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IZA DP No. 15499

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ABSTRACT

Minimum Wages and Restaurant Employment for Teens and Adults in Metropolitan and Non-metropolitan Areas*

This study estimates effects of minimum wages on individual restaurant employment using the 2005-2019 Current Population Survey (CPS) and a two-way fixed effects regression model. I examine effects for teens and adults with less than an associate's degree for the entire U.S. and by metropolitan area status. The results indicate that minimum wages on average decrease restaurant employment for teens and increase restaurant employment for these adults, suggesting that minimum wages induce labor-labor substitution. However, this pattern is driven by metropolitan areas residents. The estimated coefficient for minimum wages on teen restaurant employment in non-metropolitan areas is not statistically significant.

JEL Classification: J20, J30, R10
Keywords: minimum wages, restaurants, employment, teens

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1. Introduction

Minimum wages are a popular topic among both the general public and academics. Income inequality is rising, and many low pay workers struggle to secure even a modest lifestyle. Raising the minimum wage is often advocated on the grounds that it will improve the well-being of those at the bottom of the income distribution. However, there is concern among many economists that minimum wages may actually harm the group they are intended to help (Neumark and Wascher 2008; Meer and West 2016; Jardim et al. 2018; Aaronson and Phelan 2019; Clemens and Wither 2019; Even and Macpherson 2019; Harasztosi and Lindner 2019; Laporsek et al. 2019; Monras 2019; Neumark and Shupe 2019). The law of demand indicates that an increase in the price of a product will lower the quantity of it that buyers wish to purchase. Thus, classical economics suggests that an increase in the minimum wage will lower the demand for labor and reduce equilibrium employment. That is, minimum wages may result in fewer potential workers having jobs and earning income in the labor market. Those who have jobs may benefit from higher wages, but the lost earnings of the non-employed may more than offset the wage gains of the employed. However, net effects of minimum wages on equilibrium employment have been hotly debated for decades (Card 1992; Katz and Krueger 1992; Neumark and Wascher 1992). Labor markets may respond to minimum wages in complicated ways, possibly resulting in no effect or even positive effects of minimum wages on equilibrium employment levels (Card and Krueger 1994; Dickens et al. 1999; Addison et al. 2009; Dube et al. 2010; Allegretto et al. 2011; Allegretto et al. 2017; Cenzig et al. 2019). The relationship is ultimately an empirical question, and the large empirical literature has not achieved consensus.

The current paper examines effects of minimum wages on individual restaurant employment using the monthly Currently Population Survey (CPS) during the 2005-2019 time

period and two-way fixed effects regression models. This period includes federal minimum wage changes during 2007-2009 and numerous changes in state and local minimum wages. I focus on the restaurant industry because it is an industry that heavily employs low-wage workers, and one for which minimum wages are likely to be especially salient. I also briefly examine effects of minimum wages on non-restaurant employment and overall employment. I focus on teens and adults with education less than an associate's degree. Teens are an interesting group to study because their limited education and work experience result in low productivity, making them a group of workers whose employment should be especially sensitive to binding minimum wages. Minimum wages may induce firms to employ fewer teen workers and substitute toward other inputs such as older and more-skilled workers and physical capital. Less educated adults typically have more work experience and higher productivity than teens. To the extent that firms substitute toward more experienced workers, minimum wages may increase their employment rates, especially in industries very sensitive to minimum wages such as the restaurant industry. However, very binding minimum wages may reduce overall employment for less educated adults. Especially strict minimum wages may cause some firms to reduce their production output or even go out of business. Reduced employment due to minimum wages can directly harm displaced workers in the short run via reduced incomes, but it can also have longer run effects via reduced on-the-job skill development (Meier et al. 2018). In particular, teen employment may serve as a first step on the career ladder for many young people, especially those who do not go to college.

There is also reason to expect minimum wage effects on teen employment to differ across metropolitan and non-metropolitan areas. Adverse employment effects are thought to result from minimum wages that exceed workers' marginal productivity, but worker productivity varies

across areas because of differences in complementary production inputs and access to markets. In particular, workers are historically more productive in metropolitan areas, resulting in a well-documented urban wage premium (Glaeser and Maré 2001; Yankow 2006; Ahlfeldt and Pietrostefani 2019). If productivity of teen or less educated workers is lower in non-metropolitan areas, minimum wages may be especially binding and result in especially negative employment responses (Thompson 2009). Productivity in metropolitan areas may be high enough that minimum wages have no adverse effects on employment if not sufficiently binding. Alternatively, substitutable inputs may be more plentiful in metropolitan markets, increasing the salience of substitution effects that reduce teen employment. In particular, less skilled immigrants are more prevalent in metropolitan areas and may be substitutes for teen workers (Smith 2012; Neumark and Shupe 2019).

The effects of minimum wages on employment may also be affected by monopsony power, labor supply responses, output price increases, and other channels of adjustment (Boal and Ransom 1997; Wessels 1997; Bhaskar and To 1999; Dickens et al. 1999; Aaronson 2001; Aaronson et al. 2008; Ahn et al. 2011; Giuliano 2013; Hirsch et al. 2015; Clemens et al. 2018; Phelan 2019; Azar et al. 2019; Munguía 2019; Neumark 2019). If hiring firms have substantial monopsony power, market wages may be well below those that would prevail in competitive labor markets and binding minimum wages may raise wages without reducing employment; equilibrium employment may even increase. A higher minimum wage may also cause potential workers to increase their labor supply and job search intensity, and hired workers may increase their work effort and job tenure at a given firm. These positive responses could offset adverse effects on labor demand. Adverse effects may also be minimal if firms can pass on the costs of higher wages to consumers by raising output prices or engage in other channels of adjustment

such as reduced non-wage benefits or worse working conditions. These responses may also differ across areas. For example, employers in small towns and rural areas may have especially strong monopsony power that allows them to keep wages low. Similarly, small town employers may have monopoly power in local output markets, allowing them to easily pass on minimum wage increases to consumers via higher output prices. Additionally, supplying labor in rural areas may require commuting greater distances from one's home, and higher wages may make longer commutes more acceptable. Thus, expected differences in minimum wage effects on employment across metropolitan and non-metropolitan areas are unclear *a priori*. Some factors suggest more adverse effects for less populous areas, but other factors suggest more positive effects in less populous areas.

