Who Benefits from a Minimum Wage Increase?

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Abstract

This paper addresses the question of how a minimum wage increase affects the wages of low-wage workers. Most studies assume that there is a simple mechanical increase in the wage for workers earning between the old and the new minimum wage with some studies allowing for spillovers to workers with wages just above this range. Rather than assume that the wages of these workers would have remained constant, this paper estimates how a minimum wage increase impacts a low-wage worker's wage relative to the wage the worker would have if there had been no minimum wage increase. The method allows for the effect to depend not only on the initial wage of the worker, but also nonlinearly on the size of the minimum wage increase. Using Current Population Survey data from 2005 to 2008, a period with a large number of state-level minimum wage increases, this paper finds that low-wage workers are hurt by a small minimum wage increase. Larger minimum wage increases benefit not only those workers directly affected but spill over to workers with moderately higher wages. Finally, this paper finds evidence for heterogeneity in the effect by age, gender, income, and race.

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1. Introduction

The minimum wage literature has primarily focused on evaluating the employment effects of a minimum wage increase.[1] In this paper, we address the far less-studied question of documenting the wage effects of a minimum wage increase. We focus our attention on estimating how the wage effects of a minimum wage increase differ across the wage distribution and by the size of the minimum wage increase. Most studies assume that a minimum wage increase causes those workers with an initial wage between the old and the new minimum wage to have their wage bumped up to the new minimum wage. Some studies allow for minimum wage spillovers to a predefined group of workers with slightly higher wages.[2] However, when calculating benefits, the implicit assumption is that wages for low-wage workers would have remained constant had it not been for the minimum wage increase.

In contrast, we start with the assumption that low-wage workers would have experienced wage changes in the absence of a minimum wage increase. In our approach, the benefit of a minimum wage increase to a particular low-wage worker is the difference in the hourly wage after the minimum wage increase and the hourly wage the worker would have experienced had there been no minimum wage increase. It is possible for this difference to be negative for some workers if the wage increase they would have experienced is larger than what they actually experienced with a small minimum wage increase. This approach is most similar to Neumark et al. (2004) in that we estimate the effect of a minimum wage increase on the wages of current low-wage workers allowing the effect to differ for workers with different initial wage rates.

[1] See Card (1992a), Card (1992b), Katz and Krueger (1992), Neumark and Wascher (1992), Card and Krueger (1994), Spriggs and Klein (1994), Card and Krueger (1995), Deere et al. (1995), Neumark and Wascher (1995), Currie and Fallick (1996), Lang and Kahn (1998), and Baker et al. (1999). Neumark and Wascher (2007) provide a comprehensive review.

[2] The observation that a minimum wage increase affects the wages of workers earning more than the new minimum wage originated with Gramlich (1976) and has been confirmed in many subsequent studies.

However, our analysis is different than Neumark et al. (2004) in that we also allow for the effect to depend on the size of the minimum wage increase without imposing linearity. Allowing for this additional flexibility in the estimation allows us to better understand how a minimum wage increase affects wages.

An alternative approach would be to analyze how a minimum wage increase affects the wage distribution as in DiNardo et al. (1996). However, this approach is better suited to understanding how the minimum wage affects income inequality and is not applicable to analyzing how a minimum wage increase affects the wages of current low-wage workers. Because we estimate the effect for current workers, we can subsequently analyze how the effect differs for various demographic groups. For example, it is well documented that workers earning the minimum wage are predominantly women, adults (rather than teenagers), and members of low-income households (bottom 40 percent of the household income distribution). However, this does not necessarily imply that these groups experience larger wage gains from a minimum wage increase than other groups.

Our approach does not address employment effects nor does it address the wage effects for new entrants into low-wage positions who were not working before the minimum wage increase, some of whom benefit from the law change. These limitations are notable, but our question of how a minimum wage increase affects the wages of current low-wage workers is important to crafting good labor market policy and has not been fully answered. Our analysis provides a more complete picture of the wage effects than has been previously available.

Our analysis shows that the wage impact of a minimum wage increase depends on the size of the minimum wage increase as well as the characteristics of the individual. Surprisingly, we find that a small minimum wage increase may actually hurt low-wage workers by causing

them to experience less wage growth than they otherwise would have without the minimum wage increase. We do a great deal of sensitivity analysis and show that this finding is quite robust. We hypothesize that employers may use a minimum wage increase as a focal point in setting wages and thus when a minimum wage increase is small this may limit wage increases.

2. Data

We use the public-use Current Population Survey (CPS) outgoing rotation group data between August 2005 and June 2008. CPS respondent households are interviewed for four consecutive months, followed by an eight-month hiatus, followed by a final four consecutive months of interviews. A household initially interviewed in January 2006 would thus be interviewed through April of that year, as well as January through April of 2007. We include only the fourth and eighth interview months – outgoing months spaced one year apart – which contain more detailed employment and wage data. Employing the methodology of Lefgren and Madrian (1999), we match respondent interviews year to year based on state, month interviewed, household identifiers, sex, race, and age.

We report summary statistics from the matched sample in Table 1. The sample includes individuals aged 16 to 65 who are employed at the time of both interviews. In order to mitigate problems from reporting error, we impose a threshold $0.10 below the minimum wage and exclude individuals reporting a wage below this threshold at the time of their first interview. Similarly, individuals earning less than half of the relevant minimum wage at the time of their second interview have been excluded. We also exclude individuals reporting wage growth greater than 1,000 percent. Finally, self-employed workers and those in the agricultural sector have been removed. This leaves us with a final sample of 100,754 observations.

