Working Paper Series 615
(ISSN 1211-3298)

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Prague, March 2018

ISBN 978-80-7343-422-9 (Univerzita Karlova, Centrum pro ekonomický výzkum a doktorské studium)
ISBN 978-80-7344-458-7 (Národohospodářský ústav AV ČR, v. v. i.)

Does Minimum Wage Affect Workplace Safety?*

Vít Hradil† (CERGE-EI)‡

March 2018

Abstract

Empirical evidence on the employment effects of minimum wage legislation suggests the possibility that firms react to increases in low-skilled labor costs driven by minimum wages by reducing investments in non-wage job aspects, which can mitigate the need for layoffs. Such adjustments may involve the worsening of workplace safety. To evaluate the hypothesis that increases in minimum wages result in a higher incidence of occupational injuries and illnesses, I use employer-level data from the United States and variation in state minimum wages during 1996-2013. The results suggest that states which increase their minimum wage experience an increase in the incidence of occupational injuries and illnesses. The effect appears stronger in industries that employ large numbers of low-wage workers, and those where the workforce is intensively exposed to health risks.

JEL Classification: I10, J32, J81

Keywords: minimum wage, job safety, occupational injuries and illnesses

* This study was supported by Charles University, GAUK project No. 172615. I would like to thank Alena Bicakova, Stepan Jurajda, Nikolas Mittag, Alexander Mas, and participants at the Labor Lunch seminar series at Princeton University for helpful comments and suggestions. All remaining errors are my own.

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Introduction

The full extent of the economic effects of minimum wage legislation, despite having been examined extensively, still remains a source of controversy among scholars, and is far from exhausted as a research topic. Theoretical effects of minimum wage hikes on producer behavior include reductions in employment and increases in output prices, or reduced expenditures on non-wage worker compensation, such as on-the-job training, workplace conditions, job safety or fringe benefits (Schmitt, 2013).

Considering that jobs for which the minimum wage floor is binding typically involve manual labor, it seems reasonable to suspect that saving money on workplace conditions and job safety, induced by the rising minimum wage, may result in a higher frequency of occupational injuries and illnesses within this pool of workers. For instance, the potential reluctance of employers to provide education about job safety or appropriate equipment may have a direct impact on the physical health of workers (see, e.g., Sawacha, Naoum, and Fong, 1999). It has also been shown that injury rates are significantly affected by the emphasis top managers put on job safety (Shannon, Mayr, and Haines, 1997), and that the incidence rates of occupational injuries and illnesses tend to increase if employees are required to work long hours or overtime (Dembe, Erickson, Delbos, and Banks, 2005; Dong, 2005). Moreover, poor working conditions or the potential increase in pressure applied on employees, e.g., through the shortening of breaks, or demanding higher effort, may induce more stress, depression, and other mental illnesses. The aim of this paper is to evaluate whether minimum wage hikes lead, possibly via some of the abovementioned channels, to increased incidence rates of occupational injuries and illnesses.

My main contribution is that I provide empirical support for Wessels‘ (1980) theoretical model of the worsening of non-wage job attributes (in this particular case job safety) resulting from minimum wage hikes. I show that industries in US states that increase their minimum wage tend to subsequently exhibit higher incidence rates in general, and this effect is more strongly manifested in industries that employ relatively many low-wage earners, are riskier, and more exposed to health damaging job characteristics. I also find specific job characteristics that make industries more responsive to minimum wage hikes, and identify major industry groups where the effect is the strongest. The rest of this paper is structured as follows: first I summarize the related previous literature, then I describe my data and methodological approach; next I present my results, and finally conclude.

Literature Review

Early theoretical models of the minimum wage pointed predominantly towards disemployment effects (i.e. job destruction), both under the assumption of full sector (Johnson, 1969; McCulloch, 1974) and partial sector coverage (Welch, 1974; Mincer, 1976; Gramlich, Flanagan, and Wachter, 1976). However, the empirical work on the impact of minimum wage legislation on employment has yielded notably mixed results (see, e.g., Card and Krueger, 1994, for a positive effect, Neumark and Wascher, 2004, for a negative effect, or Dube, Naidu, and Reich, 2007, for no effect). The available literature on this issue is examined in several meta-studies, e.g. in Doucouliagos and Stanley (2009), who conclude that the disemployment effect of the minimum wage does not appear generally to be significant.[1,2]

A possible way for employers to cope with minimum wage hikes, other than through layoffs, is to pass the increased input price on to customers through higher output prices. Aaronson (2001) finds that restaurant prices do in fact tend to rise in response to increases in

[1] A summary of the literature dealing with disemployment effects of the minimum wage can be found in Schmitt (2013).
[2] One potential explanation why some studies have found negative employment effects is offered in Dube, Lester, and Reich (2010) who argue that this may be due to the omission of spatial heterogeneities in employment trends, which then produces spurious results. Accounting for those, they do not find any effect of the minimum wage on employment.

the minimum wage, while Basker and Taimur Khan (2016) provide evidence of positive price elasticity of fast-food meals with respect to minimum wage. Harasztosi, Lindner, Bank, and Berkeley (2015), examining a substantial minimum wage hike in Hungary, find that its negative effect on employment was at most small, and the profitability of low-wage labor employers did not seem to be affected. In line with the argument presented above, they find that this is due to the affected employers passing the increase in their labor costs on to customers. MaCurdy (2015) even argues that because of these price increases, three in four low-income families ended up as net losers from the 1996 minimum wage hike in the US as their expenditures rose but their income was not affected.

Apart from employment and output prices, the next possible effect of the minimum wage, discussed within the competitive framework (the only one that will be of concern here)[3], is that on non-wage expenditures on workers. The possibility of reductions in non-wage expenditures motivated Wessels (1980) to expand the standard labor market minimum wage model by including the interaction of supply and demand for non-wage attributes of jobs, such as fringe benefits, workplace conditions, and job safety. Wessels concludes that increases in the binding level of the minimum wage may cause a reduction in non-wage expenditures on employees, which may help explain the lack of evidence for job destruction. Similarly, Leighton and Mincer (1981) and Hashimoto (1982) point out that the reduction in one particular fringe benefit – on-the-job training opportunities – can also enable employers to cope with an increase in the minimum wage without necessitating reductions in employment.

Clearly, there seems to be a valid theoretical background for the notion that jobs affected by increases in the minimum wage, if they are not destroyed by it, can exhibit worsened non-

[3] Two other branches of literature on this topic are the Institutional Model and the Dynamic Monopsony Model. These two models, however, are essentially unrelated to the topic of this paper, and therefore, the interested reader is referred to Schmitt (2013) for more information.

wage conditions as a result. This would mean that apart from the obvious aim of minimum wage policies, which is to redistribute wealth towards low-skilled groups of workers (Freeman, 1996), an intervention of this kind may also bring about various unintended consequences for the workers.

A broad test of the worsening of non-wage job aspects, stemming from increases in the minimum wage, was provided in Holtzer, Katz, and Krueger (1994). Here, the authors hypothesize that if the extra rents coming from a higher nominal minimum wage are appropriated by the employers through the reduction in expenditures on non-wage job aspects, then we should not observe any unusual increase in the number of people applying for these vacancies. Their results reject this hypothesis since they show significantly more queuing for jobs paying the minimum wage than for those paying slightly above it. It seems, therefore, that the employees are willing to consciously tradeoff the higher nominal wage for potentially worse working conditions.

This conclusion, however, hinges on the assumption of the workers being perfectly aware of all features of the vacancies in question, including job safety and workplace conditions, which does not seem realistic. Thus, for an evaluation of the non-wage aspects of minimum wage jobs, it may be more informative to look at the quitting rate rather than the application rate. This issue is addressed in Sicilian and Grosberg (1993). The results of their study show that a binding minimum wage indeed implies a much higher quitting rate. Their interpretation is that while the minimum wage does attract more applicants for a job, it might be caused primarily by their incorrect perception of the job's true value. Soon after signing the employment contract, the poor quality of non-wage aspects is discovered, which compels workers to quit.