I first examine average effects of minimum wages on restaurant employment during the 2005-2019 period for teens and less educated adults. I find that minimum wages on average decrease restaurant employment for teens and increase restaurant employment among less educated adults.[1] These results are qualitatively robust across several alternative specifications proposed in previous literature.[2] The negative effect for teen employment is in contrast to some recent literature examining earlier time periods (Allegretto et al. 2017; Cenzig et al. 2019). The

[1] The estimates for teens are intended as causal effects, but estimates for adults may not represent unbiased causal effects. Location decisions for teens are largely determined by their parents and independent of minimum wages changes. However, adults may move toward or away from minimum wages in aggregate, and even if there is minimal net migration, the composition of adult workers may change in ways that lead to selection bias in the estimated effects of minimum wages on adult employment. Prior literature on minimum wages and migration finds mixed results (Boffy-Ramirez 2013; Cadena 2014; Giulietti 2014; Monras 2019; Zhang 2018). Additionally, the net effects estimated likely reflect a combination of potential supply and demand responses. In particular, higher minimum wages may increase teen labor supply but reduce labor demand for teen workers; a negative overall effect on teen restaurant employment indicates that the effect on labor demand dominates. Higher minimum wages should also increase adult labor supply, but the expected effect on labor demand for adult workers is less clear. In general demand for low productivity workers will decrease but demand for more productive workers may increase.

[2] The bulk of the minimum wage studies in the U.S. have used two-way fixed effects models similar to that used in the current study. However, there is some debate on things like whether to include division-time fixed effects, region-time fixed effects, or just time fixed effects; whether to include area-specific time trends; and what time periods to examine. Thus, I consider several alternatives to the main specification.

negative average effect also persists when limitting the sample to the 2010-2019 period to exclude years before and during the recent federal minimum wage increases and Great Recession. However, the significant negative effect of minimum wages on teen restaurant employment holds for metropolitan areas but not non-metropolitan areas. Thus, there is important spatial heterogeneity.

Minimum wages increase restaurant employment for adults with education less than an associate's degree, and the effects are especially strong for immigrants. Furthermore, minimum wages reduce non-restaurant employment for less educated adults. Thus, minimum wages appear to shift some adults from outside the restaurant industry into restaurant industry employment. Immigrant populations and immigrant employment effects are especially pronounced in metropolitan areas, which may contribute to differential effects of minimum wages on teen restaurant employment between metropolitan and non-metropolitan areas. Minimum wages shift restaurant employment from less experienced workers to more experienced ones. Non-metropolitan areas have fewer immigrants and likely weaker labor-labor substitution opportunities for restaurant employers.

The effects of minimum wages on restaurant employment are important to study. The restaurant industry is a traditionally low-wage sector with low skill requirements for entry. As such, the industry employs a large number of entry-level workers, many of whom are paid at or near the minimum wage. Thus, minimum wage increases are often thought to be especially binding for the restaurant industry and the industry has received considerable attention (Card and Krueger 1994; Dube et al. 2010; Jha et al. 2022). However, previous studies of minimum wages on restaurant employment typically use county-level aggregated data and do not examine the potential changing composition of restaurant workers due to minimum wages. Analysis of CPS

data reveals that the restaurant industry is the single largest industry of employment for teens ages 16-17 and accounts for more than one-third of their employment. Thus, restaurant employment is an important stepping stone for young workers into the labor force that I find to be especially impacted by minimum wage changes.

2. Data and Methods

This paper uses individual-level employment data from the monthly Current Population Survey (CPS) for years 2005-2019 obtained from IPUMS (Flood et al. 2021). Starting the sample period in 2005 has the advantage of focusing on relatively recent years and corresponds to the start of a new era in metropolitan area definitions. The sample period ends in 2019 to avoid the influence of the COVID-19 pandemic on labor market outcomes. I focus on teens ages 16-17 and adults ages 23-59 with education less than an associate's degree. I do not focus on ages 18-22 because their location and employment decisions are influenced by college enrollment in ways that complicate analysis. However, I do briefly examine ages 18-22 in appendix results. For less educated adults, I examine immigrants and native-born persons separately.

Building on previous literature, I estimate linear probability models of the form:

$$RestEmploy_{iat} = \theta LogMinimumWage_{at} + \beta X_{iat} + \pi Z_{at} + \gamma_a + \delta_{r(a)t} + \varepsilon_{iat}$$

The main dependent variable is an indicator equal to one if individual i from geographic area a in time period t was employed in the restaurant industry during the survey reference week and zero otherwise. The sample includes persons regardless of labor force participation status. I also consider additional dependent variables including non-restaurant employment, any industry employment, restaurant server employment, and log hourly wages among persons in the CPS

outgoing rotation group samples employed and paid hourly. Geographic areas are defined by unique combinations of metropolitan areas and states, with each state's non-metropolitan areas aggregated into a single area per state.[3] Time is defined by unique month-year combinations. X_{iat} is a vector of control variables for individual characteristics and includes dummy variables for age, sex, race, ethnicity, and citizenship status. Z_{at} is a vector of area-time control variables and includes the state unemployment rate provided by the Bureau of Labor Statistics (BLS) Local Area Unemployment Statistics (LAUS) program and four variables constructed from the monthly CPS: the teen share of the population, the immigrant share of the population, the adult employment rate, and the mean hours worked for employed adults.[4] The regressions include area fixed effects (γ_a) and region-time fixed effects ($\delta_{r(a)t}$).[5] ε_{iat} is a mean zero error term. All regressions use CPS survey weights. Standard errors are clustered by state; the District of Columbia is included and treated as a state yielding 51 clusters.

$LogMinimumWage_{at}$ is the explanatory variable of interest. I obtained monthly minimum wage data for states and sub-state areas described in Vaghul and Zipperer (2016) with updates through 2019 from Ben Zipperer's github site.[6] Most local areas lack sub-state minimum wages and/or cannot be identified using CPS geography. Thus, for most areas, the minimum wage is measured as the higher of the federal and state minimum wage. For identifiable local areas with sub-state minimum wages, I define the minimum wage as the maximum of the federal, state, county, and city minimum wage.[7] The prevalence of local

[3] A metropolitan area wholly within a single state is its own single area, while a metro area spanning two or more states is defined as two or more unique areas to reflect differing state minimum wages. In robustness checks below, I explore using only state-level explanatory variables instead of the preferred sub-state measures.
[4] I also explore models without area-time control variables.
[5] I use the four Census regions: Northeast, Midwest, South, and West. I also explore models including division-time effects and local area-specific time trends.
[6] https://github.com/benzipperer/historicalminwage/releases/tag/v1.2.0 ; accessed on February 12, 2020.
[7] Federal labor law allows firms to pay a youth minimum wage to persons under age 20 for the first 90 days of employment. Some states with higher than federal minimum wages also have youth minimum wage provisions.

minimum wages increases over time. By 2019, 15 identifiable unique local areas in the CPS have minimum wages exceeding the state and federal minimum wage. San Francisco was the only identifiable local area with a local minimum wage exceeding the state minimum wage at the beginning of the sample period in 2005. I convert monetary variables to January 2019 real dollars using the Consumer Price Index. I measure the explanatory variable of interest in natural logs.