The 2005 to 2008 period is notable for a large number of state-level minimum wage changes in addition to the federal minimum wage increase of 2007. From 2005 to 2008, 28 states and the District of Columbia increased the local minimum wage. An additional 20 states were affected by the federal increase.[3] At the level of the individual observation, we define the minimum wage increase as the change that occurs in the year between interviews in the applicable minimum wage. For example, the Arkansas minimum wage rose from $5.15 to $6.25 on October 1, 2006 and there was no minimum wage change in 2007. An individual living in Arkansas whose first outgoing interview occurred in September 2006 is thus defined as having experienced a $1.10 minimum wage increase, while an individual first interviewed in October 2006 is defined as experiencing no increase.

Nearly 64 percent of the respondents in our sample experienced a minimum wage increase between interviews. This includes individuals in 48 states and the District of Columbia. The remaining 36 percent of individuals who did not experience a minimum wage increase between interviews span 44 states and the District of Columbia. These minimum wage changes differed not only in their timing and location, but in their magnitude. Minimum wage changes during this period were as small as $0.10 and as large as $2.10.[4] This dispersion in magnitude across states and time will be a focal point of our analysis.

Before proceeding to the empirical analysis, we pause to note an important aspect of the data. We observe considerable upward wage mobility among low-wage workers even in the absence of a minimum wage law change. Table 2, which examines the wage mobility of workers that did not experience a minimum wage change between interviews, illustrates this point.

[3] Alaska, which had a minimum wage of $7.15 throughout the entire sample, and Minnesota, which had a minimum wage of $6.15 throughout the entire sample, were not affected by a minimum wage change in any year.
[4] Montana increased its minimum wage from $6.15 to $6.25 on January 1, 2008. Iowa increased its minimum wage from $5.15 to $6.20 on April 1, 2007 and again to $7.25 on January 1, 2008, so that individuals first interviewed between January and March of 2007 experienced an increase of $2.10.

Workers are divided into five categories based upon their wage relative to the applicable minimum wage at the time of the first interview. We report the movement of workers among these groups between their first and second interviews. Specifically, the table reports the percentage of workers in a particular group at time t that belong to a given group at time $t + 1$. As can be seen in the table, most low wage workers experience considerable wage growth in our sample even in the absence of a minimum wage increase. Less than a third of the workers earning no more than 10 percent above the minimum wage at the time of their first interview still earn within 10 percent of that minimum a year later. Furthermore, half of these individuals earn more than 25 percent above the minimum wage at the time of their second interview. For an individual in a state with a minimum wage of $5.15, this implies that less than a third would still have a wage of no more than $5.65 and more than half would have a wage greater than $6.40.[5]

We observe similar patterns higher in the wage distribution. Of those individuals earning between 25 and 50 percent above the minimum wage at the time of their first interview, over 60 percent earn more than 50 percent above the minimum wage the following year, with nearly 29 percent earning more than double the minimum. These simple averages reveal that minimum wage changes are not occurring in a static environment, but rather in one in which there is already a large degree of upward mobility among low wage earners.

3. Estimation

The large number and staggered timing of state-level minimum wage changes creates a rich environment in which to analyze the effects of minimum wage law changes. We abstract from any employment effects and focus solely on the wage effects of a minimum wage change

[5] $5.15, the federal minimum wage prior to the 2007 increase, is the applicable minimum wage for more than half the individuals that do not experience a minimum wage increase in our sample.

conditional on continued employment. We hypothesize that such effects may differ along two dimensions. First, following Neumark et al. (2004), we allow the effect of a minimum wage increase to vary throughout the wage distribution, with individuals at or near the initial minimum wage level experiencing different wage changes than individuals at the upper end of the wage distribution. The wage effect at or near the initial minimum wage is primarily mechanical while those effects higher in the wage distribution are often called minimum wage spillovers. Second, we examine effects that vary according to the size of the change in the minimum wage itself.

Nearly 64 percent of the individuals in our sample experienced a minimum wage increase, but there is substantial heterogeneity in the size of the minimum wage increase they experienced. More than 16 percent experienced a small minimum wage increase of less than five percent of the initial minimum wage while over one-tenth experienced a very large increase of more than 25 percent of the initial minimum wage. Figure 1 shows this heterogeneity in a histogram of the size of the minimum wage increases experienced by the individuals in our sample.

In order for our model to allow for different effects by the initial-wage group and by the size of the minimum wage increase, we employ the following specification:

$$\%\Delta W_{ismy} = \beta_0 + \sum_{j=1}^{7} \beta_j 1(WageGroup_{ismy} = j) + \sum_{k=1}^{5} \gamma_k 1(\Delta MinWage_{smy} = k) + \sum_{j=1}^{7}\sum_{k=1}^{5} \delta_{jk} 1(WageGroup_{ismy} = j) \times 1(\Delta MinWage_{smy} = k) + \eta \boldsymbol{X}_{ismy} + \lambda_s + \mu_m + \omega_y + \varepsilon_{ismy}. \quad (1)$$

The dependent variable $\%\Delta W_{imys}$ is defined as the percentage wage change between interviews experienced by individual *i* first interviewed in month *m* of year *y* in state *s*.