Studies focusing on specific non-wage job aspects that could potentially worsen due to minimum wage hikes have been quite limited in number so far. In their famous study on fast-food restaurants, Card and Krueger (1994) fail to find any significant effect of the minimum wage hike on the most typical fringe benefit in this industry – free or low-priced meals for employees. Another fringe benefit – training opportunities – was the focus of Neumark and Wascher (2001), where it is shown that higher minimum wages are associated with reduced on-the-job training, which is clearly an example of worsened non-wage benefits. This finding is then confirmed in their later study, Neumark and Wascher (2003).

Non-wage job attributes can be indirectly related to employee health through the provision of health insurance. Simon and Kaestner (2004) focus on the generosity of health insurance and pension schemes provided by employers and conclude that increases in minimum wage do not have a significant discernible impact on these. On a similar note, Royalty (2001) concludes in her study that relatively small minimum wage hikes are associated with increases in offers of health insurance and pension benefits to employees, while larger minimum wage increases have the opposite effect. Finally, McCarrier, Zimmerman, Ralston, and Martin (2011) report that higher minimum wages are associated with the reduced odds of low-skilled workers reporting cost-related barriers to needed medical care and do not have a significant effect on the probability of a worker being uninsured.

Studies concerned with the direct relationship between the minimum wage and health outcomes focus predominantly on the income and time cost effects associated with the policy. Kronenberg, Jacobs, and Zucchelli (2015) test the hypothesis that the 1999 minimum wage hike improved mental health among employees, as it constituted a positive shock to income. Using difference-in-differences coupled with matching, they find only limited short-run positive effects. The same policy change is used in Reeves, McKee, Mackenbach, and Whitehead (2016) who find that workers whose wages rose after the minimum wage hike exhibit lower probability of reporting mental illnesses, but no change in blood pressure, hearing ability, or smoking was found. The authors attribute the improved mental health condition to the reduction in financial strain. A similar conclusion is reached in Lenhart (2015), who shows that the 1999 policy change in the UK resulted in improvements in some health measures, and demonstrates that these effects are likely due to reductions in financial stress and changes in leisure expenditures. For US data, Averett, Smith, and Wang (2016) use the Current Population Survey and a difference-in-differences approach to show that employed white female teenagers report better overall health with a minimum wage increase while Hispanic male teenagers report worse health. Finally, Horn, Maclean, and Strain (2016) use the Behavioral Risk Factor Surveillance Surveys and with both the difference-in-differences as well as triple-differences technique, they confirm that minimum wage hikes tend to reduce mental strain among low-wage earners but find some evidence that minimum wage increases may worsen some aspects of self-reported health, especially among unemployed male workers, perhaps due to their diminished employment opportunities.

Since studies on the effects of the minimum wage on health outcomes rely on self-reported health status, it is quite difficult to ascertain to what extent the observed changes are attributable to income effects, lowered mental strain, time cost effects or perhaps changes in job safety. The aim of this paper is to shed some light on one particular channel that may connect the minimum wage and actual employee health – the frequency of occupational injuries and illnesses.

Data and Methodology

The unit of observation in my setting is an industry within a U.S. state. The explained variable is the incidence rate, i.e. the number of recorded occupational injuries and illnesses per 100 workers. An occupational injury or illness is defined by the Bureau of Labor Statistics as one that is related to work activity or workplace, and results in any or more of the following: loss of consciousness; days away from work; restricted work activity or job transfer; medical treatment beyond first aid. Additionally, several other specific cases are also included.[4] The difference between an injury and illness lies essentially in whether the change in health condition results from an instantaneous event or exposure (injury; e.g. a cut or fracture) or not (illness; e.g. pneumonia or rheumatism), and since both of these possibilities are related to my hypothesized causal channel, I examine them both jointly in this paper.[5]

The key explanatory variable is a continuous treatment variable expressing the level of a state-specific minimum wage in a given state and year. To avoid potential bias due to unobservable heterogeneity between states, industries and years, I include a full set of fixed effects. Moreover, since the effect is hypothesized to occur through decreased investment, and therefore may not be observed immediately after a minimum wage hike, I include lagged values of the minimum wage. Following Allegretto, Dube and Reich (2011), I also include a state-specific linear time trend term to control for heterogeneity in the underlying trends in job safety. My empirical specification thus takes the following form:

$$(1) \qquad y_{ist} = \alpha_i + \theta_t + \delta_s + \sum_{\tau=0}^{2} \beta_\tau \, MW_{s,t-\tau} + \eta_s \cdot t + \varepsilon_{ist}.$$

Here, i indexes industries, s indexes states, and t indexes years. MW is the real (PPI adjusted) value of the state-specific minimum wage, and the incidence rate is calculated in accordance with the methodology used by the Bureau of Labor Statistics, i.e.:

$$(2) \qquad y_{ist} = incidence\_rate_{ist} = \frac{N_{ist}}{EH_{ist}} \times 200000,$$

[4] See the BLS SOII Handbook of Methods (https://www.bls.gov/opub/hom/soii/pdf/soii.pdf) for details.
[5] Fatal injuries are left out here due to insufficient data availability.

where N is the number of injuries and illnesses, EH are total hours worked by all employees during the calendar year and 200,000 is the base for 100 equivalent full-time workers (working 40 hours a week, 50 weeks per year). I estimate this model using least squares, and use clustering at the state level for inference.

The key assumption for my identification strategy is that in the absence of a treatment, the trends in the development of the outcome variable would be the same in the control and treatment groups. As shown in Dube, Lester, and Reich (2010), traditional empirical studies on the effects of the minimum wage on employment that use the same identification strategy tend to produce spurious effects, due to spatial heterogeneities in employment trends that are unrelated to minimum wage policies. However, it is not clear whether the issue is actually of concern here as it may plausibly be the case that, unlike the employment trends, the incidence rate trends do not exhibit such consistent differences.

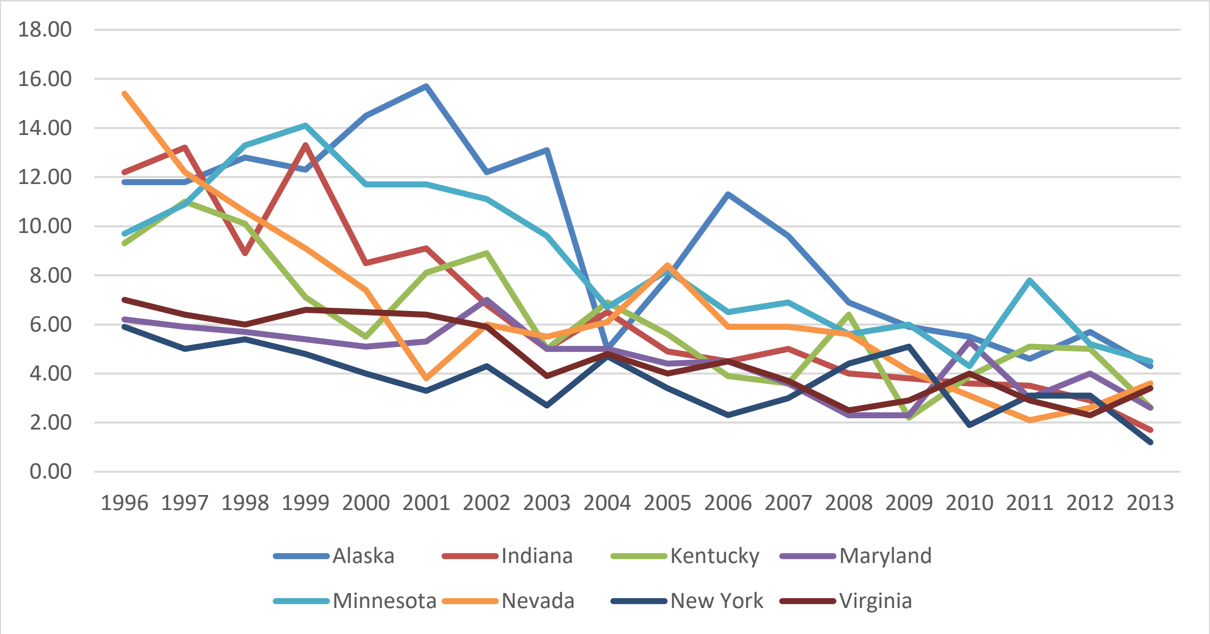
I use US data from 1996-2013. The reason for this choice is twofold. First, the earliest methodologically standardized data on injuries and illnesses available from the BLS come from 1996. Second, The Occupational Safety and Health Act, enacted in 1970, should ensure that the US data will not be contaminated by time-varying changes in state-specific legislation concerning job safety, as the vast majority of job safety regulation has been governed uniformly for the whole country by the Act ever since it was passed.

