Do Minimum Wage Increases Benefit Low-Income Households? Evidence from the Performance of Residential Leases*

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Abstract

We extend the debate on the benefits to increasing the minimum wage by examining the impact on expenses associated with shelter, a previously unexplored area. Our analysis uses a unique data set that tracks household rental payments. Increases in state minimum wages significantly reduce the incidence of renters defaulting on their lease contracts by 1.7 percentage points over three months, relative to similar renters who did not experience an increase in the minimum wage. This represents 32% fewer defaults. However, this effect slowly decreases over time as landlords react to wage increases by increasing rents.

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I Introduction

Household shifts in spending and debt utilization in response to temporary and permanent changes in income are topics of primary interest to economists and policy makers. The ability to effectively identify such responses is central to understanding and evaluating key government programs aimed at helping low-income households. One such program, first introduced in Australia and New Zealand in the 1890s, is the minimum wage, which is often the subject of contentious debate.[1] For example, the introduction of the Raise the Wage Act of 2017 in the U.S. Senate (cosponsored by Senators Sanders (I-Vt.) and Murray (D-Wa.)), which would increase the federal minimum wage to $15 per hour by 2024, reinvigorated the discussion and debate about the effects of increasing the minimum wage.[2]

Prior studies debating the effects of changes to the minimum wage tend to concentrate on examining responses of households with respect to spending and debt utilization (Aaronson et al., 2012), estimating how minimum wage changes impact household incomes (Card and Krueger, 1994) or employment (Wellington, 1991; Galan and Puente, 2015; Hoffman, 2014; Aaronson and Phelan, 2017; Cengiz et al., 2019), whether the minimum wage helps lower income individuals (MaCurdy, 2015; Dettling and Hsu, 2017), or if the minimum wage differences across states alter worker commuting patterns (McKinnish, 2017). We extend this debate by examining the impact of changes to the minimum wage on expenses associated with housing, a previously unexplored area and a first-order expense for most households. Specifically, we examine how increases to state minimum wages alter the propensity for renters to default on their lease payments. Our analysis recognizes that income instability, particularly among low-income households, is often responsible for incidences of homelessness or dependency on government housing assistance (Desmond, 2016).

[1] See Waltman (2000) for a concise history of the minimum wage.

[2] See S.1242 - Raise the Wage Act, 115th Congress (2017-2018), https://www.congress.gov/bill/115th-congress/senate-bill/1242.

To contextualize our analysis, we note that households often face positive and negative permanent and transitory shocks to income (Campbell and Cocco, 2015). Whether an income shock arising from a change in the minimum wage is positive or negative, permanent or temporary is an open question. Since income volatility is directly associated with the ability of households to pay their rent, changing the minimum wage could have two possible impacts on the lease default rate.

First, if an increase in the minimum wage is a realized positive, permanent shock that does not induce a corresponding increase in unemployment or reduction in hours worked (McKinnish, 2017; Draca et al., 2011), then it would reduce the probability of lease default (assuming no contemporaneous increase in housing costs). Cengiz et al. (2019) study job changes throughout the wage distribution and conclude that the minimum wage increases in their study (which were between 37% and 57% of the median wage) did not have a significant impact on employment outcomes for individuals in the lowest wage bins. In addition, Dettling and Hsu (2017) provide supporting evidence for the assumption that a change in the minimum wage is a positive income shock by noting that credit card delinquency rates declined following an increase in the minimum wage. In the rental market context, such an outcome may be temporary as the long run equilibrium, which hinges on local market supply and demand elasticities, requires that income shocks are capitalized into rents.[3]

Second, and in contrast to the positive view, a minimum wage hike may increase the probability of unemployment (Neumark et al., 2004; Galan and Puente, 2015), which would represent a negative transitory income shock. As a result, it could increase the probability of a rental default. Yet, evidence for a positive relation between minimum wage changes and unemployment is controversial as Dube et al. (2010) and Hoffman (2014) do not find a causal connection. Furthermore, Doucouliagos and Stanley (2009) provide a compelling meta-analysis of the literature suggesting that little to no evidence

[3]See Glaeser (2008) for a comprehensive discussion of the theoretical models in urban economics that outline the connection between wages and rents.

exists to link an increase in the minimum wage with unemployment. Even so, the impact of increasing the minimum wage remains the subject of debate. As such, its effect is an open empirical question with interpretation of the results often depending on whether it is viewed through the lens of a first or second order expense.

By focusing on the impact of changes in the minimum wage on housing, we bring to bear a policy analysis on a first-order expense that has not been studied. As a result, we contribute to the understanding of how changes in the minimum wage can affect household consumption decisions and our unique data allow us to study this question using a clean identification strategy. Thus, we are able to establish a causal connection between the change in a state minimum wage law and the risk associated with rental housing. We identify the causal connection by showing that rental defaults decline while landlords do not raise rent in the short term following an increase in the minimum wage. However, consistent with theoretical models in urban economics, we also show that this effect weakens in the long run as wage increases are capitalized into rents.

We use a unique panel data set comprising the payment performance records on individual renters to identify the change in household rental payment risk (the probability of a late or defaulted payment) following various state-level changes in minimum wage laws. Our data come from RentBureau, a national credit repository that tracked the payment patterns of individual leases in multifamily properties from January 2000 to November 2009. The advantage of this data source is that it is a national database of rental performance covering over 1.8 million individual leases from approximately 2,600 multifamily properties in 41 states. The data contain the lease characteristics (start date, stop date, last payment date, and rent) and property location. For each month over the 24 months prior to the last reporting date, the RentBureau data indicate whether or not the rent was paid on time. Thus, we have a vector of rent payments over time for each lease contract. However, the disadvantage is that the database contains limited information about individual renters. To overcome this shortcoming, we merge the RentBureau data

with Census data based on the property's zip code to obtain neighborhood demographic information. Furthermore, we take advantage of the actual rents recorded from the individual leases to segment the data into high- and low-rent properties, which allows us to test the effect of changes in the minimum wage laws on the households most likely to be affected – those paying the lowest rent.

Similar to Aaronson et al. (2012), we employ a difference-in-differences estimation strategy where identification rests on the ability to control for property location, renter, and lease-year fixed effects, allowing us to compare the payment pattern for renters before and after an increase in the minimum wage with similar renters in states that did not experience a change in the minimum wage. However, the monthly reporting of rental payments allows us to more precisely isolate the impact of a state minimum wage change. Furthermore, by focusing directly on housing costs, our study examines a first-order expense (i.e., shelter) versus broader consumer consumption expenditures often studied in the literature.

Our analysis shows the following empirical findings: First, property owners in states that increased the minimum wage experienced on average a 1.74 percentage-point reduction in the three-month renter default rate following the wage increase relative to the average default rate in states that did not increase the minimum wage, which corresponds to 32% fewer defaults in relative terms. We corroborate that these results hold for six-month default rates and that there is a positive correlation between the size of the treatment effect and the increase in the level of the minimum wage. Second, we show that renter responses to minimum wage hikes rise over time, which is consistent with the increase in wages having an immediate impact on relaxing renter budget constraints. Third, when segmenting the sample by rent level, which should correlate for renter income, we show that the intensive effect is greatest for households having the lowest rent level, which are the households most likely to be impacted by the change in the minimum wage. Fourth, we show that landlords react by increasing rents beginning

approximately three months after the change in minimum wage levels. This result is consistent with changes in the minimum wage operating through the demand channel allowing landlords to capitalize the wage increase.

We implement a variety of tests to confirm the validity of the parallel trends assumption underlying our difference-in-differences strategy. We first confirm no statistically significant difference in lease default rates between treated and control states prior to an increase in the minimum wage after controlling for most factors associated with heterogeneity in lease defaults across states. We also implement a non-parametric test comparing each treated state with a nearest non-treated neighboring state to assess that default rates are similar in the pretreatment period. Finally, we confirm that our results hold using a synthetic controls approach that creates a counterfactual control group matching the pretreatment trends in the treated states.

We also demonstrate that our results are robust to a variety of alternative explanations. For example, we confirm that our results are robust to alternative measures of renter payment risk. We further demonstrate that the results are robust to the key assumption that employment and residency location are the same by excluding properties in cross-state border metropolitan statistical areas (MSAs). We then exclude observations from 2007 and 2008 to assuage concerns that our results are driven by the rental contracts observed during the housing crisis period in the 2000s. We also control for the potential that local rental regulations, such as rent control, may impact lease defaults. Finally, we note that potential endogeneity between minimum wage increases and rental market risk should bias against our findings.

Our study contributes to three streams in the literature. First, our study expands the literature that examines how consumption and credit use responds to income shocks. For example, recent studies have looked at how individual consumption decisions respond to changes in adjustable-rate mortgage payments (Di Maggio et al., 2017), sales tax holidays (Agarwal et al., 2017), increases in minimum payments on credit cards (d'Astous and

Shore, 2017), tax rebates (Cui, 2017), and unanticipated fiscal policies (Agarwal and Qian, 2014). Since our results indicate that landlords partially capitalize the increase in the minimum wage through higher rents, our analysis provides an upper bound on the ability of low-income households to increase discretionary spending following an increase in the minimum wage.

Second, we add to the growing literature examining the economic impact of changes in policies and regulations. For example, Holmes (1998) demonstrates that state level right-to-work laws can impact business formations and locations. Hsu et al. (2018) provide evidence indicating that unemployment insurance helps reduce mortgage defaults and thus stabilizes the housing markets. On the credit supply channel, Melzer (2011) shows how state-level regulations of payday lending can impact the risk of low-income households, while Pence (2006) and Wheelock (2008) demonstrate how state-level laws governing borrower rights can affect mortgage credit availability. Furthermore, Pennington-Cross and Ho (2008) provide evidence that state laws designed to protect borrowers from predatory lending practices lead to a modest increase in credit costs. Since the results show that renter risk declines following an increase in the minimum wage, our study suggests that policies designed to stabilize lower-income households do in fact reduce the riskiness of the target households, which is consistent with the results reported in Dettling and Hsu (2017) regarding the effect of increases in the minimum wage on credit utilization among lower-income adults.

Last, our study adds to the growing literature on decisions regarding shelter. For example, Ambrose and Diop (2014) note how expansion of credit supply can alter the risk of the rental market. Contributing to the understanding of the interactions of macroeconomic policies and rental markets, our study suggests that rising incomes could offset the impact of household movement from renting to ownership. This is consistent with Abdallah and Lastrapes (2013) who provide evidence showing that state-level spending on consumption is sensitive to housing demand shocks.

The rest of our paper proceeds as follows. Section II provides a description of our administrative data set and the state-level minimum wage changes. Section III outlines the empirical method, and Section IV presents the results. Section V discusses rental market effects. Section VI describes the various robustness checks that confirm the primary findings. Section VII concludes.

