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Immigrants at the Margin: Labor Market Effects of the Minimum Wage

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Abstract

We examine the differential effects of minimum wages on immigrant and native workers in the United States. We find that minimum wage increases lead to reduced hours of work among immigrants with no effect on their employment. The effects are concentrated among recently-arrived, likely-undocumented workers in high turnover industries. Native workers show no such response, even when examining native subgroups with similar characteristics to the most affected immigrants. We conclude that affected immigrant labor markets feature low-surplus, low-investment employment relationships with flexible hours, but they are embedded in labor markets where replacement is unusually costly.

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1 Introduction

The modern minimum-wage literature is characterized by a striking empirical regularity: even sizable increases in the minimum wage rarely generate meaningful declines in employment. That null finding does not, however, imply that minimum-wage policy is neutral for firms. A higher wage floor is a cost shock and firms can re-optimize on multiple margins by raising product prices, altering hiring and vacancy creation, adjusting hours per worker, changing screening and training intensity, and reshaping retention policies and job design. The core labor market question is therefore is which input margins move, for whom, and what those adjustments reveal about the underlying frictions and incidence in low-wage labor markets.

This paper revisits that question through the lens of immigrant–native heterogeneity in the response to minimum wage increases. Non-citizen immigrants account for a large share of the low-wage workforce and are substantially more likely than natives to work in near-minimum-wage jobs. Moreover, several canonical adjustment channels imply that incidence may differ by nativity: immigrants are disproportionately represented among new hires, are often more mobile geographically and across jobs in response to local shocks, and may face distinct institutional constraints tied to their legal status, documentation, and discrimination. These features make immigrant–native comparisons uniquely informative about firm re-optimization when the wage floor rises—particularly about whether adjustments occur on the extensive margin (employment/separations) or on the intensive margin (hours), and what those patterns implies about contracting, compliance, and replacement frictions in low-wage and immigrant labor markets.

Our work finds that minimum-wage increases raise hourly wages for both immigrants and natives in the affected low-wage population, with pass-through for immigrants that is comparable to, and in some specifications larger than, that for natives. For immigrants, however, these wage gains do not translate into higher weekly earnings because hours worked fall enough to offset the higher wage rate, driven in part by a shift from full-time to part-time work. Importantly, we find no evidence of employment declines for either immigrants or natives in our main specifications. Hours reductions begin around the time minimum-wage hikes are announced, before they actually

go into effect, which suggests that firms adjust labor inputs quickly in response to these policy changes.

We then show that the intensive-margin response is sharply concentrated among immigrants who have the weakest attachment to the labor market and in settings where hours are most flexible: non-citizens, likely-undocumented immigrants, more recent arrivals, and high-turnover industries (with particularly pronounced effects in agriculture and parts of the service sector). Complementing the hours results, labor-market flow patterns indicate increased persistence in part-time jobs among immigrants, consistent with firms preserving matches while re-optimizing hours. These findings suggest a mechanism in which firms face nontrivial replacement costs, as in a models of labor hoarding. Immigrant-specific hiring and replacement frictions (linked to enforcement, documentation constraints, and limited substitutability) appear to play an essential role given the concentration of the effects on immigrants with the weakest labor market attachment. We explore migration responses and other sources of composition effects, and conclude that these do not affect our findings.

Our empirical analysis builds on recent advances in minimum-wage research that improve identification of directly exposed workers and sharpen inference about distributional effects (Cengiz et al., 2022; Borjas and Cassidy, 2019; Cengiz et al., 2019). Using these methods and a longer CPS time series, we revisit the effects of minimum wage increases on immigrants and natives and substantially improve on earlier work in this area (e.g. Orrenius and Zavodny (2008)). This question remains important both because low-wage immigrant labor was central to early minimum wage debates and because concerns persist that undocumented workers may be paid below the statutory minimum (Dube and Lindner (2024)). We find substantial wage pass-through for both immigrants and natives, smaller wage responses for likely-undocumented than likely-documented immigrants, and no employment effect for either group. Unlike recent evidence from Brazil, where minimum wage increases reduce earnings inequality without hours cuts, our estimates indicate that adjustment in the U.S. occurs in part through immigrant hours (Derenoncourt et al., 2025).

More broadly, our results show that the canonical null effect on employment can coexist with

meaningful adjustment in hours among the most weakly attached workers. In that sense, our findings connect to work emphasizing compositional upgrading and substitution toward more advantaged labor within low-wage sectors (Giuliano, 2013; Clemens and Wither, 2019; Clemens, 2021), as well as recent evidence that hours and work arrangements may be a central adjustment margin under a higher wage floor (Jardim et al., 2022; Farkas, 2025). They are also consistent with literatures highlighting anticipatory firm responses (Renkin, Montialoux and Siegenthaler, 2022; Kudlyak, Tasci and Tüzemen, 2025), and labor-hoarding behavior when replacement is costly (Oi, 1962; Burnside, Eichenbaum and Rebelo, 1993; Giupponi and Landais, 2023). Our contribution is to show that, even in the absence of job loss, minimum wage incidence can appear in who loses hours, with that burden falling disproportionately on immigrant workers with weaker attachment to the U.S. labor market.

2 Data and Empirical Framework

2.1 Data

As is standard in the minimum wage literature, we use the Current Population Survey (CPS) from the Integrated Public Use Microdata Series (IPUMS) (Ruggles et al., 2025). The CPS is a nationally representative survey of employment statistics where approximately 60,000 households are randomly chosen and interviewed in eight surveys. We use CPS data from 1994 to 2019, as the question on nativity was introduced with the CPS redesign in 1994. Because most prominent state-level minimum wage increases occurred after 1990, dropping the sample before 1994 is likely to have minimal impact on the estimates. We restrict our sample to the population aged 16 to 54, dropping older individuals as they experience distinct minimum wage effects due to interaction with their retirement decisions (Borgschulte and Cho, 2020; Hampton and Totty, 2023).

We focus on the following labor market outcomes: hourly wages (surveyed in the fourth and eighth surveys), working hours, and employment rates (surveyed in all eight surveys). In the CPS, only workers who are paid hourly report their hourly wages. For workers who are not paid hourly,

we define the hourly wage as usual weekly earnings divided by usual weekly hours.[1] The working hours used as the outcome variable in the analysis are the actual number of hours worked at their main job in the previous week.

The minimum wage data are obtained from Cengiz et al. (2022). Following Cengiz et al. (2022), we focus on the 168 "prominent" minimum wage increase events from 1994 to 2019, where the minimum wage was increased by more than $0.25 and more than 2% of the workforce earned between the old and new minimum wages. We collapse the quarterly events into yearly events, as the number of observations in each state-year cell is small when focusing on immigrants. If there exists a minimum wage increase event in any quarter of the year, we consider that year to have a minimum wage event.[2]

2.2 Predicting Minimum Wage Worker

To identify workers most likely to be affected by the minimum wage increase, we employ machine learning techniques, closely following the approach of Cengiz et al. (2022). Among various machine learning methodologies, we primarily use random forest, a popular ensemble learning method for both classification and regression tasks. This method predicts outcomes by constructing multiple decision trees from random subsets of the dataset and features (i.e., variables used for predictions). The inherent randomness of this approach mitigates the tendency of decision trees to overfit, reducing the model's variance. As demonstrated by Cengiz et al. (2022), our findings remain robust event when alternative prediction methodologies, such as boosting, or simple linear models, are applied.

In predicting minimum wage workers, we define a worker as a minimum wage worker if their hourly wage is less than 125% of the statutory minimum wage. Within this group, we focus on workers aged 16 to 54 who meet the following criteria: (1) no prominent minimum wage event has occurred past five years and (2) a prominent minimum wage change is upcoming within the next

[1] For workers who have varying usual weekly hours, we use the actual weekly hours in the past week.
[2] Analyses using quarterly events yield identical results.

three years. These criteria are intended to create a clean and relevant prediction sample, with the first criterion ensuring a stabilized wage distribution and the second identifying workers likely to experience a minimum wage event soon.

Using this sample, we apply a random forest algorithm with 1,024 trees (number of iterations) and two randomly selected features from the following variables: age, sex, race (categorized as white, black, Hispanic, and others) education (categorized as less than high school, high school graduates, some college, and BA or more) and marital status. We then calculate the probability of each observation being a minimum wage worker, averaging the probabilities across the 1,024 trees.[3]

In the main analysis, we restrict the sample to the "high-probability group," defined as the top 10% of individuals with the highest predicted probability of being minimum wage workers, following Card and Krueger (1995). At this threshold, 66% of individuals in the high-probability group are minimum wage workers, and this group accounts for 21% of all minimum wage workers in the sample. In robustness analyses, we also examine the effects of minimum wages when using alternative probability thresholds.[4]

2.3 Empirical Strategy

Using the high-probability group, defined as the top 10% of individuals with the highest predicted probability of being minimum wage workers, we collapse the individual-level data to the state and year levels, using CPS sampling weights. We then estimate the following event-based model, which closely follows the approach of Cengiz et al. (2019) and Cengiz et al. (2022)

$$y_{st}^{n} = \sum_{\tau=-4}^{4} \beta_{\tau} MWtreat_{st}^{\tau} + \Omega_{st} + \phi_{s} + \gamma_{t} + \varepsilon_{st} \tag{1}$$

[3]Note that this probability from the classification forests is equivalent to the predicted outcomes from the regression forests when the outcomes are in binary.

[4]The demographic characteristics of immigrants and natives in our final sample are presented in Appendix Table A1

where y_{st}^{n} is the average labor market outcome for nativity group n (immigrants or natives) in state s and year t. The labor market outcomes include hourly wages, weekly earnings, working hours, and employment rates, all in logarithmic form.

$MWtreat_{st}^{\tau}$ are the event dummies, which take the value of 1 if the minimum wage was increased τ years before or after year t in state s. The event window spans four years before ($\tau = -4$) to four years after ($\tau = 4$) the minimum wage increase, with $\tau = 0$ being the year of the increase. Our analysis focuses on the 168 "prominent" state-level minimum wage increase events from 1994 to 2019, where the minimum wage increased by more than \$0.25 and over 2% of the workforce earned between the old and new minimum wages.

Unlike Cengiz et al. (2022) and standard event-study models, we normalize the effect two years before the treatment (β_{-2}) to zero, so β_{τ} represents the effect of minimum wage increase τ years after (or before) the treatment relative to the effect two years before. We use $\tau = -2$ as the baseline, rather than $\tau = -1$, to account for potential anticipatory effects of minimum wage increases. The new minimum wage is usually announced a year before the actual minimum wage increase, allowing firms and workers to adjust their labor demand and supply decisions before the actual increase.

Given our focus on the prominent minimum wage increases, we control for small increases (less than \$0.25 increase or lower than 2% of the workforce earned between the new minimum wage) and federal increases through the term Ω_{st}. Specifically, we include dummies for 2-3 years before the event, 1 year before the event, and 0-4 years after the event, each specified separately for small and federal increases. As is standard in state-panel designs, we also include state fixed effects (ϕ_s) and year fixed effects (γ_t). we later show that additionally controlling for unemployment rates or state-specific linear trends has minimal impacts on the estimates.