The variable $1(WageGroup_{imys} = j)$ is an indicator variable equal to 1 if individual *i* has a wage in the range of wage group *j* at the time of the first interview. It is included to account for

differences in the rate of wage growth across the wage distribution. We define seven wage groups with the first three groups corresponding to an initial hourly wages less than 10 percent above the minimum wage at the time of the first interview, between 10 and 20 percent above the minimum wage, and between 20 and 30 percent above the minimum wage, respectively. The fourth group corresponds to an initial hourly wage at least thirty percent above the minimum wage, but less than $11 (approximately the 25th percentile of the wage distribution). The final three wage groups include initial hourly wages within approximately the second, third and fourth quartiles of the wage distribution at the time of their first interview. The wage ranges for the seven wage groups along with the number of individuals with an initial wage within each wage group are given in Table 3.

Similarly, $1(\Delta MinWage_{smy} = k)$ is an indicator variable equal to 1 if the minimum wage increase in state *s* in month *m* of year *y* falls within minimum-wage-change group *k*, where the groups are defined as in Table 4. More than one third of the individuals in our sample are included in the first minimum-wage-change group, indicating no minimum wage change. The remainder of the sample is divided between groups experiencing a minimum wage change of less than 5 percent, between 5 and 10 percent, between 10 and 20 percent, and greater than 20 percent. For those in the sample that experienced a minimum wage increase, about 45 percent experienced a minimum wage change of between 10 and 20 percent, which includes the federal minimum wage change of approximately 13.6 percent. Table 4 also indicates the number of states that experienced a minimum wage change within each bin. Note that within our sample period the same state may have experienced both a year with a minimum wage change and a year without a minimum wage change.

To allow for differential effects of a minimum wage increase throughout the wage distribution, we include the interaction of these two indicator variables. With the no-change group excluded, this leaves 24 δ_{jk} parameters indicating the effect of an increase in the minimum wage of a given size (indicated by group *k*) for initial-wage group *j* relative to the baseline initial-wage groups that experienced no minimum wage change. Not only does this allow for a differential effect of a minimum wage increase by initial-wage group, as in Neumark et al. (2004), it also allows for a nonlinear response to an increase in the minimum wage that differs by the magnitude of the change. This not only allows for the possibility that minimum wage changes affect low- and high-wage individuals differently, but also for the possibility that the difference between the low- and high-wage responses depend upon the magnitude of the minimum wage increase. The flexibility of this model allows for a more complete understanding of the wage effects of a minimum wage increase.

The model also includes a vector of controls, $\boldsymbol{X}_{isy}$, including gender, race, ethnicity, education level, family income, and a quadratic term in age. In order to control for local economic conditions, the average annual state unemployment rate is also included. To control for broader macroeconomic and geographical trends as well as seasonality, we include month, year, and state fixed effects.

4. Results

We report the estimated impact of a minimum wage change of size *k* for wage group *j*, which is given by $\hat{\gamma}_k + \hat{\delta}_{jk}$ from equation (1) in Table 5 along with corresponding standard errors. For ease of exposition, we report only this estimated effect and corresponding standard errors; complete tables with all suppressed covariates are available upon request. The columns of

Table 5 do not indicate separate specifications as is common in the literature; the coefficient estimates are from a single regression presented in matrix form. Each reported coefficient estimate represents the effect of a given minimum wage change for individuals within a given wage group *relative to individuals within the same wage group who experienced no increase in the minimum wage*. Thus, an individual initially earning within ten percent of the minimum wage who experienced an increase in the minimum wage of less than five percent saw her wage increase by 10.8 percent *less* than an individual who saw no minimum wage increase. An individual in the same wage group who experienced a minimum wage increase of greater than 20 percent experienced nearly 40 percent greater wage growth relative to an individual experiencing no minimum wage law change.

The results are striking. Within the first quartile of the wage distribution, individuals experiencing minimum wage increases of less than five percent have *lower* wage growth than similar individuals who experience no change in the minimum wage law, with the magnitude of the effect ranging from -6.3 percent to -21 percent. Moderate minimum wage changes of five to 20 percent lead to small, often statistically insignificant wage effects. It is only for minimum wage increases in excess of 20 percent that we observe strong positive wage effects of a minimum wage increase, with these effects concentrated among workers within an initial wage no more than 10 percent above the minimum wage. Of the individuals experiencing a minimum wage increase in our sample, more than 25 percent experienced an increase of less than five percent. The possibility that such changes might yield *lower* wage growth for low wage individuals, even ignoring potential disemployment effects, is surprising.

While we have limited our sample to individuals whose wage increases by less than a factor of 10, more than 6 percent of the individuals in the remaining sample report at least a

doubling of their hourly wage between interviews. Furthermore, over five percent of individuals reported a decline in hourly wages of more than one half. It is unlikely that such outcomes are driven primarily by changes in minimum wage laws. In an effort to mitigate the effect of such extreme wage changes on our estimates, we repeat the above specification in a median regression framework as proposed by Koenker and Bassett (1978). The median regression estimates of the δ_{jk} parameters from equation (1) are the effects of the minimum wage increase at the median percentage wage change rather than on average. Skewness in the conditional percentage wage change distribution causes the OLS results to be different than the median regression results. To the extent the results differ, we prefer the median regression results as they ignore extreme wage changes.

Table 6 reports results for the median regression specification. Again, the parameter estimates are from a single median regression; the columns do not indicate separate regression specifications. The median regression point estimates are smaller than those from the OLS specification, but the qualitative results are similar. Individuals earning an initial hourly wage in the bottom quarter of the wage distribution (below $11) experience lower wage growth following a minimum wage increase of less than 5 percent than similar individuals experiencing no minimum wage change. The magnitude of this effect varies from -3.6 percent to -9.5 percent, with results significant at the 1 percent level for all wage levels except within 10 percent of the minimum wage, which is significant at the 5 percent level.