Data on the dependent variable – the incidence rate – were obtained from the BLS Survey of Occupational Injuries and Illnesses (SOII). This annual survey is conducted in nearly all states, and truthful and accurate reporting in it is required by law. The survey participants – employers – are notified by the end of the year prior to the survey that they have been chosen to participate, and are asked to keep track of injuries and illnesses in their establishments throughout the following year. They are instructed about the precise methodology and recording standards they need to follow. While large employers take part in the survey every year, the choice of smaller participants is made by randomizing within location, size, and industry groups in order to ensure high representativeness of the final sample. In total, about 250,000 establishments take part in the survey each year. Only farms with fewer than 11 employees, Federal government agencies, self-employed, and household workers are excluded from the survey. The data is then published at the state-, year-, and industry-level. From 1996 to 2002, the industry classification was the SIC, and since 2003 it was the NAICS. I use 2-digit aggregation for the SIC, and 3-digit aggregation for the NAICS, as these are basically equivalent with respect to the level of aggregation. Using higher-digit aggregation would lead to the loss of a lot of data, as smaller sub-industries very often do not meet the publication standards due to the small number of establishments sampled. On the other hand, higher-level aggregation would not allow for any meaningful cross-industry comparison. Figure 1 shows recent development in incidence rates in the construction sector in 8 randomly chosen US states. It illustrates a downward time trend, which has been observed in all industries over the past decades, and substantial variation across states.

Table 1: Summary Statistics

	1996-2002	2003-2013
Classification	2-digit SIC	3-digit NAICS
Unique Industries	104	128
Unique States	45	48
Avg. Obs./Year	2105	2457
Avg. Incidence Rate	5.85	
Total Obs.	41763	

Figure 1: Incidence Rates of Non-fatal Occupational Injuries and Illnesses in the Construction of Buildings Sector, Selected States, 1996-2013

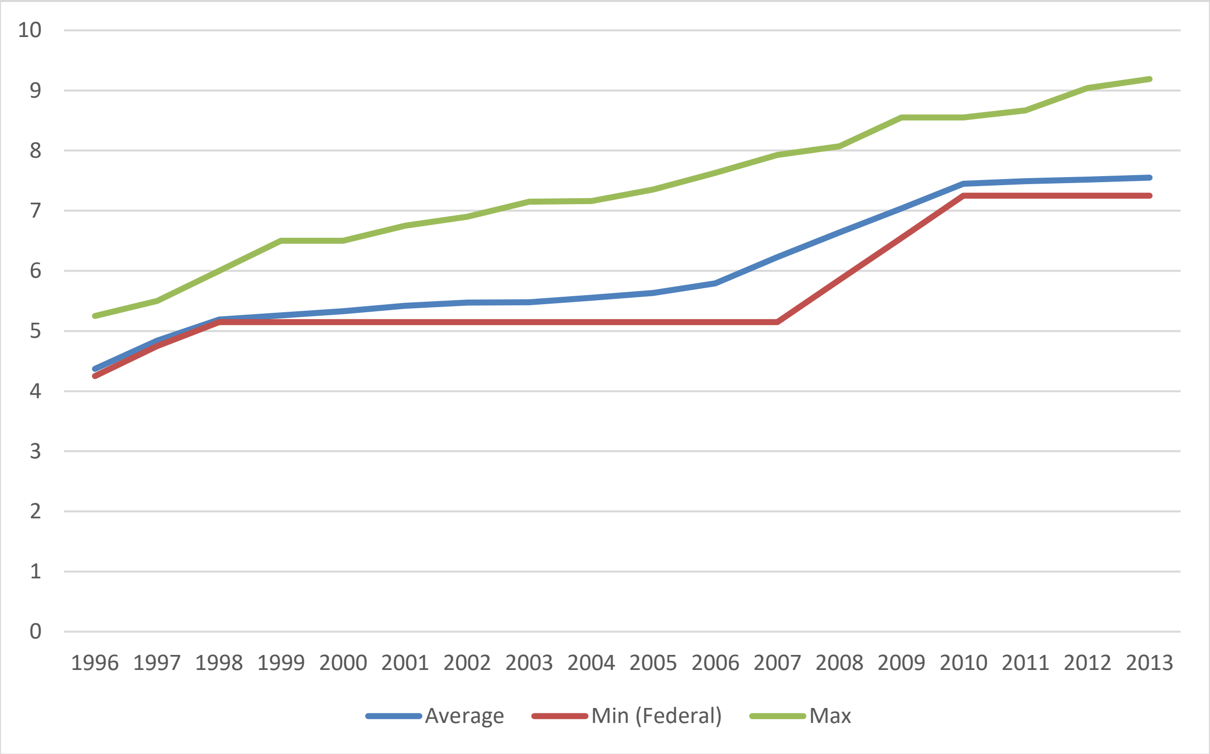


NOTES: The incidence rates were calculated using the BLS definition, see equation (2) above. The number of states was limited to 8 for the sake of clarity. The sector was chosen as representative due to its high importance in terms of total number of employees and the relatively high risk of injuries.

SOURCE: US Bureau of Labor Statistics, Survey of Occupational Injuries and Illnesses.

Data on the key explanatory variable – the state-specific minimum wage – were obtained from the US Department of Labor.[6] All minimum wages used here were valid as of January 1 in a state and year. Table A1 in the Appendix illustrates the extent of variation in state-specific minimum wages for the period of 1996-2012. Figures for the Producer Price Index, utilized to adjust the nominal minimum wage, are regularly reported by the BLS.

Figure 2: Nominal Minimum Wages in US states, January 1 figures, 1996-2013



[6] https://www.dol.gov/whd/state/stateMinWageHis.htm

Results

Column (1) in Table 2 presents the OLS estimates of equation (1). Since there are no strict rules for the appropriate number of lags of the key explanatory variable, the choice was made based on adjusted R^2. The model with no lags performed best in this respect, and is therefore preferred. I include 2 full sets of industry fixed effects, one corresponding to the pre-2003 SIC coding system, and one for the NAICS coding. This brings about a break between 2002 and 2003, but since this change occurred uniformly in all states, it should not bias the results in any way, the change should be captured by year fixed effects.[7]

[7] To verify the unimportance of the break in the coding, I have performed two robustness checks. First, dropping any particular year from the sample does not qualitatively change the results. Second, I converted the whole SIC-coded part of the sample into NAICS using employment ratios reported by the BLS (the conversion procedure is described below). Running the regression on the whole reconstructed NAICS-coded sample delivered essentially identical results.