The effects of minimum wage increases over time can be summarized into a single coefficient, $\hat{\beta}_{Avg}$, which averages the post-period effects. Specifically, $\hat{\beta}_{Avg}$ is calculated by subtracting the average of the pre-period effects (over three years) from the average of the post-period effects

(over five years), as estimated from the event-study model:

$$\hat{\beta}_{Avg} = \frac{1}{5}\sum_{\tau=0}^{4}\hat{\beta}_{\tau} - \frac{1}{3}\sum_{\tau=-4}^{-2}\hat{\beta}_{\tau} \tag{2}$$

Here, we exclude $\hat{\beta}_{-1}$ to eliminate potential anticipatory effects when calculating the average impacts. In the discussion of results, we report $\hat{\beta}_{Avg}$ to represent the average post-period impacts relative to the pre-period impacts of the minimum wage increases.

3 Minimum wage effects on wages, hours, and employment

3.1 Effective wages

As a first step we begin with the analysis of the effect of the minimum wage paid to likely minimum wage workers. This is important because of the possibility of non-compliance with the minimum wage among employers who hire immigrants, especially undocumented immigrants. Panel (a) of Figure 1 reports the event study for immigrants and natives in black and grey, respectively. We normalize the model to have period $\tau = -2$ to examine effects in the announcement year, $\tau = -1$. Pretrends are flat in the years into $\tau = -2$, indicating that minimum wage innovations are unrelated to wage trends in the event study framework. Interestingly, there is a large negative coefficient for immigrant workers' wages in $\tau = -1$; although the estimate is statistically insignificant at the 5% level, it may indicate that firms respond to the announcement of higher minimum wages in the future with lower wages for immigrants in anticipation. Once the new minimum wage has gone into place, both immigrant and native wages increase by more than 2 log points. The estimates for immigrants' wage responses are similar to or slightly larger than natives, in spite of the suggestive evidence of wage cuts in anticipation in period $\tau = -1$.

In Panel A of Table 1, we pool the pre- and post-periods to estimate difference-in-differences models of the wage effects. In Columns 1, we estimate a 2.9 log point increase in the immigrant wage, larger that the 2.0 wage increase among native workers. The implied elasticity of immi-

grant wages among likely-minimum-wage workers to the effective minimum wage is 0.32, while for native wages the elasticity is 0.23. Estimates for both immigrants and natives are essentially unchanged when we include controls for the state unemployment rate in Columns 2 and 5, and state linear trends in Columns 3 and 6. These estimates are also in line with previous estimates (Cengiz et al., 2022).

We conclude that minimum wage innovations produce a similar effect on the wages of both immigrants and natives. Although we cannot statistically reject the responses are the same, the point estimates for immigrants are larger than for natives. We find no evidence that immigrants' employers are more likely to fail to comply with the minimum wage.[5]

3.2 Effects on hours and employment

Panel B of Figure 1 reports the event study results on the log of working hours (conditional on working). As with the analysis of wage responses, we use period $\tau = -2$ as the reference period. There is no evidence of differential trends in the lead up to the reform, but there is a clear decline in hours in the year prior to the minimum wage increase. This is consistent with an effect at the time of announcement, which we investigate further below. Immigrants average hours of work fall by around three percent in the year prior to the minimum wage increase and remain at this level for the remainder of the event study period. By contrast, there is no effect on the work hours among the native-born, consistent with much of the prior literature.

We report the difference-in-difference results for the log of hours in Panel B of Table 1. We drop period $\tau = -1$ from model. There is a 1.7% drop in working hours in the main specification. The negative hours effect for immigrants is robust to the inclusion of controls for the overall unemployment rate and state linear trends. In contrast, effects on natives are precisely estimated zeros across all three models.

We examine the classic employment effects of the minimum wage in Panel C of Figure 1 and

[5]In Appendix Figure A1, we plot the wage distribution in 1994 and 2019 and show that there are only small differences in the share of immigrant and natives workers paid below the minimum.

Panel C of Table 1. As in Cengiz et al. (2022) and much of the literature, we find no detectable effect of the minimum wage on the log of the employment rate of likely-minimum wage workers. Pre-trends are flat in the event study, and the point estimates in the difference-in-difference models are indistinguishable from zero. In spite of the apparent decline for immigrant labor reflected in the hours estimates, the estimated effects on immigrant employment show no evidence of a decline.

To bring the estimates on hours and employment together, we separately estimate the effects on full-time and part-time employment. The results appear in Panels C and D of Figure 1 and Panels D and E of Table 1. Consistent with the decline in hours, we find a sharp decline in full-time employment among immigrants in years $\tau = -1$ and $\tau = 0$. The effect fades over time; however, the event study pattern shows a clear relationship with the timing of minimum wage increases. As full-time employment falls, part-time employment rises. In the event study, the probability of part-time employment remains elevated throughout the window of analysis. When estimated in the difference-in-difference model, full-time employment exhibits negative but statistically insignificant effects, while the increase in part-time employment among immigrants is statistically significant and robust across empirical specifications.[6]

Our event study figures show effects on work hours in the year prior to the minimum wage increase, consistent with a response by employers at the time of announcement. We examine this issue further in Panels (e) and (f). Data on the date of announcement of minimum wage increases from Leung (2021) is only available from 2004 to 2016, limiting the sample size. In this figure we contrast event study models that are measure event relative to the date of implementation of the minimum wage increase in Panel (e) versus the date of announcement in Panel (f). The results in Panel (e) mirror those in our main results in Figure 1, which use the full sample of minimum wage changes between 1994 and 2019, namely that there is a three percent decline in hours among immigrants in the year prior to implementation. The event study in Panel (f) shows that this effect in

[6]In Appendix Figure A2, we expand the analysis to look at the employment effects across the wage distribution, following Cengiz et al. (2019). There are only small differences between natives and immigrants. In Appendix Table A2, we stratify the analysis based on whether individuals are working more or less than 35 hours in the first round of the CPS. We find that hours reductions occur among those initially working more than 35 hours, indicating the effects are not explained by workers responding to a higher minimum wage by joining the workforce in low hours jobs.

$\tau = -1$ goes to zero once we measure event time relative to the date of announcement. We conclude that the negative effects on hours in our primary specification is the result of an announcement effect. Nevertheless, in what follows we continue to base estimates off of the implementation date so that we can use the full sample of data from 1994 through 2019, but drop data from $\tau = -1$ in our regression analysis.

Our hours results could in principle reflect compositional changes rather than reduced hours among incumbent workers. For example, minimum wage increases could induce in-migration of immigrants working part-time or out-migration of formerly full-time workers. To assess this possibility, Table 2 reports effects on several population measures. In the basic state-by-year fixed effects specification, minimum wage increases are associated with a 2.8% decline in the total immigrant population, but this estimate is not robust to the inclusion of state linear trends or to a specification that controls for pre-existing trends projected from the first decade of the sample. In both cases, the estimated immigrant population effect is close to zero and statistically insignificant, and there is no evidence of population adjustment among natives. The same pattern holds when we restrict attention to high school dropouts, likely minimum wage workers, and the number of employed likely minimum wage workers, the most relevant margin for potential selection bias. In each case, negative immigrant population effects appear only in the basic specification and disappear once state trends are included, while native effects are small throughout. These findings indicate that migration and related composition effects are unlikely to explain our main labor market results. Although the migration estimates are somewhat specification-sensitive, our core results on wages, hours, and employment are not.

Our main results are robust across a wide range of specifications and sample definitions.[7] Stratifying by age shows no effect on hours or employment for native-born workers in any age group, while the negative hours effect for immigrants is concentrated among those ages 16 to 24, consistent with weaker attachment to the U.S. labor market. Reweighting natives to match immigrants on age, gender, race, and industry likewise yields little or no response among natives, indicating

[7] These results appear in Appendix Tables A3 to A11 and Appendix Figure A3.

that the immigrant-native difference is not driven by observable demographic or industry composition. The results are also stable across sample periods, when excluding California, New York, or Texas, and when adding controls for state immigration policies, alleviating concerns about staggered treatment, regional concentration, or correlated policy changes. Alternative methods for identifying likely minimum-wage workers, including boosting, linear, and lasso models, produce similar estimates, and the main patterns also appear in a simpler young, low-education sample, albeit less precisely. Varying the threshold for predicted minimum-wage status shows that the effects are concentrated among workers most likely to be directly affected by the minimum wage and attenuate as lower-probability workers are added. Finally, we find no evidence that workers offset the decline in hours through second jobs, which are extremely rare in this sample.

3.3 Heterogeneity by immigrants' legal status and time in the United States

We next assess the degree to which there is heterogeneity in our primary results by immigrants' legal status and time in the United States. This heterogeneity is important for understanding the underlying mechanisms that lead the minimum wage to affect hours of work. We do not observe migrants' legal status in the United States and so we follow an established literature to impute legal status. In particular, we follow Cho (2022) and impute a foreign-born individual to be documented if they meet any of the following conditions: indicates they are a U.S. citizen; arrived in the United States before 1981; is a veteran or is currently in the armed forces; works in the public sector; was born in Cuba; works in an occupation that requires some form of licensing; is in an occupation where it is likely they have an H-1B visa; or is an individual whose spouse or parent meet any one of the above conditions. All other foreign-born individuals are classified as undocumented immigrants.[8]

Table 3 reports difference-in-difference results for immigrants separately for those we impute to be undocumented and documented.[9] Effects on hourly wages, reported in Panel A, are positive for

[8]This procedure is quite similar to that in Borjas and Cassidy (2019), who used the American Community Survey.

[9]Appendix Table A12 reports heterogeneity results by immigrants' citizenship status; these results closely resemble the analysis of likely-undocumented immigrants due to the important role of citizenship status in the construction of

undocumented workers and in line with estimates for natives from Table 1. Effects for documented workers' wages appear somewhat larger than wage effects for undocumented and native workers.

Panel B presents estimated effects on the log of working hours and it is clear that outcomes among undocumented workers explain the immigrant–natives gaps we found in Table 1. Hours decline by 2.4% for the likely-undocumented, a statistically significant decline that is robust to the specification. In contrast, effects for immigrants who are likely documented are small and statistically insignificant. Effects on employment mirror our main results, with no evidence of a decline in the log employment rate for either group of immigrants. Consistent with the patterns from the hours and employment estimates, increases in part-time employment are concentrated among likely-undocumented immigrants. In sum, hours fall among likely-undocumented immigrants, while documented immigrants resemble natives in that their labor market outcomes appear unaffected by the wage increases induced by minimum wage reforms.

Figure A4 extends the analysis to examine how effects differ based on the years since immigrants arrived in the United States. To do this, we re-estimate equation 1 using all immigrants who have been in the United States at least k years, where $k = 1$ to 15. We then use equation 2 to form summary measures of the effects. This analysis offers a secondary measure of immigrants' attachment to the U.S. labor market, with immigrants who have been in the country for a longer time more likely to be in stable employment, more likely to have legal status to work, and less likely to return migrate in the near future.

The estimates in Figure A4 reinforce our finding that the hours effect on immigrants is concentrated among those with the lowest attachment to the U.S. labor market. Panel A shows that effect of minimum wage increases on hourly wages is not meaningfully related to immigrants' time in the United States. Panels B and C demonstrate that the main result are driven by a reduction in hours among immigrants who have been in the country for a shorter time period. Panel D confirms that there is no effect of the minumum wage on employment, regardless of time in the United States.