Individuals initially earning a wage within 10 percent of the minimum wage experience increased wage growth following a minimum wage increase of 10 percent or larger, while individuals with an initial wage within 30 percent larger than the minimum wage experience increased wage growth only for minimum wage increases of 20 percent or more. The wage

effects of a minimum wage increase of any magnitude disappear for individuals earning an initial wage in the top three quartiles of the wage distribution (above $11).

Thus, the story is broadly consistent. Small increases in the minimum wage have negative effects on wage growth for low-wage individuals. Larger increases in the minimum wage have positive effects on low-wage individuals, with the effects being felt most strongly by those at or very near the initial minimum wage level. These results suggest that small minimum wage increases dampen wage growth for those at the bottom of the wage distribution. The median low-wage worker experiences higher wage growth without a minimum wage increase than with a small minimum wage increase.

Are the estimated effects for low-wage workers experiencing a small minimum wage increase reasonable? The results suggest that wages for low-wage workers in states with a minimum wage change of less than 5 percent would have grown by 4.2 percent more had there been no increase in the minimum wage. The median wage growth for low-wage workers in state-year combinations with no minimum wage increase is about 20 percent, so estimates suggesting that a small increase in the minimum wage reduces expected wage growth by 5 or even 10 percent are plausible.

One possible explanation for this finding is that the minimum wage increase acts as a focal point for employers in determining wages. When the minimum wage increase is small, employers react by only increasing minimum wage workers' wages by the required amount and then increasing the wages for workers near the minimum wage by a similar small amount, if at all. However, without a minimum wage increase there is no low-wage-growth focal point and therefore wage growth is higher for low-wage workers who experience no minimum wage increase when compared to those who experience a small minimum wage increase.

Robustness Tests

However, there are other explanations for this result. One is that there are a few states that increase the minimum wage by a small amount every year and perhaps these states happen to have lower wage growth for unrelated reasons. There are also states that never increase the minimum wage in our sample period and perhaps these states happen to have higher wage growth for unrelated reasons. We thus repeat the median regression specified above, excluding the states that belong to the same minimum wage change bin in each period. This will include states that changed the minimum wage by a similar – usually small – amount in each year, as well as those that did not change the minimum wage at all.[6] This reduces our sample to 85,138 observations, with results reported in Table 7. As is clear, the results are not driven by these "constant" states. The point estimates in Table 7 remain negative and statistically significant for low-wage individuals experiencing small minimum wage increases and positive for low wage individuals experiencing minimum wage increases of more than 20 percent. Minimum wage changes have no statistically significant effects on individuals in the upper three quartiles of the wage distribution.

One might worry that even with the inclusion of state fixed effects and state-level unemployment rates, there may be omitted variables related to state-level economic conditions that simultaneously affect percentage wage growth and the likelihood of a minimum wage change. For example, suppose that states with low productivity growth for low-wage workers respond by increasing the minimum wage by a small amount. This would explain our finding that low-wage workers in states with small minimum wage increases experience lower percentage wage growth than in states with no minimum wage increase. In order to control for

[6] This includes Alaska, Florida, Maine, Minnesota, Oregon, Vermont, Washington, and West Virginia.

such potential omitted variables, we repeat the specification from Table 7, and include state-by-year fixed effects. Note that this with this inclusion, identification no longer comes from variation in minimum wage changes that occur on January 1, as such variation will be collinear with the state-by-year effects. However, a large number of minimum wage changes – most notably the federal minimum wage change in 2007 – took place during, as opposed to at the beginning of, the calendar year. Results for this specification are reported in Table 8. As before, the broad story remains unchanged.

The specifications described thus far have not allowed covariates other than those pertaining to the magnitude of the minimum wage change to vary throughout the wage distribution. For instance, the effect of a bachelor's degree on wage growth is constrained to be identical for an individual earning a wage near the minimum wage as for an individual earning many times more than this. This is perhaps a set of overly strict restrictions on the parameters. Thus, Table 9 reports results for a specification in which the covariates for race, ethnicity, education, gender, and age are each allowed to vary by wage group. The magnitude of the negative effects of small minimum wage changes is reduced somewhat, but the qualitative results are largely unchanged.

Finally, all tables above have reported standard errors under the assumption of homoskedasticity. Table 10 reports results for a specification identical to that of Table 7, but includes bootstrapped standard errors. While standard errors do increase somewhat, the negative effect of minimum wage changes of less than 5 percent are still statistically significant for all wage groups in the lower quartile. Minimum wage increases larger than 20 percent have a positive and significant effect for individuals with a wage less than 40 percent greater than the minimum.

Tables 7 through 10 indicate that the results hold across a broad range of specifications and are not likely driven by the alternative explanations given above. The results seem most consistent with a wage focal point for employers which causes percentage wage growth to be lower for low-wage workers if there is a small minimum wage increase.

Heterogeneous Effects

The prior specifications allow the effect of a minimum wage increase to differ by the size of the minimum wage increase and by the initial wage of the worker, but not by the worker's characteristics. The minimum wage may have different wage effects by gender, race, age, education, and income. In an attempt to see if there are heterogeneous effects, Table 11 considers only low wage workers – those earning an initial wage within 30 percent of the minimum wage – and reports the response to minimum wage changes of varying sizes across multiple demographic groups. Again, the table reports results from median regressions with the additional control variables and state, month, and year fixed effects included. Each row represents a separate regression.