Table 2: OLS Estimates of Effects of Minimum Wage on the Incidence Rates of Non-Fatal Occupational Injuries and Illnesses, 1996-2013

	(1)	(2)	(3)	(4)	(5)
MW_s	0.154** (0.074) [5.845]	0.089 (0.094) [6.121]	0.121* (0.071) [5.242]	0.048 (0.085) [5.835]	0.108 (0.069) [5.647]
$MW_s * MW - intensive_i$	-	0.237* (0.127) [5.022]	-	0.240** (0.109) [4.971]	-
$MW_s * risky_i$	-	-	0.327 (0.338) [10.595]	0.303 (0.344) [10.622]	-
$MW_s * MW - intensive_i * risky_i$	-	-	-	2.221* (1.263) [9.535]	-
$MW_s * exposed_i$	-	-	-	-	0.497** (0.235) [7.386]
Industry Effects	X	X	X	X	X
State Effects	X	X	X	X	X
Year Effects	X	X	X	X	X
Observations	40207	40207	40207	40207	38588

Note: *Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level. Each column (1) to (5) gives results of 1 regression. Standard errors (in brackets) have been corrected for clustering at the state level. Square brackets show the average incidence rate. MW-intensive are industries that pay the highest share of their workforce at or below the legal minimum, according to BLS data. Risky industries are those that belong to the 90th percentile in terms of their incidence rates over the first 3 years of my sample period. Exposed industries are those that belong to the 90th percentile in terms of the exposure of their workforce to job characteristics (as defined by O*NET) that correlate with the incidence of occupational injuries and illnesses.

The interpretation of the coefficient in column (1) is that if the real minimum wage were to increase, on average, by $1 (which currently corresponds to a nominal increase of about $2) across all states, then this would be associated with an increase in the incidence rate of about

0.154, i.e. about 1.54 extra injuries or illnesses annually per 1000 full-time workers. This constitutes an increase in the average incidence rate in my sample of about 2.6%.[8]

In order to shed more light on what specific industries are the most affected by the policy, and therefore drive the effect observed in the aggregate sample, I expand model (1) from Table 2, and include various industry-specific interactions with the policy variable. The model thus takes the following form:

(3) $$y_{ist} = \alpha_i + \theta_t + \delta_s + \beta MW_{st} + \gamma MW_{st} * X_i + \eta_s \cdot t + \varepsilon_{ist}.$$

In equation (3), all terms are defined as in equation (2), and X_i is an industry-level variable expressing the intensity of specific characteristics, as described below, which may make an industry more likely to respond to a minimum wage hike by increasing the incidence rates of injuries and illnesses.

First, since minimum wage policies can be expected to affect predominantly industries that pay relatively many of their workers near the legal minimum, I define a variable indicating such industries. The BLS regularly publishes the Characteristics of Minimum Wage Workers report with data on the share of employees in an industry who report being paid "At or below minimum wage". For the SIC classified industries, the 2002 report shows it to be Agriculture (SIC 01, 02, 07, 08, and 09) with 2.9% of workers, Retail (SIC 52, 53, 54, 55, 56, 57, 58, and 59) with 8.4%, Personal Services (SIC 72) with 6.2%, and Entertainment and Recreation (SIC 79) with 5%. For NAICS, using the 2010 report, the leading industries are Agriculture (NAICS 11X) with 4.3%, Retail (NAICS 44X and 45X) with 7.3%, Leisure and Hospitality (NAICS 7XX) with 23%, and Other Services (NAICS 8XX) with 8.8%.[9] Column (2) in Table 2 gives

[8] As of December 2017, there were about 126 million full-time workers in the US. Using trivial calculation, one can extrapolate the results to imply that a $2 average minimum wage increase would be associated with about 200,000 extra injuries or illnesses annually.

[9] The particular year of the report issue is not important as the ranking of industries has been very stable for a long time.

the results of a regression with the MW-intensive interaction. The coefficient on the interaction term is positive and statistically significant at the .10 level, suggesting the hypothesized effect is stronger in industries which pay a larger part of their workforce at the legal minimum – these industries can expect an increase in their incidence rate of 0.326, which is about 6% or their average incidence rate.

Next, I interact the treatment variable with a measure of the general riskiness of an industry. For each industry in my sample, I take the average of its incidence rate across all states over the first 3 years of my sample (1996-1998 for SIC-, and 2003-2005 for NAICS-classified industries). I then select the 90th percentile of industries and classify them as risky. The results in column (3) show that while the coefficient on the interaction term is positive, it is not statistically significant. If, however, I then interact the indicator for general riskiness of an industry with the indicator of minimum-wage intensive industries in column (4), the coefficient on the triple interaction term gains in magnitude and is statistically significant at the .10 level. This suggests that industries which exhibit both relatively high incidence rates, and employ a relatively large share of low-paid workforce, are more likely to be affected by minimum wage hikes. Specifically my point estimates imply that among industries classified as both risky and MW-intensive, an increase in the average minimum wage by current $2 would correspond to an increase in their incidence rate by about 2.812 which is more than a 29% increase in their average incidence rate.

As another measure of the riskiness of an industry, I look at specific job characteristics. Since the hypothesized effect works through the worsening of job safety and workplace conditions, it should be more strongly manifested in industries where workers are regularly exposed to potentially dangerous situations. The Occupational Information Network (O*NET) in cooperation with the US Department of Labor collects and publishes data on various characteristics of many occupations, as defined by the Standard Occupation Classification

(SOC), such as their required abilities, skills, work context or work style. Each of these characteristics is then scored on a scale from 0 (lowest) to 100 (highest) based on how intensively it is needed/utilized/encountered in any given occupation. I choose those characteristics which are clearly related to job safety and the risk of the incidence of an occupational injury or illness (the full list is shown and explained in Table A2 in the Appendix). Next, I use BLS data from Occupational Employment Statistics (OES) on the relative employment of all occupations in an industry.[10] I then construct a weighted average of the intensity of every relevant job characteristic for each industry, using the relative employment of every occupation in it as weight. Thus, for each industry, I have a measure of the intensity of every relevant job characteristic. I then use partial correlation coefficients between the average industry-specific incidence rate across my whole sample and the industry-specific intensity of its job characteristics, to construct an aggregate measure of the exposure of an industry to risky job characteristics. Next, I classify industries from the 90th percentile of this measure as "exposed", and interact this indicator with the minimum wage in column (5) of Table 2. The coefficient is positive and statistically significant, suggesting that the effect of the minimum wage on the incidence rates of occupational injuries and illnesses is stronger in industries where workers are more often exposed to situations that correlate with the incidence of injuries and illnesses. According to my estimates, if the nominal minimum wage were to increase by $2, then these industries could experience an increase in their incidence rate of 0.605 which is about 8% of their average.

In order to reveal what particular job characteristics make certain industries more responsive to minimum wage hikes, I now examine each of the characteristics separately. I define an industry as intensive in a job characteristic if it belongs to the 90th percentile of

[10] I use the 1999 issue for SIC-classified industries in my sample as this is the first year when the OES used the same 7-digit occupation classification system as O*NET does. For NAICS-classified industries, I use the May 2003 issue.

industries in my sample in terms of its exposure to it. I then run a separate regression for each job characteristic, where I interact the treatment variable with a dummy indicating intensive industries. Table 3 gives results for all job characteristics that yielded a statistically significant coefficient on the interaction term at the 0.10 level or lower. 12 of the 21 job characteristics considered delivered a statistically significant coefficient on the interaction term (the remaining statistically insignificant coefficients are reported in table A3 in the Appendix). All of the significant coefficients came with a positive sign, and are quite large in magnitude relative to the average incidence rate figures (in square brackets). The strongest effect of the minimum wage relative to average incidence rate is found in industries where the workforce is the most exposed to weather, to very hot or low temperature, performs physical activities, and is exposed to inadequate lighting, vibration or contaminants.