There are several takeaways from the analysis of effects by years since arrival in the United

the measure.

States. The decline in working hours is concentrated among recently arrived immigrants and, based on the net effect of wage and hours responses, reflects a labor demand elasticity near -1 for the most recent arrivals. A more nuanced takeaway is that the effects on wages and employment do not display heterogeneity when disaggregated on this dimension, further supporting the robustness of the null effects in the main analysis. Finally, Panel B offers a useful summary measure of the result that we will return to when we assess the effects of the minimum wage on inequality, below.

3.4 Effects by Industry Turnover Rates

The concentration of hours reductions among undocumented and recent arrivals established in the previous section raises the question of whether these results reflect the characteristics of this group that may be shared among some group of natives, or whether the results are driven by something specific to this group. Perhaps the primary distinguishing feature of the labor market for undocumented immigrants is high turnover.[10]

If the results reflect high turnover rates, we would expect to see effects concentrated among immigrants and natives who work in high-turnover industries. We operationalization this idea in Table 4, where we estimate wage and hours effects separately for immigrants and natives in industries based on their turnover rates and share of immigrant workers. This disaggregation allows us to examine heterogeneous effects by immigration status and turnover, as well as ask whether the distribution of immigrants across industries can explain the results.

In Panel A we examine wage effects, finding similar estimates (albeit noisily estimated) across all eight groups. Wage increases are reasonably precisely estimated around 2.4 to 3.1% for immigrants, in line with the full-sample effect reported in Table 1. Effects among natives similarly resemble the full-sample effects from above. There is no obvious pattern shared by immigrants and natives of higher wage increases in industries with high or low turnover, or with high or low immigrant shares. Although the estimates are slightly smaller for natives, we would not be able to reject the equality between immigrants and natives for any group. Thus, there is no evidence that

[10] Appendix Figure A5 shows the strong correlation between immigrant share and industry turnover rates.

heterogeneity in the direct wage effects explains the downstream effects on hours.

In Panel B, we examine the hours effects. For immigrants, there is a clear pattern of hours effects concentrated among high-turnover industries. Among immigrants in high turnover industries, working hours fall by 3.7% and 2.3% in industries with low and high immigrant shares. No such response is detected for low turnover industries, regardless of immigrant share. In low turnover industries, we find a 0.8% and 0.5% decline in hours worked for industries with a low and high immigrant share.

Turning to natives, there is no evidence of hours reductions in high turnover industries or industries with high shares of immigrants. The estimates are near zero or, in the case of high-turnover, low-immigrant industries, weakly positive. Thus, we conclude that insofar as turnover mediates the effects, immigrant status dominates.

We attempt further disaggregations of the data, in spite of limits imposed by the size of the sample. In Appendix Table A13 we disaggregate report the results for the large industry groups, agriculture, construction, manufacturing and service. We must heavily caveat these results based on the shifting sample sizes and missing cells. With that caution, we find evidence that hours cuts are largest in the agriculture and service sectors, both of which have high turnover, low tenure, and operate in ways that resemble spot markets. We again find no meaningful effects on natives. In unreported results, we examine effects separately by likely-undocumented status, finding effects consistent with the concentration of hours losses among the likely undocumented, albeit with considerable noise and missing data concerns.

In sum, hours losses appear most pronounced among immigrants in high-turnover industries; however, there is no analogous effect among natives in these same industries. The effects appear to be a function of immigrant status in industries with weak employment relationships.[11]

[11] We also examined month-to-month labor market transitions (Appendix Table A14). The largest response among immigrant workers is an increase in part-time workers remaining part-time, with fewer transitions to full-time and a small increase in workers transitioning from full-time to part-time employment. We find no evidence that composition effects in the form of transitions from unemployment or NILF explains the rise in part-time work.

4 Discussion and Conclusion

The response to minimum wage increases between immigrants and natives. First, there is a large hours reduction among immigrants, concentrated among younger, non-citizen and likely-undocumented immigrants. The hours effects appear among immigrants in high turnover industries, independent of the industries' immigrant share. We view this main result from our empirical analysis as an immigrant-specific effect, as there is no evidence of an analogous response for subgroups of natives that share similar characteristics. Second, there is no employment effect for natives or immigrants, or any subgroup we examine. We discuss plausible explanations and the empirical evidence for these mechanisms.

Our results indicate that firms respond to the minimum wage cost shock by reducing the demand for low-wage immigrant labor and adjusting through reductions in hours rather than employment. The incidence of these hours cuts fall on the most marginal immigrants: likely-undocumented, recently immigrated, and immigrants in high turnover industries. There are several likely reasons why the labor demand shock falls on these workers. These workers occupy the lowest rungs on the job ladder and so the value of the employment relationship to both firms and workers is largely based on the firm's current period labor demand. Additionally, the technology of production and scheduling in these industries, especially the food services sector, can accommodate marginal hours cuts. Employee benefits and non-wage compensation is small in these jobs, so increases in the minimum wage increases the likelihood that compensation costs exceed the marginal product of labor.

That adjustment falls on hours and not employment implies a value in maintaining an employment relationship with these workers and a cost to replacing them. Hiring frictions for these low-wage immigrants, especially those who are undocumented, are likely to be particularly high. Firms may have difficulty finding low-wage immigrant workers due to supply constraints and search frictions. Most low-wage immigrant workers are in manual labor jobs with few English requirements; previous studies have shown low rates of substitution between immigrants and natives (see e.g. Peri and Sparber, 2009). Similarly, these workers are perhaps less likely to search for or find al-

ternative jobs in the face of hours reductions. For all of these reasons, firms may have a greater incentive to maintain an employment relationship with these workers.

Our results do not reflect two closely-related sources of labor market frictions, monopsony and screening with asymmetric information. The reduction in hours for these groups of marginal immigrants are inconsistent with basic predictions from a monopsony model. To the extent that immigrants, especially undocumented immigrants, are exposed to high degrees of monopsony power, the gap between their wages and their marginal products (the wedge) will be larger and firms would be less likely to cut their hours, relative to native-born workers. The response in these groups also do not correspond to the predictions of models with asymmetric information with screening. Less-skilled, younger, recently-arrived immigrants are likely more heterogeneous than other low-skilled workers. Insofar as firms have screened their existing workers, groups with more heterogeneity would generate a more diverse (in terms of productivity) group of workers with fewer concentrated at the lower threshold for marginal product.

In summary, the evidence shows that the labor market adjustments induced by the minimum wage fall on marginal workers, in this case, immigrants with the least attachment to the labor market. These adjustments are not along the employment margin that so many studies have examined in the past. Instead, marginal workers work fewer hours and are more likely to remain in part-time work. The effects are concentrated among recently-arrived, likely-undocumented workers in high turnover industries. We conclude that immigration enforcement that limits imposes hiring costs and limits the replacement of these workers induces labor hoarding behavior among employers.

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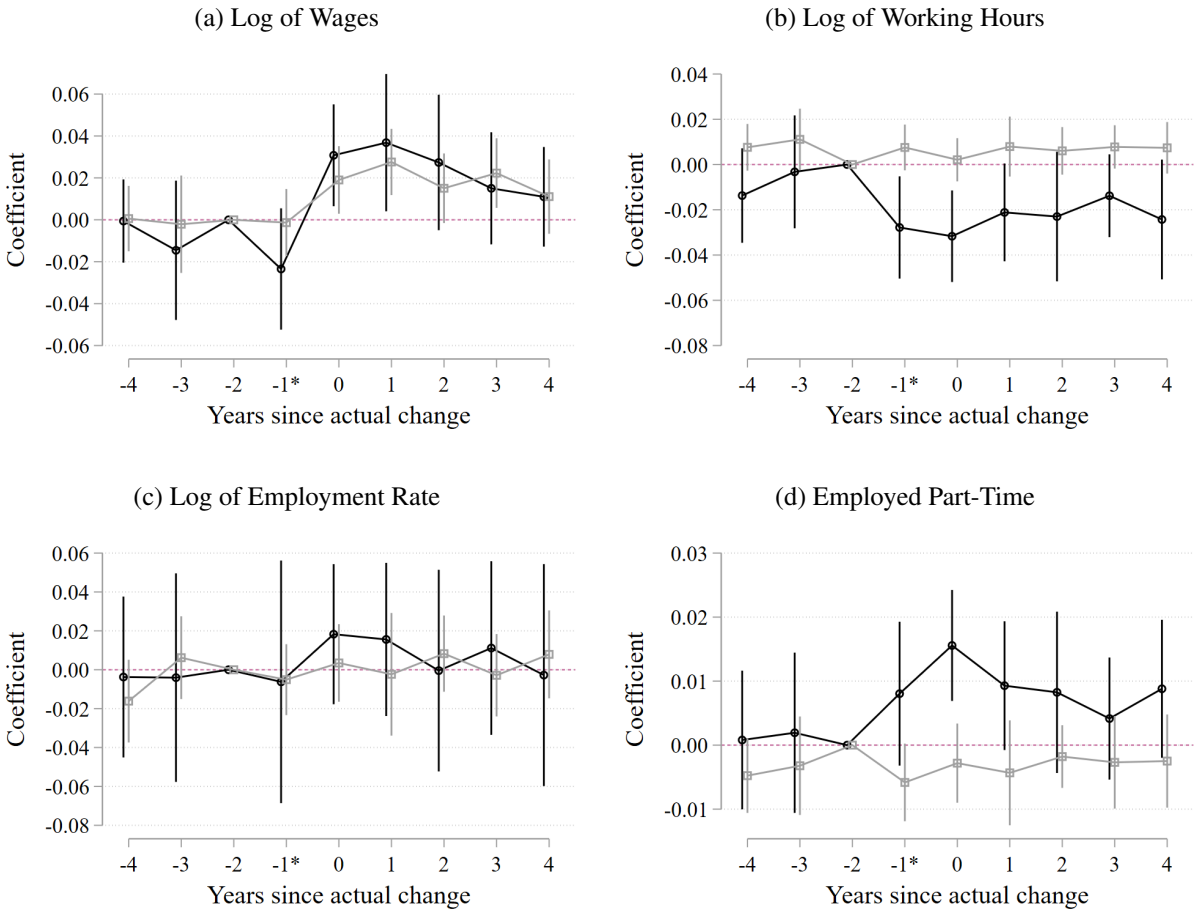
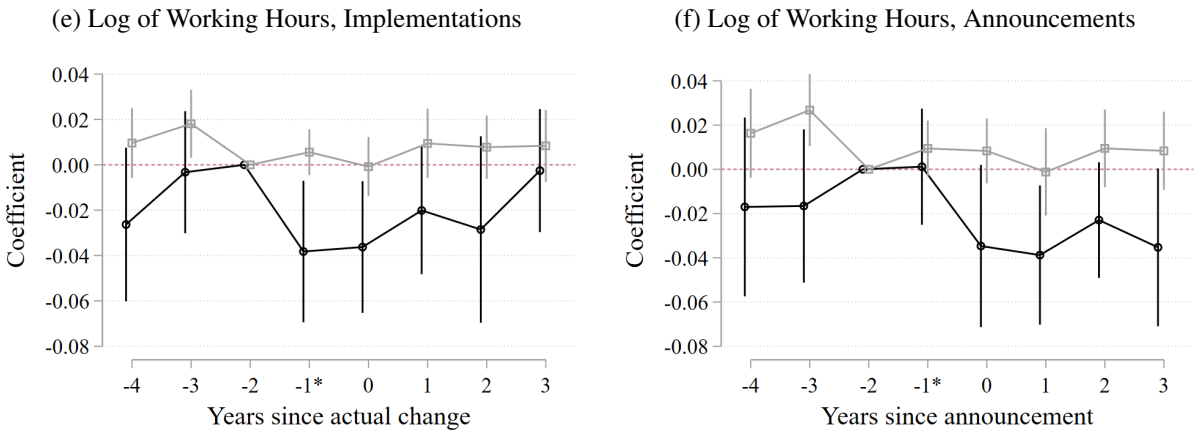
Figures and Tables