II Main Data

Because of limited financial resources, minimum wage earners are more likely to be renters than homeowners. For this group of households, making rent payments on time represents one of their most important obligations although they may face greater challenges making these payments than average households because of tighter budget constraints (Desmond, 2016). Consequently, renters represent an ideal study group when examining the effects of minimum wage increases at the household level. For this reason, we base our empirical analysis on multifamily lease performance data compiled by Experian RentBureau from 2000 to 2008.[4]

The WRDS RentBureau data represents a national snapshot of residential leases collected from property management companies. The data records lease characteristics (lease start date, lease termination date, tenant move-in date, tenant move-out date, last transaction date), property locations (city, state, and zip code), and rent payment patterns. To maintain tenant and property owner privacy, location information is limited to the property zip code level and the data contains no personally identifiable information about tenants. However, RentBureau does report the monthly rent amount and the monthly payment history, which denotes whether the tenant paid rent on time. For tenants who did not pay on time, the data reports the type of delinquency, the accrued

[4]We obtained the data from the Wharton Research Data Service (WRDS). Ambrose and Diop (2014, 2018) use the same data to examine the impact of mortgage credit expansion on the rental market and the equilibrium effects of landlord regulations on rental market outcomes, respectively. In addition, Ambrose et al. (2015) use the data to construct a time-series of monthly rents paid by a succession of tenants for each apartment unit in order to create a weighted repeat rent index.

number of late payments, and any write-off on rent and non-rental expenses due. The initial data set contains roughly 1.84 million leases on 2,648 properties located in 208 MSAs across 41 continental U.S. states. The data represent a record of tenant lease performance during the 2000s as updates are no longer available through WRDS due to changes in data collection methods.

RentBureau reports monthly lease payments in 24-digit vectors, recording historical payments over the last 24 months ending with the month of reporting or the lease maturity month. The reported payment vectors are therefore left censored since records older than 24 months are missing. However, as most residential leases are short term in nature (a year or less), issues associated with the left censoring of tenant payment records are minimized since problem tenants' leases are generally not renewed. Consistent with the commercial purpose of the database serving as a credit repository on tenants, the data contains a wealth of information about tenant rental payment history. The monthly rent payments are coded as P (on-time payment), L (late payment), N (insufficient funds or a bounced check), O (outstanding balance at lease termination), W (write-off of rent at lease termination), or U (write-off of non-rent amount owed at lease termination). We use these lease payment records to construct several lease performance measures.

Information on minimum wage increases came from Aaronson et al. (2012), who compiled the data from January issues of the *Monthly Labor Review* of the Bureau of Labor Statistics.[5] Because of rental data availability, we restrict our study to state minimum wage increases enacted from 2000 to 2008. Table 1 lists the 25 states that passed minimum wage increases during this period. As Table 1 shows, some of these states, for example, California, experienced multiple treatments (wage increases), generally 12-months apart. In aggregate, these states enacted 76 minimum wage increases over 24 separate months. Thus, on average, there are 3.04 wage hikes per state. The average wage increase was \$0.57, representing roughly 10% of the then-prevailing wage.

[5]The original data set is listed in Table A2 of the online appendix of Aaronson et al. (2012).

Therefore, over the nine years covered by our study, the average minimum wage earner in treated states earns \$1.73 (\$0.57*3.04) more per hour, representing a 30.4% wage increase.

For each treated state, we compile the tenants' payment performance over fixed time windows (three and six months) pre and post that state's minimum wage increase(s). Next, we compile the performance of leases in control states pre and post the 24 separate minimum wage increase dates in treated states.[6] After excluding leases with missing three-month performance data pre and post the minimum wage event dates, those with missing rent data, and winsorizing the data by eliminating extreme rent values, the final sample consists of 991,000 individual leases executed between 2000 and 2008.[7] The sample highly reflects the geographic distribution of the initial RentBureau data and contains 2,248 properties located in 173 MSAs across 39 states, 25 of which enacted minimum wage increases.

III Methodology

We analyze the effect of state minimum-wage increases on renters' payment performance using a pooled difference-in-differences (DID) regression methodology in a manner somewhat similar to the method employed by Cengiz et al. (2019). More specifically, we estimate the following DID model of renters' likelihood of lease default pre and post minimum-wage increase:

$$\begin{aligned} Pr(Default_{i,t}) &= \beta_1\, MWI_t + \beta_2\, Post_t + \beta_3(Post_t \times MWI_t) + \mathbf{X}_i'\,\Lambda \\ &\quad + \mathbf{Z}_{i,t}'\,\Theta + Y_t + \xi_{i,t}. \end{aligned} \tag{1}$$

[6]The control group comprises Alabama, Georgia, Idaho, Indiana, Kansas, Louisiana, Mississippi, Nebraska, Oklahoma, South Carolina, Tennessee, Texas, Utah, and Virginia.

[7]We drop leases below 1% (\$384) and above 99% (\$2,226) of the rent distribution, which allows us to focus on tenants paying market rent and that are more likely to fall in the low to medium portion of the income distribution. However, our findings are the same when we do not winsorize the data.

The dependent variable, $Default_{i,t}$, is a binary variable indicating the default status of lease i during a specified observation window (either three or six months) pre and/or post the month of a minimum wage increase at date t.[8] Our default variable indicates whether a lease was ever in default during the specified time period. We consider a lease to be in default in a given month if its status is not coded as on-time (P) or late (L) in the RentBureau data. For leases in the treated states, we compile their performance pre and post their respective state's minimum wage increase(s). In addition, we check the sensitivity of our results to our lease default definition by considering a more restrictive case in which default is defined as any lease status other than P.

The indicator variable, MWI_t, identifies states that passed minimum wage increases at date t with β_1 representing the difference in average lease default rates between treated and control states pretreatment. $Post_t$ is an indicator variable identifying the post-treatment period with the coefficient, β_2, indicating the average change in default in control states post treatment (that is, in the three or six months following the increase in the minimum wage). The coefficient for the interaction $Post_t \times MWI_t$ captures the difference in default between treated and control states post treatment. Conditional on DID assumptions being met, a negative β_3 implies that increases in state minimum wages lead to lower lease defaults and vice versa, ceteris paribus. We present both unconditional estimates and estimates conditioned on lease characteristics ($\mathbf{X}_i$), housing market and macroeconomic variables ($\mathbf{Z}_{i,t}$), time fixed effects (Y_i), and state-clustered standard errors (Bertrand et al., 2004). The last element of Equation (1) represents the error term.

Table 2 summarizes the elements of $\mathbf{X}_i$ and $\mathbf{Z}_{i,t}$. First, we control for contract rent from RentBureau since lease default increases with rent, everything else the same. In order to account for heterogeneity across locations, we collect a variety of information

[8]Table 1 shows that states with multiple minimum wage increases generally implement them at least twelve months apart. Consequently, the risk of overlap between successive observations within a state is minimal.

on local housing, labor and demographic characteristics by matching the lease records to metropolitan (MSA) or state variables. More specifically, our model includes local (MSA) yearly fair market rent (Market Rent) from Department of Housing and Urban Development (HUD), yearly per capital income from Bureau of Economic Analysis (BEA), and annual unemployment from Bureau of Labor and Statistics (BLS). We control for state rental demand using changes in state renter population using Census Bureau data, state rental supply using annual rental building permits issued from Census Bureau, and state affordable housing supply using annual low-income housing tax credit (LIHTC) units from HUD.[9] Our model also includes state annual rental vacancy rates from the US Census Bureau and regional annual inflation rates (CPI) from BLS. Finally, we account for changes in local house prices at the 3-digit Zip code level using the Federal Housing Finance Agency (FHFA) quarterly house price index.

IV Empirical Results

In this section, we discuss the baseline results, investigate the parallel trend assumption required for DID validity, and check the intensive effect of minimum wage increases over time and across renter groups.

A Baseline Results

Unconditional Results

The summary statistics reported in Panel A of Table 3 show an increase in lease defaults over time. For the sample of 990,785 individual leases, the average three-month (six-month) default rate was 1.19 (1.52) percentage points higher during the three-month

[9]Following Ambrose and Diop (2018), we define renter population as the percentage of population in the 20-34-year age group relative to the state's population. The LIHTC program is run by HUD to provide resources for the supply of affordable housing to low-income households in the U.S. (https://www.huduser.gov/portal/datasets/lihtc.html).

(six-month) period following a minimum wage increase.[10] Panels B and C compare the pre and post treatment average default rates in control and treated states, respectively. Panel B shows that average default rates post treatment were significantly higher than pretreatment default rates in the control states. The average three-month (six-month) default rate in these states post treatment was 4.54% (6.92%), compared with 3.2% (5.23%) pretreatment.[11] In contrast, average pre and post treatment default rates in treated states are statistically identical: 3.55% versus 3.73% for three-month default rates and 6.01% versus 6.35% for six-month default rates. This suggests that minimum wage increases enacted from 2000 to 2008 led to fewer lease defaults compared to states that did not increase their minimum wage.

We confirm these results using a DID model similar to Equation (1) omitting lease characteristics and macroeconomic factors but including lease-year fixed effects with standard errors clustered at the state level. Table 4 shows that the coefficients of the interaction term $Post \times MWI$ from the various model specifications are negative and significantly different from zero. In states that enacted minimum wage increases, renters experienced on average 0.98 to 1.17 percentage points fewer defaults, depending on the model specification, during the three months following minimum wage increases compared with the three preceding months. These figures represent 20.8% to 23.9% fewer defaults post treatment.[12] The six-month default estimations in Table 4 lead to the same conclusion. Renters residing in states that raised the minimum wage experienced 1.06 to 1.35 percentage point fewer defaults over the six months following the increase than renters in states with no change in minimum wage. In magnitude, the estimates represent 15% to 22.5% of the average pretreatment six-month default rate of 6.01% (Panel C of Table 3).

[10]The number of default observations is larger than the number of individual leases because most states passed multiple minimum wage increases.

[11]The trend in six-month defaults is similar, albeit higher in magnitude because of the longer observation window.

[12]The average three-month default rate in treated states post treatment is 3.73% (Panel C of Table 3), which gives the following: 0.98/(3.73+0.98)=20.8% and 1.17/(3.73+1.17)=23.9%.

Multivariate Results

Next, we check whether the unconditional results hold with the full DID model as specified in Equation (1). We control for contract (lease) and market (MSA) rents, per capita income (MSA), inflation (region), unemployment (MSA), changes in renter population (percentage of states' populations in the 20-year-old to 34-year-old age group), three-digit zip code house price index (HPI), the number of building permits issued in the state as a proxy for rental supply, the number of Low Income Housing Tax Credit (LIHTC) units built in the state to proxy for the supply of affordable housing, and state-level rental vacancy rates.

Table 5 presents the baseline DID estimation results. The specification in column (1) does not control for time (lease year) fixed effects while column (2) adds lease-year fixed effects. Overall, the results confirm the unconditional findings previously reported. Focusing on our preferred specification that incorporates lease year fixed effects (column 2), the coefficient for *Post* indicates that the average default rate in control states is significantly (1.2 percentage points) higher than treated states following a minimum wage increase.[13] The coefficient for treated states (MWI) is not statistically significant, indicating that treated states experienced lease defaults at a rate comparable to the control states. Finally, the estimated coefficient for the interaction $Post \times MWI$ (the DID parameter) is negative and statistically significant at the 0.1% level suggesting that treatment group states experienced on average 1.74 percentage points fewer defaults following the minimum wage increase than states in the control group. This amounts to 31.8% fewer defaults – an economically significant effect.[14] To put these results into perspective, we note that the average minimum wage increase in our sample is \$0.57/hour or 10%, and thus a 1% increase in the minimum wage corresponds to 3.2% decrease in default.

[13] As noted earlier, we cluster standard errors at the state level.

[14] 1.74/(3.73+1.74)=31.8%, where 3.73% is the average three-month default rate in treated states post treatment reported in Panel C of Table 3.

