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Minimum Wages and Health

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Introduction

The U.S. Federal minimum wage has been constant at \$7.25 since July 2009, during which time it has lost 11% of its purchasing power. Its real purchasing power is about where it was in the early 1980s, and below its late-1960s peak. Over this same period, many states have increased or are discussing increasing their minimum wages. In January 2016, 14 states raised their minimum wages either through a vote or because their minimum wages are indexed to inflation. It is estimated that changes in the minimum wage affect 20 to 30 percent of the work force (Belman and Wolfson, 2014), thus understanding its impacts is important.

Labor activists and many politicians argue that the current federal minimum wage of \$7.25 is not enough to support a family.¹ Others have also noted that raising minimum wages could potentially close the gender wage gap since women are more likely to hold minimum wage jobs.² Some states have hired experts who have shown that raising the minimum wage could be beneficial for the health of the state's residents (e.g. Bhatia, 2014; Krisberg, 2015). Thus, although raising the minimum wage raises costs for employers who might well respond by eliminating jobs, supporters of increases note that the net effect is likely to be positive since higher minimum wages will pull at least some people out of poverty. On the other side are those who note that minimum wages are not a terribly effective tool for raising low income families out of poverty and they advocate for a more generous Earned Income Tax Credit (e.g. Sabia and Nielsen, 2015).

There is an extensive literature and debate in labor economics regarding the effects of raising the minimum wage on employment (e.g. Addison et al., 2013; Belman and Wolfson,

¹ See the Living Wage Calculator run by MIT professor Amy Glasmeier at <http://livingwage.mit.edu/articles/15-minimum-wage-can-an-individual-or-a-family-live-on-it>.

² The American Association of University Women have are among those who have advocated this: <http://www.aauw.org/2014/08/07/raise-the-wage/>

2014; Allegretto et al., 2011). In this paper, we consider another dimension along which raising the minimum wage may have an impact on individual well-being—the health outcomes of the low-income workers who receive pay increases.³

To establish that minimum wage increases lead to better health via income effects one must first empirically document that higher minimum wages increase the earnings of (at least some) workers. This has been established in the literature by at least some scholars (Belman and Wolfson, 2014; Sabia, Pitts, and Argys, 2014). It has also been established that income influences health (e.g. Evans and Garthwaite, and Averett and Wang, 2014). In this paper, we turn to whether these increases in minimum wages have a causal effect on an individual's health. Below we present a brief review of the literature in this area and then some preliminary results. We conclude with a discussion of our future plans with respect to this research.

The goal of this research is to empirically examine whether there is a causal link between minimum wage increases and health. Using difference-in-differences and instrumental variables identification strategies and data drawn from the Behavior Risk Factor Surveillance Survey (BRFSS) from 1991-2013, we estimate the effect of minimum wage increases on several health-related outcomes. We posit that such increases in minimum wages raise incomes for at least some individuals and that this is the mechanism by which minimum wage increases might change health behaviors and improve health.

Previous Literature

There are only a handful of studies of which we are aware that examine the effect of minimum wage increases on health-related outcomes. Kronenberg et al. (2015) and Reeves et al. (2014)

³ There is also a possibility that if some workers lose their jobs to minimum wage increases they will experience adverse health consequences. See Schaller and Stevens 2015 for recent work on job loss and health outcomes.

both examine the effects on mental health of the increases in the minimum wage in the United Kingdom. They reference the work of Benzeval et al. (2014) who showed that income shocks could affect mental health through several pathways. These include being able to purchase more material goods and services which can have a direct impact on mental health such as a better diet. The second pathway is the stress pathway whereby having a low income relative to others can create stress. The third pathway is the behavior pathway where those with higher incomes are less likely to engage in behaviors that can lead to poor mental health such as substance abuse. Kronenberg et al., using a DD method, do not find any significant effects while Reeves et al. find that the increases lead to improved mental health.

In the U.S. there are several papers that examine the role of minimum wages and whether or not an individual has health insurance. There has been concern that minimum wages might reduce access to health care as employers substitute higher minimum wages for less generous plans or dropping coverage for employees. Simon and Kaestner (2004) explored the possibility that employers also respond to minimum wages by adjusting non-wage components of the job including health insurance. In their analysis of CPS data spanning the years 1979-2000, they find no evidence that results indicate no discernible effect of the minimum wage on the provision of health insurance (or other fringe benefits) for low-skill workers. On the other hand, the direct income-increasing effect of higher minimum wages may be that workers have more income to afford insurance premiums and/or out-of-pocket medical expenses. McCarrier et al. (2011) use the Behavioral Risk Factor Surveillance (BRFSS) data (1996-2007) to examine whether increases in the minimum wage affect un-insurance rates and/or the unmet medical needs of low-wage workers. Their findings suggest that a higher minimum wage implies fewer unmet medical needs but no effect on un-insurance rates.

Other health-related work on the minimum wages includes work linking minimum wage increases to obesity and alcohol use. Also using BRFSS but with different years (1984 – 2006), Meltzer and Chen (2011) examine the effect of a decrease in the real minimum wage on rates of obesity in the US. Their paper examines all workers not just low-wage workers and finds an association between declines in the real minimum wage and increased incidence of obesity. Meltzer and Chen discuss what the causal link may be between declines in the minimum wage and increased obesity; they emphasize that declines in the minimum wage lower the price of fast food and increase its consumption. This increased consumption of fast food leads to greater obesity. Sabia, Pitts, and Argys (2014), using 1991 – 2011 CPS Outgoing Rotation Groups, YRBS and BRFSS data, find no significant effects of minimum wage increases on alcohol consumption.

Finally, more generally, Sabia and Nielson (2015) also exploit the variability in state minimum wage laws over time and find no significant effects of raising minimum wages on low income populations in terms of health insurance coverage, doctor's visits, or sufficient resources to purchase food or eat a balanced meal.

We extend this literature in several ways. First, we extend the data used by McCarrier et al. and Meltzer and Chen to encompass a longer time period during which the economy in the US has experienced increasing minimum wage so that the minimum wage potentially plays an important role for individuals' health outcomes and health-related decisions. We also examine a more comprehensive set of health outcomes, health-related behaviors and insurance coverage. Finally, we use the method of instrumental variables to account for the potential endogeneity of minimum wage increases. In the next section, we provide information on the minimum wage

changes over time and across states as well as detailed information on the health outcomes we study.

Data

Minimum Wage:

To examine associations between minimum wage policies and access to health care and health outcomes, we gather data on the prevailing minimum wage rate in each state for years 1991-2013.⁴ We calculate the minimum wage as the greater of the state minimum wage (if one exists) and the federal minimum wage. Information on the state minimum wages was collected from the state labor-law changes published annually in the January edition of the Monthly Labor Review. We deflate minimum wages and all other dollar values used in the analysis using the CPI-U with the base years of 1982-1984.

Over the period of our sample, the federal minimum wage changed 6 times due to three legislative changes (1991, 1996-1997, and 2007-2009) while the states changed their minimum wages 383 times over this time frame (this includes the federal minimum wage changes).⁵ Some states have more regular changes in the minimum wage because they index the minimum wage to inflation⁶ but others have had to deliberately introduce legislation or make constitutional changes to affect an increase in their minimum wage. (Please see our appendix for a full list of states that changed their minimum wage as well as other details regarding minimum wage workers).

Changes in minimum wage over time vary across states. The largest one year change in the minimum wage was in Iowa where it increased by \$2.10 and the smallest one year changes

⁴ Meaningful state variation in minimum wages did not start until the end of the 1980s (Simon and Kaestner, 2004).

⁵ Appendix A1 details these changes in minimum wages.

⁶ See Appendix A for dates of indexation.

occurred in Vermont, Hawaii, Delaware and Connecticut which each had a change of \$.50. Figures A1 and A2 present the nominal and the real minimum over time averaged across states (including the District of Columbia) and the maximum minimum wage in any state in a given year and the minimum is always the federal. While the nominal minimum wage on average has been rising, the real minimum wage has been fairly constant hovering under \$4 (in 1982-84 dollars).

The minimum wage is only relevant for a subset of workers. In 2014, the BLS reports that 58.7 percent of all wage and salary workers were by the hour and of those 3.9 percent earned the federal minimum or less. The Fair Labor Standards Act allows for exemptions from the minimum wage for certain groups. Workers who are less than 25 years old, women, blacks and Hispanics are more likely to earn minimum wages. Minimum wage workers are also less educated and predominantly in the south and the Midwest.⁷

Health Outcomes

To examine the effect of minimum wage changes on health, we use data from the Behavior Risk Factor Surveillance Survey (BRFSS) 1991 to 2013. From the BRFSS we construct a dataset consisting of pooled cross-sectional observations at the individual level. The BRFSS is a telephone survey of adults aged 18 to 99. When weighted, the BRFSS is designed to be representative of the U.S. population.

We examine the following dependent variables: a binary variable equal to one if the respondent reports having any type of health insurance in that year (e.g. Medicaid, Private Insurance, Medicare), self-reported health (measured on a Likert scale where 1=excellent, 2=very good, 3=good, 4= and 5=poor), a binary variable equal to one if self-reported health is excellent or very good, 0 otherwise, the number of days in the past month the respondent

⁷ Appendix B details characteristics of minimum wage workers.

reported poor mental health, a binary indicator equal to one if the respondent did not report any days of bad mental health in the past 30 days and a binary variable equal to one if the respondent is a current smoker.

Covariates:

From the BRFSS, we control for race/ethnicity, education, marital status, age, and number of adults in the household. We combine our BRFSS individual level data with state-level data on labor force characteristics and other policies that vary that vary at the state level. In particular, we control for the percentage of the state's workforce that is covered by a collective bargaining agreement, the percent that is a member of a union, the cutoff for Medicaid eligibility, the maximum AFDC/TANF benefits for a family of three, the state unemployment rate and the percent of the state's population that is below the poverty line. We use these controls because they are likely correlated both the level of the minimum wage in a state and the health outcomes of the workers in a state.

Sample and Summary Statistics:

Based on characteristics of minimum wage workers described by the BLS, our preferred sample consists of youth aged 18 to 24 years who report an education of high school graduate or less and who are currently working since this is the group for whom the minimum wage is likely to be binding. Table 1 presents our sample means by gender. Women are slightly more likely than men to be insured whereas men are more likely to report excellent or very good health and that they have better mental health. Because the minimum wage is more likely to affect workers who are low-skilled and/or lack work experience, we also estimate our models separately by race/ethnicity. In tables 2 and 3, we present our sample means by these groups.

Our sample means in table 2 indicate that Hispanic men are far less likely to report having health insurance compared to women or white or black men. Average self-reported health is best (lowest values indicate better reported health) for white men and lowest for Hispanic women. Hispanic and white women are far less likely to report excellent health than are black women and men are more likely to report excellent health than are women. On average, men report fewer days of poor mental health than women and among women, whites report more days of poor mental health than blacks and Hispanics. Given this, a larger fraction of men report having no bad mental health days in the past 30 days as compared to women and among women, black women have the best mental health and white women the worst. Finally, white men and women are more likely to smoke than are blacks or Hispanics and while black women are less likely to smoke than black men, the reverse is true for white and Hispanic men and women.