Figure 1: Impacts of Minimum Wages Over Time

I. Implementations Data (1994-2019)



II. Implementations and Announcements Data (2004-2016)



Notes: Figures plot the event-study coefficients from equation 1. We run separate regressions for immigrants (black) and natives (gray). Standard errors are clustered by state. Vertical lines represent 95 percent confidence intervals. The event windows are -4 (4 years before the minimum wage increase) and +4 (4 years after the minimum wage increase). I use 148 "prominent" minimum wage increase events from 1994 to 2019, where the minimum wage increased by more than $0.25 and over 2% of the workforce earned between the old and new minimum wages. I normalize the effect two years before the treatment (β_2) to zero. In Panels (e) and (f), I use 91 "prominent" minimum wage increase events from 2004 to 2016, where the minimum wage was announced.

Table 1: Impacts of Minimum Wages on Labor Market Outcomes

	Immigrants			Natives		
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Log of Hourly Wage					
Average Effects of Minimum Wages	0.029***	0.029***	0.027***	0.020***	0.019***	0.019***
	(0.009)	(0.008)	(0.008)	(0.003)	(0.003)	(0.003)
Elasticity	0.340	0.338	0.316	0.223	0.221	0.217
Mean of Outcome	10.68	10.68	10.68	9.85	9.85	9.85
	Panel B: Log of Working Hours					
Average Effects of Minimum Wages	-0.017***	-0.017***	-0.016***	0.000	-0.000	-0.000
	(0.004)	(0.005)	(0.005)	(0.003)	(0.003)	(0.003)
Elasticity	-0.200	-0.203	-0.187	0.000	-0.002	-0.005
Mean of Outcome	31.46	31.46	31.46	22.52	22.52	22.52
	Panel C: Log of Employment Rate					
Average Effects of Minimum Wages	0.011	0.010	0.010	0.006	0.006	0.009
	(0.010)	(0.011)	(0.013)	(0.007)	(0.006)	(0.006)
Elasticity	0.128	0.122	0.116	0.071	0.063	0.098
Mean of Outcome	0.37	0.37	0.37	0.36	0.36	0.36
	Panel D: Employed Full-Time					
Average Effects of Minimum Wages	-0.005	-0.005*	-0.005	0.001	0.001	0.001
	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)
Mean of Outcome	0.22	0.22	0.22	0.09	0.09	0.09
	Panel E: Employed Part-Time					
Average Effects of Minimum Wages	0.008***	0.008***	0.008***	-0.000	-0.000	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Mean of Outcome	0.15	0.15	0.15	0.25	0.25	0.25
Number of Events	167	167	167	168	168	168
Number of Observations	1323	1323	1323	1326	1326	1326
Number of Individuals	223996	223996	223996	1882984	1882984	1882984
Controls						
State Fixed Effects	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y	Y	Y
Unemployment Rate		Y	Y		Y	Y
State Linear Trends			Y			Y

Notes: Standard errors are clustered by state and shown in parentheses. Regressions are weighted by the number of observations in each cell. Stars denote statistical significance at the 0.1 (*), 0.05 (**), and 0.01 (***) levels.

Table 2: Impacts of Minimum Wages on the Number of Immigrants and Natives

	Immigrants			Natives		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log of Total Population						
Average Effects of Minimum Wages	-0.028***	-0.005	0.004	-0.001	-0.001	-0.001
	(0.009)	(0.003)	(0.009)	(0.003)	(0.002)	(0.002)
Elasticity	-0.341	-0.063	0.045	-0.016	-0.013	-0.016
Panel B: Log of # of High School Dropouts						
Average Effects of Minimum Wages	-0.042***	-0.004	0.019	-0.004	-0.009*	-0.012**
	(0.014)	(0.008)	(0.016)	(0.005)	(0.005)	(0.005)
Elasticity	-0.499	-0.052	0.229	-0.043	-0.099	-0.141
Panel C: Log of # of Likely Minimum Wage Workers						
Average Effects of Minimum Wages	-0.038***	-0.007	0.008	-0.002	-0.005	-0.007*
	(0.012)	(0.006)	(0.013)	(0.004)	(0.004)	(0.004)
Elasticity	-0.459	-0.087	0.092	-0.017	-0.060	-0.078
Panel D: Log of # of Employed Likely Minimum Wage Workers						
Average Effects of Minimum Wages	-0.032**	-0.002	0.014	0.001	-0.001	-0.004
	(0.013)	(0.007)	(0.013)	(0.005)	(0.003)	(0.005)
Elasticity	-0.383	-0.029	0.164	0.017	-0.011	-0.048
Controls						
State Fixed Effects	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y	Y	Y
State Linear Trends (1994-2019)		Y			Y	
State Linear Trends (1994-2003)			Y			Y

Notes: Standard errors are clustered by state and shown in parentheses. Regressions are weighted by the number of observations in each cell. Stars denote statistical significance at the 0.1 (*), 0.05 (**), and 0.01 (***) levels.

Table 3: Impacts of Minimum Wages on Likely Undocumented and Documented Immigrants

	Undocumented			Documented		
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Log of Hourly Wage					
Average Effects of Minimum Wages	0.021***	0.020***	0.021***	0.038***	0.038***	0.034***
	(0.008)	(0.007)	(0.007)	(0.010)	(0.010)	(0.010)
Elasticity	0.244	0.236	0.242	0.440	0.441	0.397
Mean of Outcome	10.43	10.43	10.43	11.07	11.07	11.07
	Panel B: Log of Working Hours					
Average Effects of Minimum Wages	-0.024***	-0.024***	-0.023***	-0.006	-0.007	-0.005
	(0.005)	(0.005)	(0.006)	(0.008)	(0.008)	(0.009)
Elasticity	-0.274	-0.280	-0.266	-0.076	-0.077	-0.053
Mean of Outcome	32.62	32.62	32.62	29.46	29.46	29.46
	Panel C: Log of Employment Rate					
Average Effects of Minimum Wages	0.010	0.010	0.009	0.015	0.015	0.015
	(0.014)	(0.014)	(0.015)	(0.015)	(0.017)	(0.019)
Elasticity	0.119	0.113	0.101	0.177	0.174	0.181
Mean of Outcome	0.38	0.38	0.38	0.36	0.36	0.36
	Panel D: Employed Full-Time					
Average Effects of Minimum Wages	-0.007	-0.008*	-0.008*	-0.001	-0.001	-0.001
	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)
Mean of Outcome	0.24	0.24	0.24	0.19	0.19	0.19
	Panel E: Employed Part-Time					
Average Effects of Minimum Wages	0.011***	0.012***	0.011***	0.004	0.004	0.004
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)
Mean of Outcome	0.14	0.14	0.14	0.17	0.17	0.17
Number of Events	165	165	165	165	165	165
Number of Observations	1303	1303	1303	1305	1305	1305
Number of Individuals	132994	132994	132994	87767	87767	87767
Controls						
State Fixed Effects	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y	Y	Y
Unemployment Rate		Y	Y		Y	Y
State Linear Trends			Y			Y

Notes: Standard errors are clustered by state and shown in parentheses. Regressions are weighted by the number of observations in each cell. Stars denote statistical significance at the 0.1 (*), 0.05 (**), and 0.01 (***) levels.

Table 4: Impacts of Minimum Wages by Industry Turnover and Immigrant Share

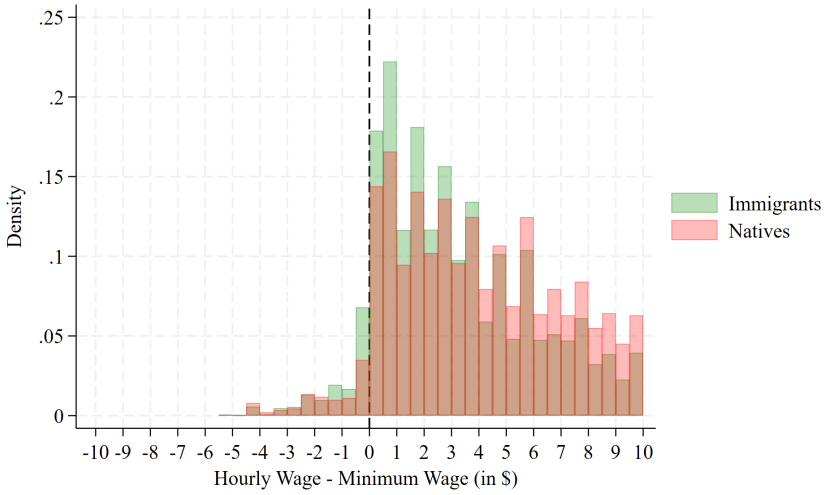
	Immigrants				Natives			
Industry Categories	Low	Low	High	High	Low	Low	High	High
by Turnover Rate	Turn	Turn	Turn	Turn	Turn	Turn	Turn	Turn
Industry Categories	Low	High	Low	High	Low	High	Low	High
by Immigrant Share	Imm	Imm	Imm	Imm	Imm	Imm	Imm	Imm
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Log of Hourly Wage								
Avg MW Effects	0.024**	0.025**	0.030*	0.031***	0.016***	0.009	0.023***	0.025***
	(0.011)	(0.012)	(0.016)	(0.010)	(0.004)	(0.008)	(0.006)	(0.005)
Mean of Outcome	11.11	11.43	10.50	9.88	10.27	10.77	9.86	8.82
Panel B: Log of Working Hour								
Avg MW Effects	-0.008	-0.005	-0.037**	-0.023***	-0.000	0.004	0.010*	-0.006
	(0.008)	(0.006)	(0.019)	(0.006)	(0.005)	(0.007)	(0.006)	(0.004)
Mean of Outcome	29.52	35.77	28.58	30.30	22.99	26.82	20.93	20.91
Number of Events	158	154	124	158	168	168	168	168
Number of Observations	1163	1165	923	1182	1326	1326	1326	1326
Number of Individuals	25069	24366	8279	33569	308510	87542	125189	275514
Controls								
State Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y

Notes: Standard errors are clustered by state and shown in parentheses. Regressions are weighted by the number of observations in each cell. Stars denote statistical significance at the 0.1 (*), 0.05 (**), and 0.01 (***) levels.

