict analysis to individuals who are paid hourly. Here we see a somewhat larger effect, with a 2.5 pp decline in employment in Bin 1 and a 1.9 pp increase in employment in Bin 2. This is because hourly individuals are more likely to be low earners compared with individuals paid weekly. Finally, in Column (6), instead of measuring employment counts in each wage bin, I use total hours in each wage bin. Here we see a smaller point estimates that are not significant.

In Table B.2, I repeat the analysis from Table B.1 but now restricted to individuals who report working in the restaurant industry.[11] Now we see much larger point estimates. In the main specification in Column (2) we see a 15 pp decline in employment in Bin 1, a 9 pp increase in Bin 2, and a 3 pp increase in employment in Bin 3. Now if we look at hours per bin in Column (6), we see a 11 pp decline in hours in Bin 1, a 5 pp increase in hours in bin 2, and a 3 pp increase in hours in bin 3. This suggests that employers may adjust hours in response to the minimum wage increase, partially muting the magnitude of the change in the wage distribution we see in terms of employment.

To more directly measure the effect of the minimum wage increases on employment and hours, in Table B.3, I estimate the difference-in-difference effect of the minimum wage on the employment per population ratio and the total hours worked per population. All estimates are not statistically significant across specifications. However, confidence intervals are relatively wide, with the change in employment rates ranging from a 1.5 pp decline to a 1.3 pp increase and the change in hours ranging from a decline of 0.82 to an increase in 0.3 hours per population, compared with an average of 21 hours per population.

In Table B.4, I estimate a triple difference specification for the change in employment by occupation, omitting the effect for professional occupations. Consistent with the OEWS

[11] The CPS does not provide detailed enough industry information to restrict to limited-service restaurants.

Table B.1: State by Wage Bin Level Specification, CPS

	(1)	(2)	(3)	(4) Alt. Bins	(5) Only Hourly	(6) Hours
Post × Treated × Bin 1	-0.014**	-0.014	-0.010	-0.016*	-0.025*	-0.006
	(0.005)	(0.008)	(0.008)	(0.008)	(0.010)	(0.007)
Post × Treated × Bin 2	0.010*	0.010	0.007	0.009	0.019*	0.006
	(0.005)	(0.005)	(0.004)	(0.005)	(0.007)	(0.006)
Post × Treated × Bin 3	0.001	0.001	-0.002	-0.001	0.004	-0.000
	(0.005)	(0.005)	(0.006)	(0.005)	(0.008)	(0.006)
Post × Treated × Bin 4	-0.001	-0.001	0.001	-0.002	-0.008	0.000
	(0.005)	(0.006)	(0.007)	(0.006)	(0.007)	(0.006)
Post × Treated × Bin 5	0.002	0.002	0.001	-0.002	0.001	0.004
	(0.005)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Post × Treated × Bin 6	0.004	0.004	0.003	-0.004	0.005	0.003
	(0.005)	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)
Post × Treated × Bin 7	-0.000	-0.000	0.003	-0.005	-0.003	0.000
	(0.005)	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)
Post × Treated × Bin 8	0.004	0.004	0.003	-0.001	0.000	0.004
	(0.005)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)
Post × Treated × Bin 9	0.001	0.001	-0.001	0.002	0.001	0.000
	(0.005)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Observations	5,376	5,376	4,872	5,376	5,376	5,376
R-squared	0.873	0.968	0.970	0.965	0.973	0.964
Sample	All	All	Restricted	All	All	All
Fixed Effects	No	Yes	Yes	Yes	Yes	Yes

Note: State-level specifications using CPS data. *** p<0.001, ** p<0.01, * p<0.05. Specifications with fixed effects include state by bin and year by bin fixed effects. Standard errors clustered at the state level, except for column (1) which reports robust standard errors. The restricted sample only includes treated states that increased the minimum wage from the federal level.

Table B.2: State by Wage Bin Level Specification, CPS, Restaurant Sample

	(1)	(2)	(3)	(4) Alt. Bins	(5) Only Hourly	(6) Hours
Post × Treated × Bin 1	-0.149***	-0.149***	-0.116***	-0.150***	-0.167***	-0.107***
	(0.012)	(0.029)	(0.028)	(0.029)	(0.035)	(0.025)
Post × Treated × Bin 2	0.092***	0.092***	0.081**	0.089***	0.118***	0.049*
	(0.012)	(0.022)	(0.025)	(0.021)	(0.021)	(0.022)
Post × Treated × Bin 3	0.030**	0.030*	0.023	0.032*	0.042**	0.026*
	(0.012)	(0.011)	(0.012)	(0.012)	(0.014)	(0.012)
Post × Treated × Bin 4	0.010	0.010	0.009	0.011	0.004	0.013
	(0.012)	(0.010)	(0.013)	(0.010)	(0.009)	(0.015)
Post × Treated × Bin 5	0.006	0.006	-0.001	0.004	-0.004	0.011
	(0.012)	(0.007)	(0.005)	(0.006)	(0.004)	(0.011)
Post × Treated × Bin 6	0.003	0.003	-0.003	0.004	0.000	0.004
	(0.012)	(0.005)	(0.003)	(0.004)	(0.002)	(0.007)
Post × Treated × Bin 7	0.003	0.003	-0.000	0.003	-0.001	0.005
	(0.012)	(0.003)	(0.003)	(0.004)	(0.002)	(0.005)
Post × Treated × Bin 8	-0.002	-0.002	-0.000	-0.003	-0.001	-0.003
	(0.012)	(0.002)	(0.002)	(0.002)	(0.001)	(0.003)
Post × Treated × Bin 9	0.000	0.000	-0.001	0.000	-0.001	0.000
	(0.012)	(0.001)	(0.001)	(0.002)	(0.000)	(0.002)
Observations	5,376	5,376	4,872	5,376	5,376	5,376
R-squared	0.921	0.961	0.963	0.960	0.965	0.932
Sample	All	All	Restricted	All	All	All
Fixed Effects	No	Yes	Yes	Yes	Yes	Yes