Table 3: OLS Estimates of Effects of Minimum Wage on the Incidence Rates with Exposure Interaction Terms

Dependent Variable = Incidence Rate of Occupational Injuries and Illnesses

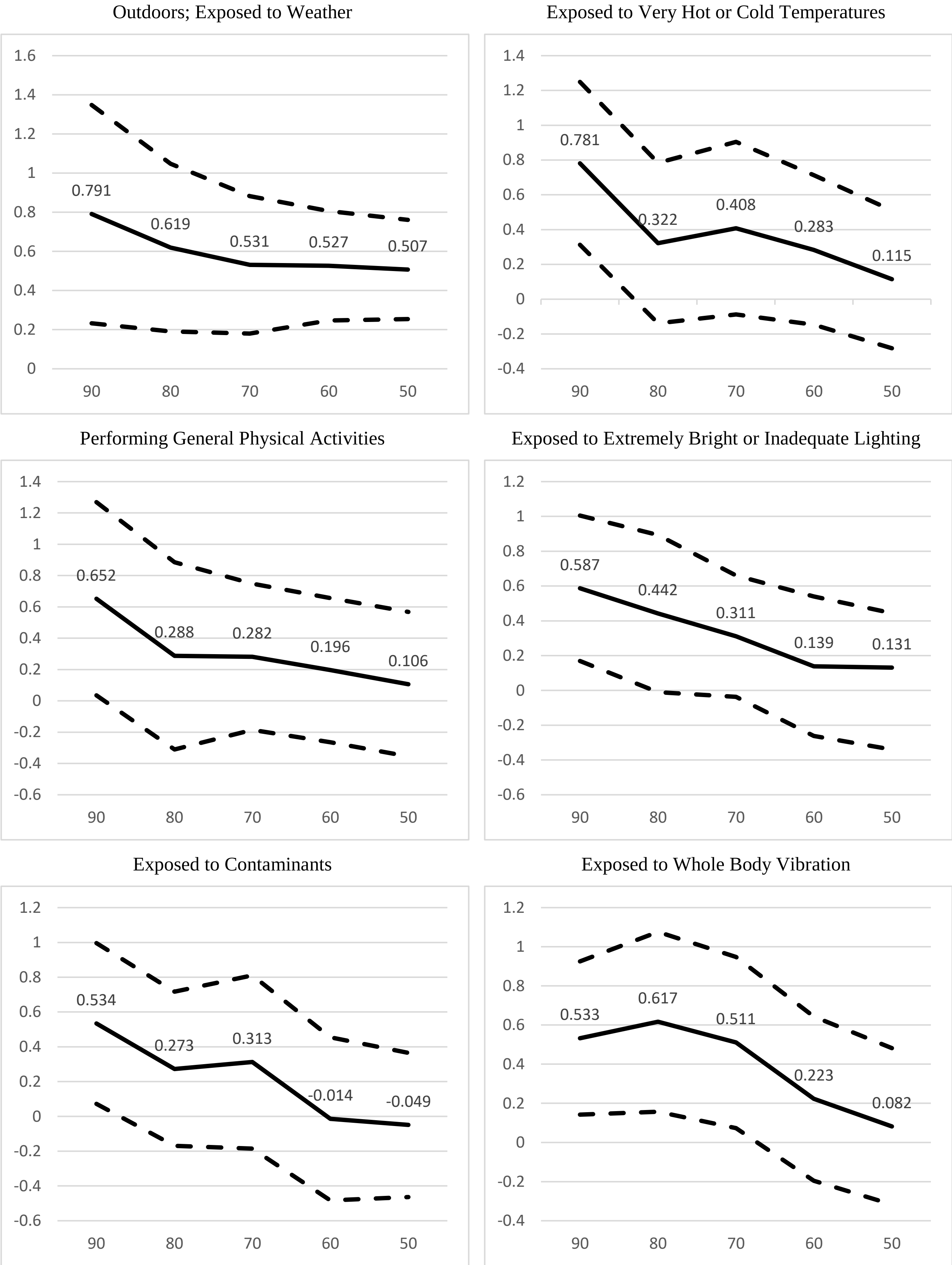
Exposure to…	MW	MW*Exposure Dummy	Exposure to…	MW	MW*Exposure Dummy
(1) Cramped Workspace	0.110 (0.077) [5.824]	0.492*** (0.175) [5.781]	(7) Bright or Inadequate Lighting	0.103 (0.081) [5.796]	0.587*** (0.207) [6.048]
(2) Contaminants	0.110 (0.070) [5.797]	0.534** (0.229) [6.624]	(8) Outdoors, Exposed to Weather	0.077 (0.078) [5.759]	0.791*** (0.276) [6.387]
(3) Disease or Infections	0.108 (0.071) [5.628]	0.529*** (0.187) [7.568]	(9) Performing General Physical Activities	0.094 (0.079) [5.664]	0.652** (0.306) [7.222]
(4) Hazardous Conditions	0.122 (0.075) [5.932]	0.356*** (0.119) [4.787]	(10) Spend Time Climbing	0.124 (0.076) [5.828]	0.366* (0.188) [5.741]
(5) Radiation	0.112 (0.070) [5.727]	0.475* (0.239) [6.719]	(11) Spend Time Keeping or Regaining Balance	0.116 (0.079) [5.795]	0.436** (0.206) [6.048]
(6) Whole Body Vibration	0.110 (0.076) [5.821]	0.533*** (0.194) [5.811]	(12) Very Hot or Cold Temperature	0.084 (0.076) [5.802]	0.781*** (0.232) [5.999]

N= 38588

Note: *Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level. The results of 12 separate regressions are reported, each including the Minimum Wage variable and its interaction with a dummy variable indicating industries that belong to the 90th percentile in terms of the exposure to respective job characteristics. All regressions include a full set of industry, year, and state fixed effects. Square brackets show the average incidence rate. Standard errors (in brackets) have been corrected for clustering at the state level.

While the 90th percentile is suggestive of a specific job characteristic being relevant, it may also be informative to see what happens if I decrease the intensity threshold. Figure 3 graphs the coefficients (on the Y axis) on the interaction terms from multiple regressions, gradually decreasing the cut-off percentile (on the X axis) that defines intensive industries from 90 to 50. I look specifically at the 6 job characteristics that appear to be the most relevant. As I decrease the cut-off, the coefficients on the interaction terms start losing both their magnitude and statistical significance, suggesting that as the subset of industries becomes relatively less intensive in its exposure to the respective health-threatening job characteristics, the effect of the minimum wage on its incidence rates softens and eventually disappears.

Figure 3: Coefficients on Exposure Interaction Terms



Note: Solid line shows the values of the coefficients on the interaction terms between the minimum wage and a dummy variable indicating that industry i is in the 90th, 80th, 70th, 60th, 50th percentile, respectively, in terms of its intensity of exposure to the job characteristics. Dashed lines show the 95% confidence interval.

Next, I attempt to identify what specific groups of industries are the most affected by the observed effect. Since my original sample includes industries coded using two different systems, I have to convert industries coded under the SIC classification into their NAICS counterparts in order to be able to consistently classify the whole sample into major industry groups. For each state and year in the SIC-coded part (i.e. from 1996-2002) of my sample, I compute the corresponding NAICS-coded industry incidence rates as weighted averages of the actual SIC-coded incidence rate figures, using employment ratios as weights.[11] I then run a separate regression for each of the major industry groups (2-digit NAICS) with its respective indicator variable interacted with my treatment variable.