Identification of causal effects in this study requires several assumptions. Most importantly, minimum wages should be conditionally uncorrelated with the error term in the regression equation. There should be no reverse causality and no omitted variables correlated with both minimum wage changes and the dependent variables. This means that minimum wages changes should be determined by quasi-random political processes and other factors not directly driven by employment prospects of the target population. Including area fixed effects accounts for time-invariant differences across local areas, and local area time-varying controls are intended to account for broader economic conditions that might influence policy choices.[8] Identification of causal effects also requires that minimum wage changes do not influence migration decisions. This assumption is likely satisfied for teens since their location decisions are largely determined by their parents and independent of minimum wages changes. However, adults may migrate toward or away from minimum wage changes and induce selection bias in the estimated coefficients for adults. Prior literature has found both attractive and repulsive effects of minimum wages on adult migration, so this is an unsettled issue (Boffy-Ramirez 2013;

However, limited information, compliance costs, and ripple effects likely reduce employers' eagerness to offer and teen workers' willingness to accept wages below the normal minimum wage. Youth minimum wage rates often change along with adult minimum wages, though not always proportionally. I follow previous literature and measure the explanatory variable of interest using adult minimum wages.

[8] E.g., a strong local economy may induce policy makers to increase local minimum wages, which would positively bias the regression coefficients absent controls for local area time-varying characteristics. I conduct sensitivity analysis below excluding these controls and find similar results.

Cadena 2014; Giulietti 2014; Monras 2019; Zhang 2018). The CPS has limited information on migration and is thus not well-suited to studying effects of minimum wages on migration or accounting for possible selection. Ultimately, the coefficient estimates for teens are intended as causal effects, but the estimates for adults may be less reliable if distorted by migration, so some caution in interpretation is warranted for the adult results.

I first estimate effects for the full sample of geographic areas.[9] This study is also interested in how minimum wage effects on restaurant employment vary between metropolitan statistical areas (MSAs) and non-metropolitan areas. The CPS also includes some individuals that are not identified as either metropolitan or non-metropolitan residents to preserve respondent confidentiality. I include these observations in the full sample but exclude them from the metropolitan and non-metropolitan sub-sample analysis. These individuals account for seven percent of the full sample.

Table 1 provides sample means for the dependent variables, the minimum wage, and the area-time control variables for the full area sample in Column (1).[10] Columns (2) and (3) provide sub-sample means for non-MSAs and MSAs, respectively. Panel A shows that restaurant employment makes up a large proportion of overall teen employment. Overall teen employment rates are low, especially in MSAs.[11] The gap between MSAs and non-MSAs may

[9] The CPS reports place of residence but not where an individual works. Most low-wage workers work and live in the same area, but there is some cross-area commuting, which may be affected by minimum wages (McKinnish 2017; Shirley 2018). Some previous studies use identification from differences among adjacent counties across state borders, and such cross-border designs may be particularly affected by commuting and other spillovers across nearby areas (Neumark 2019; Dieterle et al. 2020). This should be less of an issue for the current study but cannot be ruled out.

[10] Table 1 reports the hourly wage and minimum wage in levels instead of logs for ease of interpretation, but the regression analysis uses log minimum wages and log hourly wages. Appendix Table A1 reports the number of minimum wage changes by year and selected summary statistics for nominal minimum wages. Appendix Table A2 reports the restaurant employment distribution by age/group. Teens ages 16 and 17 account for 2.88 and 5.11 percent of all restaurant employment, respectively.

[11] Low teen employment rates are consistent with prior research (Smith 2012; Morisi 2017; Neumark and Shupe 2019)

partially reflect differences in individual characteristics (e.g. race, ethnicity, and immigrant status), differing focus on education, and differing labor market characteristics such as higher minimum wages and greater labor supply competition (e.g. with immigrants) in MSAs. While exploring various correlates of this gap would be interesting for future research, the current study focuses on effects of minimum wages on restaurant employment and how they vary by MSA status. Panels B and C report sample means for immigrants and natives ages 23-59 with less than an associate's degree. Restaurant employment is almost twice as high among immigrants as native adults. Immigrants also have slightly higher overall employment rates but lower hourly wages.

3. Regression Results

3.1 Main Results

The main results for minimum wage effects on restaurant employment are in Table 2. Full sample results including all geographic areas are in Column (1). Column (2) reports results for non-metropolitan areas, and Column (3) reports results for MSAs. Column (4) reports the differences between Columns (2) and (3) coefficients; standard errors for Column (4) are estimated via pooled regression and a full set of interactions between explanatory variables and an MSA status indicator. Results for teens are in Panel A, while Panels B and C are for immigrants and natives ages 23-59 with education less than an associate's degree. I report coefficients and standard errors along with elasticities in brackets computed by dividing coefficients by the group-specific sample restaurant employment rate in Table 1.

Results for the full age 16-17 sample in Column (1) of Table 2 Panel A indicate that minimum wages on average significantly reduce teen restaurant employment with a coefficient

estimate of -0.041 that is statistically significant at the one percent level. Dividing this coefficient by the corresponding sample mean (0.078) yields an elasticity of -0.523; i.e., a 10 percent increase in the minimum wage reduces the probability of teen employment by 5.23 percent. The sample average minimum wage change (among areas with a change) was 7.8 percent of the previous level, so a typical minimum wage change has a meaningfully large negative impact on teen restaurant employment. Similarly, the teen MSA sample coefficient in Column (3) of Panel A is -0.055 and the elasticity is -0.732. Non-MSAs, however, exhibit a different pattern. The coefficient estimate in Column (2) of Panel A is positive, though not statistically significantly different from zero at conventional levels. Column (4) confirms that the point estimates for MSAs and non-MSAs are significantly different in Panel A. Teen restaurant employment responds differently to minimum wages between MSAs and non-MSAs.