We consider the effects across subsamples of male, female, white, black, Hispanic, young (age 22 and under), low-education (no high school diploma), and low-income (annual household income under $40,000) individuals. As a result of estimating a large number of parameters with greatly reduced sample sizes, many results are not statistically significant. However, the qualitative story is much the same for all these groups: individuals experiencing small minimum wage increases see lower wage growth than individuals experiencing no minimum wage change at all. Across nearly all groups, a minimum wage increase of less than 5 percent has a negative effect on wage growth. The estimated negative effect for black individuals is quite small – and

slightly positive – and reflects the low wage growth for black individuals in the absence of a minimum wage increase. A similar story holds for women: they experience lower wage growth without a minimum wage increase and therefore a small minimum wage increase has less of a negative effect on wage growth.

For young individuals, those with no diploma, white individuals and Hispanic individuals, minimum wage increases greater than 10 percent have a positive effect on wage growth that is significant at at least the 10 percent level. Female individuals also experience positive and statistically significant wage growth from minimum wage changes of greater than 20 percent.

5. Conclusion

There is strong evidence that a small minimum wage increase actually reduces the annual wage growth for many low-wage workers. This result is both important to labor policy and was previously absent from the minimum wage literature. Larger minimum wage increases have positive wage effects that spill over to workers with wages higher than the new minimum wage. Workers with wages in the top three quartiles of the wage distribution do not seem to experience any wage impact from a minimum wage increase regardless of the size. These findings are robust to a variety of alternative specification ands methods and are generally consistent by income, gender, race, and age with some exceptions. Pointedly, female and black workers seem to suffer far less of the negative effects of a small minimum wage increase.

We suggest that the negative effects of a minimum wage increase work by setting a low-wage-growth focal point for employers of low-wage workers. Had the minimum wage increase not occurred, employers would have provided larger wage increases to their employees. While

this focal-point story is consistent with the results, we provide no evidence to substantiate that this is the mechanism.

The 2005-2008 data comes from a period that is ideal for studying the effect of a minimum wage increase because of the large number of state-level minimum wage increases of various sizes. The short time period helps to address other methodological and interpretation issues common in minimum wage studies. Our use of median regression methods increases confidence that the results are being driven by the minimum wage increases and not by skewness in the annual wage growth distribution.

It should be recognized that new entrants to low-wage jobs would likely benefit from a minimum wage increase and these individuals have been excluded from the analysis. Similarly, workers who experience large wage losses would also benefit from a minimum wage increase. However, because there are few of these workers, their impact on the OLS regression result is small. Finally, our study does not consider any increased unemployment risk for a low-wage worker as a result of a minimum wage increase. However, even with these limitations, the results indicate that a small minimum wage increase likely hurts more low-wage workers than it helps.

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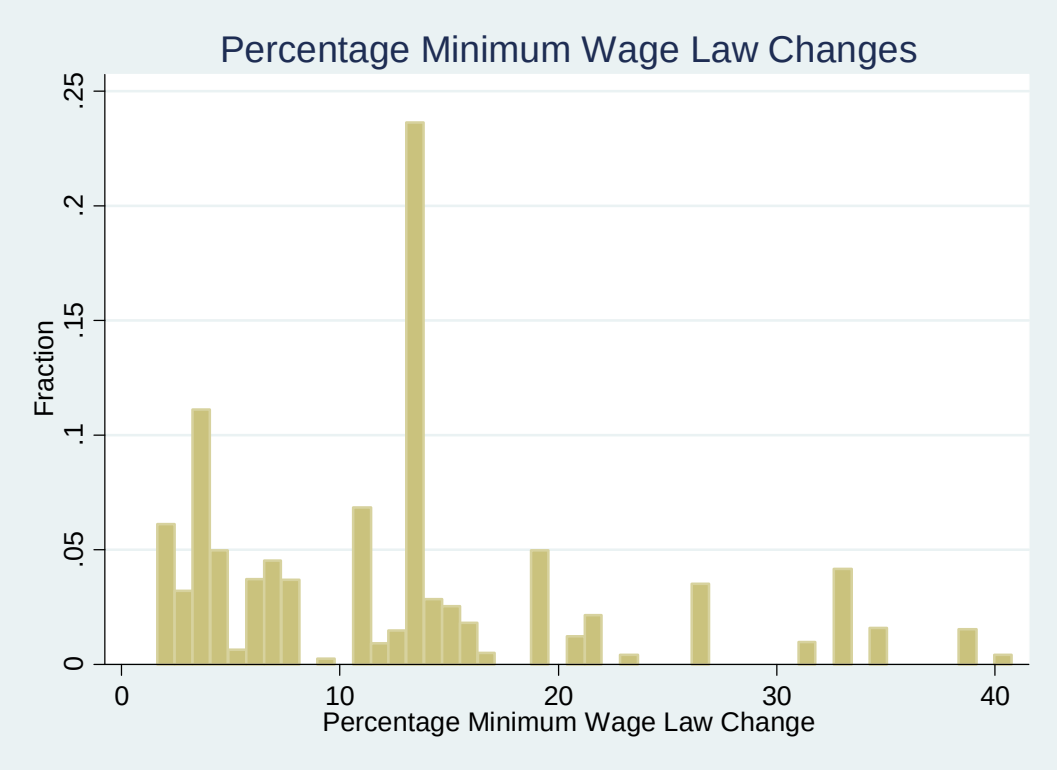
Figures and Tables

Figure 1: Percentage Minimum Wage Increases



Note: The above figure depicts the percentage change in minimum wage laws affecting 64,327 individuals in 48 states and the District of Columbia who experienced a minimum wage change between interviews.