The results of all 20 regressions are reported in Table 4. The positive effect of the minimum wage on incidence rates appears to be strongest in Utilities, and Transportation/Warehousing, where the coefficient on the interaction term is significant at the 0.05 and 0.01 level, respectively. The coefficient on Health Care and Social Assistance, while also positive, is only significant at the 0.1 level. Interestingly, the last significant coefficient in these regressions is that on the Manufacturing industry interaction, and it is negative. Thus, increases in the minimum wage seem to be associated with decreases in incidence rates in that industry. This may actually sound understandable in light of recent evidence provided by Lordan and Neumark (2018), who show that in the period from 1980-2015, increases in minimum wages led to job losses particularly among low-skilled workers in the Manufacturing sector. Thus, it could be the case that as these workers, who are generally more likely to get injured on their job, are substituted for higher-skilled workers or automation, the overall incidence rates in the industry actually go down.

[11] The NAICS-to-SIC employment shares can be found on the BLS website (https://www.bls.gov/ces/naicstosic2.htm).

Table 4: OLS Estimates of Effects of Minimum Wage on the Incidence Rates with Industry Group Interactions

Dependent Variable = Incidence Rate of Occupational Injuries and Illnesses

Industry group	MW	Industry group interaction term	Industry group	MW	Industry group interaction term
(1) Agriculture	0.133	0.962	(11) Real Estate Rental and Leasing	0.152*	0.109
	(0.083)	(0.666)		(0.078)	(0.217)
	[6.000]	[6.430]		[6.043]	[4.305]
(2) Mining	0.165*	-0.661	(12) Professional, Scientific, and Technical Services	0.155*	-0.175
	(0.082)	(0.836)		(0.078)	(0.249)
	[6.018]	[5.268]		[6.043]	[2.157]
(3) Utilities	0.142*	1.096**	(13) Management of Companies and Enterprises	0.155*	-0.177
	(0.076)	(0.433)		(0.078)	(0.181)
	[6.015]	[5.148]		[6.002]	[6.632]
(4) Construction	0.147*	0.148	(14) Administrative and Support and Waste Management	0.146*	0.312
	(0.082)	(0.317)		(0.077)	(0.238)
	[5.980]	[6.542]		[6.030]	[5.088]
(5) Manufacturing	0.373***	-0.883***	(15) Educational Services	0.155*	-0.105
	(0.101)	(0.251)		(0.078)	(0.312)
	[5.580]	[7.273]		[6.023]	[3.555]
(6) Wholesale Trade	0.161**	-0.159	(16) Health Care and Social Assistance	0.136*	0.316*
	(0.078)	(0.105)		(0.075)	(0.173)
	[6.032]	[5.347]		[5.963]	[6.717]
(7) Retail Trade	0.121	0.208	(17) Arts, Entertainment, and Recreation	0.150*	0.149
	(0.083)	(0.152)		(0.079)	(0.356)
	[6.195]	[4.984]		[5.993]	[6.448]
(8) Transportation and Warehousing	0.099	0.551***	(18) Accommodation and Food Services	0.144*	0.305
	(0.078)	(0.198)		(0.079)	(0.195)
	[5.842]	[7.510]		[6.022]	[5.481]
(9) Information	0.164**	-0.218	(19) Other Services	0.153*	0.024
	(0.076)	(0.281)		(0.082)	(0.206)
	[6.155]	[3.419]		[6.092]	[3.869]
(10) Finance and Insurance	0.154*	0.012	(20) Public Administration	0.106	0.669
	(0.080)	(0.315)		(0.074)	(0.452)
	[6.107]	[1.435]		[5.886]	[7.611]

N= 47462

Note: *Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level. The results of 20 separate regressions are reported, each including the Minimum Wage variable and its interaction with a dummy variable indicating industries that belong to respective industry groups. All regressions include a full set of industry, year, and state fixed effects. Square brackets show the average incidence rate. Standard errors (in brackets) have been corrected for clustering at the state level.

Conclusion

This paper provides empirical evidence on the worsening of one specific non-wage job attribute – the frequency of occupational injuries and illnesses – as a result of minimum wage increases. To the best of my knowledge, this study is the first to quantify the effects of minimum wage policies on workplace safety. Using US industry-level employer side data from 1996-2013, I obtain results indicating that increases in the legal minimum wage are accompanied by increases in the incidence rates of occupational injuries and illnesses. Specifically, my point estimates imply that if the binding nominal minimum wage in the US were to increase by about $2 on average across states, then this would lead to 0.154 extra injuries and illnesses per 100 full-time workers (i.e. about 200,000 extra injuries or illnesses annually in the whole US workforce) which corresponds to an increase in the average incidence rate in my sample of about 2.%.

I also show that the effect is more strongly manifested in industries that pay a relatively large share of their workforce near the legal minimum and are generally more risky. Moreover, I find that the effect is also stronger in industries whose workforce is relatively more frequently exposed to job aspects that are related to injuries and illnesses. I am also able to identify what specific job characteristics make industries more responsive to minimum wage increases in terms of its effects on workplace safety, such as the exposure to very hot or cold temperatures, weather, or inadequate lighting.

Finally, I find that industries that can expect the largest increases in their incidence rates as a result of minimum wage increases fall into the Utilities, Transportation and Warehousing, and Health Services and Social Assistance categories. Conversely, minimum wage hikes seem to cause a decrease in incidence rates in Manufacturing industries, which can potentially be explained by the previously documented substitution of a low-skilled labor force for higher-skilled workers or automation, making the remaining workforce less exposed to health threatening factors.

The main limitation of my study is that it inevitably needs to rely on the numbers of occupational injuries and illnesses reported by firms to the BLS. This may bring about an attenuation bias stemming from the measurement error caused by unreliable record-keeping. Generally speaking, these data sources are believed to underestimate the true incidence rates somewhat (Ruser, 2010) but no available study shows a direct relationship between the degree of firms' misreporting and the minimum wage. I cannot, however, rule out the possibility that reporting rates may decrease in response to minimum wage hikes, as employees may be motivated to conceal their injuries in order not to lose their jobs in the face of increased competition for minimum wage positions. Nonetheless, both of these potential limitations would imply that my estimates show the lower bound of the true effect. Also, further research on this topic would benefit from firm-level data sources as the aggregation into 3-digit NAICS industries prohibits more detailed examination.

The existence of an adverse effect of the minimum wage on job safety could be a useful piece of information for the evaluation of the pros and cons of such a policy. It can be interpreted either as another reason to replace the minimum wage with alternative policies helping the working poor that do not cause health damage (e.g. the Earned Income Tax Credit), or as evidence of the need to accompany minimum wage legislation with stricter job safety regulation that would mitigate the unintended health consequences. Alternatively, given that this study was to some extent able to identify industries that are the most affected by the policy, these could be targeted primarily for job safety inspections in time periods following minimum wage hikes.