To summarize, Table 5 shows that state-level minimum wage increases are strongly associated with a significant reduction in lease defaults, ceteris paribus. Furthermore, the magnitude of this effect is stronger than that derived from unconditional estimations reported in Table 4 and the effects of the other explanatory variables included in Equation (1) are plausible, reinforcing the validity of the DID default outcome. For example, contract and market rents are negatively related to default, likely because they proxy for tenant quality and rental market risk, respectively. Per capita income and inflation are positive and significant, consistent with income lagging inflation. As expected, an increase in demand (renter population) leads to fewer defaults. Affordable housing supply also has a similar effect on default as the remaining renter pool becomes less risky. On the other hand, greater rental housing supply appears to have a small positive effect on default. Finally, increases in house prices are negatively related to default, but the effect is small.

We note that interpretation of our results hinges on the underlying implicit assumption that increases in state minimum wages do not produce a corresponding reduction in hours worked or greater unemployment. Unfortunately, given the nature of our data, we are unable to test this assumption directly as we do not observe the employment status of the individual renters in the data. However, as noted in the introduction, Dube et al. (2010) and Hoffman (2014) do not find a causal connection between unemployment and increases in the minimum wage while Doucouliagos and Stanley (2009) conclude that little to no evidence exists in the literature linking minimum wage hikes with unemployment.

The sample used in the baseline estimations in Table 5 pools three types of lease performance data: leases for which we observe the pretreatment period only, those for which we observe the post-treatment period only, and those for which both periods are available. To confirm that the results are not biased by the sample construction, we restrict our sample to tenants observed pre and post treatment. This restriction reduces

the sample from 984,376 to 726,332 leases. These estimation results (tabulated in the on-line appendix Table A.1) are in all respects similar to the results derived from the larger sample in Table 5, thus confirming the appropriateness of our original sample. We also check that the results persist in six-month lease default rates (see Table A.2 in the on-line appendix) and again find that minimum wage increases are associated with lower lease defaults in treated states compared with states with no increase in minimum wage.

B Parallel Trends Test

A key condition for validity of the DID framework is the parallel trend requirement. The DID methodology implicitly assumes that the outcome of interest (i.e., lease defaults) trends similarly for the treated and control groups during the pretreatment period and would have followed the same trend post treatment in the absence of treatment. We feel that this assumption is met based on the following three reasons.

First, our DID model controls for most factors likely to affect household risk and rental default at the MSA or state level. These factors include local rent, income, unemployment, house price, rental supply and demand factors, and regional inflation (see Table 5), which capture most causes of heterogeneity in lease defaults across states, thus allowing us to extract the true value of the treatment effect. Most importantly and consistent with the assumption of parallel trends pretreatment, the results from the fully specified model indicate no statistically significant difference in lease default rates between treated and control states in the period prior to an increase in the minimum wage.

Second, we use a non-parametric framework to examine the behavior of average lease defaults in treated and control states pre and post treatment. To implement this, we compare each treated state with a neighboring untreated state.[15] A potential challenge

[15]Table A.3 in the on-line appendix lists treated states and matched control states. When there is

is the multiplicity of treatment dates in some states. For simplicity, we focus on one treatment date for each treated state and compare its average monthly lease default rate pre and post that treatment date with its matched control state's corresponding default rate. We select the treatment dates listed in Table A.3 to minimize potential contamination from other treatments. Figure 1 shows the outcomes from these parallel trends tests for the monthly average default rates during the 12 months pre and post treatment. Although average default rates are similar across treated and control states in the pretreatment period, the default rates diverge in the post treatment period as average defaults in treated states edged lower. Again, this implies satisfaction of the parallel trends assumption critical for validity of the DID framework.

Third, we confirm the parallel trends assumption using a synthetic control approach (Abadie and Gardeazabal, 2003; Abadie et al., 2010). The synthetic control method creates a counterfactual control group such that the variable of interest (lease default rate) in that group trends similarly to that of the treated group during the pretreatment period. We then observe differences in the post-treatment period between the treated group and the synthetic group. Table A.4 in the on-line appendix reports the results and shows that default is significantly lower in treated states after treatment in a random effect estimation framework, which is confirmed when adding fixed effects. Most importantly and as expected, the difference in default pretreatment (the coefficient for MWI) is insignificant since this method creates a synthetic group matching the treated group pretreatment. These results persist after controlling for heteroskedasticity by using White standard errors, although the statistical significance drops due to the decline in sample size. Thus, the results using the synthetic control confirm the validity of our previous results.

no neighboring untreated state, we select a non-neighboring, but relatively similar untreated state, or in rare cases a neighboring treated state with no overlapping treatment period.

C Post Treatment Time Effect

Next, we explore the intensity of the treatment effect over time. For this, we estimate the following variant of Equation (1) comparing monthly lease defaults during the six months post treatment with the three months before treatment.[16]

$$\begin{aligned} Pr(Default_{i,t}) &= \beta_1\, MWI_t + \sum_{k=1}^{6} \beta_2^k\, Post_t^k + \sum_{k=1}^{6} \beta_3^k\, (Post_t^k \times MWI_t) + \mathbf{X}_i'\, \Lambda \\ &\quad + \mathbf{Z_{i,t}}'\, \Theta + \, Y_i + \zeta_{i,t}. \end{aligned} \tag{2}$$

The time superscript k indicates the post treatment months ($k = 1, 2, \ldots, 6$). As previously noted, our focus is on the interaction term $Post_t^k \times MWI_t$. Figure 2 shows the DID coefficient estmiates for the fully specified model (Table A.5 in the online appendix reports all coefficient estimates). The estimated coefficients of the interaction terms are negative and significant. Furthermore, F-tests unequivocally reject the null hypotheses of equality between successive interaction coefficients. The clear decline in lease default rates following the minimum wage increase is consistent with minimum wage increases having an immediate positive impact on renters' ability to meet rent payments. Unfortunately, concerns about possible contagion from other wage increases and potential confounding factors limit our ability to extend the post-treatment time analysis beyond six months.

D Effect by Rent Groups

MaCurdy (2015), Dettling and Hsu (2017), and Cengiz et al. (2019) show that increases in minimum wages should be more consequential for low-income earners. Similarly, we expect minimum wage increases to differentially affect rental payments for various income groups, with lower-income earners likely seeing the largest effect. Normally, the intensive effect of minimum wage increases on lease default should be negatively

[16] The variables have the same meaning as in Equation (1).

related to household income. Unfortunately, we do not directly observe income in the RentBureau data.[17] But since the contract rent should be strongly correlated with household income, we use it as a proxy for income.

To test the income effect, we first normalize each observed rent by the respective MSA fair market rent (FMR). Next, we classify the leases by state into rent level quintiles.[18] We then estimate equation (1) separately for each quintile group. This specification is similar in spirit to the analysis of Cengiz et al. (2019) who estimated the effect of minimum wage increases across various wage bins. Table 6 reports the results. Panel A shows the unconditional DID results while panel B reports the multivariate DID results. In both panels, we observe that the estimated coefficients for the $Post \times MWI$ interaction are negative and statistically significant across rent quintiles. Furthermore, we note that the magnitude of the estimates is largest for the lowest rent quintile. This confirms that renters paying the lowest rent experienced a significantly greater effect following an increase in the minimum wage. In other words, the intensive effect of a minimum wage increase is lowest for the high-rent group. Assuming that rent level is correlated with income, the results are consistent with lower-income households benefiting more from minimum wage increases.

Although the magnitude of the effect of a minimum wage increase in the lowest rent quintile is consistent with expectations, one concern is that we also observe a negative, albeit smaller, effect in the highest rent quintile. To the extent that income is correlated with rent, one would normally not expect to find an effect in the highest rent quintile as individuals in this segment of the market most likely have incomes well above the minimum wage threshold and thus are least likely to be impacted by a change in minimum wages. However, we note that rent is a crude approximation for income and to the extent that lower income individuals do occupy high rent units, we would expect

[17] Because of privacy concerns, RentBureau only collects limited information on renters beyond lease characteristics.

[18] We first winsorize the data to remove outliers such that the contract rent ranges from \$384 to \$2,226 (Table 2) and limit the analysis to years 2006 to 2008.

to find a significant effect in the upper rent quintiles. As a result, we recognize the possibility that our rent bin estimates are biased toward finding an effect in the upper rent categories.

To confirm whether this bias is indeed present in the data, we matched the upper limit of the first rent quintile ($565) and the lower limit of the fifth rent quintile ($945) to the distribution of renter household incomes across various housing costs buckets from the 2005 American Housing Survey (AHS).[19] Figure 4 reports the distribution of renters segmented into ten income brackets while figures 5 and 6 report the renter household distributions based on incomes less than and greater than $40,000, respectively. Consistent with our assumption that income and rent are correlated, Figure 4 shows that a higher proportion of renters in the lower income brackets have monthly housing costs below $565 (the upper limit of the first rent quintile), and a much higher proportion of high income renters (those with incomes above $100,000) have rents above $945 (the lower limit of the upper quintile). However, it is clear that some low income renters have monthly housing costs significantly greater than the lower limit of the fifth rent quintile. We can see this clearly in Figure 5, which shows the distribution of renter households with incomes less than $40,000. For households at this income level, which corresponds to the income level most likely to be impacted by a change in the minimum wage, we note that a non-trivial share have housing costs that fall into the upper rent quintile. As a result, the estimated coefficient for the interaction term in Table 6 indicating an impact of the minimum wage in the highest rental group is to be expected. Furthermore, Figure 6, which reports the distribution of households with incomes above $40,000, suggests that a non-trivial number of higher income households fall into the very low rental quintile. Taken together, Figures 5 and 6 suggest a downward bias in the estimated impact of the minimum wage change for the lower rental quintile and an upward bias in the top rental quintile reported in Table 6.

[19] We combine the AHS family income into ten groups and keep the 15 AHS housing cost bins.

V Rental Market Effects

A Landlord Response

Changes in the minimum wage do not happen in isolation. It is possible that a minimum wage increase may alter the prevailing rental market equilibrium. Everything else equal, higher wages may lead to higher rents due to the resulting increase in demand. Furthermore, depending on the structure of the rental market, landlords may try to capitalize on this opportunity by raising rents. As long as any resulting increase in rents does not overwhelm the direct effect of the wage increase on lease performance, the net effect on rent default should be negative.

In this section, we test the effect of minimum wage increases on rents and thereby pin down the net benefit households derive from wage increases. To do so, we estimate the following model of rents:

$$R_{i,t} = \beta_1 MWI_t + \sum_{k=1}^{6} \beta_2^k Post_t^k + \sum_{k=1}^{6} \beta_3^k (Post_t^k \times MWI_t) + \mathbf{X}_i' \Lambda + \mathbf{Z_{i,t}}' \Theta + \zeta_i \quad (3)$$

where $R_{i,t}$ are rents on new leases in the month before and the six months after a minimum wage increase at date t. The superscript k indicates the months following the minimum wage change at date t, and the other variables have the same meaning as in Equation (1).