Table 1: Summary Statistics

Observations	100,754
Mean Wage	19.26
Percentage Employed	100
Sex	
Male	51.78
Female	48.22
Race	
White	83.38
Black	10.31
Hispanic	12.05
Education	
Less than High School	8.97
High School Only	47.59
Bachelor's or More	43.44
Age	
16-19	2.96
20-24	7.03
25-34	20.44
35-44	26.54
45-54	27.84
55-65	15.19
Family Income	
Low	6.92
Low-Mid	18.79
Mid	20.73
Mid-High	30.94
High	22.61

Note: The following individuals have been removed: those earning a wage more than $0.10 below the minimum wage, those earning less than half the minimum wage in year two, those earning an hourly wage greater than $100, those experiencing a wage change greater than 1,000 percent have been removed, those listed as self-employed respondents and agricultural workers, and individuals younger than 16 and individuals older than 65. Low income families are defined as those with an annual family income of less than $20,000. Low-Mid income includes families earning between $20,000 and $40,000 annually. Mid includes families earning between $40,000 and $60,000 annually. Mid-High includes families earning between $60,000 and $100,000 annually, and High includes families earning at least $100,000 annually. Individuals are weighted by sample weights included in the CPS.

Table 2: Wage Mobility

		Second Interview Wage				
		≤ Minimum Wage*1.1	MW*1.1 - MW*1.25	MW*1.25 - MW*1.5	MW*1.5 - MW*2	MW*2 <
First Interview Wage	≤ Minimum Wage*1.1	30.03	19.86	18.49	17.58	14.04
	MW*1.1 - MW*1.25	11.15	17.98	25.28	22.71	22.88
	MW*1.25 - MW*1.5	6.19	6.23	26.50	32.23	28.86
	MW*1.5 - MW*2	2.53	2.83	6.94	42.41	45.29
	MW*2 <	0.90	0.81	2.11	7.67	88.51

Note: The above table includes 36,427 individuals from 44 states and the District of Columbia who did not experience a minimum wage increase between interviews. Percentages represent the percent of a given wage bin at the time of the first interview that belong to a given bin at the time of the second interview, so that percentages sum horizontally to 100. Individuals are weighted by sample weights included in the CPS.

Table 3: Minimum Wage Groups

Wage Group	Observations
Wage ≤ Minimum Wage*1.1	2,569
MW*1.1 < Wage ≤ MW*1.2	2,442
MW*1.2 < Wage ≤ MW*1.3	2,103
MW*1.3 < Wage ≤ $11	19,128
$11 < Wage ≤ $16	25,132
$16 < Wage ≤ $24	24,536
$24 < Wage	24,844

Note: The above table includes 100,754 observations. The final three rows correspond approximately to the upper three quartiles of the wage distribution.

Table 4: Minimum Wage Changes

Wage Change	Observations	States
No Minimum Wage Law Change	36,427	45
0 < Minimum Wage Law Change ≤ 5%	16,372	14
5% < Minimum Wage Law Change ≤ 10%	8,267	8
10% < Minimum Wage Law Change ≤ 20%	29,362	33
20% < Minimum Wage Law Change	10,326	11

Table 5: Ordinary Least Squares

Wage Group	Minimum Wage Change ≤ 5%	5% - 10%	10% - 20%	> 20%	Obs
Wage ≤ Minimum Wage*1.1	-0.108***	0.0385	0.0542	0.394***	2,569
	(0.0411)	(0.0529)	(0.0457)	(0.138)	
MW*1.1 < Wage ≤ MW*1.2	-0.0807*	-0.0980*	0.0319	0.116	2,442
	(0.0427)	(0.0521)	(0.0437)	(0.0719)	
MW*1.2 < Wage ≤ MW*1.3	-0.210***	0.00156	-0.0411	0.0878	2,103
	(0.0456)	(0.0732)	(0.0498)	(0.0867)	
MW*1.3 < Wage ≤ $11	-0.0633***	-0.00870	0.0214*	0.0178	19,128
	(0.0181)	(0.0262)	(0.0129)	(0.0171)	
$11 < Wage ≤ $16	0.00718	0.0224	0.00555	-0.0186	25,132
	(0.0132)	(0.0161)	(0.00922)	(0.0125)	
$16 < Wage ≤ $24	0.00370	0.0258*	0.00105	0.00696	24,536
	(0.0111)	(0.0140)	(0.00755)	(0.0111)	
$24 < Wage	-0.00189	-0.0179*	-0.00735	0.00497	24,844
	(0.0104)	(0.0104)	(0.00681)	(0.0102)	
Obs	16,372	8,267	29,362	10,326	

Note: The above table reports results from a single ordinary least squares regression that includes all 100,754 observations. Additional covariates not reported above include race, ethnicity, gender, education level, household income, age and age squared, state of residence, month and year of interview and the average state unemployment rate during the year of the first interview. The final three rows correspond approximately to the upper three quartiles of the wage distribution. Robust standard errors are reported.