Table 3 presents the sample means for our independent variable for the six groups that we study. The average minimum wage varies little across the groups. As expected, the proportion in each group who did not finish high school varies with Hispanic men being the least likely to have a high school diploma and white men are the most likely. The other covariates are similar across groups.

Empirical Model

We estimate the following equation:

$$(1) \quad y_{ist} = \alpha + \gamma_1 MW_{st} + \gamma_2 Z_{it} + \gamma_3 X_{st} + \theta_s + \tau_t + \varepsilon_{ist}$$

where y_{ist} is an indicator for a health outcome/behavior for individual i residing in state s at year t ; MW_{st} is the minimum wage (the highest of either the state or the federal minimum in real terms, and in our IV estimation it is the instrumented minimum wage); Z_{it} is a vector of

individual controls including age, race/ethnicity, gender, education, marital status; X_{st} is a vector of state-specific time-varying economic and policy controls; θ_s is a time-invariant state effect; τ_t is a time-invariant year effect; and ε_{ist} is an error term.

Equation (1) identifies the effect of minimum wages on health outcomes from within state variation in minimum wages from year to year. Federal variation in minimum wages is subsumed by the year fixed effects. Thus, equation (1) assumes that unmeasured factors that vary by state/year are uncorrelated with minimum wages and the health outcomes we study.

However, the inclusion of state and year fixed effects does not prevent correlation in the Eq. (1) error term, ε , within states over time, or across states at a point in time (e.g. Arellano, 1987). Ignoring this correlation can lead to biases in the standard errors, especially when the level of aggregation varies across the variables included in the model (see Bertrand et al., 2004). As a result, all standard errors have been clustered to allow for any type of correlation structure among the error terms for a given state.

Results

OLS results

In tables 4a-b we present the OLS regression results as described in equation 1 weighted by the BRFSS sample weights. The table contains two panels. In table 3a we present the results for young workers (aged 18 to 24) with high school education or less which is the group the minimum wage is most likely to treat. The effects are estimated separately by gender. Young men are more likely to be insured and young women are more likely to have better mental health. The days of poor mental health coefficient is estimated with negative binomial model.⁸ Looking

⁸Zhou et al. (2014) demonstrate the importance of the appropriate statistical model when using the healthy days measure in the BRFSS.

at individuals age 18-64, both men and women are more likely to have health insurance and women are less likely to smoke.⁹ The positive and significant coefficient on health insurance is in contrast to the findings of Simon and Kaestner (2004) and McCarrier et al. (2011) who find no effect of higher minimum wages on health insurance.¹⁰

Tables 5, 6, 7 and 8 present the results by gender and race and age group for those who are working and the entire sample population of the effect of the minimum wage on our six health outcomes. Tables 5 and 6 present the results for young people aged 18-24 and Tables 7 and 8 present the results for all people aged 18-64. Once again the estimates are obtained using OLS except for the days of poor mental health outcome which is estimated using a negative binominal model.

In Table 5a-c, for young white men there are no effects of minimum wage on health outcomes in sample in either those working and in a sample not limited to those who are working. For young black men workers experience fewer days of poor mental health. For young Hispanic men there are no effects.

In Table 6a-c, young white women workers appear to have better mental health yet there is no effect in the entire sample. Young black women workers are less likely to smoke. This is also true for the entire sample. For young Hispanic women there are no effects.

In Table 7a-c, we are now examining the adult population age 18-64. For white men who are working or in the entire sample, there is an effect of greater likelihood of having insurance. Black men workers are more likely to smoke which may indicate that cigarettes are a normal

⁹ The BRFSS does not allow us to assess the type of insurance plan held by those who are insured.

¹⁰ We note that the Affordable Care Act made it possible for young adults to remain on their parent's health insurance plans. We have not yet incorporated this into our analysis.

good.¹¹ For the entire sample of black men, they are more likely to be insured. For Hispanic men, they are more likely to have insurance and have fewer poor mental health days.

In Table 8a-c, we find that white women workers are more likely to have insurance and there are no effects for the entire population. For black women, they are less likely to smoke but for workers the effect is only significant at the 10% level. Hispanic women who work or are in the entire sample have better health and are more likely to report excellent or very good health.

In Table 9, we estimate the models by gender and partner status on the assumption that the minimum wage might be particularly important for those who are not partnered. We find fewer days of poor mental health for women who are partnered and unpartnered men are more likely to have health insurance while unpartnered women are more likely to have good mental health.

One reason that we may not see many health effects of the minimum wage is that younger individuals are healthier. Thus, in Table 10a-d, we estimate the models for older individuals who are more likely to experience health problems. We also expand our health outcomes to include regular checkups, having a flu shot, having their blood pressure taken and for women, having a mammogram. We only present estimates for those who report that they are currently working. Men tend to have worse mental health, while older women are less likely to have a mammogram and less likely to smoke.

Endogeneity of Minimum Wage Increases

Clearly the decision to raise the minimum wage is not made randomly. For example, the state of California commissioned a report that demonstrated a strong association between minimum

¹¹ We are currently not controlling for state cigarette taxes but we plan to do so in the next iteration of this paper.

wages and mental health (Bhatia, 2014) and used this as justification to advocate for increasing the minimum wage. While state generosity with regards to the minimum wage might not be random it needs to be uncorrelated with the health of the individuals in the state in order for our identification to be valid.

As a test of whether or not state policy makers increase their minimum wages in response to the health of their electorate, we collapse the data at the (state, year) level and regress the minimum wage on a period lag of each health outcome, controlling for our other covariates including state and year fixed-effects. The results of this exercise are presented in Table 11. We use two panels, one is our preferred sample of young, low-educated workers, the other consists of all workers of all ages and education. We might expect that policymakers who are concerned about the health of their citizens would potentially change the minimum wage in response to these concerns. Our results indicate a positive correlation between health insurance/self-reported health and minimum wages and a negative correlation between smoking and minimum wages. Thus, while not a formal test of endogeneity, these results indicate that the minimum wage in each state may well be a function of the overall health status of the state population. Hence, we turn to the instrumental variables method.

IV results

Because the minimum wage is potentially endogenous to health, we also conduct an instrumental variable estimation. Specifically, we now estimate the following regression model:

$$(2) \quad y_{ist} = \alpha + \gamma_1 MW_{st} + \gamma_2 Z_{it} + \gamma_3 X_{st} + \theta_s + \tau_t + \varepsilon_{ist}$$

$$(3) \quad MW_{st} = \beta_0 + \beta_1 G_{st} + \gamma_2 Z_{it} + \gamma_3 X_{st} + \theta_s + \tau_t + \zeta_{ist}$$

Where the first equation (equation 2) is exactly the same as the OLS regression model in equation 1, while the second equation (equation 3) shows the first-stage specification of the 2SLS estimator. The variable G_{st} is the IV for the minimum wage and it measures the political party of the governor.¹² State governors are either Democrats, Republicans or Independents. Most but not all states who have increased their minimum wages have been those considered to be “blue” states.¹³

The IV results are presented in Table 12 and for comparison purposes, we also present the OLS results.¹⁴ We find that the first stage F-statistic is above 10 (and often much greater) for all groups except for Hispanic males. In Appendix C we present the first stage IV results. As expected, states with a Republican governor are less likely to have raised their minimum wages as compared to those with a Democratic governor. Thus, our instrument appears to be a strong predictor of minimum wage increases. We also test for the endogeneity of the minimum wage using the Durbin-Wu-Hausman test (see p.183 of Cameron and Trivedi (2009) for details). The null hypothesis is that minimum wage is exogenous. In almost all of our models, we see that the hypothesis is not rejected so according to this test, we cannot reject exogeneity of minimum wages in this model.

Focusing on panel A of table 12, we have the results for white men and women. Like our OLS results, the IV results are not statistically significant although they are larger in magnitude and occasionally the opposite sign compared to the OLS results. As expected, the standard errors from the IV estimates are larger than those of the OLS estimates. Panel B, which presents the

¹² We have plans to incorporate other instrumental variables including the proportion of the state legislature that is female. We also plan to estimate DDD models with a comparison group of slightly older workers with some college.

¹³ Over our sample period, only four states did not change the political party of their governor.

¹⁴ The OLS estimates here are slightly different from those in the earlier tables because these estimates are not weighted.

results for Blacks is similar in that the IV results are never statistically significant. Although our OLS results indicated that black men living in higher minimum wage states were more likely to have health insurance, our IV results are now negative (and of the opposite sign) but with a much larger standard error. For black women, OLS results indicated better health but those estimates are now rendered insignificant. Finally, for Hispanic women (we do not discuss the results for Hispanic men given that the first stage F is so low), we find no significance for OLS or IV.

Minimum Wages and Employment Outcomes

Our estimates suggest that for some groups, there may be a positive impact of the minimum wage on some health outcomes/behaviors and on having health insurance. As described earlier, the primary mechanism would be an income effect. Thus, we attempt to establish if the minimum wage indeed increases the income/earnings of the young adults in our sample. This is important as this income effect is one of the mechanisms by which we believe higher minimum wages might improve health. The BRFSS does not have earnings data and collects income only categorically thus we turn to data from the Current Population Survey.

In tables 13, 14 and 15, we present results from the CPS Merged Outgoing Rotation Groups survey over the time from 1991 to 2013 and examine several outcomes: hourly wages, weekly earnings, usual hours of work and employment. We use the same sample restrictions we use in our models—that the individuals not have more than a high school diploma and we estimate the models for all workers aged 18 to 64 and then for younger workers between the ages of 18 and 24. In addition, for the wage/earnings outcomes, we estimate the models for all individuals and then we further limit the sample to those who are paid by the hour as an additional way to ensure that we are focusing on a group for whom the minimum wage is binding. We log both weekly and hourly earnings (which are in real terms) and we log the

minimum wage so that our coefficients can be interpreted as elasticities. We estimate these models both with and without state specific time trends. It is common in the recent minimum wage literature to include state specific time trends (e.g. Allegretto et al., 2011) although this considerably reduces available variation for identification (Sabia and Nielson, 2015).

The top panel of the table presents the results for models without state specific time trends while the bottom panel presents the models with state specific time trends. Focusing first on the top pane, we find, for white men, we find those living in states with higher minimum wages have lower hours of work, while for young white women we find that they are slightly more likely to work. These effects disappear with the addition of the state specific time trends. For black men and women, we find evidence of both lower hourly and lower weekly earnings but no effect on hours of work. Once again, the addition of the state specific time trends renders these coefficients insignificant. For Hispanic men, we find lower weekly earnings and lower hours (for those paid by the hour). Interestingly, Hispanic women are the only group for whom we see both an increase in the hourly wages for young workers regardless of if they are paid hourly or not. The finding that the results are sensitive to the inclusion of state specific time trends has been documented in the minimum wage literature (Sabia, 2009). Aside from Hispanic women, we do not find evidence of increased income for those living in higher minimum wage states.