Figure 3 plots the estimated coefficients for the DID parameters.[20] Again, focusing on the interaction terms ($Post_t^k \times MWI_t$), we note that the estimated coefficients are positive and statistically significant starting three months after the minimum wage increase. Thus, the results suggest that landlords capitalize the permanent nature of the minimum wage shocks into rents. For example, the rents in months three through six following the minimum wage increase are approximately \$65.6 higher than rents in the three months prior to the change in the minimum wage, which represents an increase

[20] Table A.6 in the online appendix reports the full estimation results.

of 6.4%.[21] To put this in perspective, the average of the 76 state-level minimum wage changes was \$0.57/hour or 10% and ranged from 1.6% to 35% with the average increase in rents taking up 57.2% of the average income increase.[22]

B Tenants' Housing Decision

We have established that minimum wage increases lead to higher rents, as compared with prevailing rents in states with no wage increase. Next, we consider tenants' housing consumption decisions after wage increases. More specifically, we explore whether wage increases alter household mobility. To that effect, we estimate the likelihood of a household moving to a different rental unit as a result of a minimum wage increase using the following DID linear probability model:

$$\begin{aligned} Pr(Move_{i,t}) &= \beta_1\, Post_t + \beta_2\, MWI_t + \beta_3\, (Post_t \times MWI_t) + \mathbf{X}_i'\Lambda + \mathbf{Z_{i,t}}'\Theta \\ &\quad + Y_t + \omega_i, \end{aligned} \tag{4}$$

where $Move_{i,t}$ is a dummy variable indicating whether tenant i moved following a minimum wage increase at date t, and $\mathbf{X}_i$ and $\mathbf{Z_{i,t}}$ have the same meanings as in Equation (1). Y_t are minimum wage change year fixed effects.

We estimate this model for tenants whose leases expired within three months following a minimum wage increase and who entered into new leases between three to nine months after the wage change. Therefore, we only examine tenants with repeat leases, which results in a sample of 15,046 leases. The DID coefficient estimate in column (1) of Table 8 shows that tenants in states that enacted a minimum wage increase are 8.9 percentage points more likely to move to a different unit after the wage change.

Next, we explore the likelihood of moving for different rent groups. For this analysis,

[21] From Table A.6 we obtain (0.0361+0.0545+0.0613+0.0887)*100=\$56.6, which divided by average rent of \$886 in Table 2 gives 6.4%.

[22] The average monthly income increase is \$0.57*40*52/12=\$98.8. Thus, the ratio of rent to income is \$56.6/\$98.8=57.2%.

we divide the tenants into two groups and identify the low-rent group as those whose rents are less than or equal to their location's respective MSA fair market rent. Column (2) shows that tenants in the low rent group are less likely to move following a minimum wage increase. Though somewhat unexpected, this result makes sense because low-income renters are more likely to miss rent payments, thus more exposed to involuntary moves due to evictions. Also, high-rent households are likely to have more than one income earner and are therefore less financially constrained after a wage increase when making housing choices. This evidence indicates that wage increases further benefit targeted households by allowing them to adjust housing consumption. Unfortunately, our data is not rich enough to allow us to further elaborate on tenant housing decisions.

VI Robustness Checks

A Alternative Default Measure

So far, we have assumed a lease to be in default if its status in the RentBureau data is not coded as P (i.e., rent paid on time) or L (i.e., late rent payment). To confirm that this default measure is not driving the results, we also use an alternative, less restrictive default measure considering just non-timely rent payments as the default event. As expected, this alternative default measure leads to more defaults (see resulting average default rates in on-line appendix Table A.7). The average three-month default rate pre (post) minimum wage increase based on this new default measure is 15.2% (16.8%) in Panel A of Table A.7, compared with 3.2% (4.4%) in Panel A of Table 3. More important, this new default measure also shows a significant increase in defaults in control states post treatment (Panel B of Table A.7) and no material change in treated states (Panel C of Table A.7). We find the same result when we use six-month defaults. Furthermore, unconditional and multivariate estimation results in Tables A.8 and A.9 in the on-line appendix confirm the previous DID default results. However, post-treatment

effects based on this alternative default measure are larger, due to the higher incidence of default resulting from this measure.

B Employment Location

A key assumption of our analysis is that residency and employment location are the same. Although this assumption is realistic since our analysis is at the state level, it would be problematic in MSAs that span multiple states, such as Charlotte-Concord-Gastonia MSA (NC and SC) and Cincinnati MSA (OH, KY, and IN), which include treated and untreated areas.[23] In these MSAs, it is possible that some people commute to a neighboring state for work. Furthermore, a minimum wage increase in one state may cause neighboring state residents to seek work in that state, which would muddle the DID identification strategy since some people may choose treatment. We note that 20 of the 173 MSAs making our sample span across several states. Thus, we re-estimate the model excluding leases from properties located in these 20 cross-state border MSAs. We summarize these results in the on-line appendix Table A.10. Despite the smaller sample size, the previous results hold. In treated states, three-month lease defaults were 1.8 percentage points lower following minimum wage increases, compared with a mean pretreatment default rate of 3.55% in those states.

C Impact of the 2007-08 Crisis

Our study period spanning 2000 to 2008 almost coincides with the recent housing market boom that saw a substantial surge in homeownership that adversely affected the riskiness of the rental market as documented by Ambrose and Diop (2014). Table 1 shows that the wage increases are not uniformly distributed over that period. The distribution is negatively skewed with 2007 and 2008, probably the most critical years of that period,

[23] Of the 382 MSAs listed on Bureau of Economic Analysis website, 47 span over two or more states (https://www.bea.gov/regional/docs/msalist.cfm).

accounting for 50% of wage increases (38 out of 76). Even though it is unclear how the increase in rental market risk during that period differentially affected treated and control areas, prudence dictates that we check if our findings hold when we exclude the later years.[24] Even though the sample size drops considerably after excluding 2007 and 2008 minimum wage increases, the estimation results reported in the on-line appendix Table A.10 confirm that the previous findings are not confined to those years. The DID three-month lease default rate estimate is -0.93 percentage points, compared with a mean pretreatment default rate of 3.55% in treated states.

D Local Regulations

Local rent control and other municipal regulations, such as city-level minimum or living wage requirements, are also likely to affect local rental markets. We acknowledge that there may be heterogeneity in local responses to state minimum wage increases, and municipal wage regulations are likely to exist and may even be significant. However, this study focuses on cross-state, rather than within-state, variations in lease defaults in response to state minimum wage changes. State minimum wage requirements are generally less aggressive than most cities' living wages, but tend to be more binding on employers.[25]

As far as rent control regulations are concerned, they should normally cause payment defaults to fall by making rents more affordable for generally riskier tenants. Consequently, these regulations should normally bias against finding significant differences in

[24] Although the migration of lower risk tenants to homeownership described by Ambrose and Diop (2014) should lead to increase default in the rental market, ceteris paribus. This transition of some renters to homeownership should also lower rents, hence leading to fewer defaults. Thus, the net effect is unclear. Also, it is unclear why this would affect treated and control states differently.

[25] For example, the City of Madison, WI, steadily increased mandated living wages from $9.01 in 2001 to $13.01 in 2018, while the state minimum wage remained at the federal level of $7.25 since 2009. However, Madison's living wage only applies to persons directly employed by the city or employed city contractors or recipient of city financial assistance. As a side note, Madison's living wage was recently nullified by 2017 Wis. Act 327, which became effective April 18, 2018. (Source: https://www.cityofmadison.com/finance/wage/factsheet.cfm)

lease defaults.[26] Nonetheless, we formally control for rent control regulations by excluding from our sample states with rent control cities, namely, California, Maryland, and New York, and find that our main results are unchanged (on-line appendix Table A.10).

VII Conclusions

We estimate the impact of changes in state-level minimum wage laws on renter lease payment performance. Our analysis is based on a pooled difference-in-differences regression method that employs property, renter, and lease-year fixed effects allowing us to compare the payment pattern for renters before and after an increase in the state minimum wage relative with similar renters in states that did not change the minimum wage.

We find four key results. First, we find a significant decline in defaults following an increase in the minimum wage relative to states that did not increase the minimum wage. Second, we report that renter responsiveness to changes in the minimum wage increases over time. This is consistent with the theory that increases in the minimum wage have an immediate impact by relaxing renter budget constraints. Third, our analysis indicates that renters most likely in the lower-income segment of the population (those in the lower rent levels) experience the greatest reduction in rental default rates following an increase in the minimum wage. Finally, we find that landlords partially capitalize minimum wage increases into rents starting approximately three months following the law change.

Our study provides evidence on how households respond to income shocks with respect to shelter, a first-order expense. Furthermore, since landlords partially capitalize the income shock into future rents, our analysis suggests an upper bound on the ability of lower-income households to increase discretionary spending following an increase in the minimum wage. Finally, the results provide evidence that efforts to stabilize lower-

[26]Low-Income Tax Credit (LIHTC) developments should also result in lowering lease defaults. We try to limit LIHTC leases from making it into our sample by excluding leases with rent below $384 per month.

income households via increases in the minimum wage do in fact reduce the riskiness of low-income households.

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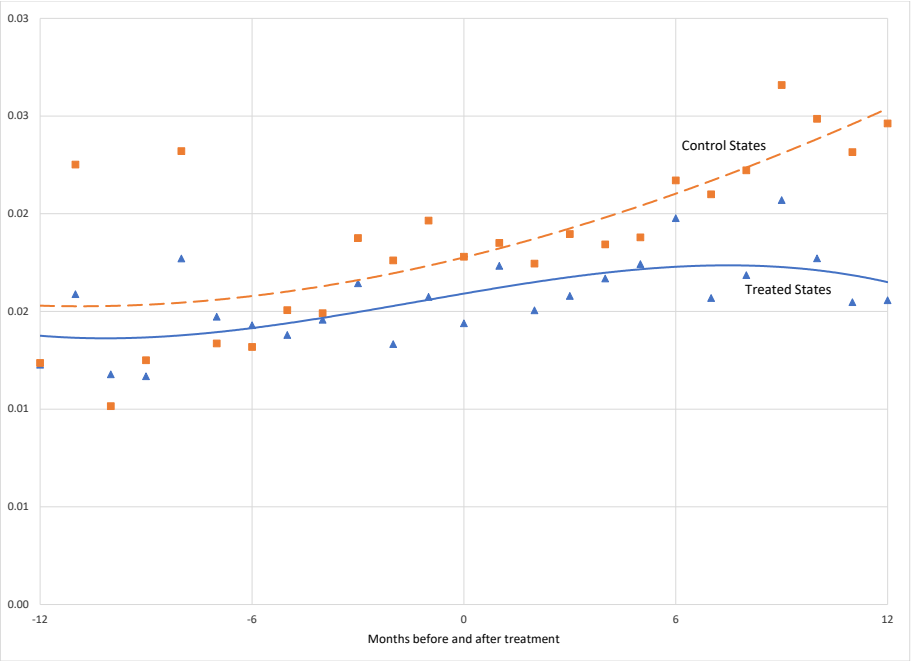

Figure 1: Parallel trends test: Polynomial trend lines of average monthly default rates pre- and post treatment based on the nearest neighbor state as the control group

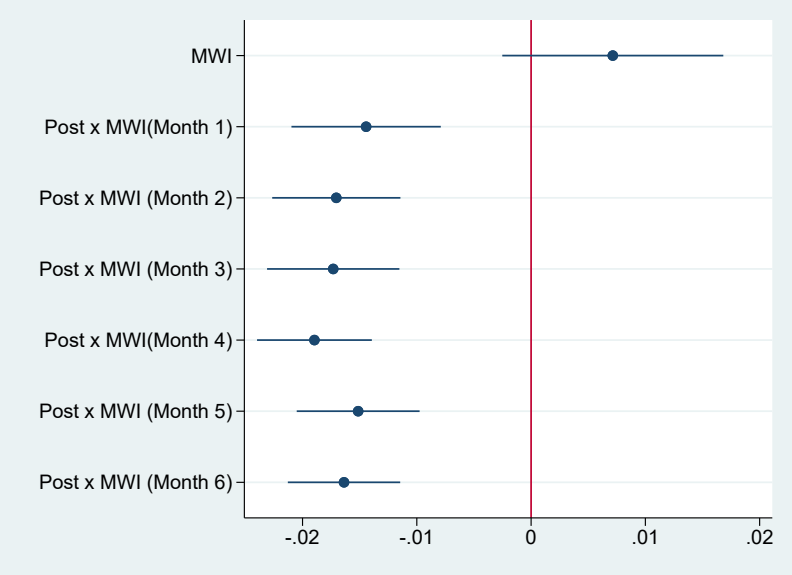

Figure 2: These are DID regression estimates and 95% confidence intervals of default in treated states over the six months following minimum wage increases as modeled in Equation (2). The corresponding regression results are reported in Table A.5 column 2.