Table 6: Median Regression

Wage Group	Minimum Wage Change				
	≤ 5%	**5% - 10%**	**10% - 20%**	**> 20%**	**Obs**
Wage ≤ Minimum Wage*1.1	-0.0420**	0.0201	0.0487***	0.246***	2,569
	(0.0173)	(0.0204)	(0.0171)	(0.0323)	
MW*1.1 < Wage ≤ MW*1.2	-0.0946***	-0.0392*	0.00554	0.0655**	2,442
	(0.0184)	(0.0210)	(0.0171)	(0.0278)	
MW*1.2 < Wage ≤ MW*1.3	-0.0930***	0.0753***	-0.0111	0.0906***	2,103
	(0.0189)	(0.0265)	(0.0180)	(0.0305)	
MW*1.3 < Wage ≤ $11	-0.0357***	-0.0202*	0.00195	0.0146*	19,128
	(0.00934)	(0.0116)	(0.00583)	(0.00830)	
$11 < Wage ≤ $16	-0.00418	0.00106	0.000974	-0.00958	25,132
	(0.00776)	(0.00875)	(0.00535)	(0.00788)	
$16 < Wage ≤ $24	0.00505	0.00602	-0.000887	0.000891	24,536
	(0.00771)	(0.00867)	(0.00541)	(0.00803)	
$24 < Wage	0.00365	-0.0112	-0.00336	0.00660	24,844
	(0.00770)	(0.00779)	(0.00540)	(0.00828)	
Obs	16,372	8,267	29,362	10,326	

Note: The above table reports results from a single median regression that includes all 100,754 observations. Additional covariates not reported above include variables for race, ethnicity, gender, education level, household income, age and age squared, state of residence, month and year of interview and the average state unemployment rate during the year of the first interview. The final three rows correspond approximately to the upper three quartiles of the wage distribution.

Table 7: Median Regression with Constant States Removed

Wage Group	Minimum Wage Change				
	≤ 5%	**5% - 10%**	**10% - 20%**	**> 20%**	**Obs**
Wage ≤ Minimum Wage*1.1	-0.0738***	0.00181	0.0308*	0.228***	2,004
	(0.0230)	(0.0214)	(0.0181)	(0.0328)	
MW*1.1 < Wage ≤ MW*1.2	-0.0700***	-0.0647***	0.00942	0.0662**	1,952
	(0.0264)	(0.0219)	(0.0180)	(0.0284)	
MW*1.2 < Wage ≤ MW*1.3	-0.0945***	0.0720***	-0.00825	0.0874***	1,649
	(0.0273)	(0.0274)	(0.0190)	(0.0310)	
MW*1.3 < Wage ≤ $11	-0.0500***	-0.0202*	-0.00132	0.00882	16,897
	(0.0129)	(0.0120)	(0.00609)	(0.00850)	
$11 < Wage ≤ $16	-0.00893	0.00191	-0.000219	-0.0126	21,090
	(0.00984)	(0.00916)	(0.00560)	(0.00809)	
$16 < Wage ≤ $24	0.00192	0.0103	-0.00169	0.000120	20,485
	(0.00964)	(0.00905)	(0.00567)	(0.00825)	
$24 < Wage	0.00926	-0.00731	0.00384	0.0129	21,061
	(0.00944)	(0.00808)	(0.00564)	(0.00850)	
Obs	6,491	7,848	28,161	10,326	

Note: The above table reports results from a median regression that includes 85,138 observations. Observations from states with a minimum wage change that falls into the same change bin in each year, and observations from states that never change the minimum wage have been removed. Additional covariates not reported above include race, ethnicity, gender, education level, household income, age and age squared, state of residence, month and year of interview and the average state unemployment rate during the year of the first interview. The final three rows correspond approximately to the upper three quartiles of the wage distribution.

Table 8: Median Regression, State-Year Fixed Effects

		Minimum Wage Change				
		≤ 5%	**5% - 10%**	**10% - 20%**	**> 20%**	**Obs**
Wage Group	**Wage ≤ Minimum Wage*1.1**	-0.0824***	-0.0463	0.0200	0.222***	2,004
		(0.0315)	(0.0417)	(0.0191)	(0.0347)	
	MW*1.1 < Wage ≤ MW*1.2	-0.0914***	-0.109***	-0.00558	0.0556*	1,952
		(0.0342)	(0.0417)	(0.0190)	(0.0303)	
	MW*1.2 < Wage ≤ MW*1.3	-0.106***	0.0337	-0.0217	0.0778**	1,649
		(0.0348)	(0.0450)	(0.0199)	(0.0328)	
	MW*1.3 < Wage ≤ $11	-0.0659***	-0.0657*	-0.00900	0.00225	16,897
		(0.0245)	(0.0369)	(0.00742)	(0.0123)	
	$11 < Wage ≤ $16	-0.0209	-0.0457	-0.00759	-0.0174	21,090
		(0.0229)	(0.0362)	(0.00709)	(0.0120)	
	$16 < Wage ≤ $24	-0.00786	-0.0405	-0.00979	-0.00333	20,485
		(0.0229)	(0.0362)	(0.00719)	(0.0121)	
	$24 < Wage	-0.00483	-0.0487	-0.00522	0.00735	21,061
		(0.0228)	(0.0361)	(0.00727)	(0.0123)	
	Obs	6,491	7,848	28,161	10,326	

Note: The above table reports results from a single median regression that includes 85,138 observations. Observations from states with a minimum wage change that falls into the same change bin in each year, and observations from states that never change the minimum wage have been removed. Additional covariates not reported above include variables for race, ethnicity, gender, education level, household income, age and age squared, month of interview and state-by-year fixed effects. The final three rows correspond approximately to the upper three quartiles of the wage distribution.