Conclusions and Extensions

Policymakers are increasingly calling for higher minimum wages citing the potential positive effects of higher minimum wages on health both mental and physical. While there is a large economics literature linking income to health, we know little about how minimum wage increases might affect health. Our preliminary results indicate that there is some evidence that

increasing the minimum wage may lead to little to no effect of the minimum wage on the probability of having health insurance, the probability of smoking or self-reported general or mental health.

We plan to extend this analysis in several directions. First, we plan to incorporate data from the National Health Interview Survey which has more health outcomes and allows us to examine teenagers who are those who are likely to earn minimum wage. The BRFSS data is for those aged 18 and older and thus we cannot assess the health of younger teenagers in response to minimum wage changes. We also plan to add controls for state cigarette taxes to our models. In addition, to be sure that our IV working only through its effect on minimum wages and is not also correlated with health outcomes, we plan to gather more information on state health spending such as spending on mental health as well as add other instruments.

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Table 1: Sample Means by Gender¹

Variable	women	men
Min wage	3.0551 (.315)	3.0642 (.3126)
Insured	.6777	.6363
Health Status	2.3996 (.9239)	2.2576 (.9398)
Exc./VG Health	.185	.2448
Days Poor MH	5.412 (8.496)	3.355 (7.1212)
Has Good MH	.4987	.622
Smoker	.2772	.2759
Age years	20.9748 (2.0754)	20.9427 (2.0628)
Poverty	12.5652 (3.3708)	12.5805 (3.3521)
Unemployment Rate	5.5721 (1.8117)	5.6333 (1.8408)
Union Member	11.9591 (5.8174)	11.9565 (5.8782)
Rep by Union	13.4878 (5.864)	13.4862 (5.9239)
AFDC/TANF benefits	411.1646 (154.7515)	416.9193 (155.6448)
Medicaid Cutoff	180.8437 (38.8316)	180.6409 (39.0681)
# adults in HH	2.2891 (1.0494)	2.5595 (1.0781)
Never Married	.6455	.7116
Separated/divorced/widowed	.059	.0255
Less than high school	.1745	.2069
white	.6591	.6823
black	.1363	.0844
Observations	38419	48479

Standard deviations of continuous variables in parentheses

¹ Insured: Has Health Insurance (binary), Health Status: Self reported health 1=excellent, 5=poor, Exc./VG Health: Self reported health status=excellent or very good then this=1, otherwise zero (binary), Days Poor MH: number of bad mental health days in past month, Has Good MH: =1 if had no bad mental health days in past month (binary), Smoker=1 if currently a cigarette smoker, 0 otherwise

Table 2: Means Working Aged 18-25 High School graduates or less²

Variable	white men	white women	black men	black women	Hispanic men	Hispanic women
Insured	.6744	.6939	.6419	.6938	.5556	.6461
Health Status	2.1886 (.9045)	2.3515 (.8948)	2.2357 (.9509)	2.3935 (.9685)	2.4162 (1)	2.4774 (.943)
Exc. Health	.2536	.1842	.2649	.2155	.2265	.1772
Days Poor MH	3.3655 (7.0611)	5.3712 (8.5828)	2.9631 (6.973)	4.325 (8.0556)	3.3028 (7.0625)	4.749 (8.215)
Has Good MH	.6095	.4723	.6797	.5795	.6212	.5082
Smoker	.32	.3406	.1757	.1318	.2221	.1995
Observations	28943	22997	3643	4688	3514	2509

Standard deviations of continuous variables in parentheses

² Insured: Has Health Insurance (binary), Health Status: Self reported health 1=excellent, 5=poor, Exc./VG Health: Self reported health status=excellent or very good then this=1, otherwise zero (binary), Days Poor MH: number of bad mental health days in past month, Has Good MH: =1 if had no bad mental health days in past month (binary), Smoker=1 if currently a cigarette smoker, 0 otherwise

Table 3: Means Working Aged 18-25 High School graduates and less

Variable	white men	white women	black men	black women	Hispanic men	Hispanic women
Min Wage	3.0255 (.3088)	3.026 (.3127)	2.9931 (.2807)	2.9778 (.2795)	3.065 (.2855)	3.0689 (.2856)
Age years	20.8658 (2.0854)	20.9074 (2.1024)	20.9358 (2.054)	21.2229 (2.0291)	21.0811 (2.0126)	21.002 (2.0468)
Poverty	12.1826 (3.2119)	12.1479 (3.1943)	13.6311 (3.889)	13.5675 (3.8359)	12.9228 (3.6964)	12.7988 (3.64)
Unemployment Rate	5.3656 (1.7385)	5.3267 (1.7264)	5.7869 (1.8396)	5.6503 (1.6979)	5.4291 (1.6329)	5.368 (1.6676)
Union Member	12.053 (5.6008)	12.1498 (5.5894)	10.8393 (5.978)	10.6773 (5.6521)	13.7842 (6.3932)	13.7789 (6.4262)
Rep by Union	13.6216 (5.6441)	13.709 (5.6288)	12.3758 (6.1002)	12.1996 (5.773)	15.4711 (6.4215)	15.433 (6.4273)
AFDC/TANF benefits	409.7201 (148.4901)	409.0393 (146.4673)	340.5421 (144.0055)	337.7671 (139.5132)	446.329 (162.8081)	441.5959 (164.32)
Medicaid Cutoff	177.5022 (38.5746)	177.6733 (38.4607)	183.9499 (34.8805)	186.0034 (36.0632)	182.4446 (40.0302)	181.0791 (38.3834)
# adults in HH	2.5049 (1.0067)	2.3146 (.9915)	2.3813 (1.0326)	1.9456 (1.0207)	2.704 (1.2309)	2.3711 (1.1449)
Never Married	.7082	.6046	.7999	.8225	.6505	.6006
Separated/divorced/widowed	.0249	.0661	.0264	.0348	.0299	.0725
Less than high school	.1816	.1588	.1658	.1527	.3315	.2543
Observations	28943	22997	3643	4688	3514	2509

Standard deviations of continuous variables in parentheses

Table 4: OLS results by gender

		Men High School or less, working						Women, High School or less, working					
VARIABLES	Insured	Health Status	Exc./VG Health	Days Poor MH	Has Good MH	Smoker	Insured	Health Status	Exc./VG Health	Days Poor MH	Has Good MH	Smoker	
		Age 18-24						Age 18-24					
Panel A	Min wage	0.072*** (0.021)	0.005 (0.035)	0.019 (0.023)	-0.1101 (0.1361)	0.024 (0.036)	-0.002 (0.018)	0.002 (0.025)	0.028 (0.052)	-0.010 (0.025)	-0.1979*** (0.0652)	0.079** (0.031)	0.013 (0.026)
	Constant	0.714*** (0.091)	1.914*** (0.253)	0.348*** (0.126)	0.7275 (0.5124)	0.466*** (0.146)	-0.150 (0.100)	0.695*** (0.134)	2.127*** (0.219)	0.278** (0.118)	2.8134*** (0.4000)	-0.187* (0.104)	-0.279* (0.155)
	Sample R-squared	41,100 0.090	39,146 0.053	39,146 0.016	37,263	37,357 0.023	41,885 0.066	34,013 0.042	32,052 0.030	32,052 0.010	30,400	30,448 0.033	34,313 0.094
		Age 18-64						Age 18-64					
Panel B	Min wage	0.039*** (0.011)	0.029 (0.024)	-0.001 (0.007)	-0.0016 (0.0671)	-0.009 (0.019)	-0.003 (0.008)	0.021** (0.011)	-0.011 (0.022)	0.004 (0.006)	-0.0864* (0.0508)	0.012 (0.017)	-0.018** (0.007)
	Constant	0.364*** (0.056)	2.020*** (0.132)	0.307*** (0.042)	0.9651*** (0.2911)	0.643*** (0.073)	0.359*** (0.040)	0.484*** (0.044)	2.262*** (0.112)	0.252*** (0.039)	1.7792*** (0.2102)	0.426*** (0.075)	0.338*** (0.039)
	Sample R-squared	375,449 0.142	357,248 0.076	357,248 0.018	342,002	342,598 0.028	375,231 0.044	444,244 0.094	424,407 0.070	424,407 0.014	405,560	406,489 0.028	443,274 0.054

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

All regressions include covariates, state/year fixed effects and are weighted.

The coefficients are estimated using OLS except the coefficient on days of poor mental health which is estimated using a negative binominal regression.

Table 5: OLS results: **Men, High School or less, Age 18-24**

VARIABLES	Working						Working and Not Working						
	Insured	Health Status	Exc./VG Health	Days Poor MH	Has Good MH	Smoker	Insured	Health Status	Exc./VG Health	Days Poor MH	Has Good MH	Smoker	
White							White						
Panel A	Min wage	0.051 (0.034)	-0.063 (0.056)	0.048* (0.024)	-0.2174 (0.1434)	0.046 (0.031)	0.009 (0.026)	0.037 (0.025)	-0.010 (0.054)	0.009 (0.019)	-0.1671 (0.1169)	0.027 (0.029)	0.005 (0.021)
	Constant	0.909*** (0.147)	2.077*** (0.266)	0.243 (0.150)	1.6121** (0.6783)	0.242 (0.164)	-0.168 (0.115)	1.351*** (0.125)	1.498*** (0.181)	0.455*** (0.097)	0.4094 (0.5358)	0.486*** (0.151)	-0.424*** (0.088)
	Sample	28,213	26,721	26,721	25,460	25,460	28,813	45,413	43,747	43,747	41,687	41,687	46,867
	R-squared	0.040	0.020	0.013		0.030	0.056	0.050	0.024	0.011		0.028	0.071
Black							Black						
Panel B	Min wage	0.110 (0.099)	0.002 (0.206)	-0.049 (0.098)	-1.0353** (0.4252)	0.115* (0.065)	-0.039 (0.052)	0.112** (0.053)	-0.147 (0.143)	0.088 (0.077)	-0.4493* (0.2449)	0.011 (0.054)	-0.029 (0.026)
	Constant	0.693** (0.307)	1.295 (0.814)	0.939** (0.411)	1.1605 (2.0444)	0.435 (0.363)	-0.084 (0.196)	1.222*** (0.220)	1.943*** (0.699)	0.345 (0.321)	-0.8987 (1.0720)	1.034*** (0.210)	-0.553*** (0.123)
	Sample	3,546	3,318	3,318	3,157	3,157	3,614	7,290	6,971	6,971	6,607	6,607	7,494
	R-squared	0.058	0.049	0.048		0.069	0.052	0.065	0.034	0.027		0.039	0.064
Hispanic							Hispanic						
Panel C	Min wage	0.105 (0.081)	0.184 (0.150)	-0.060 (0.049)	0.4520 (0.2930)	-0.074 (0.075)	-0.037 (0.062)	0.088 (0.067)	-0.083 (0.195)	0.045 (0.074)	0.2732 (0.1989)	-0.063 (0.049)	-0.047 (0.054)
	Constant	1.067*** (0.371)	2.009** (0.880)	0.023 (0.262)	-1.6514 (1.6518)	1.101*** (0.383)	0.245 (0.200)	1.398*** (0.325)	2.335*** (0.707)	-0.024 (0.205)	-0.7293 (1.3085)	1.172*** (0.301)	0.391* (0.229)
	Sample	3,413	3,185	3,185	3,089	3,089	3,465	5,340	5,041	5,041	4,857	4,857	5,459
	R-squared	0.135	0.106	0.087		0.056	0.087	0.123	0.079	0.048		0.052	0.076

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

All regressions include covariates, state/year fixed effects and are weighted.