Panel B of Table 2 reports that a higher minimum wage increases the probability of restaurant employment among less educated immigrant adults for the full sample and MSA sample. Coefficients in Columns (1) and (3) are 0.062 and 0.065 and correspond to elasticities of 0.809 and 0.841, respectively. The Column (2) non-MSA coefficient for immigrants is not significantly different from zero, but Column (4) also indicates that the non-MSA and MSA coefficients for immigrants are not significantly different from each other. Panel C illustrates a similar pattern for native-born less educated workers, but magnitudes are smaller for natives than immigrants. Specifically, the native coefficients in Columns (1) and (3) are 0.020 and 0.022 and correspond to elasticities of 0.494 and 0.522, respectively.[12]

[12] Appendix Table A3 reports restaurant employment results for ages 18-22. These ages are expected to be more skilled on average and have higher productivity than ages 16-17. Higher minimum wages could induce some employers to engage in skill upgrading by hiring more workers ages 18-22 and fewer ages 16-17. Unfortunately, estimating minimum wage effects for ages 18-22 is more complicated because this group has higher geographic mobility due to college enrollment, military enlistment, job search, etc. Additionally, CPS instructions inform parents that they are to include information for their children temporarily away at college in their household survey (U.S. Census Bureau 2015). Thus, some college students work in one area but are included in their parents'

Overall, Table 2 suggests that minimum wages induce restaurant employers to shift from teen workers and toward adult workers with more experience, especially immigrants.[13] Teen workers are profitable inputs to restaurants at sufficiently low wages, but raising minimum wages alters the input price of teens relative to adult workers and makes hiring teen workers less profitable. Firms respond by substituting toward workers with more experience and higher productivity. However, there is no adverse effect of minimum wages on teen restaurant employment in non-MSAs. This appears to result from weaker opportunities for labor-labor substitution in non-MSAs, in part due to lower prevalence of immigrants in the local workforce.[14]

3.2 Robustness Checks

household in a different area, potentially biasing regression estimates. Coefficient estimates in Appendix Table A3 are small and not statistically significant. At face value, this suggests that minimum wages appear to minimally affect average employment levels for ages 18-22. However, there is differing productivity among workers within this group, and it is possible that positive effects for some groups may offset negative effects for others. We cannot draw strong conclusions for ages 18-22.

[13] Specific margins of adjustment toward immigrant workers in the restaurant industry may partially reflect industry shifts, impacts on migration, and the types of restaurants in the local area. I later consider effects on non-restaurant employment. The prior empirical research related to minimum wages and migration is mixed with some studies finding increased out-migration of less skilled workers (Cadena 2014; Monras 2019; Zhang 2018) and others finding some evidence of increased in-migration (Boffy-Ramirez 2013; Giulietti 2014). Minimum wages may also shift the composition of restaurants in an area from lower to higher quality (Luca and Luca 2019). There may also be some shift toward ethnic restaurants staffed by immigrants, especially if minimum wages are less binding for ethnic restaurants due to greater employment of family, tipped workers, or undocumented workers.

[14] Appendix Table A4 reports local area time-varying control variable results for restaurant employment that correspond to the main specifications in Table 2. Full sample results for teens indicate that local area employment conditions matter. Adult employment rates and hours worked have positive coefficients for teen restaurant employment and the unemployment rate has a negative coefficient; these control variable results suggest that a stronger local economy increases teen restaurant employment as expected. The immigrant share does not have a significant effect on teen employment for the full sample, though the difference in Column (4) is significant at the ten percent level. Note that the immigration share itself does not necessarily trigger labor-labor substitution in restaurant employment from teens to adult immigrants. It depends on the local composition of immigrant workers and how employers and various workers respond to minimum wages. I am unable to directly estimate labor-labor substitution effects in restaurant employment due to minimum wages because of data limitations and potential endogenous migration of immigrants that may occur in response to minimum wages. This may be an area for future research with better data and alternative identification strategies.

Tables 3-5 present results for various robustness checks to the preferred specification in Table 2. Table 3 presents robustness checks for the teen sample. Panel A modifies the preferred specification by adding area-specific linear time trends. The full sample coefficient estimate decreases to -0.031, but it is still statistically significant and the elasticity of -0.395 is still meaningfully large. The difference in coefficients between MSAs and non-MSAs also shrinks and is no longer significant at the ten percent level in Column (4); the p-value is 0.116. Inclusion of area-specific time trends is a source of contention in recent minimum wage literature (Addison et al. 2009, 2013; Neumark et al. 2014; Meer and West 2016; Alegretto et al. 2017; Neumark and Wascher 2017; Neumark 2019), with critics arguing that including area-specific trends is inappropriate because treatments effects from minimum wages may grow over time causing the parametric trends to partial out delayed treatment effects. My preferred specifications exclude area-specific trends, but the main results in this study are qualitatively robust to including area-specific time trends.

Panel B of Table 3 modifies the preferred specification by replacing region-time fixed effects with Census division-time fixed effects. Focusing on spatially proximate controls is another point of contention among researchers. I use region-time fixed effects in the main specification as a middle ground in the debate. That said, results with division-time fixed effects are similar to the preferred specification. Panel C alters the preferred specification by excluding time-varying area controls from the regression. Results are again similar to the preferred specification. Panel D reports results that exclude sub-state explanatory variables and instead only use state-level variation. Results differ only slightly from the preferred specification, but I argue that the results using sub-state explanatory variables are preferred. Panel E adds an additional control for adult median wages in the local area; median wages are potentially affected

by minimum wage spillovers up the wage distribution, so this control is not included in the preferred specification, but results are robust to its inclusion. Panel F limits the sample to years 2010-2019 to exclude the Great Recession and federal minimum wage changes during 2007-2009. The results are largely similar to the preferred specification except the coefficient estimate for non-MSAs increases to 0.077 and is significantly different from zero at the ten percent level.

Table 4 considers the same robustness checks as Table 3 but for immigrants ages 23-59 with education less than an associate's degree. Table 5 does the same for natives ages 23-59 with education less than an associate's degree. The results in Tables 4 and 5 are generally similar to the preferred estimates in Table 2. One exception, however, is in Panel D, where we exclude sub-state explanatory variables and use only state-level variation; coefficient estimates shrink. However, this specification ignores the proliferation of local minimum wages, so it is not preferred.

3.3 Additional Outcomes

Appendix Tables present results for alternative dependent variables; specifications are otherwise similar to Table 2. The dependent variable in Table A5 is a dummy for non-restaurant employment. For teens in Panel A, there is a negative coefficient of minimum wages on non-restaurant employment in MSAs significant at the ten percent level, but the magnitude (-0.021) is smaller than for restaurant employment in Table 2, indicating that adverse employment impacts of minimum wages on MSA teens are concentrated in the restaurant industry. Minimum wages have significant negative effects on non-restaurant employment of immigrant adults in Panel B. In Panel C, minimum wages also reduce native adult non-restaurant employment for the full

sample and MSA sample. Combined with Table 2, these results suggest that minimum wages shift some adult workers from non-restaurant employment to restaurant employment.

The dependent variable for Table A6 is a dummy equal to one if the individual is employed in any industry. Because I estimate linear models, Table A6 coefficients are the sum of corresponding coefficients in Tables 2 and A5 subject to slight rounding error. Table A6 Panel A confirms that minimum wages reduce overall employment for the full teen sample and the MSA teen sample, but not for non-MSA teens. Panel B indicates there is no significant effect of minimum wages on overall employment for the immigrant adult sample, except in non-MSAs where the coefficient is negative and significant at the ten percent level. Panel C indicates no significant effect for the adult native sample.