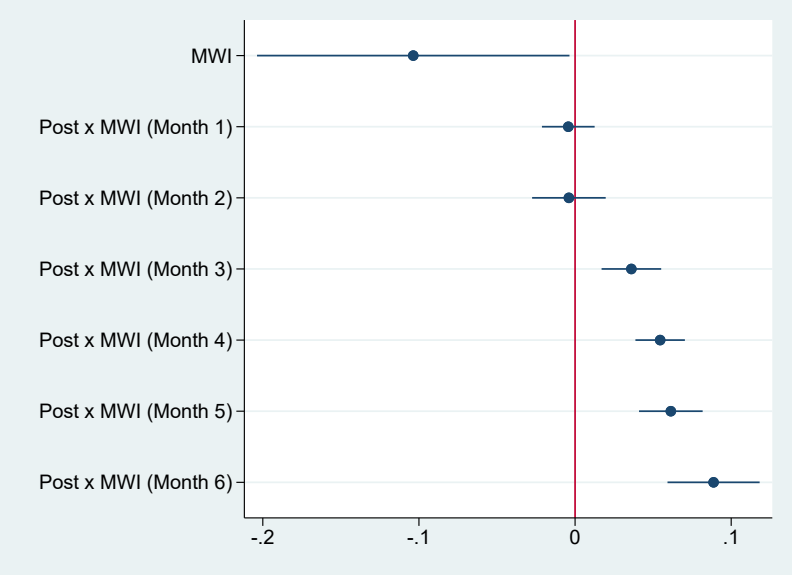

Figure 3: These are DID regression estimates and 95% confidence intervals of rent (in '000s) in treated states over the six months following minimum wage increases as modeled in Equation (3). The corresponding regression results are reported in Table A.6 column 2.

Figure 4: These are distributions of renter households by income group across various housing cost buckets from the 2005 American Housing Survey (AHS) national data – no-cash rents are not included. We combine the AHS family income groups into ten, but keep the fifteen housing cost bins used by AHS. The red vertical line at Q1 ($565) and the blue one at Q5 ($945) are the upper limit of the first rent quintile and the lower limit of the fifth rent quintile from the 2005 leases in the RentBureau data used in this study.

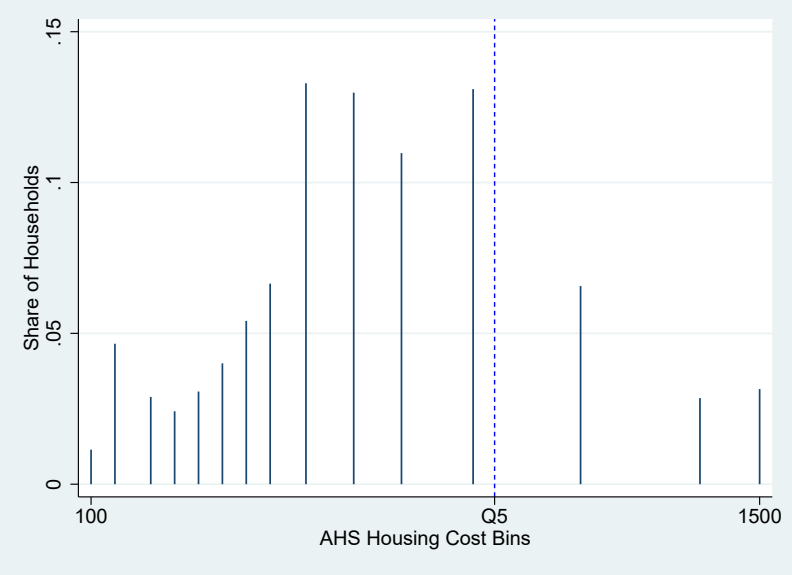

Figure 5: This distribution combines renter households earning less than $40,000 (**Low-Income Renter Households**) and shows the share of households in each of the fifteen housing cost buckets from the 2005 American Housing Survey (AHS) national data. As in Figure 4, the blue vertical line at Q5 ($945) is the lower limit of the fifth rent quintile from the 2005 leases in the RentBureau data used in this study.

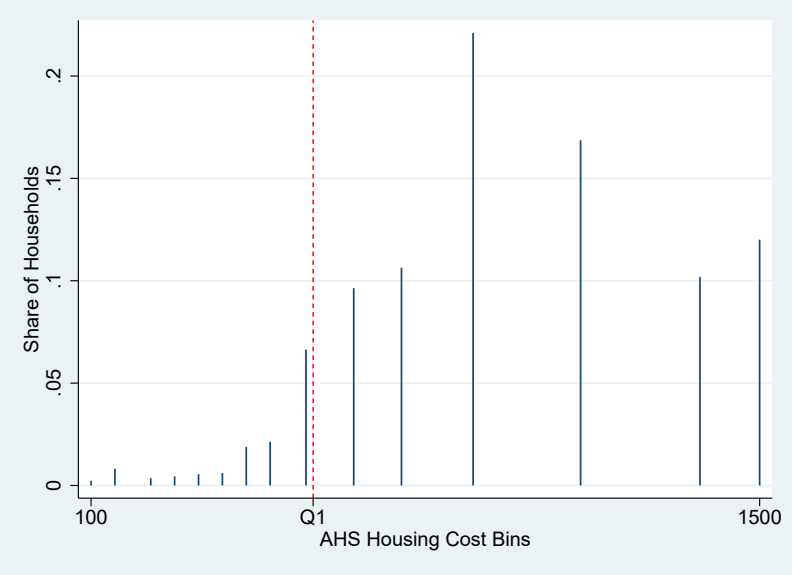

Figure 6: This distribution combines renter households earning at least $40,000 (**High-Income Renter Households**) and shows the share of households in each of the fifteen housing cost buckets from the 2005 American Housing Survey (AHS) national data. As in Figure 4, the red vertical line at Q1 ($565) is the upper limit of the first rent quintile from the 2005 leases in the RentBureau data used in this study.

Table 1: State Minimum Wage Increases from 2000 to 2008

State	*Date*	*Increase* ($)	*New Minimum Wage* ($)	*State*	*Date*	*Increase* ($)	*New Minimum Wage* ($)
Arizona	Jan-07	1.60	6.75	Massachusetts	Jan-01	0.75	6.75
Arizona	Jan-08	0.15	6.90	Massachusetts	Jan-07	0.75	7.50
Arkansas	Oct-06	1.10	6.25	Massachusetts	Jan-08	0.50	8.00
California	Jan-01	0.50	6.25	Michigan	Oct-06	1.80	6.95
California	Jan-02	0.50	6.75	Michigan	Jul-07	0.20	7.15
California	Jan-07	0.75	7.25	Michigan	Jul-08	0.25	7.40
California	Jan-08	0.50	8.00	Minnesota	Aug-05	1.00	6.15
Colorado	Jan-07	1.70	6.85	Missouri	Jan-07	1.35	6.50
Colorado	Jan-08	0.17	7.02	Missouri	Jan-08	0.15	6.65
Connecticut	Jan-00	0.50	6.15	Nevada	Nov-06	1.00	6.15
Connecticut	Jan-01	0.25	6.40	Nevada	Jan-07	0.18	6.33
Connecticut	Jan-02	0.30	6.70	New Hampshire	Sep-07	1.35	6.50
Connecticut	Jan-03	0.20	6.90	New Hampshire	Sep-08	0.75	7.25
Connecticut	Jan-04	0.20	7.10	New York	Jan-05	0.85	6.00
Connecticut	Jan-06	0.30	7.40	New York	Jan-06	0.75	6.75
Connecticut	Jan-07	0.25	7.65	New York	Jan-07	0.40	7.15
Delaware	Oct-00	0.50	6.15	North Carolina	Jan-07	1.00	6.15
Delaware	Jan-07	0.50	6.65	Ohio	Jan-07	1.70	6.85
Delaware	Jan-08	0.50	7.15	Ohio	Jan-08	0.15	7.00
Florida	Jan-06	1.25	6.40	Oregon	Jan-03	0.40	6.90
Florida	Jan-07	0.27	6.67	Oregon	Jan-04	0.15	7.05
Florida	Jan-08	0.12	6.79	Oregon	Jan-05	0.20	7.25
Illinois	Jan-04	0.35	5.50	Oregon	Jan-06	0.25	7.50
Illinois	Jan-05	1.00	6.50	Oregon	Jan-07	0.30	7.80
Illinois	Jan-07	1.00	7.50	Oregon	Jan-08	0.15	7.95
Illinois	Jan-08	0.25	7.75	Pennslyvania	Jan-07	1.10	6.25
Iowa	Apr-07	1.05	6.20	Pennslyvania	Jul-07	0.90	7.15
Iowa	Jan-08	1.05	7.25	Washington	Jan-00	0.80	6.50
Kentucky	Jun-07	0.70	5.85	Washington	Jan-01	0.22	6.72
Maine	Jan-02	0.60	5.75	Washington	Jan-02	0.18	6.90
Maine	Jan-03	0.50	6.25	Washington	Jan-03	0.11	7.01
Maine	Jan-05	0.10	6.35	Washington	Jan-04	0.15	7.16
Maine	Jan-06	0.15	6.50	Washington	Jan-05	0.19	7.35
Maine	Oct-06	0.25	6.75	Washington	Jan-06	0.28	7.63
Maine	Oct-07	0.25	7.00	Washington	Jan-07	0.30	7.93
Maine	Oct-08	0.25	7.25	Washington	Jan-08	0.14	8.07
Maryland	Jan-07	1.00	6.15	Wisconsin	Jun-05	0.55	5.70
Massachusetts	Jan-00	0.75	6.00	Wisconsin	Jun-06	0.80	6.50

This table documents the minimum wage increases from 2000 to 2008 passed by 25 of the 39 states represented in the RentBureau lease performance data. These 25 states constitute our initial treatment group, with our initial control group consisting of the remaining 14 states, namely Alabama, Georgia, Idaho, Indiana, Kansas, Louisiana, Mississippi, Nebraska, Oklahoma, South Carolina, Tennessee, Texas, Utah, and Virginia.