The coefficients are estimated using OLS except the coefficient on days of poor mental health which is estimated using a negative binominal regression.

Table 6: OLS results: Women, High School or less, Age 18-24

		Working						Working and Not Working					
VARIABLES	Insured	Health Status	Exc./VG Health	Days Poor MH	Has Good MH	Smoker	Insured	Health Status	Exc./VG Health	Days Poor MH	Has Good MH	Smoker	
White							White						
Panel A	Min wage	0.007 (0.032)	0.070 (0.075)	-0.033 (0.031)	-0.2397** (0.1001)	0.103** (0.047)	0.046 (0.041)	0.004 (0.019)	0.052 (0.046)	-0.011 (0.021)	-0.0696 (0.0717)	0.041 (0.033)	0.023 (0.025)
	Constant	0.796*** (0.147)	1.448*** (0.376)	0.448** (0.181)	2.3530*** (0.5628)	-0.249 (0.187)	-0.385** (0.168)	1.200*** (0.113)	1.445*** (0.247)	0.300*** (0.105)	1.2709*** (0.4586)	0.125 (0.154)	-0.516*** (0.104)
	Sample	22,643	21,174	21,174		20,119	22,906	44,100	41,637	41,637	39,532	39,532	44,839
	R-squared	0.033	0.020	0.014	0.036	0.061	0.043	0.021	0.011		0.028	0.081	
Black							Black						
Panel B	Min wage	-0.051 (0.071)	-0.002 (0.145)	0.024 (0.069)	-0.0775 (0.2615)	0.001 (0.070)	-0.132*** (0.045)	0.065* (0.033)	-0.024 (0.069)	-0.019 (0.035)	-0.0163 (0.1299)	0.005 (0.033)	-0.085** (0.034)
	Constant	0.695** (0.318)	2.725*** (0.626)	-0.115 (0.301)	2.0681* (1.1842)	-0.021 (0.324)	0.196 (0.156)	0.680*** (0.168)	2.681*** (0.370)	0.016 (0.172)	0.6184 (0.7884)	0.509*** (0.160)	-0.304* (0.159)
	Sample	4,651	4,400	4,400	4,106	4,106	4,658	10,494	9,914	9,914	9,325	9,325	10,549
	R-squared	0.062	0.050	0.045		0.061	0.077	0.062	0.020	0.020		0.041	0.066
Hispanic							Hispanic						
Panel C	Min wage	0.099 (0.127)	-0.233 (0.167)	0.072 (0.088)	-0.4417 (0.4135)	0.098 (0.088)	-0.078 (0.071)	0.114* (0.065)	-0.205 (0.126)	0.062 (0.045)	0.2203 (0.2281)	-0.055 (0.062)	-0.035 (0.059)
	Constant	1.351*** (0.480)	3.318*** (0.995)	-0.025 (0.395)	4.5284** (1.7847)	-0.171 (0.433)	0.258 (0.364)	0.346 (0.376)	2.478*** (0.762)	0.043 (0.273)	0.3763 (1.4386)	0.423 (0.394)	-0.032 (0.224)
	Sample	2,466	2,276	2,276	2,217	2,217	2,475	5,456	5,053	5,053	4,888	4,888	5,504
	R-squared	0.111	0.094	0.075		0.079	0.092	0.105	0.079	0.042		0.050	0.092

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

All regressions include covariates, state/year fixed effects and are weighted.

The coefficients are estimated using OLS except the coefficient on days of poor mental health which is estimated using a negative binominal regression.

Table 7: OLS results: Men, High School or less, Age 18-64

VARIABLES	Working						Working and Not Working						
	Insured	Health Status	Exc./VG Health	Days Poor MH	Has Good MH	Smoker	Insured	Health Status	Exc./VG Health	Days Poor MH	Has Good MH	Smoker	
White							White						
Panel A	Min wage	0.028** (0.010)	-0.028 (0.024)	0.012* (0.007)	0.0023 (0.0493)	0.005 (0.012)	-0.001 (0.009)	0.027*** (0.008)	-0.032 (0.022)	0.007 (0.005)	-0.0029 (0.0417)	0.003 (0.010)	-0.001 (0.008)
	Constant	0.683*** (0.046)	1.893*** (0.126)	0.293*** (0.044)	1.1748*** (0.3050)	0.562*** (0.071)	0.489*** (0.040)	0.495*** (0.050)	2.064*** (0.106)	0.299*** (0.024)	1.6091*** (0.2379)	0.538*** (0.060)	0.490*** (0.032)
	Sample	280,145	265,514	265,514	254,314	254,314	280,138	468,187	446,609	446,609	427,205	427,205	468,600
	R-squared	0.091	0.041	0.016		0.037	0.042	0.095	0.113	0.024		0.045	0.040
Black							Black						
Panel B	Min wage	0.014 (0.020)	0.049 (0.055)	0.011 (0.015)	0.0543 (0.1260)	-0.027 (0.036)	0.045** (0.022)	0.038** (0.015)	-0.059 (0.053)	0.039* (0.021)	-0.0084 (0.0875)	-0.037 (0.027)	0.026 (0.018)
	Constant	0.671*** (0.079)	1.706*** (0.294)	0.342*** (0.120)	0.2025 (0.6969)	0.695*** (0.161)	0.106 (0.084)	0.441*** (0.064)	2.199*** (0.266)	0.264** (0.100)	0.8509* (0.4586)	0.741*** (0.108)	0.161** (0.072)
	Sample	31,112	29,358	29,358	28,063	28,063	31,055	58,278	55,620	55,620	52,961	52,961	58,243
	R-squared	0.073	0.057	0.027		0.026	0.032	0.075	0.141	0.041		0.039	0.032
Hispanic							Hispanic						
Panel C	Min wage	0.137*** (0.043)	-0.158 (0.113)	0.025 (0.040)	-0.351*** (0.1163)	0.038 (0.033)	-0.013 (0.037)	0.109*** (0.037)	-0.164 (0.114)	0.047 (0.041)	-0.2381*** (0.0848)	0.023 (0.030)	-0.004 (0.032)
	Constant	0.247 (0.165)	2.539*** (0.426)	0.214* (0.119)	2.4614*** (0.6288)	0.418** (0.204)	0.353** (0.138)	0.077 (0.163)	2.725*** (0.337)	0.106 (0.095)	2.2938*** (0.4462)	0.508*** (0.182)	0.373*** (0.124)
	Sample	18,591	17,341	17,341	16,786	16,786	18,648	29,047	27,286	27,286	26,232	26,232	29,179
	R-squared	0.134	0.079	0.027		0.038	0.049	0.113	0.098	0.028		0.043	0.055

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

All regressions include covariates, state/year fixed effects and are weighted.

The coefficients are estimated using OLS except the coefficient on days of poor mental health which is estimated using a negative binominal regression.

Table 8: OLS results: Women, High School or less, Age 18-64

VARIABLES	Working						Working and Not Working						
	Insured	Health Status	Exc./VG Health	Days Poor MH	Has Good MH	Smoker	Insured	Health Status	Exc./VG Health	Days Poor MH	Has Good MH	Smoker	
White							White						
Panel A	Min wage	0.019** (0.007)	-0.040 (0.028)	0.007 (0.008)	-0.0925* (0.0532)	0.024 (0.018)	-0.006 (0.010)	0.016* (0.008)	-0.035 (0.029)	0.006 (0.007)	-0.0804* (0.0439)	0.019 (0.018)	-0.003 (0.007)
	Constant	0.699*** (0.042)	1.977*** (0.134)	0.308*** (0.039)	1.9745*** (0.2628)	0.355*** (0.093)	0.505*** (0.049)	0.594*** (0.038)	2.121*** (0.137)	0.277*** (0.030)	2.0573*** (0.2224)	0.384*** (0.085)	0.477*** (0.037)
	Sample	326,282	310,769	310,769	297,221	297,221	325,686	638,689	609,568	609,568	581,936	581,936	637,755
	R-squared	0.074	0.034	0.012		0.036	0.050	0.069	0.106	0.020		0.040	0.051
Black							Black						
Panel B	Min wage	0.004 (0.024)	0.026 (0.038)	0.011 (0.026)	-0.0947 (0.0784)	-0.000 (0.034)	-0.035* (0.018)	0.036* (0.020)	0.033* (0.018)	-0.005 (0.012)	-0.0906 (0.0684)	0.008 (0.029)	-0.047*** (0.010)
	Constant	0.628*** (0.083)	2.043*** (0.205)	0.164 (0.118)	1.5271*** (0.2583)	0.464*** (0.149)	0.079 (0.066)	0.506*** (0.081)	2.232*** (0.168)	0.214*** (0.069)	1.7999*** (0.2684)	0.491*** (0.126)	0.250*** (0.056)
	Sample	54,329	51,856	51,856	49,600	49,600	54,141	111,226	106,421	106,421	101,478	101,478	110,758
	R-squared	0.066	0.056	0.025		0.024	0.030	0.049	0.143	0.037		0.035	0.027
Hispanic							Hispanic						
Panel C	Min wage	0.041 (0.027)	-0.264*** (0.087)	0.080*** (0.025)	-0.1723 (0.1939)	-0.042 (0.058)	-0.038 (0.034)	0.072** (0.029)	-0.212*** (0.067)	0.048*** (0.014)	0.1010 (0.1096)	-0.058 (0.051)	-0.031 (0.029)
	Constant	0.599*** (0.144)	3.100*** (0.331)	-0.065 (0.099)	2.4646*** (0.8497)	0.289 (0.230)	0.363** (0.151)	0.280** (0.122)	3.068*** (0.226)	-0.024 (0.053)	0.7942 (0.5825)	0.517** (0.209)	0.253** (0.112)
	Sample	17,659	16,499	16,499	15,928	15,928	17,640	37,524	34,994	34,994	33,703	33,703	37,536
	R-squared	0.110	0.103	0.028		0.029	0.056	0.111	0.126	0.028		0.026	0.066

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

All regressions include covariates, state/year fixed effects and are weighted.

The coefficients are estimated using OLS except the coefficient on days of poor mental health which is estimated using a negative binominal regression.