Table A7 examines effects of log minimum wages on log hourly wages earned among employed persons who are paid hourly and surveyed in the CPS outgoing rotation group. As expected, higher minimum wages raise actual wages for employed teens. However, higher wages for employed teens should be cautiously interpreted because of adverse effects on teen employment. Interestingly, higher minimum wages do not significantly increase hourly wages for adult immigrants. Hourly wages for the native adult full sample and MSA sample are also not significantly affected, but wages are significantly increased for less educated adult natives in non-MSAs. The lack of effect for most adult groups likely reflects that the overwhelming majority of these workers make considerably more than minimum wage.

Many restaurant workers are employed as tipped servers, and employers in many states are allowed to pay tipped workers a wage below the regular minimum so long as the "paid wage" plus tips exceeds the minimum wage. Analysis of CPS data indicates that 21.4 percent of all restaurant workers are employed as servers, though only 16.1 percent of teen restaurant workers

are employed as servers. Employers may be less likely to hire teens as servers because of less experience or because they cannot serve alcohol. The minimum paid wage (excluding tips) is set at $2.13 by federal law, but many states require a higher paid wage for tipped workers, including some that require tipped employees be paid the full regular minimum wage in their state. Minimum paid wages to tipped employees generally increase with changes to state minimum wage laws, but there are some exceptions. More details are provided online by the U.S. Department of Labor. https://www.dol.gov/agencies/whd/state/minimum-wage/tipped

Table A8 considers effects of minimum wages on the probability of being employed as a restaurant server. This is a joint outcome that equals one if the individual is a restaurant server and zero if not; thus, non-server restaurant employees are coded as zero for this. The specifications are otherwise the same as Table 2. Table A8 reports that minimum wages decrease the probability of being employed as a restaurant server for teens ages 16-17 and increase the probability for immigrants and natives ages 23-59 with less than an associate's degree; this is the same pattern as overall restaurant employment. Thus, effects on server employment do not appear fundamentally different than other restaurant employment.

Another question of interest is the effect of minimum wages on hours worked in the restaurant industry. Overall effects on hours worked depend on both the extensive margin and the intensive margin. For the restaurant industry, the extensive margin is the effect on the probability of restaurant employment. The intensive margin is hours worked in the restaurant industry. One can directly examine the extensive margin as done above. However, one cannot directly isolate effects on the intensive margin when the extensive margin is changing because the treatment (minimum wage) likely alters selection into the restaurant industry. I.e., the minimum wage likely alters the composition of workers in the restaurant industry in both

observable (e.g. age) and unobservable (labor market attachment) dimensions. There is no credible way to account for selection on unobservables in this setting, which prevents isolating the intensive margin response. A credible alternative is to look at the extensive and intensive margins jointly, i.e., examine hours worked in restaurants among all individuals with those not working in the restaurant industry coded as having zero restaurant work hours as in Appendix Table A9. The coefficient directions and elasticities are generally similar to those for the extensive margin.

A final question heavily debated in the literature is whether minimum wages affect overall restaurant employment (Dube et al. 2010; Jha et al 2022). Unfortunately, I cannot provide clear evidence on this. Using the CPS and similar methods as in this study does not indicate a significant effect on overall employment in restaurants (among all ages and education levels) nor hours worked in restaurants. The results (not reported) are not precise, but I cannot the reject the null hypothesis that overall restaurant employment is unaffected by minimum wages. Thus, the primary effect of minimum wages on restaurant employment may be which workers are employed rather than how many workers are employed.

4. Conclusion

Minimum wages are a source of frequent and intense debate among academics and the general public. The current study examines effects of minimum wages on restaurant employment for teens and less educated adults during the 2005-2019 period. Results for adults are potentially affected by selection bias due to migration, so some caution is warranted in interpretation; they are suggestive but not definitive. However, results for teens are intended as causal effects. I find that minimum wages reduce restaurant employment among teens but

increase restaurant employment among less educated adults. This suggests that restaurants respond to higher minimum wages via labor-labor substitution, i.e., they shift from teenagers with limited work experience to older and more experienced adult workers. Results also suggest that less educated adults shift from non-restaurant employment to restaurant employment. The adverse effects of minimum wages on teen restaurant employment are isolated to metropolitan areas and not found in non-metropolitan areas.

This paper does not address all the unresolved issues in the minimum wage literature, but it does provide useful evidence on the impacts of minimum wages on employment in the restaurant industry. Previous studies of minimum wages on restaurant employment typically use county-level aggregated data instead of individual-level data such as the CPS. However, aggregated data analyses are generally unable to focus on the detailed composition of restaurant workers and may overlook employer substitution among different types of workers. Specifically, the CPS allows analysis by detailed age and other characteristics and enables the current study to fill a gap in the literature by conducting a close look at effects on minimum wages on restaurant employment for teens ages 16-17. These teens are just starting to enter the labor market and are disproportionately employed in restaurants. Minimum wage effects appear to be heterogeneous across areas and potential workers. Metropolitan teens are often adversely affected by minimum wage increases via reduced opportunities for restaurant employment.

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Table 1: Sub-Sample Means by MSA Status

	(1) Full Sample	(2) Non-MSAs	(3) All MSAs
A. Ages 16-17			
Employed in Restaurant	0.078	0.091	0.075
Employed in Non-Restaurant	0.125	0.155	0.118
Employed at All	0.203	0.246	0.193
Employed as Restaurant Server	0.013	0.020	0.011
Hourly Wage	9.069	8.727	9.146
Minimum Wage	8.316	7.920	8.403
Unemployment Rate	6.126	6.018	6.170
Teen Share	0.090	0.092	0.089
Immigrant Share	0.160	0.046	0.186
Adult Employed Rate	0.733	0.706	0.738
Adult Mean Hours	40.45	40.79	40.37
Individual Observations	662,997	134,458	484,342
B. Immigrants Ages 23-59 with Educ. Less than Associate's Degree			
Employed in Restaurant	0.077	0.069	0.077
Employed in Non-Restaurant	0.636	0.653	0.635
Employed at All	0.713	0.723	0.712
Employed as Restaurant Server	0.011	0.012	0.011
Hourly Wage	14.639	13.779	14.698
Minimum Wage	8.670	8.104	8.709
Unemployment Rate	6.308	5.900	6.344
Teen Share	0.084	0.090	0.084
Immigrant Share	0.259	0.089	0.271
Adult Employed Rate	0.732	0.705	0.733
Adult Mean Hours	40.34	40.87	40.31
Individual Observations	1,086,950	75,438	973,862
C. Natives Ages 23-59 with Education Less than Associate's Degree			
Employed in Restaurant	0.040	0.034	0.042
Employed in Non-Restaurant	0.663	0.653	0.665
Employed at All	0.703	0.687	0.707
Employed as Restaurant Server	0.009	0.007	0.009
Hourly Wage	16.858	16.138	17.057
Minimum Wage	8.209	7.902	8.301
Unemployment Rate	6.161	6.082	6.209
Teen Share	0.084	0.088	0.083
Immigrant Share	0.132	0.042	0.159
Adult Employed Rate	0.729	0.702	0.736
Adult Mean Hours	40.47	40.75	40.38
Individual Observations	5,421,327	1,366,232	3,636,791

Notes: The sample is from the 2005-2019 monthly CPS. Estimates uses CPS survey weights. The full sample includes observations that cannot be classified as either metropolitan or non-metropolitan. The log hourly wage mean is for workers paid hourly.