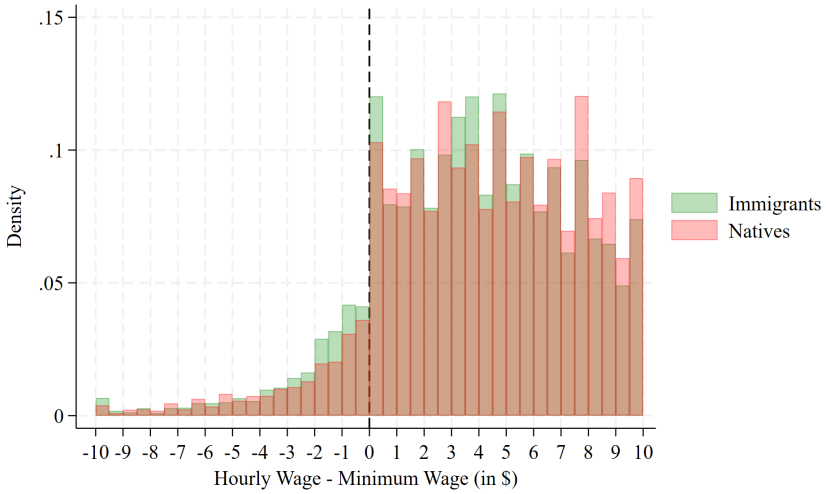
Appendix Figures and Tables

Figure A1: Wage Distribution of Immigrants and Natives, Ages 16 to 54

(a) Year 1994

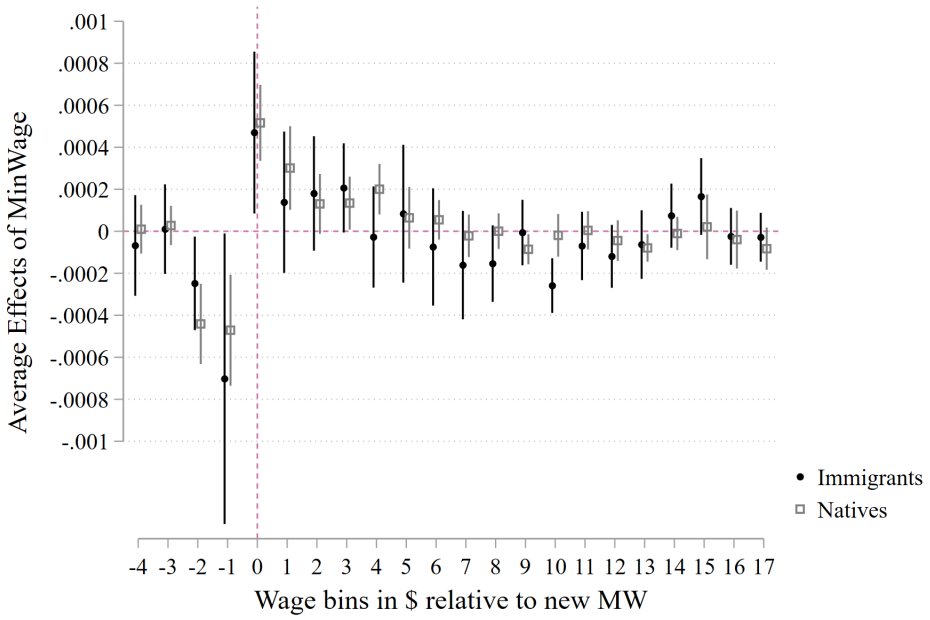


(b) Year 2019



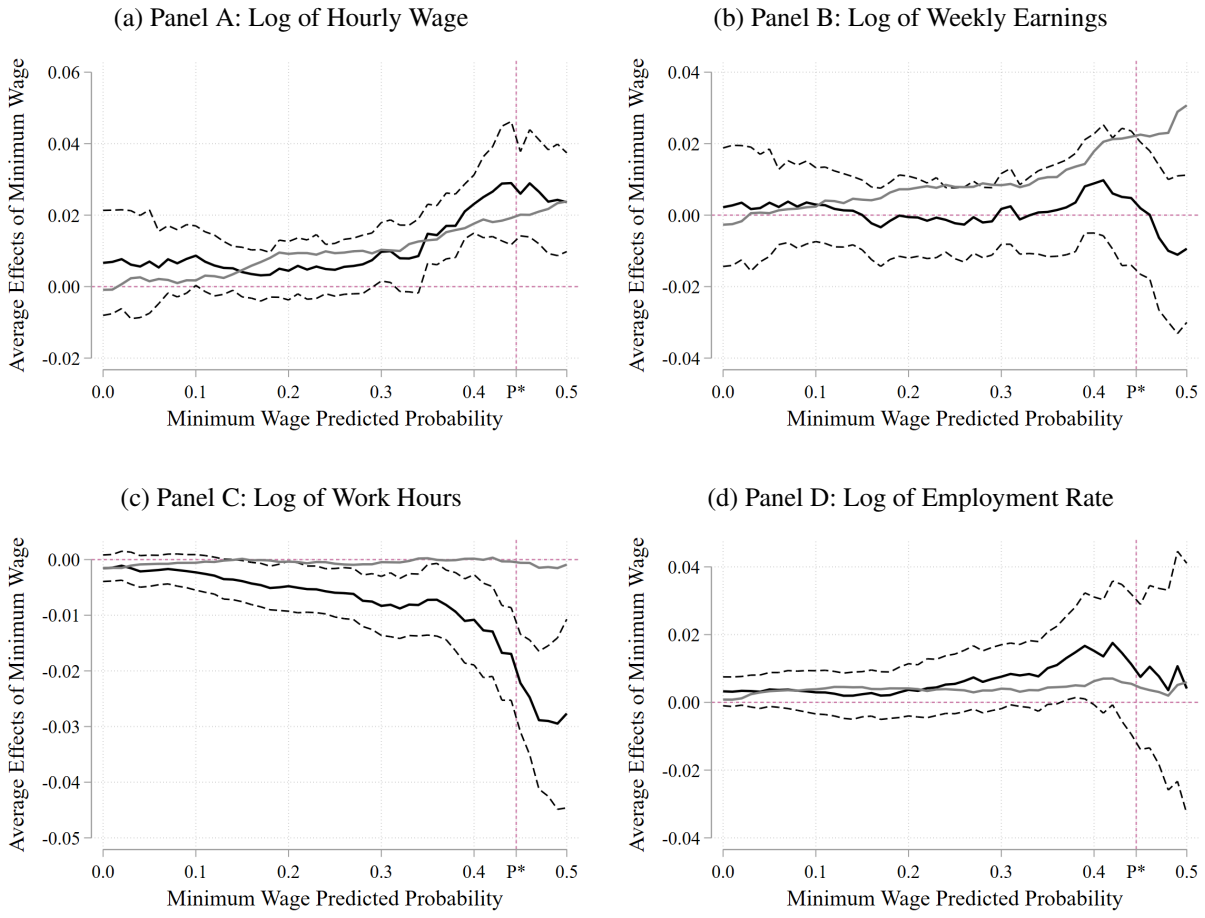
Notes: CPS sample aged 16 to 54.

Figure A2: Impacts of Minimum Wages on Bin-level Employment Probability



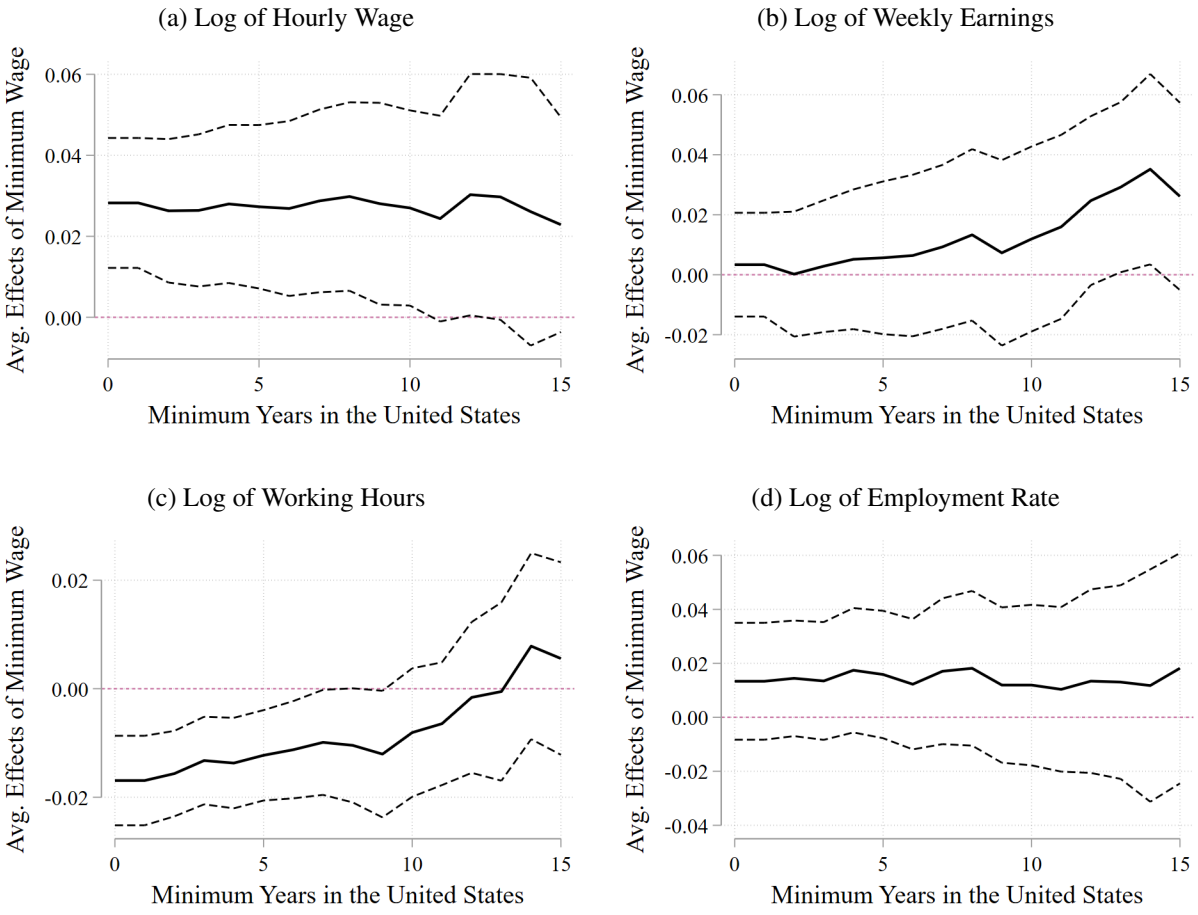
Notes: CPS sample aged 16 to 54.