Table 9: OLS results by partnered status

		Men High School or less, working, Age 18-24					Women, High School or less, working , Age 18-24						
VARIABLES	Insured	Health Status	Exc./VG Health	Days Poor MH	Has Good MH	Smoker	Insured	Health Status	Exc./VG Health	Days Poor MH	Has Good MH	Smoker	
Partnered							Partnered						
Panel A	Min wage	0.044 (0.047)	-0.044 (0.080)	0.041 (0.025)	-0.4553* (0.2407)	0.025 (0.051)	-0.024 (0.031)	0.029 (0.044)	-0.062 (0.075)	-0.020 (0.026)	-0.4592** (0.1934)	0.065* (0.033)	0.001 (0.040)
	Constant	0.456** (0.210)	2.090*** (0.454)	0.144 (0.140)	3.3244** (1.3090)	0.336 (0.228)	0.471** (0.221)	0.551** (0.237)	2.636*** (0.421)	0.128 (0.165)	3.3052*** (0.7481)	-0.106 (0.189)	-0.129 (0.180)
	Sample R-squared	11,195 0.151	10,380 0.071	10,380 0.024	9,882	9,882 0.040	11,208 0.105	10,413 0.083	9,607 0.061	9,607 0.025	9,155	9,155 0.042	10,421 0.100
Not Partnered							Not Partnered						
Panel B	Min wage	0.082*** (0.022)	0.018 (0.039)	0.013 (0.029)	-0.0234 (0.1406)	0.028 (0.035)	0.007 (0.022)	-0.016 (0.029)	0.079 (0.071)	-0.012 (0.031)	-0.0776 (0.0667)	0.083** (0.039)	0.019 (0.027)
	Constant	0.784*** (0.119)	1.924*** (0.283)	0.405** (0.164)	0.8877* (0.4624)	0.478*** (0.172)	-0.247** (0.109)	0.749*** (0.136)	1.931*** (0.320)	0.347** (0.151)	2.8758*** (0.4997)	-0.194* (0.113)	-0.315 (0.198)
	Sample R-squared	29,808 0.080	28,666 0.051	28,666 0.020	27,381	27,381 0.024	30,574 0.064	23,546 0.044	22,391 0.025	22,391 0.014	21,245	21,245 0.036	23,839 0.110

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

All regressions include covariates, state/year fixed effects and are weighted.

The coefficients are estimated using OLS except the coefficient on days of poor mental health which is estimated using a negative binominal regression.

Table 10: OLS results for older adults

VARIABLES	Insured	Health Status	Exc./VG Health	Days Poor MH	Has Good MH	Smoker	Exam in past year	Flu shot in last year	Blood Pressure taken last year	Mammogram in last year	
Men, High School or less, working, Age 65 or older											
Panel A	Min wage	0.004 (0.020)	0.056 (0.054)	0.005 (0.031)	1.1194** (0.4441)	-0.112** (0.044)	-0.020 (0.023)	-0.006 (0.051)	0.019 (0.031)	-0.118 (0.086)	
	Constant	0.835*** (0.129)	3.254*** (0.512)	-0.078 (0.198)	-3.2466** (1.6452)	1.272*** (0.146)	0.758*** (0.127)	0.509* (0.257)	-0.100 (0.213)	0.721 (0.527)	
	Sample	18,064	17,621	17,621	17,031	17,050	17,943	15,385	17,087	2,185	
	R-squared	0.074	0.042	0.019		0.025	0.029	0.048	0.117	0.597	
Women, High School or less, working, Age 65 or older											
Panel B	Min wage	-0.005 (0.011)	-0.079 (0.051)	-0.004 (0.017)	0.2043 (0.1658)	0.005 (0.024)	-0.048*** (0.014)	-0.015 (0.025)	0.037 (0.024)	-0.141 (0.101)	-0.043* (0.022)
	Constant	0.954*** (0.054)	2.716*** (0.331)	0.106 (0.125)	0.1362 (0.9009)	0.719*** (0.174)	0.636*** (0.089)	0.516*** (0.123)	-0.230 (0.249)	1.064*** (0.393)	0.776*** (0.156)
	Sample	38,987	38,103	38,103	36,616	36,704	38,761	33,129	37,005	4,538	23,170
	R-squared	0.030	0.047	0.014		0.018	0.018	0.024	0.113	0.545	0.079
Men, High School or less, working, Age 70 or older											
Panel C	Min wage	0.017 (0.059)	-0.022 (0.102)	0.064 (0.050)	0.8891 (0.8433)	-0.105 (0.063)	-0.022 (0.043)	0.022 (0.057)	0.016 (0.044)	0.045 (0.174)	
	Constant	0.883*** (0.217)	4.694*** (0.791)	-0.428 (0.295)	-2.2169 (3.1539)	1.321*** (0.221)	0.800*** (0.193)	0.741** (0.336)	0.613** (0.232)	0.468 (0.746)	
	Sample	8,081	7,900	7,900	7,620	7,631	8,025	6,942	7,666	875	
	R-squared	0.200	0.051	0.045		0.048	0.040	0.070	0.147	0.625	
Women, High School or less, working, Age 70 or older											
Panel D	Min wage	0.013 (0.016)	-0.288*** (0.090)	0.064** (0.025)	0.1967 (0.2420)	-0.036 (0.032)	-0.035** (0.016)	0.006 (0.026)	0.032 (0.040)	-0.101 (0.216)	-0.006 (0.035)
	Constant	1.074*** (0.085)	3.341*** (0.446)	0.023 (0.165)	0.3776 (1.2480)	0.912*** (0.185)	0.406*** (0.100)	0.594*** (0.176)	0.422 (0.336)	0.959 (0.813)	0.949*** (0.241)
	Sample	17,797	17,419	17,419	16,718	16,766	17,689	15,157	16,898	1,918	10,401
	R-squared	0.039	0.047	0.018		0.033	0.020	0.034	0.121	0.572	0.091

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

All regressions include covariates, state/year fixed effects and are weighted.

The coefficients are estimated using OLS except the coefficient on days of poor mental health which is estimated using a negative binominal regression.

Table 11: Endogeneity Check

VARIABLES	Insured	Health Status	Exc. Health	Days Poor MH	Has Good MH	Smoker
Workers 18-24, Education HS graduate or less						
Min Wage	0.386*	-0.330***	0.893**	-0.009	-0.098	-0.960***
	(0.228)	(0.100)	(0.403)	(0.014)	(0.162)	(0.242)
Constant	2.848***	3.180***	2.116***	2.462***	2.447***	3.501***
	(0.538)	(0.660)	(0.615)	(0.621)	(0.619)	(0.563)
Observations	1,108	1,012	1,012	983	983	1,108
R-squared	0.536	0.557	0.554	0.554	0.554	0.541
Workers 18-64, All Education Levels						
Min Wage	0.715**	-0.582***	1.693***	-0.016	-0.188	-1.983***
	(0.340)	(0.112)	(0.329)	(0.018)	(0.179)	(0.317)
Constant	2.146***	2.836***	1.000	1.609**	1.446**	2.474***
	(0.589)	(0.725)	(0.675)	(0.700)	(0.684)	(0.583)
Observations	1,108	1,012	1,012	983	983	1,108
R-squared	0.537	0.564	0.564	0.556	0.556	0.551

Standard errors in parentheses.

Each column represents a separate regression of the minimum wage on a one year lag of the health indicator. All models include full set of controls shown in table 2 plus year dummies. Unit of observation is a state/year cell.

*** p<0.01, ** p<0.05, * p<0.1

Table 12: Comparison of OLS and IV, High School and less, Age 18-24

VARIABLES		Insured		Health Status		Exc. Health		Days Poor MH		Has Good MH		Smoker	
		(1A) OLS	(1B) IV	(2A) OLS	(2B) IV	(3A) OLS	(3B) IV	(4A) OLS	(4B) IV	(5A) OLS	(5B) IV	(6A) OLS	(6B) IV
White Men	Min wage	0.003 (0.021)	0.139 (0.165)	-0.013 (0.051)	0.218 (0.344)	0.028 (0.018)	0.171 (0.166)	-0.469 (0.327)	1.408 (2.546)	0.045* (0.023)	-0.319* (0.177)	-0.016 (0.016)	-0.194 (0.161)
	F-test on 1 st stage Observations	28,257	27,346	26,767	25,901	26,767	25,901	25,506	24,752	25,506	24,752	28,862	27,934
White Women	Min wage	0.030 (0.018)	0.060 (0.150)	-0.014 (0.032)	-0.115 (0.298)	-0.001 (0.014)	0.074 (0.130)	-0.467 (0.370)	-1.304 (2.808)	0.037 (0.028)	0.107 (0.162)	-0.003 (0.018)	0.007 (0.148)
	F-test on 1 st stage Observations	22,677	21,971	21,208	20,537	21,208	20,537	20,152	19,568	20,152	19,568	22,940	22,224
Black Men	Min wage	0.155** (0.068)	-0.131 (0.529)	-0.129 (0.086)	0.970 (1.469)	0.068 (0.046)	-0.624 (0.687)	-0.268 (0.775)	-5.116 (9.828)	-0.013 (0.047)	0.235 (0.661)	-0.036 (0.031)	-0.365 (0.421)
	F-test on 1 st stage Observations	3,558	3,354	3,330	3,159	3,330	3,159	3,169	3,012	3,169	3,012	3,626	3,421
Black Women	Min wage	0.062 (0.047)	0.058 (0.320)	-0.196** (0.090)	0.572 (0.795)	0.104*** (0.038)	0.123 (0.337)	-0.259 (0.630)	3.341 (6.499)	-0.045 (0.047)	-0.037 (0.395)	-0.084** (0.032)	-0.172 (0.223)
	F-test on 1 st stage Observations	4,660	4,320	4,409	4,106	4,409	4,106	4,114	3,837	4,114	3,837	4,667	4,327
Hispanic Men	Min wage	0.030 (0.064)	0.337 (0.662)	0.020 (0.086)	2.389 (2.200)	-0.002 (0.034)	-0.934 (0.931)	0.191 (0.861)	9.539 (13.992)	0.021 (0.059)	-1.582 (1.053)	0.007 (0.034)	0.371 (0.579)
	F-test on 1 st stage Observations	3,454	3,399	3,227	3,183	3,227	3,183	3,131	3,093	3,131	3,093	3,507	3,452
Hispanic Women	Min wage	0.042 (0.060)	-0.402 (0.537)	-0.043 (0.137)	0.191 (1.149)	-0.013 (0.055)	-0.006 (0.470)	-0.869 (1.459)	-3.561 (10.289)	0.085 (0.072)	-0.235 (0.629)	-0.070 (0.043)	-0.257 (0.449)
	F-test on 1 st stage Observations	2,492	2,443	2,302	2,259	2,302	2,259	2,243	2,201	2,243	2,201	2,501	2,453

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.