Table 2: Regression Results for Probability of Restaurant Employment

	(1) Full Sample	(2) Non-MSA Sample	(3) MSA Sample	(4) Difference (2) - (3)
A. Ages 16-17				
Log Minimum Wage	-0.041	0.040	-0.055	-0.095
	(0.010)***	(0.038)	(0.010)***	(0.040)**
	[-0.523]	[0.438]	[-0.732]	
B. Immigrants Ages 23-59 with Education Less than Associate's Degree				
Log Minimum Wage	0.062	0.029	0.065	0.037
	(0.029)**	(0.048)	(0.031)**	(0.063)
	[0.809]	[0.417]	[0.841]	
C. Natives Ages 23-59 with Education Less than Associate's Degree				
Log Minimum Wage	0.020	0.014	0.022	0.007
	(0.006)***	(0.011)	(0.008)***	(0.014)
	[0.494]	[0.413]	[0.522]	

Notes: The sample is from the 2005-2019 monthly CPS. All regressions include individual controls for age, sex, race, ethnicity, and citizenship status, area fixed effects, region-time fixed effects, and area-time controls including the unemployment rate, teen share, immigrant share, adult employment rate, and adult mean hours. Standard errors in parentheses are clustered by state. Elasticities in brackets are computed by dividing the coefficient by the group-specific sample mean of the restaurant employment dummy. *Significant at 10% level; **Significant at 5% level; ***Significant at 1% level.

Table 3: Robustness Checks for Ages 16-17 Restaurant Employment

	(1) Full Sample	(2) Non-MSA Sample	(3) MSA Sample	(4) Difference (2) - (3)
A. Adding Linear Area-Time Trends				
Log Minimum Wage	-0.031	0.022	-0.039	-0.061
	(0.015)**	(0.032)	(0.016)**	(0.038)
	[-0.395]	[0.241]	[-0.519]	
B. Adding Division-Time Effects				
Log Minimum Wage	-0.043	0.029	-0.055	-0.084
	(0.010)***	(0.041)	(0.010)***	(0.041)**
	[-0.548]	[0.318]	[-0.732]	
C. Excluding Area-Time Controls				
Log Minimum Wage	-0.036	0.036	-0.050	-0.086
	(0.010)***	(0.038)	(0.011)***	(0.040)**
	[-0.459]	[0.394]	[-0.666]	
D. No Sub-state Explanatory Variables				
Log Minimum Wage	-0.031	0.037	-0.047	-0.085
	(0.011)***	(0.038)	(0.012)***	(0.041)**
	[-0.395]	[0.405]	[-0.626]	
E. Controlling for Local Area Adult Median Wages				
Log Minimum Wage	-0.036	0.036	-0.047	-0.082
	(0.011)***	(0.037)	(0.012)***	(0.039)**
	[-0.459]	[0.394]	[-0.626]	
F. Years 2010-2019				
Log Minimum Wage	-0.039	0.077	-0.055	-0.133
	(0.013)***	(0.040)*	(0.013)***	(0.040)***
	[-0.497]	[0.844]	[-0.732]	

Notes: The specifications correspond to Table 2 Panel A except as indicated in the panel names. Standard errors in parentheses are clustered by state. Elasticities in brackets are computed by dividing the coefficient by the group-specific sample mean of the restaurant employment dummy. *Significant at 10% level; **Significant at 5% level; ***Significant at 1% level.

Table 4: Robustness Checks for Immigrant Adult Restaurant Employment

	(1) Full Sample	(2) Non-MSA Sample	(3) MSA Sample	(4) Difference (2) - (3)
A. Adding Linear Area-Time Trends				
Log Minimum Wage	0.072	0.061	0.076	0.014
	(0.037)*	(0.055)	(0.038)*	(0.074)
	[0.940]	[0.878]	[0.984]	
B. Adding Division-Time Effects				
Log Minimum Wage	0.069	-0.029	0.072	0.101
	(0.033)**	(0.052)	(0.034)**	(0.071)
	[0.900]	[-0.417]	[0.932]	
C. Excluding Area-Time Controls				
Log Minimum Wage	0.061	0.014	0.064	0.050
	(0.029)**	(0.047)	(0.031)**	(0.062)
	[0.796]	[0.202]	[0.828]	
D. No Sub-state Explanatory Variables				
Log Minimum Wage	0.030	0.026	0.032	0.007
	(0.016)*	(0.048)	(0.017)*	(0.057)
	[0.391]	[0.374]	[0.414]	
E. Controlling for Local Area Adult Median Wages				
Log Minimum Wage	0.072	0.030	0.075	0.042
	(0.034)**	(0.053)	(0.037)**	(0.066)
	[0.940]	[0.432]	[0.971]	
F. Years 2010-2019				
Log Minimum Wage	0.056	-0.071	0.062	0.133
	(0.031)*	(0.069)	(0.032)*	(0.081)
	[0.731]	[-1.022]	[0.802]	

Notes: The specifications correspond to Table 2 Panel B except as indicated in the panel names. Standard errors in parentheses are clustered by state. Elasticities in brackets are computed by dividing the coefficient by the group-specific sample mean of the restaurant employment dummy. *Significant at 10% level; **Significant at 5% level.

Table 5: Robustness Checks for Native Adult Restaurant Employment

	(1) Full Sample	(2) Non-MSA Sample	(3) MSA Sample	(4) Difference (2) - (3)
A. Adding Linear Area-Time Trends				
Log Minimum Wage	0.016	0.003	0.020	0.017
	(0.007)**	(0.010)	(0.008)**	(0.013)
	[0.396]	[0.089]	[0.475]	
B. Adding Division-Time Effects				
Log Minimum Wage	0.023	0.013	0.024	0.011
	(0.007)***	(0.009)	(0.008)***	(0.013)
	[0.569]	[0.384]	[0.570]	
C. Excluding Area-Time Controls				
Log Minimum Wage	0.019	0.014	0.020	0.007
	(0.006)***	(0.010)	(0.007)***	(0.014)
	[0.470]	[0.413]	[0.475]	
D. No Sub-state Explanatory Variables				
Log Minimum Wage	0.010	0.014	0.010	-0.005
	(0.005)**	(0.010)	(0.006)*	(0.012)
	[0.247]	[0.413]	[0.237]	
E. Controlling for Local Area Adult Median Wages				
Log Minimum Wage	0.020	0.013	0.023	0.010
	(0.007)***	(0.011)	(0.008)***	(0.015)
	[0.494]	[0.384]	[0.546]	
F. Years 2010-2019				
Log Minimum Wage	0.032	0.020	0.033	0.013
	(0.007)***	(0.017)	(0.008)***	(0.019)
	[0.791]	[0.59]	[0.784]	

Notes: The specifications correspond to Table 2 Panel C except as indicated in the panel names. Standard errors in parentheses are clustered by state. Elasticities in brackets are computed by dividing the coefficient by the group-specific sample mean of the restaurant employment dummy. *Significant at 10% level; **Significant at 5% level; ***Significant at 1% level.