Table 2: Variable Summary Statistics

Variable	*Description*	*# Obs*	*Mean*	*SD*	*Min*	*Max*
Minimum Wage Increase ($)	Dollar hourly wage increase	76	0.57	0.44	0.10	1.80
Minimum Wage Increase (%)	Percents hourly wage increase	76	10	8.7	1.6	35.0
Rent ($000s)	Contract rent	984,376	0.886	0.353	0.384	2.226
Market Rent ($000s)	Lagged MSA fair market rent, yearly (HUD)	839	0.640	0.170	0.407	1.471
PC Income (log)	Lagged MSA per capita income, yearly (log)	839	10.37	0.20	9.58	11.07
Inflation	Lagged CPI region, yearly	33	189.08	15.14	163.60	215.20
Unemployment	Lagged MSA annual unemployment rate (%)	839	4.89	1.33	2.22	10.59
Change Renter Population	Lagged change state renter population, yearly (%)	179	0.67	1.04	-6.38	3.38
HPI	Lagged FHFA house price index (3-digit zip code), quarterly	2,604	184.16	50.00	110.89	374.19
Rental Supply (log)	Lagged building permits issued in state, yearly (log)	179	8.91	0.97	6.68	11.27
Affordable Housing Supply (log)	Lagged LIHTC units built in state, yearly (log)	179	7.54	1.01	2.94	9.80
Vacancy	Lagged state vacancy rate, yearly	179	0.110	0.029	0.042	0.181

Table 3: Summary Statistics of Three-Month and Six-Month Lease Defaults

	3-Month Defaults				*6-Month Defaults*			
	# Leases	*# Obs*	*Mean*	*SD*	*# Leases*	*# Obs*	*Mean*	*SD*
Panel A: Full Sample								
Pre MWI	830,319	2,678,930	0.0324	0.1770	671,117	2,017,577	0.0532	0.2244
Post MWI	934,065	2,944,237	0.0443	0.2058	819,884	2,396,450	0.0684	0.2525
Difference & t-statistic			*-0.0119*				*-0.0152*	
			(73.33)				*(66.40)*	
Panel B: Control Group								
Pre MWI	564,632	2,365,570	0.0320	0.1759	471,749	1,791,783	0.0523	0.2227
Post MWI	598,237	2,554,093	0.0454	0.2081	534,900	2,076,022	0.0692	0.2538
Difference & t-statistic			*-0.0134*				*-0.0169*	
			(76.92)				*(68.93)*	
Panel C: Treated Group								
Pre MWI	265,687	313,360	0.0355	0.1851	199,368	225,794	0.0601	0.2377
Post MWI	335,828	390,144	0.0373	0.1894	284,984	320,428	0.0635	0.2438
Difference & t-statistic			*-0.0017*				*-0.0034*	
			(3.87)				*(5.12)*	

This table reports summary statistics of 3-month and 6-month lease defaults pre and post state minimum wage increases passed from 2000 to 2008. The treated group consists of the 25 states that enacted minimum wage increases during that period and the control group consists of the 14 other states in the RentBureau data that did not pass a minimum wage increase (See Table 1). Our sample consist of 990,785 individual leases signed between 2000 and 2008. We observe the performance of each lease for up to 24 months. We consider a lease current (not in default) in a given month if RentBureau records its status as either P (on-time payment) or L (late payment). Three-month (six-month) defaults indicate whether leases defaulted in any one month during the three (six) months pre and post a minimum wage increase.

Table 4: Unconditional DID Estimation of the Effect of State Minimum Wage Increases on Three and Six Month Lease Defaults

	3-Month Default		*6-Month Default*	
	(1)	*(2)*	*(1')*	*(2')*
Post	0.0134***	0.0146***	0.0169***	0.0206***
	(0.0006)	(0.0006)	(0.0006)	(0.0007)
MWI	0.0036**	0.0027*	0.0078***	0.0074***
	(0.0011)	(0.0012)	(0.0019)	(0.0019)
Post x MWI	-0.0117***	-0.0098***	-0.0135***	-0.0106***
	(0.0010)	(0.0010)	(0.0014)	(0.0014)
Constant	Yes	Yes	Yes	Yes
Lease-Year FE	No	Yes	No	Yes
State-Clustered SE	Yes	Yes	Yes	Yes
# Leases	*990,785*	*990,785*	*907,035*	*907,035*
Adjusted R-squared	*0.001*	*0.003*	0.001	0.004

This table reports unconditional DID OLS estimation results of variations in lease defaults in treated and control states pre and post minimum wage increases. The dependent variable is a 3-month (6-month) lease default indicator tracking whether tenants have missed a payment during the 3-month (6-month) period pre and the 3-month (6-month) period post a minimum increase. The 3-month and 6-month default samples consists of 990,785 and 907,035 individual leases, respectively. We define a lease as current (not in default) in a given month if RentBureau records its status as either P (on-time payment) or L (late payment). For leases in treated states, we track their performance pre and post each minimum wage increase in that state. For leases in control states, we track lease performance pre and post each minimum wage increase date in the treated group. *Post* stands for the post treatment period and *MWI* indicates treated states. The figures in parentheses are state-clustered standard errors. One, two, or three stars indicate statistical significance at 5%, 1%, or 0.1%, respectively.

Table 5: Multivariate DID Estimation of the Effect of State Minimum Wage Increases on Three-Month Lease Defaults

	(1) *3-mo. Default*	*(2)* *3-mo. Default*
Post	0.0129***	0.0118***
	(0.0006)	(0.0010)
MWI	0.0095***	0.0079
	(0.0017)	(0.0046)
Post x MWI	-0.0129***	-0.0174***
	(0.0011)	(0.0026)
Rent (Lease)	-0.0088***	-0.0053**
	(0.0020)	(0.0019)
Market Rent	-0.0077	-0.0164
	(0.0063)	(0.0082)
PC Income	0.0130*	0.0246*
	(0.0064)	(0.0096)
Inflation	0.0001*	0.0014***
	(0.0001)	(0.0002)
Unemployment	0.0008	-0.0002
	(0.0006)	(0.0013)
Change Renter Population	-0.0008	-0.0014
	(0.0006)	(0.0008)
HPI	-0.0000	-0.0001**
	(0.0000)	(0.0000)
Rental Supply	0.0022	0.0045
	(0.0012)	(0.0028)
Affordable Housing Supply	-0.0026*	-0.0051
	(0.0011)	(0.0029)
Vacancy	0.0208	0.0603
	(0.0272)	(0.0677)
Constant	Yes	Yes
Lease-Year FE	No	Yes
State-Clustered SE	Yes	Yes
# Leases	*984,376*	*984,376*
Adjusted R-squared	*0.001*	*0.005*

This table reports multivariate DID OLS estimation results of lease defaults in treated and control states pre and post minimum wage increases. The dependent variable is a 3-month lease default indicator tracking whether tenants have missed a payment during the 3-month period pre and post a minimum increase. A lease is current (not in default) in a given month if RentBureau records its status as either P (on-time payment) or L (late payment). For leases in treated states, we track their performance pre and post each minimum wage increase in that state. For leases in the control group, we track lease performance pre and post the minimum wage increase dates in each treated state. *Post* stands for the post treatment period and *MWI* indicates treated states. The figures in parentheses are state-clustered standard errors. One, two, or three stars indicate statistical significance at 5%, 1%, or 0.1%, respectively.

Table 6: DID Estimation of the Effect of Minimum Wage Increase on Lease Performance (Three-Month Defaults) by Income Quintile Based on the Ratio of Rent to MSA Fair Market Rent

	(1) *Quintile 1*	*(2)* *Quintile 2*	*(3)* *Quintile 3*	*(4)* *Quintile 4*	*(5)* *Quintile 5*
Panel A: Unconditional Results					
Post	0.0238***	0.0180***	0.0158***	0.0131***	0.0095***
	(0.0025)	(0.0013)	(0.0010)	(0.0009)	(0.0011)
MWI	0.0032	0.0072*	0.0046	0.0021	0.0057*
	(0.0027)	(0.0032)	(0.0024)	(0.0014)	(0.0024)
Post x MWI	-0.0170**	-0.0128***	-0.0105***	-0.0081***	-0.0099***
	(0.0055)	(0.0035)	(0.0022)	(0.0021)	(0.0026)
Constant	Yes	Yes	Yes	Yes	Yes
State-Clustered SE	Yes	Yes	Yes	Yes	Yes
# Leases	*123,602*	*123,401*	*122,871*	*123,047*	*122,789*
Adjusted R-squared	*0.003*	*0.002*	*0.001*	*0.001*	*0.001*
Panel B: Multivariate Results					
Post	0.0186***	0.0136***	0.0115***	0.0090***	0.0067***
	(0.0021)	(0.0012)	(0.0008)	(0.0008)	(0.0009)
MWI	0.0046	0.0068	0.0067	0.0064	0.0146*
	(0.0089)	(0.0077)	(0.0064)	(0.0055)	(0.0056)
Post x MWI	-0.0314***	-0.0255***	-0.0233***	-0.0195***	-0.0188***
	(0.0058)	(0.0040)	(0.0031)	(0.0030)	(0.0033)
Control Variables	Yes	Yes	Yes	Yes	Yes
Lease-Year FE	Yes	Yes	Yes	Yes	Yes
State-Clustered SE	Yes	Yes	Yes	Yes	Yes
# Leases	*122,269*	*122,187*	*121,714*	*121,888*	*121,676*
Adjusted R-squared	*0.010*	*0.007*	*0.006*	*0.005*	*0.004*

This table reports DID regression results of lease defaults in treated and control states pre and post minimum wage increases by rent/income group. For each state, we classify annually leases into rent quintile groups according to the ratio of rent to FMR and estimate the model for each group separately. In order to have enough observations in each quintile for every state, we restrict our sample to 2006 to 2008. *Post* stands for the post treatment period and *MWI* indicates treated states. The model includes the same control variables as in Table 5. The figures in parentheses are state-clustered standard errors clustered. One, two, or three stars indicate statistical significance at 5%, 1%, or 0.1%, respectively.

Table 7: Difference in DID Estimates of the Effect of Minimum Wage Increase on Lease Performance (Three-Month Defaults) between the Bottom and Top Income Quintiles Based on the Ratio of Rent to MSA Fair Market Rent

	Difference in DID Estimates		
	Difference Estimates	*Chi2*	*Prob > Ch2*
Panel A: Unconditional DID Results			
Post x MWI (Quintile 1 - Quintile 5)	-0.007	2.21	0.137
Constant	Yes		
State-Clustered SE	Yes		
# Leases	615,710		
Panel B: Multivariate DID Results			
Post x MWI (Quintile 1 - Quintile 5)	-0.013	5.91	0.015
Control Variables	*Yes*		
Lease-Year FE	*Yes*		
State-Clustered SE	*Yes*		
# Leases	609,734		

This table reports differences in DID effect of minimum wage increase on lease defaults in treated and control states pre and post minimum wage increases between the bottom rent quintile and the top rent quintile – quintile regression results are reported in Table 6. For each state, we classify leases into rent quintile groups annually according to the ratio of rent to FMR and estimate the model for each group separately. In order to have enough observations in each quintile for every state, we restrict our sample to 2006 to 2008. Panel A reports unconditional, while panel B shows conditional results following Equation (1). *Post* stands for the post treatment period and *MWI* indicates treated states. The model in panel B includes the same control variables as in Table 5. We adopt the seemingly unrelated estimation approach to test the difference in DID estimates for quintiles 1 and 5 using state state-clustered standard errors clustered.