Table 13: Minimum Wages and Employment Outcomes CPS data: Whites

VARIABLES	paidhre lnhourwage	paidhre young lnhourwage	lnhourwage	young lnhourwage	paidhre lnearnweek	paidhre young lnearnweek	lnearnweek	young lnearnweek	paidhre uhourse	paidhre young uhourse	uhourse	young uhourse	all work	young work
White Men														
Inmw	-0.046 (0.028)	-0.004 (0.026)	-0.027 (0.027)	0.013 (0.027)	-0.081** (0.037)	-0.063 (0.043)	-0.048 (0.035)	-0.046 (0.043)	-0.798** (0.349)	-2.029*** (0.694)	-0.066 (0.287)	-1.395* (0.727)	-0.003 (0.009)	-0.013 (0.023)
Constant	-2.907*** (0.044)	-4.035*** (0.059)	-2.844*** (0.037)	-4.317*** (0.063)	0.832*** (0.056)	-1.538*** (0.108)	0.926*** (0.047)	-1.888*** (0.118)	42.002*** (0.595)	10.071*** (1.662)	43.387*** (0.489)	6.787*** (1.737)	1.137*** (0.016)	-0.108*** (0.036)
Observations	849,734	164,699	1,517,385	197,032	900,748	178,393	1,613,179	213,671	851,179	165,109	1,711,486	202,732	2,312,734	323,170
R-squared	0.176	0.104	0.175	0.117	0.181	0.144	0.176	0.159	0.072	0.117	0.055	0.120	0.046	0.082
White Women														
Inmw	-0.010 (0.025)	0.031 (0.030)	-0.023 (0.025)	0.010 (0.030)	-0.048 (0.038)	-0.014 (0.062)	-0.055 (0.039)	-0.040 (0.055)	-0.504 (0.486)	-1.025 (1.027)	-0.224 (0.369)	-1.237 (0.883)	0.018 (0.015)	0.051** (0.019)
Constant	-3.140*** (0.035)	-4.306*** (0.053)	-3.073*** (0.032)	-4.610*** (0.072)	0.324*** (0.044)	-2.249*** (0.102)	0.451*** (0.041)	-2.674*** (0.125)	33.348*** (0.595)	-0.821 (1.474)	34.888*** (0.499)	-4.586*** (1.577)	0.754*** (0.024)	-0.381*** (0.030)
Observations	885,227	158,737	1,435,576	190,086	937,511	171,535	1,516,183	204,882	886,959	159,075	1,544,040	193,460	2,419,324	328,037
R-squared	0.095	0.108	0.096	0.131	0.071	0.149	0.070	0.177	0.036	0.124	0.022	0.137	0.015	0.051
With state specific time trends														
VARIABLES	paidhre lnhourwage	paidhre young lnhourwage	lnhourwage	young lnhourwage	paidhre lnearnweek	paidhre young lnearnweek	lnearnweek	young lnearnweek	paidhre uhourse	paidhre young uhourse	uhourse	young uhourse	all work	young work
White Men														
Inmw	-0.003 (0.018)	0.024 (0.030)	-0.007 (0.018)	0.043 (0.029)	-0.011 (0.024)	0.032 (0.052)	-0.012 (0.026)	0.046 (0.045)	-0.048 (0.378)	-0.491 (0.911)	0.130 (0.293)	0.016 (0.871)	-0.001 (0.010)	0.005 (0.022)
Constant	-3.026*** (0.034)	-4.119*** (0.060)	-2.926*** (0.037)	-4.395*** (0.060)	0.676*** (0.040)	-1.695*** (0.116)	0.825*** (0.050)	-2.058*** (0.118)	40.777*** (0.676)	8.441*** (1.886)	43.146*** (0.596)	5.513*** (1.917)	1.151*** (0.017)	-0.106*** (0.035)
Observations	849,734	164,699	1,517,385	197,032	900,748	178,393	1,613,179	213,671	851,179	165,109	1,711,486	202,732	2,312,734	323,170
R-squared	0.177	0.105	0.176	0.118	0.182	0.145	0.177	0.160	0.072	0.118	0.055	0.121	0.046	0.082
White Women														
Inmw	0.013 (0.020)	0.068** (0.029)	-0.002 (0.019)	0.051* (0.029)	-0.030 (0.027)	0.048 (0.052)	-0.031 (0.028)	0.021 (0.048)	-0.722* (0.409)	-0.368 (0.928)	-0.142 (0.291)	-0.400 (0.826)	0.012 (0.012)	0.035 (0.022)
Constant	-3.223*** (0.035)	-4.362*** (0.044)	-3.144*** (0.034)	-4.675*** (0.058)	0.233*** (0.045)	-2.334*** (0.087)	0.350*** (0.045)	-2.758*** (0.109)	33.381*** (0.609)	-1.466 (1.532)	34.385*** (0.465)	-5.410*** (1.622)	0.724*** (0.020)	-0.392*** (0.034)
Observations	885,227	158,737	1,435,576	190,086	937,511	171,535	1,516,183	204,882	886,959	159,075	1,544,040	193,460	2,419,324	328,037
R-squared	0.096	0.110	0.096	0.132	0.072	0.151	0.071	0.178	0.036	0.124	0.022	0.138	0.015	0.051

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

All models include the following covariates: marital status, less than high school education, state specific covariates, and state and year fixed effects.

Table 14: Minimum Wages and Employment Outcomes CPS data: Blacks

VARIABLES	paidhre lnhourwage	paidhre young lnhourwage	lnhourwage	young lnhourwage	paidhre lnearnweek	paidhre young lnearnweek	lnearnweek	young lnearnweek	paidhre uhourse	paidhre young uhourse	uhourse	young uhourse	all work	young work
Black Men														
lnmw	-0.097*	-0.161*	-0.122**	-0.174**	-0.143**	-0.096	-0.137**	-0.121	-1.161*	-1.395	-0.602	-1.313	0.005	-0.073
	(0.051)	(0.088)	(0.058)	(0.085)	(0.054)	(0.148)	(0.059)	(0.124)	(0.639)	(2.248)	(0.491)	(1.750)	(0.026)	(0.068)
Constant	-3.104***	-3.747***	-3.029***	-3.928***	0.602***	-1.254***	0.635***	-1.487***	40.911***	12.740***	40.397***	11.627***	1.035***	-0.305***
	(0.068)	(0.109)	(0.060)	(0.099)	(0.088)	(0.166)	(0.074)	(0.152)	(0.990)	(2.842)	(0.782)	(2.316)	(0.040)	(0.085)
Observations	97,194	15,699	143,811	18,308	103,138	17,163	153,001	20,021	97,387	15,743	151,822	18,645	244,674	42,874
R-squared	0.145	0.089	0.139	0.090	0.148	0.130	0.133	0.135	0.061	0.130	0.045	0.131	0.062	0.095
Black Women														
lnmw	-0.107***	-0.037	-0.149***	-0.078	-0.107**	-0.015	-0.175***	-0.111	-0.250	0.398	-1.063*	-1.050	0.033	0.024
	(0.037)	(0.050)	(0.045)	(0.049)	(0.050)	(0.099)	(0.057)	(0.099)	(0.543)	(1.929)	(0.543)	(1.769)	(0.027)	(0.048)
Constant	-3.219***	-4.092***	-3.121***	-4.233***	0.307***	-1.830***	0.443***	-2.006***	35.312***	3.370	36.703***	1.636	0.744***	-0.549***
	(0.052)	(0.071)	(0.064)	(0.075)	(0.059)	(0.172)	(0.078)	(0.155)	(0.663)	(3.131)	(0.657)	(2.637)	(0.047)	(0.077)
Observations	127,521	19,267	189,553	22,531	134,801	21,103	199,290	24,530	127,834	19,335	195,342	22,833	328,204	52,668
R-squared	0.109	0.105	0.112	0.111	0.093	0.134	0.093	0.145	0.034	0.116	0.024	0.121	0.019	0.065
With state specific time trends														
VARIABLES	paidhre lnhourwage	paidhre young lnhourwage	lnhourwage	young lnhourwage	paidhre lnearnweek	paidhre young lnearnweek	lnearnweek	young lnearnweek	paidhre uhourse	paidhre young uhourse	uhourse	young uhourse	all work	young work
Black Men														
lnmw	-0.000	-0.115	-0.016	-0.102	-0.024	-0.010	-0.006	0.008	-0.436	-0.607	0.039	0.098	-0.008	-0.090
	(0.047)	(0.086)	(0.050)	(0.091)	(0.047)	(0.122)	(0.051)	(0.117)	(0.726)	(1.994)	(0.564)	(1.768)	(0.024)	(0.067)
Constant	-3.329***	-3.986***	-3.189***	-4.116***	0.361***	-1.429***	0.439***	-1.692***	39.972***	13.425***	39.901***	9.417***	1.028***	-0.246***
	(0.050)	(0.164)	(0.045)	(0.151)	(0.064)	(0.199)	(0.058)	(0.205)	(1.092)	(2.810)	(0.952)	(2.694)	(0.039)	(0.088)
Observations	97,194	15,699	143,811	18,308	103,138	17,163	153,001	20,021	97,387	15,743	151,822	18,645	244,674	42,874
R-squared	0.146	0.094	0.140	0.094	0.149	0.135	0.135	0.138	0.062	0.135	0.045	0.135	0.063	0.097
Black Women														
lnmw	-0.040	-0.038	-0.046	-0.076	-0.035	-0.094	-0.062	-0.146*	-0.304	-1.285	-0.951	-1.571	0.012	0.011
	(0.031)	(0.057)	(0.041)	(0.059)	(0.039)	(0.095)	(0.060)	(0.084)	(0.426)	(1.921)	(0.578)	(1.585)	(0.027)	(0.044)
Constant	-3.305***	-4.110***	-3.225***	-4.282***	0.167***	-1.781***	0.285***	-2.036***	33.261***	2.808	34.881***	-0.629	0.731***	-0.474***
	(0.038)	(0.094)	(0.048)	(0.089)	(0.049)	(0.209)	(0.072)	(0.188)	(0.630)	(3.818)	(0.489)	(3.252)	(0.054)	(0.092)
Observations	127,521	19,267	189,553	22,531	134,801	21,103	199,290	24,530	127,834	19,335	195,342	22,833	328,204	52,668
R-squared	0.111	0.109	0.113	0.115	0.094	0.138	0.094	0.148	0.035	0.121	0.025	0.125	0.020	0.067

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

All models include the following covariates: marital status, less than high school education, state specific covariates, and state and year fixed effects.