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Appendix

Table A1: State-specific Minimum Wages in the US (current USD), 1996-2013

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Federal	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.85	6.55	7.25	7.25	7.25	7.25	7.25
AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AK	5.25	5.65	5.65	5.65	5.65	7.15	7.15	7.15	7.15	7.15	7.15	7.15	7.15	7.25	7.75	7.75	7.75	7.75
AZ	-	-	-	-	-	-	-	-	-	-	-	6.75	6.90	7.25	7.25	7.35	7.65	7.80
AR	4.25	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25
CA	4.75	5.15	5.75	5.75	6.25	6.25	6.75	6.75	6.75	6.75	6.75	7.50	8.00	8.00	8.00	8.00	8.00	8.00
CO	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	6.85	7.02	7.28	7.24	7.36	7.64	7.78
CT	4.77	5.18	5.18	5.65	6.15	6.40	6.70	6.90	7.10	7.10	7.40	7.65	7.65	8.00	8.25	8.25	8.25	8.25
DE	4.75	5.15	5.15	5.65	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.65	7.15	7.25	7.25	7.25	7.25	7.25
FL	-	-	-	-	-	-	-	-	-	-	6.40	6.67	6.79	7.21	7.25	7.25	7.67	7.79
GA	3.25	3.25	3.25	3.25	3.25	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15
HI	5.25	5.25	5.25	5.25	5.25	5.25	5.75	6.25	6.25	6.25	6.75	7.25	7.25	7.25	7.25	7.25	7.25	7.25
ID	4.25	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.85	6.55	7.25	7.25	7.25	7.25	7.25
IL	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.50	6.50	6.50	7.50	7.75	8.00	8.00	8.25	8.25	8.25
IN	3.35	3.35	4.25	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.85	6.55	7.25	7.25	7.25	7.25	7.25
IA	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	6.20	7.25	7.25	7.25	7.25	7.25	7.25
KS	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	7.25	7.25	7.25	7.25
KY	4.25	4.25	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.85	6.55	7.25	7.25	7.25	7.25	7.25
LA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ME	4.75	5.15	5.15	5.15	5.15	5.15	5.75	6.25	6.35	6.50	6.75	7.00	7.25	7.50	7.50	7.50	7.50	7.50
MD	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	6.15	6.55	7.25	7.25	7.25	7.25	7.25
MA	4.75	5.25	5.25	5.25	6.00	6.75	6.75	6.75	6.75	6.75	6.75	7.50	8.00	8.00	8.00	8.00	8.00	8.00
MI	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	6.95	7.15	7.40	7.40	7.40	7.40	7.40	7.40
MN	4.25	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15
MS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MO	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	6.50	6.65	7.05	7.25	7.25	7.25	7.35
MT	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	6.15	6.55	6.90	7.25	7.35	7.65	7.80
NE	4.25	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.85	6.55	7.25	7.25	7.25	7.25	7.25
NV	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	6.15	6.15	6.85	7.55	7.55	8.25	8.25	8.25
NH	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	6.50	6.55	7.25	7.25	7.25	7.25	7.25
NJ	5.05	5.05	5.05	5.15	5.15	5.15	5.15	5.15	5.15	6.15	7.15	7.15	7.15	7.25	7.25	7.25	7.25	7.25
NM	4.25	4.25	4.25	4.25	4.25	4.25	4.25	5.15	5.15	5.15	5.15	5.15	6.50	7.50	7.50	7.50	7.50	7.50
NY	4.25	4.25	4.25	4.25	5.15	5.15	5.15	5.15	5.15	6.00	6.75	7.15	7.15	7.25	7.25	7.25	7.25	7.25
NC	4.25	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	6.15	6.55	7.25	7.25	7.25	7.25	7.25
ND	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.85	6.55	7.25	7.25	7.25	7.25	7.25
OH	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	5.15	6.85	7.00	7.30	7.30	7.40	7.70	7.85
OK	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.85	6.55	7.25	7.25	7.25	7.25	7.25
OR	4.75	5.50	6.00	6.50	6.50	6.50	6.50	6.90	7.05	7.25	7.50	7.80	7.95	8.40	8.40	8.50	8.80	8.95
PA	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	6.75	7.15	7.25	7.25	7.25	7.25	7.25
RI	4.75	5.15	5.15	5.65	6.15	6.15	6.15	6.15	6.75	6.75	7.10	7.40	7.40	7.40	7.40	7.40	7.40	7.75
SC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SD	4.25	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.85	6.55	7.25	7.25	7.25	7.25	7.25
TN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TX	3.35	3.35	3.35	3.35	3.35	5.15	5.15	5.15	5.15	5.15	5.15	5.85	6.55	7.25	7.25	7.25	7.25	7.25
UT	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.85	6.55	7.25	7.25	7.25	7.25	7.25
VT	4.75	5.25	5.25	5.75	5.75	6.25	6.25	6.25	6.75	7.00	7.25	7.53	7.68	8.06	8.06	8.15	8.46	8.60
VA	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.85	6.55	6.55	7.25	7.25	7.25	7.25
WA	4.90	4.90	4.90	5.70	6.50	6.72	6.90	7.01	7.16	7.35	7.35	7.93	8.07	8.55	8.55	8.67	9.04	9.19
WV	4.25	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.85	6.55	7.25	7.25	7.25	7.25	7.25	7.25
WI	4.75	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.70	5.70	6.50	6.50	7.25	7.25	7.25	7.25	7.25
WY	1.60	1.60	1.60	1.60	1.60	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15

NOTES: A gray-shaded field indicates an increase in the binding level of minimum wage, i.e. either an increase in the state-specific minimum wage which exceeds the prevailing federal minimum wage, or an increase in the federal minimum wage that exceeds the prevailing state-specific minimum wage. Dash (-) denotes the absence of a state-specific minimum wage in a given state and year.

SOURCES: US Bureau of Labor Statistics, Monthly Labor Review, January issues; Department of Labor, Employee Administration.

Table A2: Job characteristics

Label	Description	5 Most Intensive Occupations
Cramped Workspace, Awkward Positions	How often does this job require working in cramped work spaces that requires getting into awkward positions?	- Mobile Heavy Equipment Mechanics, Except Engines - Roof Bolters, Mining - Insulation Workers, Mechanical - Mine Shuttle Car Operators - Control and Valve Installers and Repairers, Except Mechanical Door
Exposed to Contaminants	How often does this job require working exposed to contaminants (such as pollutants, gases, dust or odors)?	- Continuous Mining Machine Operators - Derrick Operators, Oil and Gas - Metal-Refining Furnace Operators and Tenders - Mine Cutting and Channeling Machine Operators - Mine Shuttle Car Operators
Exposed to Disease or Infections	How often does this job require exposure to disease/infections?	- Acute Care Nurses - Dental Hygienists - Family and General Practitioners - Internists, General - Critical Care Nurses
Exposed to Hazardous Conditions	How often does this job require exposure to hazardous conditions?	- Chemical Plant and System Operators - Elevator Installers and Repairers - Painters, Transportation Equipment - Petroleum Pump System Operators, Refinery Operators, and Gaugers - Explosives Workers, Ordnance Handling Experts, and Blasters
Exposed to Hazardous Equipment	How often does this job require exposure to hazardous equipment?	- Mine Cutting and Channeling Machine Operators - Manufactured Building and Mobile Home Installers - Sawing Machine Setters, Operators, and Tenders, Wood - Fallers - Roof Bolters, Mining
Exposed to High Places	How often does this job require exposure to high places?	- Elevator Installers and Repairers - Roofers - Structural Iron and Steel Workers - Wind Turbine Service Technicians - Derrick Operators, Oil and Gas
Exposed to Minor Burns, Cuts, Bites or Stings	How often does this job require exposure to minor burns, cuts, bites, or stings?	- Glass Blowers, Molders, Benders, and Finishers - Metal-Refining Furnace Operators and Tenders - Conveyor Operators and Tenders - Layout Workers, Metal and Plastic - Mobile Heavy Equipment Mechanics, Except Engines