Table 8: DID Estimation of Likelihood of Renter Moving after a Minimum Wage Increase

	(1)	*(2)*
Post	0.2424***	0.2428***
	(0.0491)	(0.0492)
MWI	-0.0465	-0.0452
	(0.0389)	(0.0393)
Post x MWI	0.0886*	0.1118**
	(0.0333)	(0.0365)
Post x MWI x Low Rent Group		-0.0855
		(0.0574)
Rent (Lease)	0.0524*	0.0455
	(0.0240)	(0.0267)
Market Rent	-0.1464*	-0.1423*
	(0.0594)	(0.0607)
Inflation	0.0002	0.0002
	(0.0028)	(0.0028)
PC Income	0.3141**	0.3195**
	(0.0899)	(0.0873)
Unemployment	0.0094	0.0092
	(0.0120)	(0.0120)
HPI	-0.0008*	-0.0008*
	(0.0004)	(0.0004)
Vacancy	-1.3448**	-1.3486**
	(0.4566)	(0.4562)
MWI Year FE	Yes	Yes
State-Clustered SE	Yes	Yes
# Leases	*15,046*	*15,046*
Adjusted R-squared	*0.095*	*0.095*

This table reports difference-in-differences OLS estimation of tenants' probability of moving after minimum wage increase. Our sample consists of tenants with leases expiring within three months after a minimum wage increase who then entered into a new lease in the following three to nine months. *Low Rent Group* is a dummy variable equal to 1 if contract rent is less or equal to MSA fair market rent. The figures in parentheses are state-clustered standard errors. One, two, or three stars indicate statistical significance at 5%, 1%, or 0.1%, respectively.

A On-line Appendix – Not for publication

Table A.1: Multivariate DID Estimation of the Effect of State Minimum Wage Increases on Three-Month Default using Restricted Sample

	(1) *3-mo. Default*	*(2)* *3-mo. Default*
Post	0.0202***	0.0168***
	(0.0014)	(0.0011)
MWI	0.0099**	0.0082
	(0.0034)	(0.0047)
Post x MWI	-0.0117***	-0.0169***
	(0.0032)	(0.0033)
Rent (Lease)	-0.0059*	-0.0027
	(0.0028)	(0.0020)
Market Rent	-0.0106	-0.0192*
	(0.0074)	(0.0074)
PC Income	0.0123	0.0235*
	(0.0086)	(0.0088)
Inflation	0.0001	0.0012***
	(0.0001)	(0.0002)
Unemployment	0.0008	-0.0000
	(0.0012)	(0.0012)
Change Renter Population	-0.0011	-0.0017
	(0.0008)	(0.0009)
HPI	-0.0000	-0.0001*
	(0.0000)	(0.0000)
Rental Supply	0.0022	0.0044
	(0.0018)	(0.0028)
Affordable Housing Supply	-0.0028	-0.0051
	(0.0019)	(0.0028)
Vacancy	-0.0017	0.0303
	(0.0497)	(0.0647)
Constant	Yes	Yes
Lease-Year FE	No	Yes
State-Clustered SE	Yes	Yes
# Leases	*726,332*	*726,332*
Adjusted R-squared	*0.003*	*0.006*

The dependent variable is a 3-month lease default indicator showing whether a tenant has missed a payment during that period. For each lease, we measure its default status over 3 months pre and post state minimum wage increases. The above multivariate OLS DID estimations are restricted to leases with no missing values of the dependent variable before and after minimum wage increases. *Post* stands for the post treatment period and *MWI* indicates treated states. The figures in parentheses are state-clustered standard errors. One, two, or three stars on top of coefficient estimates indicate statistical significance of coefficient estimates at 5%, 1%, or 0.1%, respectively.

Table A.2: Multivariate DID Estimation of the Effect of State Minimum Wage Increases on Six-Month Lease Defaults

	(1) *6-mo. Default*	*(2)* *6-mo. Default*
Post	0.0174***	0.0136***
	(0.0012)	(0.0014)
MWI	0.0163**	0.0136
	(0.0053)	(0.0077)
Post x MWI	-0.0139***	-0.0171***
	(0.0026)	(0.0032)
Rent (Lease)	-0.0078	-0.0030
	(0.0042)	(0.0033)
Market Rent	-0.0290	-0.0415*
	(0.0155)	(0.0153)
PC Income	0.0196	0.0400*
	(0.0149)	(0.0153)
Inflation	-0.0002	0.0019***
	(0.0001)	(0.0003)
Unemployment	0.0019	0.0022
	(0.0019)	(0.0021)
Change Renter Population	-0.0024	-0.0031
	(0.0014)	(0.0017)
HPI	-0.0000*	-0.0001**
	(0.0000)	(0.0000)
Rental Supply	0.0028	0.0080
	(0.0024)	(0.0043)
Affordable Housing Supply	-0.0024	-0.0087
	(0.0021)	(0.0047)
Vacancy	-0.0992	-0.0457
	(0.0833)	(0.0987)
Constant	Yes	Yes
Lease-Year FE	No	Yes
State-Clustered SE	Yes	Yes
# Leases	*894,831*	*894,831*
Adjusted R-squared	*0.002*	*0.007*

This table reports multivariate DID OLS estimation results of lease defaults in treated and control states pre and post minimum wage increases. The dependent variable is a 6-month lease default indicator tracking whether tenants have missed a payment during the 6-month periods pre and post a minimum increase – a lease is current (not in default) in a given month if RentBureau records its status as either P (on-time payment) or L (late payment). *Post* stands for the post treatment period and *MWI* indicates treated states. The figures in parentheses are state-clustered standard errors. One, two, or three stars on top of coefficient estimates indicate statistical significance of coefficient estimates at 5%, 1%, or 0.1%, respectively.

Table A.3: Treated and Control State Used in Parallel Trend Analysis

Treated State	*Treatment Date*	*Control State*
Arkansas	Oct-06	Tennessee
Arizona	Jan-07	Utah
California	Jan-07	Texas
Colorado	Jan-07	Utah
Connecticut*	Jan-06	Massachussetts
Delaware	Jan-07	Virginia
Florida	Jan-06	Georgia
Illinois	Jan-05	Indiana
Iowa	Apr-07	Nebraska
Kentucky	Jun-07	Tennessee
Maine*	Oct-06	New Hampshire
Maryland	Jan-07	Virginia
Massachusetts	Jan-07	Virginia
Michigan	Oct-06	Indiana
Minnesota	Aug-05	Nebraska
Missouri	Jan-07	Kansas
Nevada	Nov-06	Utah
New Hampshire	Sep-07	Virginia
New York*	Jan-06	Pennsylvania
North Carolina	Jan-07	South Carolina
Ohio	Jan-07	Indiana
Oregon	Jan-07	Idaho
Pennslyvania	Jan-07	Virginia
Washington	Jan-07	Idaho
Wisconsin	Jun-06	Nebraska

The 25 treated states and paired control states for selected treatment dates in month and two-digit year format. Treated states with * subscript, located in the Northeast region of country (where most states are treated), are paired with neighboring states whose treatment period do not overlap.

Table A.4: DID analysis using synthetic control states

	(1)	*(2)*	*(3)*
Post	0.0014**	0.0020***	0.0020**
	(0.0006)	(0.0007)	(0.0009)
MWI	-0.0046***	0.0466	-0.0190
	(0.0010)	(0.0849)	(0.0249)
Post x MWI	-0.0018**	-0.0020***	-0.0020*
	(0.0007)	(0.0007)	(0.0011)
Mediane Income	-0.0151***	0.0040	0.0040
	(0.0042)	(0.0104)	(0.0129)
Inflation	0.0001	-0.0001	-0.0001
	(0.0000)	(0.0001)	(0.0001)
Change Renter Population	-0.0029**	0.0298	0.0298
	(0.0015)	(0.0385)	(0.0527)
Rental Supply	0.0017*	0.0003	0.0003
	(0.0010)	(0.0016)	(0.0021)
Affordable Housing Supply	0.0021***	0.0004	0.0004
	(0.0006)	(0.0007)	(0.0008)
Vacancy	0.0538***	-0.0334	-0.0334
	(0.0169)	(0.0235)	(0.0259)
HPI	-0.1124***	-0.0827***	-0.0827***
	(0.0158)	(0.0169)	(0.0174)
Constant	Yes	Yes	Yes
MWI Panel FE	No	Yes	Yes
# Observations	*2,384*	*2,384*	*2,384*
R-squared	*0.248*	*0.425*	*0.425*

This table reports multivariate DID OLS estimation results of average lease defaults in treated and a synthetic control group pre and post minimum wage increases. The synthetic control methodology creates a counterfactual control group such that the event of interest (lease default) trends similarly during the pre-treatment period following Abadie et al. (2010). *Post* stands for the post treatment period and *MWI* indicates treated states. Columns (1) and (2) report normal standard errors whereas column (3) reports White robust standard errors. One, two, or three stars on top of coefficient estimates indicate statistical significance of coefficient estimates at 5%, 1%, or 0.1%, respectively.

Table A.5: DID Estimation of Effect of Minimum Wage Increase on Lease Performance over Time

	(1) *Monthly Default*	*(2)* *Monthly Default*
MWI	0.0090**	0.0071
	(0.0030)	(0.0048)
Post (Month 1)	-0.0054***	-0.0060***
	(0.0009)	(0.0008)
Post (Month 2)	-0.0066***	-0.0067***
	(0.0011)	(0.0010)
Post (Month 3)	-0.0059***	-0.0055***
	(0.0011)	(0.0010)
Post (Month 4)	-0.0036**	-0.0027*
	(0.0011)	(0.0011)
Post (Month 5)	-0.0059***	-0.0045***
	(0.0010)	(0.0010)
Post (Month 6)	-0.0026*	-0.0007
	(0.0013)	(0.0013)
Post x MWI (Month 1)	-0.0080*	-0.0144***
	(0.0032)	(0.0032)
Post x MWI (Month 2)	-0.0106***	-0.0170***
	(0.0025)	(0.0028)
Post x MWI (Month 3)	-0.0107***	-0.0173***
	(0.0027)	(0.0028)
Post x MWI(Month 4)	-0.0124***	-0.0190***
	(0.0023)	(0.0025)
Post x MWI (Month 5)	-0.0085**	-0.0151***
	(0.0025)	(0.0026)
Post x MWI (Month 6)	-0.0098***	-0.0164***
	(0.0022)	(0.0024)
Rent (Lease)	-0.0141***	-0.0099***
	(0.0027)	(0.0016)
Market Rent	0.0001	-0.0155
	(0.0066)	(0.0090)
PC Income	0.0112	0.0253**
	(0.0069)	(0.0081)
Inflation	0.0000	0.0015***
	(0.0001)	(0.0002)
Unemployment	0.0017	-0.0002
	(0.0011)	(0.0011)
Change Renter Population	-0.0000	-0.0014
	(0.0006)	(0.0008)
HPI	-0.0000	-0.0000
	(0.0000)	(0.0000)
Rental Supply	0.0001	0.0020
	(0.0017)	(0.0026)
Affordable Housing Supply	-0.0011	-0.0024
	(0.0020)	(0.0025)
Vacancy	0.0507	0.0975
	(0.0426)	(0.0537)
Lease-Year FE	No	Yes
State-Clustered SE	Yes	Yes
# Leases	*1,006,391*	*1,006,391*
Adjusted R-squared	*0.001*	*0.006*

This table reports difference-in-differences OLS estimation results of monthly lease defaults in treated and control states pre and post minimum wage increases, comparing defaults in the three months before minimum wage changes to defaults during each of the following six months after a wage increase. *Post* stands for the post treatment period and *MWI* indicates treated states. Our model includes the same control variables as in Table 5. The figures in parentheses are state-clustered standard errors. One, two, or three stars indicate statistical significance at 5%, 1%, or 0.1%, respectively.