Table 15: Minimum Wages and Employment Outcomes CPS data: Hispanics

VARIABLES	paidhre lnhourwage	paidhre young lnhourwage	lnhourwage	young lnhourwage	paidhre lnearnweek	paidhre young lnearnweek	lnearnweek	young lnearnweek	paidhre uhourse	paidhre young uhourse	uhourse	young uhourse	all work	young work
Hispanic Men														
Lnmw	-0.008 (0.027)	0.022 (0.033)	0.014 (0.034)	0.052 (0.038)	-0.065** (0.032)	-0.003 (0.062)	-0.023 (0.039)	0.030 (0.061)	-1.328** (0.531)	-2.635* (1.312)	-0.688 (0.477)	-2.072 (1.431)	0.004 (0.026)	-0.019 (0.046)
Constant	-3.214*** (0.042)	-3.893*** (0.056)	-3.095*** (0.046)	-4.000*** (0.055)	0.599*** (0.052)	-0.884*** (0.087)	0.706*** (0.054)	-0.995*** (0.095)	42.943*** (0.961)	21.834*** (2.092)	43.452*** (0.938)	20.396*** (2.287)	1.202*** (0.036)	0.054 (0.062)
Observations	143,887	30,560	198,570	35,923	152,162	32,769	210,802	38,641	144,149	30,631	212,945	36,814	287,556	58,700
R-squared	0.098	0.068	0.100	0.068	0.107	0.108	0.104	0.104	0.048	0.100	0.039	0.093	0.042	0.108
Hispanic Women														
lnmw	0.057 (0.047)	0.128*** (0.044)	-0.005 (0.052)	0.092** (0.044)	0.006 (0.069)	0.042 (0.106)	-0.046 (0.069)	0.017 (0.092)	-0.961 (0.701)	-0.554 (1.710)	-0.604 (0.544)	-1.027 (1.507)	0.046 (0.037)	0.054 (0.043)
Constant	-3.259*** (0.062)	-4.287*** (0.062)	-3.167*** (0.046)	-4.410*** (0.081)	0.237** (0.096)	-1.872*** (0.152)	0.377*** (0.076)	-1.962*** (0.146)	34.749*** (1.163)	5.737** (2.775)	35.265*** (0.978)	6.365** (2.805)	0.534*** (0.051)	-0.578*** (0.060)
Observations	110,582	22,520	153,404	26,189	116,871	24,158	162,079	28,077	110,799	22,569	161,063	26,587	298,836	56,492
R-squared	0.059	0.093	0.060	0.096	0.049	0.120	0.049	0.126	0.028	0.107	0.020	0.102	0.016	0.052
With state specific time trends														
VARIABLES	paidhre lnhourwage	paidhre young lnhourwage	lnhourwage	young lnhourwage	paidhre lnearnweek	paidhre young lnearnweek	lnearnweek	young lnearnweek	paidhre uhourse	paidhre young uhourse	uhourse	young uhourse	all work	young work
Hispanic Men														
Lnmw	0.009 (0.034)	0.023 (0.044)	0.028 (0.027)	0.051 (0.051)	-0.022 (0.046)	0.070 (0.072)	0.017 (0.033)	0.118* (0.068)	-0.236 (0.781)	-0.466 (1.464)	0.112 (0.651)	0.344 (1.426)	0.018 (0.023)	0.048 (0.061)
Constant	-3.087*** (0.051)	-4.062*** (0.063)	-2.977*** (0.062)	-4.263*** (0.066)	0.636*** (0.068)	-1.528*** (0.101)	0.760*** (0.075)	-1.664*** (0.107)	40.903*** (1.102)	12.830*** (2.497)	42.314*** (1.099)	13.014*** (2.626)	1.084*** (0.031)	-0.382*** (0.061)
Observations	143,887	30,560	198,570	35,923	152,162	32,769	210,802	38,641	144,149	30,631	212,945	36,814	287,556	58,700
R-squared	0.099	0.070	0.102	0.070	0.108	0.110	0.105	0.107	0.049	0.102	0.039	0.095	0.042	0.109
Hispanic Women														
lnmw	0.039 (0.045)	0.093 (0.070)	-0.023 (0.044)	0.079 (0.059)	0.013 (0.069)	0.032 (0.139)	-0.040 (0.058)	0.048 (0.115)	-0.286 (0.664)	0.211 (1.961)	-0.153 (0.557)	0.393 (1.663)	0.044 (0.031)	0.039 (0.044)
Constant	-3.091*** (0.055)	-3.798*** (0.094)	-2.975*** (0.043)	-3.979*** (0.095)	0.534*** (0.082)	-0.897*** (0.193)	0.664*** (0.049)	-1.061*** (0.174)	35.539*** (1.062)	12.281*** (3.355)	36.082*** (0.874)	13.363*** (3.397)	0.648*** (0.046)	-0.391*** (0.067)
Observations	110,582	22,520	153,404	26,189	116,871	24,158	162,079	28,077	110,799	22,569	161,063	26,587	298,836	56,492
R-squared	0.060	0.096	0.061	0.099	0.050	0.123	0.051	0.129	0.029	0.109	0.021	0.105	0.016	0.053

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

All models include the following covariates: marital status, less than high school education, state specific covariates, and state and year fixed effects.

Appendix A: Minimum wage appendix¹

The minimum wage is set by either the local, state or federal government depending on which wage rate is highest. It is set in nominal terms and changed by legislation or constitutional amendments. In this paper we focus on the variation in state minimum wages. The minimum wage in a particular state may default to the federal minimum wage if a state has either no minimum wage or has a minimum wage below the federal.² In addition, there are currently 15 states and the District of Columbia who are either already or will be in the future indexing their minimum wage to inflation.³

Table 1 shows the frequency of minimum rate changes for each state, the District of Columbia and the federal minimum wage during the sample 1991 to 2013. The federal minimum wage changed six times over this time. The maximum number of times a state's minimum wage changed was 16 in both Vermont and Washington. In Washington, the state minimum wage has been indexed to inflation since 2001. In Vermont, the state minimum wage has been indexed to inflation since 2007.⁴ Iowa has the fewest changes in the minimum wage; the minimum wage changed four times over the sample. Finally, the third column in Table A1 indicates the start date for indexing the minimum wage to inflation for the relevant states.⁵

TABLE A1: Frequency of minimum wages by state⁶

State	Frequency of minimum wage changes (1991-2013)	Start date of indexing
ALABAMA	6	
ALASKA	5	1-Jan-17
ARIZONA	9	1-Jan-07
ARKANSAS	6	
CALIFORNIA	7	
COLORADO	10	1-Jan-07
CONNECTICUT	13	
DELAWARE	9	
DIST OF COLUMBIA	9	1-Jan-17
FLORIDA	10	2-May-05

¹ All website sources were accessed in February 2016.

² Alabama, Georgia, Louisiana, Mississippi, South Carolina, Tennessee, and Wyoming either have no minimum wage or a minimum wage below the federal. Source: <http://www.epi.org/minimum-wage-tracker/>.

³ Alaska, Arizona, Colorado, Florida, Michigan, Minnesota, Missouri, Montana, Nevada, New Jersey, Ohio, Oregon, South Dakota, Vermont, Washington, and Washington D.C. have a minimum wage indexed to inflation. Source: <http://www.epi.org/minimum-wage-tracker/>.

⁴ Source: <http://www.ncsl.org/research/labor-and-employment/state-minimum-wage-chart.aspx>

⁵ Sources for the indexing start date are available upon request although most are from <http://www.ncsl.org/research/labor-and-employment/state-minimum-wage-chart.aspx>.

⁶ Authors' calculations.

GEORGIA	6	
HAWAII	7	
IDAHO	6	
ILLINOIS	9	
INDIANA	6	
IOWA	4	
KANSAS	6	
KENTUCKY	6	
LOUISIANA	6	
MAINE	11	
MARYLAND	6	
MASSACHUSETTS	8	
MICHIGAN	6	1-Jan-19
MINNESOTA	5	1-Jan-18
MISSISSIPPI	6	
MISSOURI	8	1-Jan-08
MONTANA	10	1-Jan-07
NEBRASKA	6	
NEVADA	8	1-Jul-07
NEW HAMPSHIRE	5	
NEW JERSEY	6	1-Jan-14
NEW MEXICO	5	
NEW YORK	7	
NORTH CAROLINA	6	
NORTH DAKOTA	6	
OHIO	9	1-Jan-07
OKLAHOMA	6	
OREGON	13	1-Jan-04
PENNSYLVANIA	6	
RHODE ISLAND	7	
SOUTH CAROLINA	6	
SOUTH DAKOTA	6	1-Jan-16

TENNESSEE	6	
TEXAS	6	
UTAH	6	
VERMONT	16	1-Jan-07
VIRGINIA	6	
WASHINGTON	16	1-Jan-01
WEST VIRGINIA	6	
WISCONSIN	7	
WYOMING	6	
Federal	6	

Figure A1 graphs the maximum, minimum and average minimum wage across the 50 states and the District of Columbia during the 1991 to 2013 sample. The lowest minimum wage is always equal to the federal minimum wage since no state may have a wage rate lower than the federal. The average minimum wage across states is close to the minimum except during the late 1990s to the mid-2000s. The maximum minimum wage is on average over the entire sample \$1.59 greater than the federal minimum wage. The gap between the maximum and the federal is on average \$1.12 in the first ten years of the sample then widens to \$1.96 over the final 13 years of the sample. The peak difference between the maximum and the federal occurs in 2007 when the difference is \$2.78.

Besides considering the level of the minimum wage we think about the size of the changes in the minimum wage. Perhaps the change in the nominal minimum wage needs to be of a certain size to affect people's behavior. In Table A2, we list the largest change in the nominal minimum wage by state over the sample in ascending order. Twenty-five states have largest minimum wage changes less than or equal to the largest federal minimum wage change. The state with the largest one year change in the minimum wage is Iowa where the minimum wage increased from \$5.15 in 2007 to \$7.25 in 2008. This change was enacted when the Democrats controlled the House, Senate and Governorship in Iowa.