Appendix Tables

Table A1: Number of Minimum Wage Changes and CPS Sample Summary Statistics by Year

Year	Federal Change	State Changes	Local Changes	Sample Mean Minimum Wage	Minimum Minimum Wage	Maximum Minimum Wage
2005	0	11	1	5.66	5.15	8.62
2006	0	16	1	5.83	5.15	8.82
2007	1	45	1	6.49	5.15	9.14
2008	1	44	1	6.90	5.85	9.36
2009	1	43	1	7.28	6.55	9.79
2010	0	5	1	7.46	7.25	9.79
2011	0	8	1	7.49	7.25	9.92
2012	0	8	1	7.55	7.25	10.24
2013	0	11	3	7.58	7.25	10.55
2014	0	18	6	7.76	7.25	10.74
2015	0	24	10	8.01	7.25	12.25
2016	0	18	13	8.25	7.25	13.00
2017	0	22	15	8.58	7.25	15.00
2018	0	21	14	8.86	7.25	15.45
2019	0	22	13	9.21	7.25	16.00

Notes: The numbers for state changes in 2007-2009 include binding changes from the federal minimum wage increases. The District of Columbia is included as a state. The numbers for local changes are restricted to those in unique identifiable areas in the CPS that exceed the state minimum wage. Minimum wage values in the last three columns are in nominal values.

Table A2: Restaurant Employment by Age/Group

Age Group	Percentage	Cumulative %
15	0.68	0.68
16	2.88	3.57
17	5.11	8.68
18-22	25.95	34.63
23-29	21.62	56.24
30-39	17.52	73.77
40-49	13.05	86.81
50-59	8.89	95.70
60+	4.30	100

Notes: based on author's estimates from the 2005-2019 monthly CPS.

Table A3: Results for Probability of Restaurant Employment for Ages 18-22

	(1) Full Sample	(2) Non-MSA Sample	(3) MSA Sample	(4) Difference (2) - (3)
Log Minimum Wage	0.012	0.032	0.010	-0.022
	(0.011)	(0.021)	(0.011)	(0.025)
	[0.112]	[0.326]	[0.092]	

Notes: The sample is from the 2005-2019 monthly CPS. All regressions include individual controls for age, sex, race, ethnicity, and citizenship status, area fixed effects, region-time fixed effects, and area-time controls including the unemployment rate, teen share, immigrant share, adult employment rate, and adult mean hours. Standard errors in parentheses are clustered by state. Elasticities in brackets are computed by dividing the coefficient by the group-specific sample mean of the restaurant employment dummy. *Significant at 10% level; **Significant at 5% level; ***Significant at 1% level.

Table A4: Local Area Control Variable Results for Restaurant Employment

	(1) Full Sample	(2) Non-MSA Sample	(3) MSA Sample	(4) Difference (2) - (3)
A. Ages 16-17				
Log Minimum Wage	-0.041	0.040	-0.055	-0.095
	(0.010)***	(0.038)	(0.010)***	(0.040)**
Unemployment Rate	-0.003	0.000	-0.004	-0.004
	(0.001)***	(0.002)	(0.001)***	(0.002)
Teen Share	0.056	0.091	0.047	-0.043
	(0.029)*	(0.072)	(0.029)	(0.074)
Immigrant Share	0.007	-0.108	0.006	0.114
	(0.022)	(0.068)	(0.021)	(0.067)*
Adult Employed Rate	0.050	0.037	0.044	0.007
	(0.013)***	(0.037)	(0.014)***	(0.042)
Adult Mean Hours	0.001	0.004	0.001	-0.003
	(0.001)**	(0.002)***	(0.001)**	(0.002)*
B. Immigrants Ages 20-59 with Education Less than Associate's Degree				
Log Minimum Wage	0.062	0.029	0.065	0.037
	(0.029)**	(0.048)	(0.031)**	(0.063)
Unemployment Rate	0.002	0.007	0.002	-0.005
	(0.001)*	(0.004)	(0.002)	(0.004)
Teen Share	-0.027	0.129	-0.044	-0.173
	(0.035)	(0.111)	(0.039)	(0.120)
Immigrant Share	-0.004	-0.052	0.001	0.054
	(0.016)	(0.065)	(0.017)	(0.073)
Adult Employed Rate	0.094	0.043	0.096	0.052
	(0.014)***	(0.055)	(0.017)***	(0.057)
Adult Mean Hours	0.000	-0.001	0.000	0.001
	(0.001)	(0.002)	(0.001)	(0.002)
C. Natives Ages 20-59 with Education Less than Associate's Degree				
Log Minimum Wage	0.020	0.014	0.022	0.007
	(0.006)***	(0.011)	(0.008)***	(0.014)
Unemployment Rate	0.001	0.001	0.001	0.001
	(0.000)**	(0.001)	(0.000)**	(0.001)
Teen Share	-0.017	-0.015	-0.020	-0.005
	(0.009)*	(0.020)	(0.009)**	(0.019)
Immigrant Share	0.008	0.001	0.005	0.004
	(0.006)	(0.016)	(0.007)	(0.018)
Adult Employed Rate	0.055	0.060	0.052	-0.008
	(0.005)***	(0.009)***	(0.006)***	(0.011)
Adult Mean Hours	-0.001	-0.001	-0.001	0.000
	(0.000)***	(0.000)**	(0.000)***	(0.000)

Notes: The sample is from the 2005-2019 monthly CPS. All regressions include individual controls for age, sex, race, ethnicity, and citizenship status, area fixed effects, and region-time fixed effects. Standard errors in parentheses are clustered by state. *Significant at 10% level; **Significant at 5% level; ***Significant at 1% level.