Figure A3: Impacts of Minimum Wages for Alternative Predicted Probability Thresholds



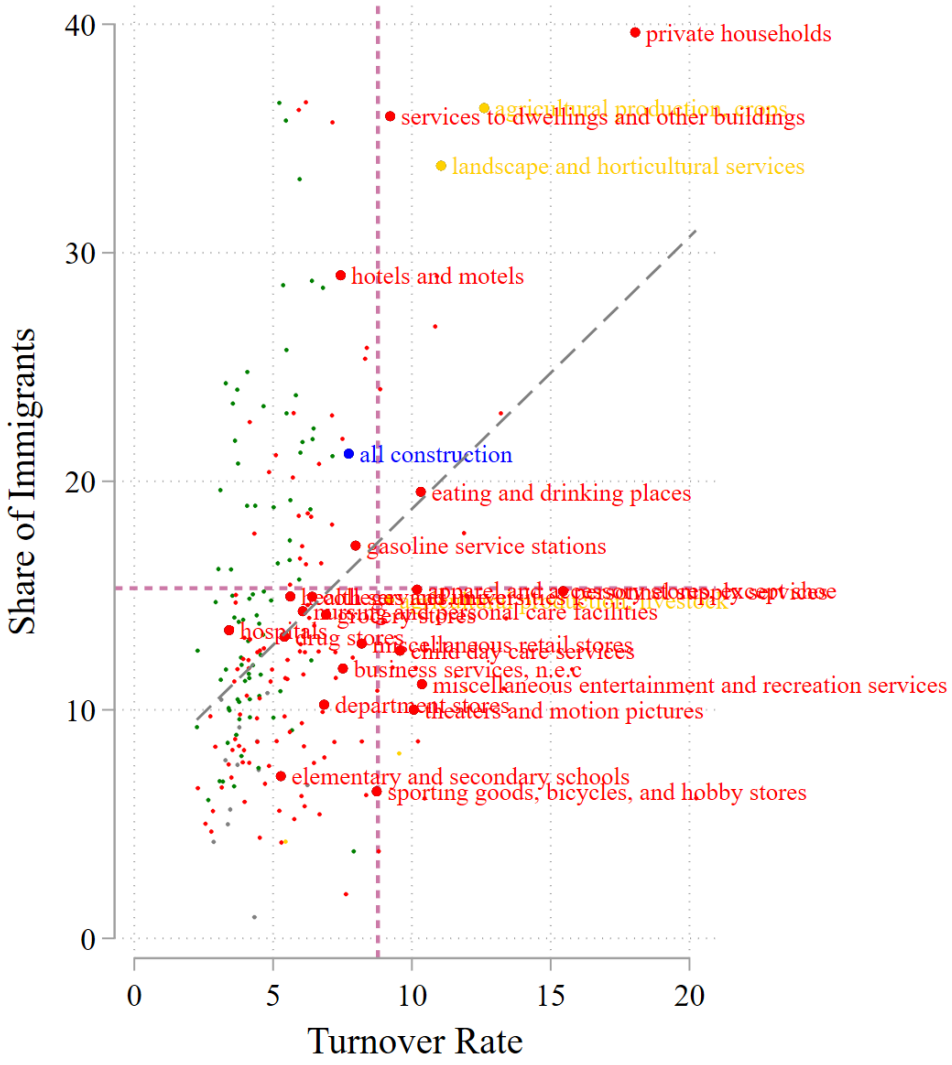
Notes: Black and gray lines represent the coefficients of immigrants and natives respectively. Robust standard errors are clustered by state. The dashed lines represent 95 percent confidence intervals for immigrants.

Figure A4: Impacts of Minimum Wages on Immigrants by Years Since Arrival in the United States



Notes: Black lines represent the coefficients of immigrants. Robust standard errors are clustered by state. The dashed lines represent 95 percent confidence intervals for immigrants.

Figure A5: Turnover Rate and Immigrant Share by Industry



Notes: Yello: agriculture, blue: construction, Green: manufacturing red: service,

Table A1: Characteristics of Likely Minimum Wage Workers

	Immigrants (1)	Natives (2)
Female	0.71	0.59
Age		
16 to 19	0.56	0.93
20 to 29	0.24	0.06
30 to 54	0.20	0.01
Race		
White	0.09	0.58
Black	0.07	0.17
Hispanic	0.64	0.19
Education		
Less than High School	0.80	0.75
High School Degree	0.10	0.13
Some College	0.09	0.12
Labor Market Outcomes		
Employed	0.36	0.34
Working Hours	31.71	22.59
Weekly Earnings	352.31	240.60
Hourly Wage	10.67	9.81
Industry		
Agriculture	0.06	0.03
Construction	0.05	0.02
Manufacturing	0.13	0.04
Service	0.75	0.90
Share Relative to Population	0.08	0.10
Observations	224,910	1,898,688

Notes: Standard errors are clustered by state and shown in parentheses. Regressions are weighted by the number of observations in each cell. Stars denote statistical significance at the 0.1 (*), 0.05 (**), and 0.01 (***) levels.

Table A2: Impacts of Minimum Wages by Working Hours in the First CPS Survey

Working Hours in 1st Survey	Immigrants		Natives	
	≥ 35	< 35	≥ 35	< 35
	(1)	(2)	(3)	(4)
Panel A: Log of Hourly Wage				
Average Effects of Minimum Wages	0.032***	0.022**	0.020***	0.020***
	(0.009)	(0.009)	(0.004)	(0.005)
Mean	10.95	9.98	10.43	9.38
Panel B: Log of Working Hours				
Average Effects of Minimum Wages	-0.015***	0.007	0.004	-0.003
	(0.003)	(0.010)	(0.003)	(0.003)
Mean	36.37	18.04	31.25	16.00
Panel C: Log of Employment Rate				
Average Effects of Minimum Wages	0.006	-0.004	-0.001	-0.001
	(0.007)	(0.013)	(0.004)	(0.003)
Mean	0.77	0.55	0.72	0.59
Panel D: Employed Full-Time				
Average Effects of Minimum Wages	-0.007*	-0.003	0.006**	0.000
	(0.004)	(0.002)	(0.002)	(0.000)
Mean	0.60	0.02	0.43	0.01
Panel E: Employed Part-Time				
Average Effects of Minimum Wages	0.013***	0.002	-0.007***	-0.002
	(0.004)	(0.006)	(0.002)	(0.002)
Mean	0.16	0.51	0.28	0.55
Number of Events	160	160	168	168
Number of Observations	1268	1224	1326	1326
Number of Individuals	67428	35078	339430	586233
Controls				
State Fixed Effects	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y

fi *Notes:* Standard errors are clustered by state and shown in parentheses. Regressions are weighted by the number of observations in each cell. Stars denote statistical significance at the 0.1 (*), 0.05 (**), and 0.01 (***) levels.

Table A3: Impacts of Minimum Wages by Age Group in the Likely Minimum Wage Sample

	Immigrants			Natives		
Age Group	16-19	20-24	25-54	16-19	20-24	25-54
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log of Hourly Wage						
Average Minimum Wage Effects	0.017*	0.027**	0.033***	0.016***	0.037***	0.019*
	(0.009)	(0.012)	(0.010)	(0.004)	(0.007)	(0.011)
Mean	10.29	10.56	11.26	9.73	10.87	12.04
Panel B: Log of Working Hours						
Average Minimum Wage Effects	-0.028***	-0.026**	-0.002	-0.000	0.001	-0.006
	(0.010)	(0.010)	(0.006)	(0.004)	(0.005)	(0.007)
Mean	26.35	34.13	35.72	21.56	30.82	34.53
Panel C: Log of Employment Rate						
Average Minimum Wage Effects	0.019	-0.018	0.021	0.005	0.008	-0.020
	(0.018)	(0.018)	(0.017)	(0.008)	(0.013)	(0.020)
Mean	0.27	0.48	0.53	0.35	0.45	0.45
Panel D: Employed Full-Time						
Average Minimum Wage Effects	-0.006**	-0.013	0.000	0.001	0.002	-0.011
	(0.002)	(0.008)	(0.007)	(0.001)	(0.005)	(0.007)
Mean	0.11	0.33	0.40	0.08	0.25	0.33
Panel E: Employed Part-Time						
Average Minimum Wage Effects	0.009**	0.012*	0.008	-0.000	0.004	0.003
	(0.004)	(0.006)	(0.005)	(0.002)	(0.004)	(0.006)
Mean	0.16	0.14	0.13	0.26	0.19	0.11
Number of Events	167	157	156	168	168	160
Number of Observations	1316	1209	1198	1326	1325	1255
Number of Individuals	127394	42268	50188	1758939	98770	28434
Controls						
State Fixed Effects	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y	Y	Y

Notes: Standard errors are clustered by state and shown in parentheses. Regressions are weighted by the number of observations in each cell. Stars denote statistical significance at the 0.1 (*), 0.05 (**), and 0.01 (***) levels.

Table A4: Characteristics of Likely Minimum Wage Workers: Reweighted Natives

	Immigrants	Natives	Reweighted Natives		
	(1)	(2)	(3)	(4)	(5)
Female	0.71	0.59	0.70	0.70	0.69
Age					
16 to 19	0.56	0.93	0.57	0.58	0.59
20 to 29	0.24	0.06	0.26	0.26	0.26
30 to 54	0.20	0.01	0.17	0.17	0.15
Race					
White	0.09	0.58	0.38	0.08	0.08
Black	0.07	0.17	0.15	0.08	0.08
Hispanic	0.64	0.19	0.37	0.67	0.67
Education					
Less than High School	0.80	0.75	0.79	0.77	0.77
High School Degree	0.10	0.13	0.11	0.12	0.12
Some College	0.09	0.12	0.11	0.11	0.11
Labor Market Outcomes					
Employed	0.36	0.34	0.38	0.35	0.32
Working Hours	31.71	22.59	27.69	28.88	29.47
Weekly Earnings	352.31	240.60	319.24	337.81	337.84
Hourly Wage	10.67	9.81	10.61	10.87	10.77
Industry					
Agriculture	0.06	0.03	0.03	0.02	0.06
Construction	0.05	0.02	0.02	0.03	0.06
Manufacturing	0.13	0.04	0.07	0.07	0.11
Service	0.75	0.90	0.87	0.86	0.77
Variables for Reweighting					
Age			Y	Y	Y
Sex			Y	Y	Y
Race				Y	Y
Industry					Y

Notes: Used logit model with fixed effects. Reweighted using CPS weights * p/(1-p). Industry category includes "no industry."

Table A5: Impacts of Minimum Wages on Labor Market Outcomes of Reweighted Natives

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Panel A: Log of Hourly Wage				
Avg MW Effects	0.020***	0.022***	0.024***	0.022***	0.020***	0.020***	0.021***	0.021***
	(0.003)	(0.002)	(0.006)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)
Mean of Outcome	9.86	9.88	10.59	10.64	10.88	10.91	10.88	10.90
				Panel B: Log of Working Hours				
Avg MW Effects	-0.000	0.001	-0.003	-0.006*	-0.005	-0.008**	-0.000	-0.001
	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)
Mean of Outcome	22.55	22.70	27.20	27.56	28.40	28.53	28.89	29.04
				Panel C: Log of Employment Rate				
Avg MW Effects	0.006	0.008	0.002	-0.001	0.001	-0.001	0.005	0.002
	(0.007)	(0.008)	(0.008)	(0.009)	(0.010)	(0.012)	(0.012)	(0.012)
Mean of Outcome	0.36	0.34	0.40	0.39	0.36	0.36	0.34	0.33
				Panel D: Employed Full-Time				
Avg MW Effects	0.001	0.001	-0.000	-0.001	-0.002	-0.002	-0.000	0.000
	(0.001)	(0.001)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)
Mean of Outcome	0.09	0.09	0.18	0.18	0.18	0.17	0.17	0.17
				Panel E: Employed Part-Time				
Avg MW Effects	-0.000	-0.001	0.001	0.001	0.002	0.001	0.002	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Mean of Outcome	0.25	0.24	0.21	0.20	0.18	0.18	0.16	0.15
Variables for Reweighting								
Age			Y	Y	Y	Y	Y	Y
Sex			Y	Y	Y	Y	Y	Y
Race					Y	Y	Y	Y
Industry							Y	Y
Cell Regression Weights								
Sum of p/(1-p)	Y		Y		Y		Y	
Sum of CPS weights*(p/(1-p))		Y		Y		Y		Y

Notes: Standard errors are clustered by state and shown in parentheses. Regressions are weighted by the number of observations in each cell. Stars denote statistical significance at the 0.1 (*), 0.05 (**), and 0.01 (***) levels.