Exposed to Radiation	How often does this job require exposure to radiation?	- Nuclear Medicine Technologists - Nuclear Medicine Physicians - Nuclear Monitoring Technicians - Dental Hygienists - Nuclear Equipment Operation Technicians
Exposed to Whole Body Vibration	How often does this job require exposure to whole body vibration (e.g., operate a jackhammer)?	- Locomotive Firers - Excavating and Loading Machine and Dragline Operators - Pipelayers - Loading Machine Operators, Underground Mining - Logging Equipment Operators
Extremely Bright or Inadequate Lighting	How often does this job require working in extremely bright or inadequate lighting conditions?	- Metal-Refining Furnace Operators and Tenders - Mates- Ship, Boat, and Barge - Mobile Heavy Equipment Mechanics, Except Engines - Refractory Materials Repairers, Except Brickmasons - Coin, Vending, and Amusement Machine Servicers and Repairers
Handling and Moving Objects	Using hands and arms in handling, installing, positioning, and moving materials, and manipulating things.	- Tire Builders - Stonemasons - Pipelayers - Brickmasons and Blockmasons - Manufactured Building and Mobile Home Installers
Indoors; not Environmentally Controlled	How often does this job require working indoors in non-controlled environmental conditions (e.g., warehouse without heat)?	- Refractory Materials Repairers, Except Brickmasons - Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders - Chemical Plant and System Operators - Mobile Heavy Equipment Mechanics, Except Engines - Woodworking Machine Setters, Operators, and Tenders, Except Sawing
Outdoors; Exposed to Weather	How often does this job require working outdoors, exposed to all weather conditions?	- Cement Masons and Concrete Finishers - Crossing Guards - Derrick Operators, Oil and Gas - Landscaping and Groundskeeping Workers - Meter Readers, Utilities
Outdoors; Under Cover	How often does this job require working outdoors, under cover (e.g., structure with roof but no walls)?	- Chemical Plant and System Operators - Biomass Plant Technicians - Animal Breeders - Aquacultural Managers - Construction and Building Inspectors
Performing General Physical Activities	Performing physical activities that require considerable use of your arms and legs and moving your whole body, such as climbing, lifting, balancing, walking, stooping, and handling of materials.	- Dancers - Tire Builders - Stonemasons - Manufactured Building and Mobile Home Installers - Choreographers
Sounds Noise Levels are Distracting or Uncomfortable	How often does this job require working exposed to sounds and noise levels that are distracting or uncomfortable?	- Automotive Specialty Technicians - Hoist and Winch Operators - Derrick Operators, Oil and Gas - Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders - Locomotive Firers

Spend Time Bending or Twisting the Body	How much does this job require bending or twisting your body?	- Maids and Housekeeping Cleaners - Manufactured Building and Mobile Home Installers - Brickmasons and Blockmasons - Refractory Materials Repairers, Except Brickmasons - Roof Bolters, Mining
Spend Time Climbing Ladders, Scaffolds or Poles	How much does this job require climbing ladders, scaffolds, or poles?	- Insulation Workers, Mechanical - Paperhangers - Pipe Fitters and Steamfitters - Helpers--Electricians - Painters, Construction and Maintenance
Spend Time Keeping or Regaining Balance	How much does this job require keeping or regaining your balance?	- Dancers - Choreographers - Fishers and Related Fishing Workers - Tree Trimmers and Pruners - Fallers
Spend Time Kneeling, Crouching, Stooping or Crawling	How much does this job require kneeling, crouching, stooping or crawling?	- Manufactured Building and Mobile Home Installers - Tile and Marble Setters - Carpet Installers - Floor Layers, Except Carpet, Wood, and Hard Tiles - Maids and Housekeeping Cleaners
Spend Time Making Repetitive Motions	How much does this job require making repetitive motions?	- Tire Builders - Shoe Machine Operators and Tenders - Brickmasons and Blockmasons - Dancers - Dental Hygienists
Spend Time Using Your Hands to Handle, Control or Feel Objects, Tools or Controls	How much does this job require using your hands to handle, control, or feel objects, tools or controls?	- Hairdressers, Hairstylists, and Cosmetologists - Mobile Heavy Equipment Mechanics, Except Engines - Refuse and Recyclable Material Collectors - Bicycle Repairers - Dental Hygienists
Very Hot or Cold Temperatures	How often does this job require working in very hot (above 90 F degrees) or very cold (below 32 F degrees) temperatures?	- Sailors and Marine Oilers - Metal-Refining Furnace Operators and Tenders - Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders - Landscaping and Groundskeeping Workers - Refractory Materials Repairers, Except Brickmasons

Table A3: OLS Estimates of Effects of Minimum Wage on the Incidence Rates with Exposure Interaction Terms (continued)

Dependent Variable = Incidence Rate of Occupational Injuries and Illnesses

Exposure to…	MW	MW*Exposure Dummy	Exposure to…	MW	MW*Exposure Dummy
(1) Hazardous Equipment	0.132*	0.300	(6) Outdoors, Under Cover	0.123	0.343
	(0.073)	(0.188)		(0.081)	(0.325)
	[5.782]	[6.202]		[5.731]	[6.629]
(2) High Places	0.139*	0.199	(7) Sound, Noise	0.136*	0.242
	(0.075)	(0.222)		(0.069)	(0.198)
	[5.788]	[6.105]		[5.790]	[6.093]
(3) Minor Burns, Cuts, Bites or Stings	0.186**	-0.322	(8) Bending or Twisting the Body	0.130*	0.301
	(0.080)	(0.283)		(0.077)	(0.295)
	[5.711]	[6.891]		[5.644]	[7.523]
(4) Handling and Moving Objects	0.174**	-0.147	(9) Kneeling, Crouching, Stooping or Crawling	0.126	0.346
	(0.076)	(0.333)		(0.079)	(0.254)
	[5.564]	[8.182]		[5.761]	[6.385]
(5) Indoors, not Environmentally Controlled	0.160**	-0.037			
	(0.079)	(0.341)			
	[5.560]	[8.271]			

N= 38588

Note: *Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level. The results of 9 separate regressions are reported, each including the Minimum Wage variable and its interaction with a dummy variable indicating industries that belong to the 90th percentile in terms of the exposure to respective job characteristics. All regressions include a full set of industry, year, and state fixed effects. Square brackets show the average incidence rate. Standard errors (in brackets) have been corrected for clustering at the state level.

Abstrakt

Empirické poznatky o dopadech minimální mzdy na zaměstnanost naznačují, že firmy mohou na nárůst nákladů na nízkokvalifikovanou pracovní sílu, způsobený růstem minimální mzdy, reagovat snížením investic do nemzdových atributů zaměstnání, díky čemuž nejsou nuceny propouštět. Tyto změny mohou zahrnovat i zhoršení bezpečnosti práce. Pro posouzení hypotézy, že růst minimální mzdy má za následek vyšší četnost pracovních úrazů a nemocí z povolání využívám data od zaměstnavatelů z USA a změny v minimálních mzdách na úrovni jednotlivých států za období 1996-2013. Mé výsledky naznačují, že státy, které zvýšily svou minimální mzdu, zaznamenaly nárůst četnosti pracovních úrazu a onemocnění. Tento efekt se zdá být silnější v odvětvích, které zaměstnávají velké množství nízkopříjmových pracovníků, a jejichž zaměstnanci jsou intenzivně vystavováni zdravotním rizikům.

Working Paper Series
ISSN 1211-3298
Registration No. (Ministry of Culture): E 19443

Individual researchers, as well as the on-line and printed versions of the CERGE-EI Working Papers (including their dissemination) were supported from institutional support RVO 67985998 from Economics Institute of the CAS, v. v. i.

Specific research support and/or other grants the researchers/publications benefited from are acknowledged at the beginning of the Paper.

Published by
Charles University, Center for Economic Research and Graduate Education (CERGE)
and
Economics Institute of the CAS, v. v. i. (EI)
CERGE-EI, Politických vězňů 7, 111 21 Prague 1, tel.: +420 224 005 153, Czech Republic.
Printed by CERGE-EI, Prague
Subscription: CERGE-EI homepage: http://www.cerge-ei.cz

Phone: + 420 224 005 153
Email: office@cerge-ei.cz
Web: http://www.cerge-ei.cz

Editor: Byeongju Jeong

The paper is available online at http://www.cerge-ei.cz/publications/working_papers/.

ISBN 978-80-7343-422-9 (Univerzita Karlova, Centrum pro ekonomický výzkum a doktorské studium)
ISBN 978-80-7344-458-7 (Národohospodářský ústav AV ČR, v. v. i.)