Table 9: Median Regression, Flexible Covariates

Wage Group	Minimum Wage Change				
	≤ 5%	**5% - 10%**	**10% - 20%**	**> 20%**	**Obs**
Wage ≤ Minimum Wage*1.1	-0.0528**	0.0170	0.0436**	0.233***	2,004
	(0.0251)	(0.0233)	(0.0195)	(0.0355)	
MW*1.1 < Wage ≤ MW*1.2	-0.0629**	-0.0783***	0.00437	0.0864***	1,952
	(0.0285)	(0.0239)	(0.0195)	(0.0306)	
MW*1.2 < Wage ≤ MW*1.3	-0.108***	-0.00889	-0.00382	0.0659**	1,649
	(0.0295)	(0.0229)	(0.0207)	(0.0334)	
MW*1.3 < Wage ≤ $11	-0.0453***	-0.0280**	-0.00528	0.00664	16,897
	(0.0138)	(0.0129)	(0.00657)	(0.00910)	
$11 < Wage ≤ $16	-0.00660	0.00856	0.00116	-0.0114	21,090
	(0.0105)	(0.00989)	(0.00602)	(0.00866)	
$16 < Wage ≤ $24	0.00681	0.0103	-0.000198	-0.00140	20,485
	(0.0103)	(0.00975)	(0.00609)	(0.00881)	
$24 < Wage	0.00422	-0.00158	0.00276	0.00563	21,061
	(0.0101)	(0.00867)	(0.00605)	(0.00909)	
Obs	6,491	7,848	28,161	10,326	

Note: The above table reports results from a single median regression that includes 85,138 observations. Observations from states with a minimum wage change that falls into the same change bin in each year, and observations from states that never change the minimum wage have been removed. Additional covariates not reported above include variables for race, ethnicity, gender, education level, household income, age and age squared. Each of these variables is allowed to vary by wage group. Also included are variables for state of residence, month and year of interview and the average state unemployment rate during the year of the first interview. Each of these variables is restricted to be constant across wage groups. The final three rows correspond approximately to the upper three quartiles of the wage distribution.

Table 10: Median Regression, Bootstrapped Standard Errors

Wage Group	Minimum Wage Change				
	≤ 5%	**5% - 10%**	**10% - 20%**	**> 20%**	**Obs**
Wage ≤ Minimum Wage*1.1	-0.0738**	0.00181	0.0308	0.228***	2,004
	(0.0307)	(0.0443)	(0.051)	(0.0408)	
MW*1.1 < Wage ≤ MW*1.2	-0.0700*	-0.0647*	0.00942	0.0662**	1,952
	(0.0371)	(0.0360)	(0.0308)	(0.0307)	
MW*1.2 < Wage ≤ MW*1.3	-0.0945***	0.0720	-0.00825	0.0874**	1,649
	(0.0324)	(0.0487)	(0.0219)	(0.0366)	
MW*1.3 < Wage ≤ $11	-0.0500***	-0.0202	-0.00132	0.00882	16,897
	(0.0133)	(0.0148)	(0.00567)	(0.00788)	
$11 < Wage ≤ $16	-0.00893	0.00191	-0.000219	-0.0126*	21,090
	(0.00851)	(0.0103)	(0.00450)	(0.00674)	
$16 < Wage ≤ $24	0.00192	0.0103	-0.00169	-0.000120	20,485
	(0.00732)	(0.0101)	(0.00480)	(0.00669)	
$24 < Wage	0.00926	-0.00731	0.00384	0.0129	21,061
	(0.00941)	(0.0101)	(0.00563)	(0.0102)	
Obs	6,491	7,848	28,161	10,326	

Note: The above table reports results from a single median regression that includes 85,138 observations. Observations from states with a minimum wage change that falls into the same change bin in each year, and observations from states that never change the minimum wage have been removed. Additional covariates not reported above include variables for race, ethnicity, gender, education level, household income, age and age squared, state of residence, month and year of interview and the average state unemployment rate during the year of the first interview. The final three rows correspond approximately to the upper three quartiles of the wage distribution. Results are reported with bootstrapped standard errors.

Table 11: Median Regression, Low Wage Earners

	Minimum Wage Change				
	≤ 5%	**5% - 10%**	**10% - 20%**	**> 20%**	**Obs**
Men	-0.0939	0.0112	0.0629	0.156	2,179
	(0.0990)	(0.0706)	(0.0544)	(0.107)	
Women	-0.0237	0.0519*	0.0387	0.115***	3,426
	(0.0404)	(0.0312)	(0.0237)	(0.0442)	
White	-0.0645	0.0541	0.0531*	0.114**	4,474
	(0.0454)	(0.0379)	(0.0271)	(0.0491)	
Black	0.00542	-0.115	0.0272	0.0543	640
	(0.148)	(0.0890)	(0.0691)	(0.162)	
Hispanic	-0.124	0.00710	0.109***	0.299***	1,199
	(0.0755)	(0.0454)	(0.0366)	(0.102)	
22 and Under	-0.0531	0.00997	0.0394**	0.0934***	1,968
	(0.0350)	(0.0287)	(0.0200)	(0.0353)	
No Diploma	-0.0543	0.0235	0.0460**	0.0803*	1,820
	(0.0411)	(0.0326)	(0.0229)	(0.0427)	
Low Income	-0.0773	-0.0108	0.00820	0.0797*	2,276
	(0.0476)	(0.0352)	(0.0262)	(0.0477)	

Note: Each row reported in the table above represents a separate median regression, including only the specified demographic group. All regressions include only individuals earning a wage at the time of the first interview within 30% of the applicable minimum wage. Additional covariates not reported above include variables for race, ethnicity, gender, education level, household income, age and age squared, state of residence, month and year of interview and the average state unemployment rate during the year of the first interview. The low income group includes individuals with a reported household income of no more than $40,000 annually.