Table A6: Impacts of Minimum Wages by Different Time Periods

	Immigrants			Natives		
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Log of Hourly Wage					
Average Effects of Minimum Wages	0.029***	0.036***	0.022***	0.020***	0.016***	0.018***
	(0.009)	(0.014)	(0.007)	(0.003)	(0.005)	(0.003)
Elasticity	0.340	0.364	0.259	0.223	0.149	0.206
Mean of Outcome	10.68	10.50	10.88	9.85	9.68	10.03
	Panel B: Log of Working Hours					
Average Effects of Minimum Wages	-0.017***	-0.017**	-0.019***	0.000	0.010**	-0.001
	(0.004)	(0.007)	(0.005)	(0.003)	(0.005)	(0.003)
Elasticity	-0.200	-0.174	-0.226	0.000	0.097	-0.010
Mean of Outcome	31.46	32.02	31.38	22.52	22.67	22.42
	Panel C: Log of Employment Rate					
Average Effects of Minimum Wages	0.011	0.005	0.007	0.006	-0.002	0.010
	(0.010)	(0.019)	(0.011)	(0.007)	(0.010)	(0.007)
Elasticity	0.128	0.051	0.086	0.071	-0.020	0.117
Mean of Outcome	0.37	0.39	0.37	0.36	0.40	0.34
	Panel D: Employed Full-Time					
Average Effects of Minimum Wages	-0.005	-0.003	-0.007**	0.001	0.004*	0.001
	(0.003)	(0.005)	(0.003)	(0.001)	(0.002)	(0.001)
Elasticity	-0.056	-0.031	-0.082	0.011	0.038	0.010
Mean of Outcome	0.22	0.24	0.22	0.09	0.11	0.09
	Panel E: Employed Part-Time					
Average Effects of Minimum Wages	0.008***	0.005	0.008***	-0.000	-0.003	0.001
	(0.002)	(0.005)	(0.002)	(0.002)	(0.002)	(0.001)
Elasticity	0.097	0.055	0.098	-0.002	-0.025	0.012
Mean of Outcome	0.15	0.15	0.15	0.25	0.28	0.24
Number of Events	167	77	155	168	78	156
Number of Observations	1323	814	1018	1326	816	1020
Number of Individuals	223996	147794	173520	1882984	1196560	1455044
Controls						
State Fixed Effects	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y	Y	Y
Time Periods						
1994-2019	Y			Y		
1994-2009		Y			Y	
2000-2019			Y			Y

Notes: Standard errors are clustered by state and shown in parentheses. Regressions are weighted by the number of observations in each cell. Stars denote statistical significance at the 0.1 (*), 0.05 (**), and 0.01 (***) levels.

Table A7: Impacts of Minimum Wages, Dropping California, New York, or Texas

	Immigrants			Natives		
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Log of Hourly Wage					
Average Effects of Minimum Wages	0.014**	0.034***	0.030***	0.017***	0.020***	0.020***
	(0.007)	(0.009)	(0.009)	(0.003)	(0.004)	(0.003)
Elasticity	0.157	0.397	0.346	0.189	0.222	0.223
Mean of Outcome	10.62	10.69	10.73	9.75	9.84	9.87
	Panel B: Log of Working Hours					
Average Effects of Minimum Wages	-0.015***	-0.016***	-0.019***	-0.002	0.002	-0.001
	(0.006)	(0.005)	(0.004)	(0.004)	(0.003)	(0.003)
Elasticity	-0.163	-0.188	-0.217	-0.017	0.023	-0.009
Mean of Outcome	31.31	31.31	31.27	22.43	22.56	22.32
	Panel C: Log of Employment Rate					
Average Effects of Minimum Wages	0.019	0.013	0.008	0.000	0.010	0.006
	(0.014)	(0.012)	(0.010)	(0.005)	(0.006)	(0.007)
Elasticity	0.210	0.155	0.089	0.000	0.113	0.066
Mean of Outcome	0.38	0.38	0.37	0.37	0.36	0.36
	Panel D: Employed Full-Time					
Average Effects of Minimum Wages	-0.003	-0.004	-0.006**	0.001	0.002*	0.001
	(0.004)	(0.004)	(0.003)	(0.001)	(0.001)	(0.001)
Elasticity	-0.036	-0.048	-0.070	0.009	0.020	0.009
Mean of Outcome	0.22	0.22	0.22	0.10	0.10	0.09
	Panel E: Employed Part-Time					
Average Effects of Minimum Wages	0.009***	0.009***	0.008***	-0.001	0.001	-0.000
	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.002)
Elasticity	0.099	0.106	0.095	-0.013	0.008	-0.000
Mean of Outcome	0.15	0.15	0.15	0.26	0.26	0.26
Number of Events	155	158	167	156	159	168
Number of Observations	1297	1297	1297	1300	1300	1300
Number of Individuals	171562	204433	203468	1727520	1795110	1774203
Controls						
State Fixed Effects	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y	Y	Y
Sample Restrictions						
Drop California	Y			Y		
Drop New York		Y			Y	
Drop Texas			Y			Y

Notes: Standard errors are clustered by state and shown in parentheses. Regressions are weighted by the number of observations in each cell. Stars denote statistical significance at the 0.1 (*), 0.05 (**), and 0.01 (***) levels.

Table A8: Impacts of Minimum Wages,Controlling Immigration Policies

	Immigrants			Natives		
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Log of Hourly Wage					
Average Effects of Minimum Wages	0.030***	0.030***	0.030***	0.019***	0.019***	0.019***
	(0.009)	(0.009)	(0.009)	(0.003)	(0.003)	(0.003)
Elasticity	0.348	0.350	0.346	0.219	0.221	0.212
Mean of Outcome	10.68	10.68	10.68	9.85	9.85	9.85
	Panel B: Log of Working Hours					
Average Effects of Minimum Wages	-0.016***	-0.016***	-0.014***	0.001	0.001	0.000
	(0.005)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)
Elasticity	-0.185	-0.182	-0.163	0.008	0.007	0.002
Mean of Outcome	31.46	31.46	31.46	22.52	22.52	22.52
	Panel C: Log of Employment Rate					
Average Effects of Minimum Wages	0.008	0.008	0.008	0.007	0.006	0.005
	(0.010)	(0.010)	(0.011)	(0.007)	(0.006)	(0.006)
Elasticity	0.090	0.095	0.094	0.076	0.067	0.052
Mean of Outcome	0.37	0.37	0.37	0.36	0.36	0.36
	Panel D: Employed Full-Time					
Average Effects of Minimum Wages	-0.005	-0.005	-0.004	0.001	0.001	0.001
	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)
Elasticity	-0.058	-0.058	-0.051	0.014	0.015	0.013
Mean of Outcome	0.22	0.22	0.22	0.09	0.09	0.09
	Panel E: Employed Part-Time					
Average Effects of Minimum Wages	0.007***	0.007***	0.007***	-0.000	-0.000	-0.000
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Elasticity	0.085	0.086	0.077	-0.003	-0.004	-0.002
Mean of Outcome	0.15	0.15	0.15	0.25	0.25	0.25
Number of Events	167	167	167	168	168	168
Number of Observations	1323	1323	1323	1326	1326	1326
Number of Individuals	223996	223996	223996	1882984	1882984	1882984
Controls						
State Fixed Effects	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y	Y	Y
Immigration Policy Controls						
Driver's Licenses	Y	Y	Y	Y	Y	Y
E-Verify		Y	Y		Y	Y
287(g) Agreements			Y			Y
Secure Communities			Y			Y

Notes: Standard errors are clustered by state and shown in parentheses. Regressions are weighted by the number of observations in each cell. Stars denote statistical significance at the 0.1 (*), 0.05 (**), and 0.01 (***) levels.

Table A9: Impacts of Minimum Wages, Different Methods of Predicting Minimum Wage Workers

	Immigrants			Natives		
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Log of Hourly Wage					
Average Effects of Minimum Wages	0.019**	0.018***	0.022***	0.017***	0.010***	0.016***
	(0.009)	(0.007)	(0.008)	(0.003)	(0.003)	(0.004)
Mean of Outcome	10.40	10.89	10.52	9.88	10.17	9.86
	Panel B: Log of Working Hours					
Average Effects of Minimum Wages	-0.028***	-0.016***	-0.021***	0.001	-0.001	-0.000
	(0.006)	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)
Mean of Outcome	29.78	33.00	30.76	22.79	24.50	22.48
	Panel C: Log of Employment Rate					
Average Effects of Minimum Wages	0.002	0.009	0.012	0.007	0.008	0.007
	(0.011)	(0.006)	(0.010)	(0.007)	(0.005)	(0.006)
Mean of Outcome	0.34	0.46	0.36	0.37	0.41	0.36
	Panel D: Employed Full-Time					
Average Effects of Minimum Wages	-0.010***	-0.005	-0.005*	0.001	0.001	0.001
	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)
Mean of Outcome	0.18	0.30	0.20	0.10	0.14	0.09
	Panel E: Employed Part-Time					
Average Effects of Minimum Wages	0.010***	0.009***	0.009***	-0.000	0.001	0.000
	(0.003)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Mean of Outcome	0.16	0.15	0.15	0.26	0.26	0.26
Number of Events	167	167	167	168	168	168
Number of Observations	1322	1322	1322	1326	1326	1326
Number of Individuals	175881	259931	216383	1939470	1835012	1890991
Controls						
State Fixed Effects	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y	Y	Y
Prediction Method						
Boosting	Y			Y		
Linear		Y			Y	
Lasso			Y			Y

Notes: Standard errors are clustered by state and shown in parentheses. Regressions are weighted by the number of observations in each cell. Stars denote statistical significance at the 0.1 (*), 0.05 (**), and 0.01 (***) levels.