Note: State-level specifications using CPS data. *** p<0.001, ** p<0.01, * p<0.05. Specifications with fixed effects include state by bin and year by bin fixed effects. Standard errors clustered at the state level, except for column (1) which reports robust standard errors. The restricted sample only includes treated states that increased the minimum wage from the federal level.

Table B.3: Effect of Minimum Wage Increase on Employment and Hours

VARIABLES	(1) Epop	(2) Epop	(3) Hours/pop	(4)) Hours/pop
Post × Treatment	-0.001	-0.008	-0.265	-0.586
	(0.007)	(0.007)	(0.285)	(0.293)
Observations	448	406	448	406
R-squared	0.920	0.927	0.899	0.909
Sample	Full	Restricted	Full	Restricted

Note: State-level specifications using CPS data. *** p<0.001, ** p<0.01, * p<0.05. Difference in difference specification, with the main effects omitted. All specifications include state and half-year fixed effects. Standard errors clustered at the state level. The restricted sample only includes treated states that increased the minimum wage from the federal level.

results reported in Table 7, there is little evidence of a substantive change in the state-wide occupational structure. In Table B.5, I replicate Appendix Table A.7 and measure the change in wage structure within occupational groups. In Panel A I include all workers and in Panel B I restrict to individuals employed in restaurants. Consistent with the OEWS data, most of the change in the wage structure is driven by service sector workers. Thus, overall results from the CPS corroborate results from the OEWS.

Table B.4: State-Level Changes in Occupational Structure, CPS

	(2) All	(2) Restaurants
Post × Treated × Managers	-0.001	0.023*
	(0.006)	(0.010)
Post × Treated × Supervisors	-0.006	0.004
	(0.007)	(0.007)
Post × Treated × Service	-0.003	-0.008
	(0.008)	(0.012)
Post × Treated × Clerical	-0.015	-0.006
	(0.008)	(0.010)
Post × Treated × Production	-0.012	0.005
	(0.009)	(0.007)
Post × Treated × Computer	-0.006	0.004
	(0.005)	(0.002)
Observations	3,136	3,136
R-squared	0.977	0.973

Notes: State-level specification with state and year fixed effects estimated using CPS data. *** p<0.001, ** p<0.01, * p<0.05. Professional occupations omitted. Treated indicates treatment state, Post indicates after the minimum wage increase.

Table B.5: State-Level Change in Wage Distribution within Occupations, CPS

	(1) Managers	(2) Supervisors	(3) Prof	(4) Service	(5) Clerical	(6) Production	(7) IT
Panel A: All Industries							
Post × T × Bin 1	0.009	-0.011	-0.003	-0.058**	-0.021	-0.010	-0.002
	(0.005)	(0.013)	(0.005)	(0.016)	(0.013)	(0.015)	(0.010)
Post × Treated × Bin 2	0.002	0.003	-0.002	0.025	0.024	0.009	0.031
	(0.006)	(0.012)	(0.005)	(0.012)	(0.012)	(0.016)	(0.016)
Post × Treated × Bin 3	0.012*	-0.006	-0.006	0.003	0.019	-0.008	0.037*
	(0.005)	(0.013)	(0.008)	(0.009)	(0.010)	(0.016)	(0.017)
Post × Treated × Bin 4	0.010	0.019	0.008	-0.011	-0.011	0.007	0.008
	(0.008)	(0.018)	(0.007)	(0.008)	(0.009)	(0.012)	(0.023)
Observations	5,376	5,376	5,376	5,376	5,376	5,376	5,328
R-squared	0.756	0.765	0.912	0.963	0.937	0.925	0.424
Panel B: Restaurants							
Post × Treated × Bin 1	0.021	-0.101	-0.124	-0.153***	-0.231**	-0.233*	
	(0.029)	(0.070)	(0.104)	(0.032)	(0.067)	(0.112)	
Post × Treated × Bin 2	-0.020	-0.003	0.112	0.095***	0.253**	0.171	
	(0.031)	(0.065)	(0.092)	(0.026)	(0.073)	(0.089)	
Post × Treated × Bin 3	-0.065	0.039	-0.088	0.037*	0.030	0.082	
	(0.052)	(0.076)	(0.103)	(0.015)	(0.031)	(0.055)	
Post × Treated × Bin 4	0.006	0.084	-0.061	0.011	-0.011	0.076	
	(0.060)	(0.050)	(0.134)	(0.010)	(0.012)	(0.052)	
Observations	5,340	4,884	2,412	5,376	5,304	4,404	
R-squared	0.379	0.377	0.345	0.960	0.823	0.585	

Notes: State-level specification with state and year fixed effects. *** p<0.001, ** p<0.01, * p<0.05. Wage bins D-L omitted. Treated indicates treatment state, Post indicates after the minimum wage increase. Each column restricted to employment in the relevant occupation group. IT omitted for the restaurants sample due to insufficient data.