Table A.6: DID Estimation of Effect of Minimum Wage Increase on Rent over Time

	(1) *Rent*	*(2)* *Rent*
MWI	0.1877	-0.1036*
	(0.1169)	(0.0492)
Post (Month 1)	-0.0057	-0.0055
	(0.0031)	(0.0029)
Post (Month 2)	-0.0098**	-0.0096***
	(0.0031)	(0.0018)
Post (Month 3)	-0.0116***	-0.0196**
	(0.0019)	(0.0057)
Post (Month 4)	-0.0111***	-0.0226***
	(0.0016)	(0.0051)
Post (Month 5)	-0.0098***	-0.0261***
	(0.0021)	(0.0055)
Post (Month 6)	-0.0007	-0.0253**
	(0.0015)	(0.0078)
Post x MWI (Month 1)	-0.0113	-0.0043
	(0.0095)	(0.0083)
Post x MWI (Month 2)	0.0127	-0.0039
	(0.0076)	(0.0116)
Post x MWI (Month 3)	0.0387***	0.0361***
	(0.0077)	(0.0094)
Post x MWI (Month 4)	0.0548***	0.0545***
	(0.0106)	(0.0078)
Post x MWI (Month 5)	0.0624***	0.0613***
	(0.0173)	(0.0100)
Post x MWI (Month 6)	0.0734**	0.0887***
	(0.0217)	(0.0145)
Market Rent		0.9074***
		(0.1356)
Inflation		-0.0016
		(0.0008)
PC Income		0.0245
		(0.0957)
Unemployment		0.0045
		(0.0129)
HPI		0.0014***
		(0.0003)
Vacancy		-1.5944**
		(0.5600)
Constant	Yes	Yes
State-Clustered SE	Yes	Yes
# Leases	*791,974*	*789,196*
Adjusted R-squared	*0.055*	*0.317*

This table reports DID OLS estimation results of rent (in '000s) in treated and control states pre and post minimum wage increases, comparing rents pre minimum wage increase to rents over the following six months. Our sample consists of 845,871 leases. *Post* stands for the post treatment period and *MWI* indicates treated states. The figures in parentheses are state-clustered standard errors. One, two, or three stars indicate statistical significance at 5%, 1%, or 0.1%, respectively.

Table A.7: Summary Statistics of Three-Month and Six-Month Lease Defaults Characterized as *Not On-Time Rent Payments*

	3-Month Defaults				*6-Month Defaults*			
	# Leases	*# Obs*	*Mean*	*SD*	*# Leases*	*# Obs*	*Mean*	*SD*
Panel A: Full Sample								
Pre MWI	830,319	2,678,930	0.1517	0.3587	671,117	2,017,577	0.2144	0.4104
Post MWI	934,065	2,944,237	0.1681	0.3740	819,884	2,396,450	0.2364	0.4248
Difference & t-statistc			*-0.0164*				*-0.0219*	
			(53.09)				*(54.83)*	
Panel B: Control Group								
Pre MWI	564,632	2,365,570	0.1505	0.3575	471,749	1,791,783	0.2118	0.4086
Post MWI	598,237	2,554,093	0.1692	0.3749	534,900	2,076,022	0.2370	0.4252
Difference & t-statistic			*-0.0187*				*-0.0251*	
			(56.65)				*(59.05)*	
Panel C: Treated Group								
Pre MWI	265,687	313,360	0.1608	0.3674	199,368	225,794	0.2354	0.4242
Post MWI	335,828	390,144	0.1610	0.3675	284,984	320,428	0.2325	0.4224
Difference & t-statistic			*-0.0002*				*0.0028*	
			(0.17)				*(2.44)*	

This table reports summary statistics of 3-month and 6-month lease defaults pre and post state minimum wage increases passed from 2000 to 2008. Our treated group regroups the 25 states that enacted minimum wage increases during that period, whereas the control group consists of the 14 other states in the RentBureau data that did not pass any minimum wage increase (See Table 1). Our sample consist of 990,785 unique leases signed between 2000 and 2008. We observe the performance of each lease for up to 24 months. We consider a lease current (not in default) in a given month if RentBureau records its status as P (on-time payment). Three-month (six-month) defaults indicate whether leases have been in default during any one month during the three (six) months pre and post a minimum wage increase.

Table A.8: Unconditional DID Estimation of Three and Six Month Lease Defaults Characterized as *Not On-Time Rent Payments*

	(1) *3-mo. Default*	*(2)* *3-mo. Default*	*(1')* *6-mo. Default*	*(2')* *6-mo. Default*
Post	0.0187***	0.0194***	0.0251***	0.0269***
	(0.0014)	(0.0014)	(0.0020)	(0.0019)
MWI	0.0105	0.0039	0.0235	0.0155
	(0.0099)	(0.0104)	(0.0136)	(0.0142)
Post x MWI	-0.0186*	-0.0139	-0.0280**	-0.0209*
	(0.0077)	(0.0080)	(0.0093)	(0.0097)
Constant	Yes	Yes	Yes	Yes
Lease-Year FE	No	Yes	No	Yes
State-Clustered SE	Yes	Yes	Yes	Yes
# Leases	*990,785*	*990,785*	*907,035*	*907,035*
Adjusted R-squared	*0.001*	*0.003*	*0.001*	*0.004*

This table reports unconditional DID OLS estimation results of variations in lease defaults in treated and control states pre and post minimum wage increases. The dependent variable is a 3-month (6-month) lease default indicator tracking whether tenants have missed a payment during the 3-month (6-month) period pre and the 3-month (6-month) period post a minimum increase – a lease is current (not in default) in a given month if RentBureau records its status as P (on-time payment). For leases in treated states, we track their performance pre and post each minimum wage increase in that state. For leases in control states (i.e. states that did not pass any minimum wage increase during the study period), we track the leases' performance pre and post the minimum wage increase dates in the treated states. *Post* stands for the post treatment period and *MWI* indicates treated states. The figures in parentheses are state-clustered standard errors. One, two, or three stars on top of coefficient estimates indicate statistical significance of coefficient estimates at 5%, 1%, or 0.1%, respectively.

Table A.9: Multivariate DID Estimation of Three- and Six-Month Lease Defaults Characterized as *Not On-Time Rent Payments*

	(1) *3-mo. Default*	*(2)* *6-mo. Default*
Post	0.0138***	0.0166***
	(0.0013)	(0.0027)
MWI	0.0378*	0.0554**
	(0.0145)	(0.0191)
Post x MWI	-0.0306***	-0.0356***
	(0.0074)	(0.0084)
Rent (Lease)	-0.0771***	-0.0747***
	(0.0121)	(0.0148)
Market Rent	-0.0453	-0.0713
	(0.0337)	(0.0559)
PC Income	0.0654	0.0677
	(0.0349)	(0.0451)
Inflation	0.0029***	0.0032***
	(0.0004)	(0.0005)
Unemployment	0.0002	0.0032
	(0.0070)	(0.0078)
Change Renter Population	-0.0040	-0.0049
	(0.0035)	(0.0045)
HPI	-0.0003*	-0.0004**
	(0.0001)	(0.0001)
Rental Supply	-0.0017	0.0033
	(0.0077)	(0.0098)
Affordable Housing Supply	0.0006	-0.0027
	(0.0073)	(0.0082)
Vacancy	0.0034	-0.1943
	(0.1996)	(0.2378)
Lease-Year FE	Yes	Yes
State-Clustered SE	Yes	Yes
# Leases	*984,376*	*894,831*
Adjusted R-squared	*0.011*	*0.012*

This table reports multivariate difference-in-differences OLS estimation results of lease defaults in treated and control states pre and post minimum wage increases. The dependent variables are 3- and 6-month lease default indicators tracking whether tenants have missed a payment during the 3-month periods pre and post a minimum increase – a lease is current (not in default) in a given month if RentBureau records its status as P (on-time payment). For leases in treated states, we track their performance pre and post each minimum wage increase in that state. For leases in control states (i.e. states that did not pass any minimum wage increase during the study period), we track the leases' performance pre and post the minimum wage increase dates in the treated states. *Post* stands for the post treatment period and *MWI* indicates treated states. The figures in parentheses are state-clustered standard errors. One, two, or three stars on top of coefficient estimates indicate statistical significance of coefficient estimates at 5%, 1%, or 0.1%, respectively.

Table A.10: DID Estimation of the Effect of State Minimum Wage Increases on Three-Month Lease Defaults (*Robustness Checks*)

	(1) *3-mo. Default* *Excl. Cross-State MSAs*	*(2)* *3-mo. Default* *Excl. 2007-2008*	*(3)* *3-mo. Default* *Excl. Rent Control*
Post	0.0124***	0.0106***	0.0117***
	(0.0011)	(0.0012)	(0.0010)
MWI	0.0074	0.0061*	0.0074
	(0.0048)	(0.0029)	(0.0053)
Post x MWI	-0.0179***	-0.0093*	-0.0160***
	(0.0029)	(0.0046)	(0.0027)
Rent (Lease)	-0.0040*	-0.0031	-0.0063**
	(0.0015)	(0.0019)	(0.0020)
Market Rent	-0.0109	-0.0298*	-0.0212**
	(0.0114)	(0.0134)	(0.0077)
PC Income	0.0194	0.0306**	0.0307**
	(0.0101)	(0.0106)	(0.0093)
Inflation	0.0014***	0.0010***	0.0014***
	(0.0002)	(0.0002)	(0.0002)
Unemployment	-0.0011	0.0011	-0.0002
	(0.0012)	(0.0013)	(0.0013)
Change Renter Population	-0.0017	-0.0033**	-0.0013
	(0.0009)	(0.0011)	(0.0010)
HPI	-0.0000	-0.0000	-0.0001**
	(0.0000)	(0.0000)	(0.0000)
Rental Supply	0.0061	0.0042	0.0047
	(0.0034)	(0.0037)	(0.0030)
Affordable Housing Supply	-0.0059	-0.0031	-0.0055
	(0.0033)	(0.0038)	(0.0028)
Vacancy Rate	0.0911	0.0772	0.0659
	(0.0677)	(0.0689)	(0.0730)
Lease-Year FE	Yes	Yes	Yes
State-Clustered SE	Yes	Yes	Yes
# Leases	*884,406*	*378,554*	*894,473*
Adjusted R-squared	*0.005*	*0.006*	*0.005*

This table reports multivariate DID OLS estimation results of lease defaults in treated and control states pre and post minimum wage increases. Column (1) excludes MSAs spreading over several states. Column (2) excludes minimum wage changes enacted in 2007 and 2008. Column (3) excludes rent-control states (CA, MD, and NY). The dependent variable is a 3-month lease default indicator tracking whether tenants have missed a payment during the 3-month periods pre and post a minimum increase – a lease is current (not in default) in a given month if RentBureau records its status as either P (on-time payment) or L (late payment). For leases in treated states, we track their performance pre and post each minimum wage increase in that state. For leases in control states (i.e. states that did not pass any minimum wage increase during the study period), we track the leases' performance pre and post the minimum wage increase dates in the treated states. *Post* stands for the post treatment period and *MWI* indicates treated states. The figures in parentheses are state-clustered standard errors. One, two, or three stars on top of coefficient estimates indicate statistical significance of coefficient estimates at 5%, 1%, or 0.1%, respectively.