Table A10: Impacts of Minimum Wages on Aged 16-21 without High School Degrees

	Immigrants			Natives		
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Log of Hourly Wage					
Average Effects of Minimum Wages	0.010	0.010	0.007	0.009**	0.009**	0.009**
	(0.011)	(0.010)	(0.010)	(0.004)	(0.004)	(0.004)
Elasticity	0.115	0.111	0.081	0.103	0.102	0.104
Mean of Outcome	11.48	11.48	11.48	11.39	11.39	11.39
	Panel B: Log of Working Hours					
Average Effects of Minimum Wages	-0.013**	-0.013**	-0.011	-0.002	-0.002	-0.000
	(0.006)	(0.006)	(0.006)	(0.003)	(0.002)	(0.002)
Elasticity	-0.148	-0.150	-0.122	-0.019	-0.021	-0.003
Mean of Outcome	32.36	32.36	32.36	29.25	29.25	29.25
	Panel C: Log of Employment Rate					
Average Effects of Minimum Wages	0.013	0.013	0.018**	0.003	0.002	0.006
	(0.008)	(0.008)	(0.008)	(0.005)	(0.004)	(0.004)
Elasticity	0.151	0.150	0.203	0.031	0.028	0.064
Mean of Outcome	0.51	0.51	0.51	0.56	0.56	0.56
	Panel D: Employed Full-Time					
Average Effects of Minimum Wages	-0.008*	-0.008*	-0.006	-0.000	-0.001	0.001
	(0.004)	(0.005)	(0.004)	(0.002)	(0.002)	(0.002)
Mean of Outcome	0.31	0.31	0.31	0.28	0.28	0.28
	Panel E: Employed Part-Time					
Average Effects of Minimum Wages	0.012***	0.013***	0.013***	0.001	0.001	0.001
	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)	(0.002)
Mean of Outcome	0.19	0.19	0.19	0.27	0.27	0.27
Number of Events	166	166	166	168	168	168
Number of Observations	1316	1316	1316	1326	1326	1326
Number of Individuals	174659	174659	174659	1820357	1820357	1820357
Controls						
State Fixed Effects	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y	Y	Y
Unemployment Rate		Y	Y		Y	Y
State Linear Trends			Y			Y

Notes: Standard errors are clustered by state and shown in parentheses. Regressions are weighted by the number of observations in each cell. Stars denote statistical significance at the 0.1 (*), 0.05 (**), and 0.01 (***) levels.

Table A11: Impacts of Minimum Wages on Hours and Multiple Jobs

	Immigrants			Natives		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log of Working Hours from Main Job (Main SPEC)						
Avg MW Effects	-0.0171***	-0.0174***	-0.0160***	0.0000	-0.0002	-0.0004
	(0.0041)	(0.0047)	(0.0052)	(0.0034)	(0.0032)	(0.0033)
Elasticity	-0.200	-0.203	-0.187	0.000	-0.002	-0.005
Mean of Outcome	31.457	31.457	31.457	22.516	22.516	22.516
Panel B: Log of Working Hours from All Jobs						
Avg MW Effects	-0.0170***	-0.0173***	-0.0160***	0.0007	0.0005	0.0002
	(0.0041)	(0.0047)	(0.0052)	(0.0032)	(0.0031)	(0.0032)
Elasticity	-0.198	-0.201	-0.186	0.008	0.006	0.002
Mean of Outcome	31.779	31.779	31.779	23.049	23.049	23.049
Panel C: Working Hours from Other Jobs						
Avg MW Effects	0.0033	0.0044	0.0006	0.0162	0.0162	0.0139
	(0.0215)	(0.0220)	(0.0231)	(0.0115)	(0.0111)	(0.0101)
Elasticity	0.038	0.051	0.006	0.184	0.185	0.158
Mean of Outcome	0.322	0.322	0.322	0.533	0.533	0.533
Panel D: Probability of Having Multiple Jobs						
Avg MW Effects	0.0004	0.0004	0.0003	0.0005	0.0005	0.0004
	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0003)
Elasticity	0.005	0.005	0.003	0.006	0.006	0.005
Mean of Outcome	0.008	0.008	0.008	0.018	0.018	0.018
Number of Events	167	167	167	168	168	168
Number of Observations	1323	1323	1323	1326	1326	1326
Number of Individuals	223996	223996	223996	1882984	1882984	1882984
Controls						
State Fixed Effects	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y	Y	Y
Unemployment Rate		Y	Y		Y	Y
State Linear Trends			Y			Y

Notes: Standard errors are clustered by state and shown in parentheses. Regressions are weighted by the number of observations in each cell. Stars denote statistical significance at the 0.1 (*), 0.05 (**), and 0.01 (***) levels.

Table A12: Impacts of Minimum Wages on Labor Market Outcomes of Non-Citizens and Citizens

	Non Citizens			Citizens		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log of Hourly Wage						
Average Effects of Minimum Wages	0.026***	0.026***	0.026***	0.025*	0.025*	0.024*
	(0.006)	(0.006)	(0.005)	(0.014)	(0.014)	(0.014)
Elasticity	0.301	0.296	0.298	0.302	0.300	0.282
Mean of Outcome	10.52	10.52	10.52	11.38	11.38	11.38
Panel B: Log of Working Hours						
Average Effects of Minimum Wages	-0.019***	-0.020***	-0.019***	-0.000	0.000	0.002
	(0.005)	(0.005)	(0.006)	(0.009)	(0.010)	(0.010)
Elasticity	-0.223	-0.228	-0.217	-0.003	0.001	0.026
Mean of Outcome	31.98	31.98	31.98	29.00	29.00	29.00
Panel C: Log of Employment Rate						
Average Effects of Minimum Wages	0.006	0.005	0.004	0.017	0.017	0.019
	(0.012)	(0.013)	(0.014)	(0.016)	(0.016)	(0.019)
Elasticity	0.064	0.054	0.047	0.205	0.206	0.225
Mean of Outcome	0.37	0.37	0.37	0.39	0.39	0.39
Panel D: Employed Full-Time						
Average Effects of Minimum Wages	-0.006*	-0.007*	-0.007*	-0.000	-0.000	0.000
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Mean of Outcome	0.22	0.22	0.22	0.20	0.20	0.20
Panel E: Employed Part-Time						
Average Effects of Minimum Wages	0.009***	0.009***	0.008***	0.006	0.006	0.006
	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)	(0.004)
Mean of Outcome	0.14	0.14	0.14	0.19	0.19	0.19
Number of Events	165	165	165	163	163	163
Number of Observations	1311	1311	1311	1256	1256	1256
Number of Individuals	177246	177246	177246	43321	43321	43321
Controls						
State Fixed Effects	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y	Y	Y
Unemployment Rate		Y	Y		Y	Y
State Linear Trends			Y			Y

Notes: Standard errors are clustered by state and shown in parentheses. Regressions are weighted by the number of observations in each cell. Stars denote statistical significance at the 0.1 (*), 0.05 (**), and 0.01 (***) levels.

Table A13: Impacts of Minimum Wages on Labor Market Outcomes by Industry

	Immigrants				Natives			
	Agr	Con	Mfg	Service	Agr	Con	Mfg	Service
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Panel A: Log of Hourly Wage				
Avg MW Effects	0.063**	0.082*	0.031***	0.026***	0.003	0.016	0.011	0.023***
	(0.031)	(0.042)	(0.010)	(0.007)	(0.018)	(0.013)	(0.012)	(0.003)
Mean of Outcome	10.50	13.41	11.22	10.43	9.82	12.11	11.22	9.64
				Panel B: Log of Working Hours				
Avg MW Effects	-0.039**	-0.001	0.003	-0.016***	0.006	-0.024	-0.001	0.000
	(0.016)	(0.018)	(0.007)	(0.006)	(0.019)	(0.019)	(0.013)	(0.003)
Mean of Outcome	37.16	35.99	37.92	29.57	22.95	28.68	29.63	21.88
				Panel C: Log of Employment Rate				
Avg MW Effects	-0.012	0.047**	-0.018	0.005	0.019	0.001	-0.008	0.003
	(0.014)	(0.021)	(0.013)	(0.004)	(0.013)	(0.016)	(0.010)	(0.003)
Mean of Outcome	0.82	0.88	0.88	0.89	0.79	0.75	0.80	0.85
				Panel D: Employed Full-Time				
Avg MW Effects	-0.033*	0.009	-0.007	-0.014***	0.009	-0.004	-0.006	0.003
	(0.020)	(0.020)	(0.011)	(0.004)	(0.009)	(0.014)	(0.011)	(0.002)
Mean of Outcome	0.63	0.70	0.76	0.45	0.24	0.40	0.45	0.20
				Panel E: Employed Part-Time				
Avg MW Effects	0.033**	0.007	-0.009	0.018***	0.006	0.008	-0.002	-0.000
	(0.016)	(0.015)	(0.007)	(0.004)	(0.009)	(0.009)	(0.009)	(0.003)
Mean of Outcome	0.18	0.17	0.12	0.42	0.53	0.33	0.33	0.62
Number of Events	90	91	124	163	164	165	162	168
Number of Observations	639	664	987	1286	1313	1309	1310	1326
Number of Individuals	4783	4447	12641	69533	30205	20632	29979	715036
Controls								
State Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y

Notes: Standard errors are clustered by state and shown in parentheses. Regressions are weighted by the number of observations in each cell. Stars denote statistical significance at the 0.1 (*), 0.05 (**), and 0.01 (***) levels.

Table A14: Impacts of the Minimum Wage on Labor Market Transitions

	Immigrants				Natives			
Emp Status This Month	FullEmp	PartEmp	UnEmp	NILF	FullEmp	PartEmp	UnEmp	NILF
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Full-Time Employed in the Previous Month								
Avg MinWage Effects	-0.0040	0.0011*	0.0003	-0.0006	0.0007	-0.0002	0.0000	0.0003*
	(0.0027)	(0.0007)	(0.0002)	(0.0005)	(0.0009)	(0.0003)	(0.0001)	(0.0002)
Mean of Outcome	0.167	0.024	0.005	0.015	0.056	0.019	0.003	0.009
Panel B: Part-Time Employed in the Previous Month								
Avg MinWage Effects	-0.0004	0.0071***	0.0000	0.0003	0.0000	-0.0006	-0.0001	0.0004
	(0.0009)	(0.0020)	(0.0002)	(0.0009)	(0.0003)	(0.0015)	(0.0001)	(0.0003)
Mean of Outcome	0.027	0.096	0.005	0.020	0.022	0.189	0.008	0.032
Panel C: Unemployed in the Previous Month								
Avg MinWage Effects	0.0005**	-0.0009***	-0.0010	0.0007	-0.0002*	0.0001	0.0001	0.0001
	(0.0002)	(0.0003)	(0.0011)	(0.0008)	(0.0001)	(0.0002)	(0.0008)	(0.0005)
Mean of Outcome	0.006	0.007	0.022	0.023	0.004	0.012	0.030	0.029
Panel D: Not in Labor Force in the Previous Month								
Avg MinWage Effects	-0.0010	0.0004	0.0004	-0.0032	0.0003**	0.0002	-0.0002	-0.0010
	(0.0006)	(0.0006)	(0.0008)	(0.0038)	(0.0001)	(0.0003)	(0.0004)	(0.0020)
Mean of Outcome	0.015	0.021	0.024	0.513	0.009	0.033	0.031	0.493
Controls								
State Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y

Notes: Standard errors are clustered by state and shown in parentheses. Regressions are weighted by the number of observations in each cell. Stars denote statistical significance at the 0.1 (*), 0.05 (**), and 0.01 (***) levels.