Table A5: Regression Results for Probability of Non-Restaurant Employment

	(1) Full Sample	(2) Non-MSA Sample	(3) MSA Sample	(4) Difference (2) - (3)
A. Ages 16-17				
Log Minimum Wage	-0.014	0.048	-0.021	-0.070
	(0.012)	(0.045)	(0.012)*	(0.047)
	[-0.112]	[0.310]	[-0.178]	
B. Immigrants Ages 23-59 with Education Less than Associate's Degree				
Log Minimum Wage	-0.085	-0.135	-0.086	0.049
	(0.040)**	(0.070)*	(0.043)*	(0.094)
	[-0.134]	[-0.207]	[-0.135]	
C. Natives Ages 23-59 with Education Less than Associate's Degree				
Log Minimum Wage	-0.051	-0.011	-0.062	-0.051
	(0.020)**	(0.010)	(0.025)**	(0.028)*
	[-0.077]	[-0.017]	[-0.093]	

Notes: The sample is from the 2005-2019 monthly CPS. All regressions include individual controls for age, sex, race, ethnicity, and citizenship status, area fixed effects, region-time fixed effects, and area-time controls including the unemployment rate, teen share, immigrant share, adult employment rate, and adult mean hours. Standard errors in parentheses are clustered by state. Elasticities in brackets are computed by dividing the coefficient by the group-specific sample mean of the non-restaurant employment dummy. *Significant at 10% level; **Significant at 5% level.

Table A6: Regression Results for Probability of Any Employment

	(1) Full Sample	(2) Non-MSA Sample	(3) MSA Sample	(4) Difference (2) - (3)
A. Ages 16-17				
Log Minimum Wage	-0.055	0.088	-0.076	-0.165
	(0.018)***	(0.057)	(0.016)***	(0.057)***
	[-0.271]	[0.358]	[-0.394]	
B. Immigrants Ages 23-59 with Education Less than Associate's Degree				
Log Minimum Wage	-0.022	-0.106	-0.020	0.086
	(0.018)	(0.055)*	(0.020)	(0.063)
	[-0.031]	[-0.147]	[-0.028]	
C. Natives Ages 23-59 with Education Less than Associate's Degree				
Log Minimum Wage	-0.031	0.003	-0.040	-0.043
	(0.020)	(0.012)	(0.025)	(0.031)
	[-0.044]	[0.004]	[-0.057]	

Notes: The sample is from the 2005-2019 monthly CPS. All regressions include individual controls for age, sex, race, ethnicity, and citizenship status, area fixed effects, region-time fixed effects, and area-time controls including the unemployment rate, teen share, immigrant share, adult employment rate, and adult mean hours. Standard errors in parentheses are clustered by state. Elasticities in brackets are computed by dividing the coefficient by the group-specific sample mean of the any employment dummy. *Significant at 10% level; ***Significant at 1% level.

Table A7: Effects on Log Hourly Wage Among Persons Employed and Paid Hourly

	(1) Full Sample	(2) Non-MSA Sample	(3) MSA Sample	(4) Difference (2) - (3)
A. Ages 16-17				
Log Minimum Wage	0.246	0.316	0.213	-0.103
	(0.025)***	(0.055)***	(0.027)***	(0.058)*
B. Immigrants Ages 23-59 with Education Less than Associate's Degree				
Log Minimum Wage	-0.029	-0.030	-0.033	-0.003
	(0.026)	(0.085)	(0.028)	(0.089)
C. Natives Ages 23-59 with Education Less than Associate's Degree				
Log Minimum Wage	-0.022	0.055	-0.044	-0.098
	(0.022)	(0.031)*	(0.027)	(0.041)**

Notes: The sample is from the 2005-2019 monthly CPS. All regressions include individual controls for age, sex, race, ethnicity, and citizenship status, area fixed effects, region-time fixed effects, and area-time controls including the unemployment rate, teen share, immigrant share, adult employment rate, and adult mean hours. Standard errors in parentheses are clustered by state. *Significant at 10% level; **Significant at 5% level; ***Significant at 1% level.

Table A8: Regression Results for Probability of Restaurant Server Employment

	(1) Full Sample	(2) Non-MSA Sample	(3) MSA Sample	(4) Difference (2) - (3)
A. Ages 16-17				
Log Minimum Wage	-0.010	-0.006	-0.013	-0.007
	(0.005)**	(0.012)	(0.005)**	(0.013)
	[-0.791]	[-0.307]	[-1.155]	
B. Immigrants Ages 23-59 with Education Less than Associate's Degree				
Log Minimum Wage	0.007	-0.020	0.009	0.028
	(0.004)*	(0.016)	(0.004)**	(0.016)*
	[0.633]	[-1.708]	[0.813]	
C. Natives Ages 23-59 with Education Less than Associate's Degree				
Log Minimum Wage	0.004	0.003	0.004	0.001
	(0.002)**	(0.003)	(0.002)**	(0.004)
	[0.449]	[0.429]	[0.424]	

Notes: The sample is from the 2005-2019 monthly CPS. All regressions include individual controls for age, sex, race, ethnicity, and citizenship status, area fixed effects, region-time fixed effects, and area-time controls including the unemployment rate, teen share, immigrant share, adult employment rate, and adult mean hours. Standard errors in parentheses are clustered by state. Elasticities in brackets are computed by dividing the coefficient by the group-specific sample mean of the restaurant server employment dummy. *Significant at 10% level; **Significant at 5% level.

Table A9: Regression Results for Hours Worked in the Restaurant Industry

	(1) Full Sample	(2) Non-MSA Sample	(3) MSA Sample	(4) Difference (2) - (3)
A. Ages 16-17				
Log Minimum Wage	-0.710	0.685	-0.947	-1.624
	(0.186)***	(0.761)	(0.191)***	(0.796)**
	[-0.517]	[0.433]	[-0.720]	
B. Immigrants Ages 20-59 with Education Less than Associate's Degree				
Log Minimum Wage	2.108	-0.507	2.289	2.820
	(1.188)*	(2.018)	(1.259)*	(2.593)
	[0.716]	[-0.178]	[0.774]	
C. Natives Ages 20-59 with Education Less than Associate's Degree				
Log Minimum Wage	0.710	0.498	0.751	0.254
	(0.226)***	(0.380)	(0.267)***	(0.498)
	[0.496]	[0.424]	[0.502]	

Notes: Hours worked in the restaurant industry equals zero for persons not employed in the restaurant industry; i.e., the dependent variable is the interaction of the restaurant employment indicator and hours worked. The sample is from the 2005-2019 monthly CPS. All regressions include individual controls for age, sex, race, ethnicity, and citizenship status, area fixed effects, region-time fixed effects, and area-time controls including the unemployment rate, teen share, immigrant share, adult employment rate, and adult mean hours. Standard errors in parentheses are clustered by state. Elasticities in brackets are computed by dividing the coefficient by the group-specific sample mean of the restaurant hours variable. *Significant at 10% level; **Significant at 5% level; ***Significant at 1% level.