Figure A1: Nominal Minimum Wage 1991-2013⁷

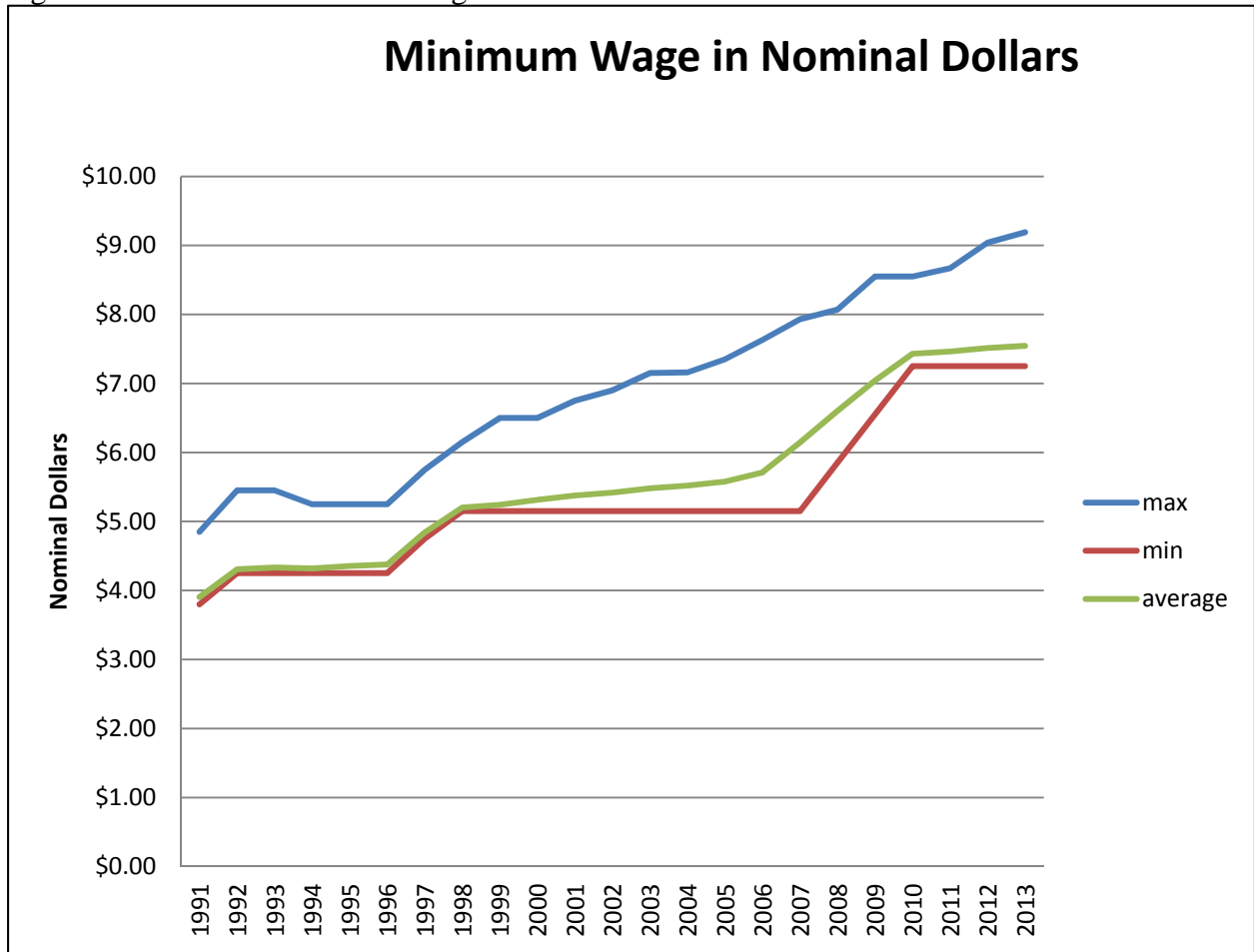


Table A2: Largest one year change in Minimum wage by state 1991-2013

State	Change in nominal minimum wage
CONNECTICUT	\$ 0.50
DELAWARE	\$ 0.50
HAWAII	\$ 0.50
VERMONT	\$ 0.50
MAINE	\$ 0.60
ALABAMA	\$ 0.70
GEORGIA	\$ 0.70
IDAHO	\$ 0.70
INDIANA	\$ 0.70
KANSAS	\$ 0.70

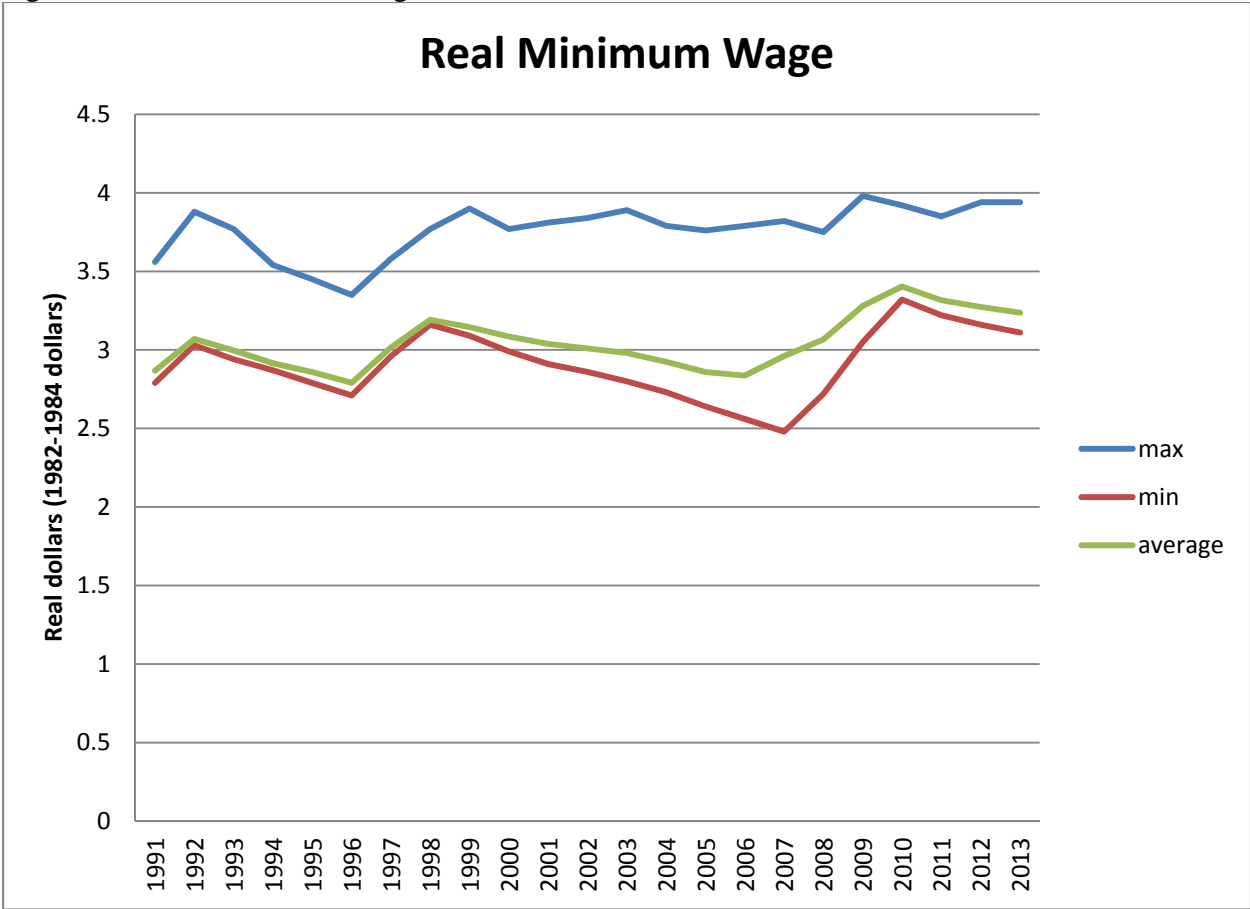
⁷ The decline in the maximum minimum wage occurs because changes in the minimum wage law in the District of Columbia during 1992 to 1993. During these years, D.C. had a range for its minimum wage and we chose the upper bound of the range.

KENTUCKY	\$ 0.70
LOUISIANA	\$ 0.70
MISSISSIPPI	\$ 0.70
NEBRASKA	\$ 0.70
NORTH DAKOTA	\$ 0.70
OKLAHOMA	\$ 0.70
RHODE ISLAND	\$ 0.70
SOUTH CAROLINA	\$ 0.70
SOUTH DAKOTA	\$ 0.70
TENNESSEE	\$ 0.70
TEXAS	\$ 0.70
UTAH	\$ 0.70
VIRGINIA	\$ 0.70
WEST VIRGINIA	\$ 0.70
WYOMING	\$ 0.70
Federal	\$ 0.70
CALIFORNIA	\$ 0.75
OREGON	\$ 0.75
WASHINGTON	\$ 0.80
WISCONSIN	\$ 0.80
MASSACHUSETTS	\$ 0.85
NEW YORK	\$ 0.85
DIST OF COLUMBIA	\$ 1.00
ILLINOIS	\$ 1.00
MARYLAND	\$ 1.00
MINNESOTA	\$ 1.00
MONTANA	\$ 1.00
NEVADA	\$ 1.00
NEW JERSEY	\$ 1.00
NORTH CAROLINA	\$ 1.00
ARKANSAS	\$ 1.10
PENNSYLVANIA	\$ 1.10
FLORIDA	\$ 1.25
MISSOURI	\$ 1.35
NEW HAMPSHIRE	\$ 1.35
NEW MEXICO	\$ 1.35
ALASKA	\$ 1.50
ARIZONA	\$ 1.60
COLORADO	\$ 1.70

OHIO	\$ 1.70
MICHIGAN	\$ 1.80
IOWA	\$ 2.10

While understanding changes in the nominal minimum wage is important, for households the relevant wage is the real minimum wage. Therefore, we deflate the state minimum wages by the Consumer Price Index- All Items Urban Consumers (base year= 1982-1984). Figure 2A graphs the maximum, minimum and average minimum wages across our sample. In 1991, the real maximum was \$3.56 and in 2013 it was \$3.94; therefore over the entire sample the growth rate is 10.7%. For the minimum the growth rate over the sample is 11.5% and for the average the growth rate over the sample 12.9%. For comparison, average hourly earnings of production and nonsupervisory employees: total private has increased 12.0% over the sample period.

Figure 2A: Real Minimum Wage 1991-2013



Appendix B: Who earns the minimum wage?

The minimum wage is only relevant for a subset of workers. Most workers earn more than the minimum wage. In 2014, according to the Bureau of Labor Statistics 58.7% of all wage and salary workers were paid hourly wage rates and 3.9% of all hourly workers earned the federal minimum wage or less. The Fair Labor Standards Act (FLSA) allows for exemptions from minimum wage law for certain groups such as tipped workers, full-time students and others.⁸

We consider who may be most affected by a minimum wage change and find that in general, workers less than 24 years old, women, and blacks and Hispanics are more likely to earn the minimum wage. In addition, workers who earn the minimum wage are more likely to live in the South or Midwest. Finally, service sector workers are the most common occupation for a minimum wage worker. In particular, 21.2% of hourly workers that work in food preparation and serving jobs earns at or below the federal minimum wage.

Table B1: Fraction of hourly workers earning minimum wage⁹

Categories		Percentage of workers paid hourly earning at or below the federal minimum wage
Total (16 years and older)		3.9
Age and gender		
16 to 24 years	Total	9.4
16 to 24 years	Men	7.4
16 to 24 years	Women	11.4
Race and gender (16 years and older)		
White	Total	3.8
	Men	2.8
	Women	4.8
Black	Total	4.3
	Men	3.5
	Women	5.0
Hispanic	Total	3.4
	Men	2.6
	Women	4.5
Educational attainment (16 years and older)		
	No high school diploma	7.3
	High school grad	3.4
	Bachelor's degree	1.9
Geographic region (16 years and older)		
	Northeast	3.7
	Midwest	4.1
	South	5.2
	West	1.8

⁸ See <http://webapps.dol.gov/elaws/whd/flsa/screen75.asp> for more details on exemptions.

⁹ Data reported in this table was obtained from BLS report 1054 from April 2015. This report describes the characteristics of minimum wage workers in 2014.

Occupation (16 years and older)		
	Management, professional, and related	0.8
	Service	10.4
	Sales and office	2.8
	Natural resources, construction & maintenance	0.6
	Production, transportation & material moving	2.1

Table B2 shows by year the percentage of hourly workers who earned at or below the federal minimum wage over our sample and also 1979 which is the first year the BLS collected data on minimum wage workers. In 1979, 13.4% of hourly workers were earning the minimum wage and by 1989 only 5.1% were. We see jumps in the percentages during the years when the federal minimum wage was increased.

Table B2: Fraction of hourly workers earning minimum wage by year¹⁰

Year	Percentage of workers paid hourly earning at or below the federal minimum wage
1979	13.4
1989	5.1
1990	5.1
1991	8.4
1992	7.7
1993	6.7
1994	6.2
1995	5.3
1996	5.4
1997	6.7
1998	6.2
1999	4.6
2000	3.6
2001	3.0
2002	3.0
2003	2.9
2004	2.7
2005	2.5
2006	2.2
2007	2.3
2008	3.0
2009	4.9
2010	6.0
2011	5.2

¹⁰ The federal minimum wage changes occurred in 1990-1991, 1996-1997 and 2007-2009.

2012	4.7
2013	4.3