THE TEEN EMPLOYMENT CRISIS

The Effects of the 2007-2009 Federal Minimum Wage Increases on Teen Employment

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Employment Policies INSTITUTE

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Executive Summary

On May 24, 2007, Congress passed legislation to increase the federal minimum wage from $5.15 to $7.25. Speaker of the House Nancy Pelosi captured the general mood in Washington when she exclaimed that "millions of hardworking Americans will be getting a raise." The public was also supportive, with polls showing broad approval of Congress' efforts to raise the minimum wage.

This enthusiasm was not universal. Labor economists who had studied past wage hikes warned that higher wages were not a free lunch; there would be a price to pay. Decades of prior research established a basic economic truth: When forced to hire and train unskilled new employees at increased wages, employers search for ways to offset that cost. Sometimes, it translates to higher prices for customers; other times, it translates to fewer hours and fewer jobs for less-experienced employees.

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Three years after the passage of federal wage legislation, teen employment prospects are suffering tremendously. The unemployment rate for 16 to 19-year-olds remains above 25 percent; for those ages 16 to 17, the unemployment rate is close to 30 percent. While the recession has been a significant cause of teens' employment woes, some advocacy groups have claimed that it's the only cause – downplaying any employment loss caused by the more than 40 percent increase in the federal minimum wage that occurred over the same time period.

In this study, labor economists William Even (Miami University) and David Macpherson (Trinity University) quantify how much teen employment declined due to increases in the federal minimum wage. The authors use Census Bureau employment data collected between January 2005 and April 2010, and follow a well-established empirical technique first initiated by labor economists Richard Burkhauser (Cornell University), Kenneth Couch (University of Connecticut), and David Wittenburg (Urban Institute).

Using state-specific variations in minimum wage growth, and carefully controlling for the effects of the recession and other state economic differences, Even and Macpherson are able to isolate only the decline in teen employment that was caused by the federal wage hike.

For the 19 states affected by all three stages of the federal wage hike, there was a 6.9 percent decline in employment for teens aged 16 to 19. This translates to approximately 98,000 fewer employed teens. Broadening the analysis to include all 32 states impacted by any stage of the federal wage increase, the authors find approximately 114,400 fewer employed teens.

When Even and Macpherson look specifically at 16 to 19-year-olds with less than 12 years of education, the proportional employment loss grows larger. In states impacted by all three wage hikes, there was a 12.4 percent decrease in teen employment.

These estimates are conservative. University of California-Irvine labor economist David Neumark, writing in *The Wall Street Journal* in 2009, predicted minimum wage-related teen employment losses of a magnitude 300,000 or greater. Even and Macpherson measure contemporaneous job loss in this study, but note that employment losses could be considerably larger if employers reacted to the increased labor costs with longer-term reductions in hiring, due to an increased reliance on self-service or automation.

The authors' conclusions aren't shocking. Economic studies dating back to the 1940s have warned that raising the minimum wage will cause job loss for the least experienced workers, a finding that has only been strengthened by newer research. One recent book by Neumark and the Federal Reserve's William Wascher summarized the economic consensus on the minimum wage this way: "[T]he literature that has emerged since the early 1990s on the employment effects of the minimum wage points quite clearly (…) to a reduction in employment opportunities for low-skilled and directly affected workers."

Even and Macpherson's research demonstrates that these employment reductions are very real, and felt most by teens with the least amount of education and experience. Future debates on a higher minimum wage should take careful account of the policy's unintended consequences.

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The Effects of the 2007-2009 Federal Minimum Wage Increases on Teen Employment

Introduction

In 2007, amendments to the Fair Labor Standards Act (FLSA) increased the federal minimum wage from $5.15 to $5.85 effective July 2007; from $5.85 to $6.55 effective July 2008; and from $6.55 to $7.25 effective July 2009. This study examines the effect of this 41 percent increase in the federal minimum wage on the employment of a group particularly vulnerable to minimum wage increases—the nearly 17 million Americans aged 16-19 (henceforth "teens").

Teens' vulnerability stems from their relative lack of workforce experience. When the price of entry-level labor rises, economic theory suggests that employers' demand will fall in response. In the workplace, this manifests itself when an employer—faced with higher labor costs—trims back staff hours, lays off marginally skilled staff members, or hires more-skilled employees to fill jobs that were traditionally entry level.

The increase in the federal minimum wage did not affect all states, because some states already mandated minimum wages above the federal requirement. Among the states whose minimum wage was increased by $2.10 as a result of the 2007-2009 minimum wage hikes, we estimate that teen employment dropped by 6.9 percent. For who that had not yet completed a high school degree, we estimate that the hikes reduced employment by 12.4 percent.

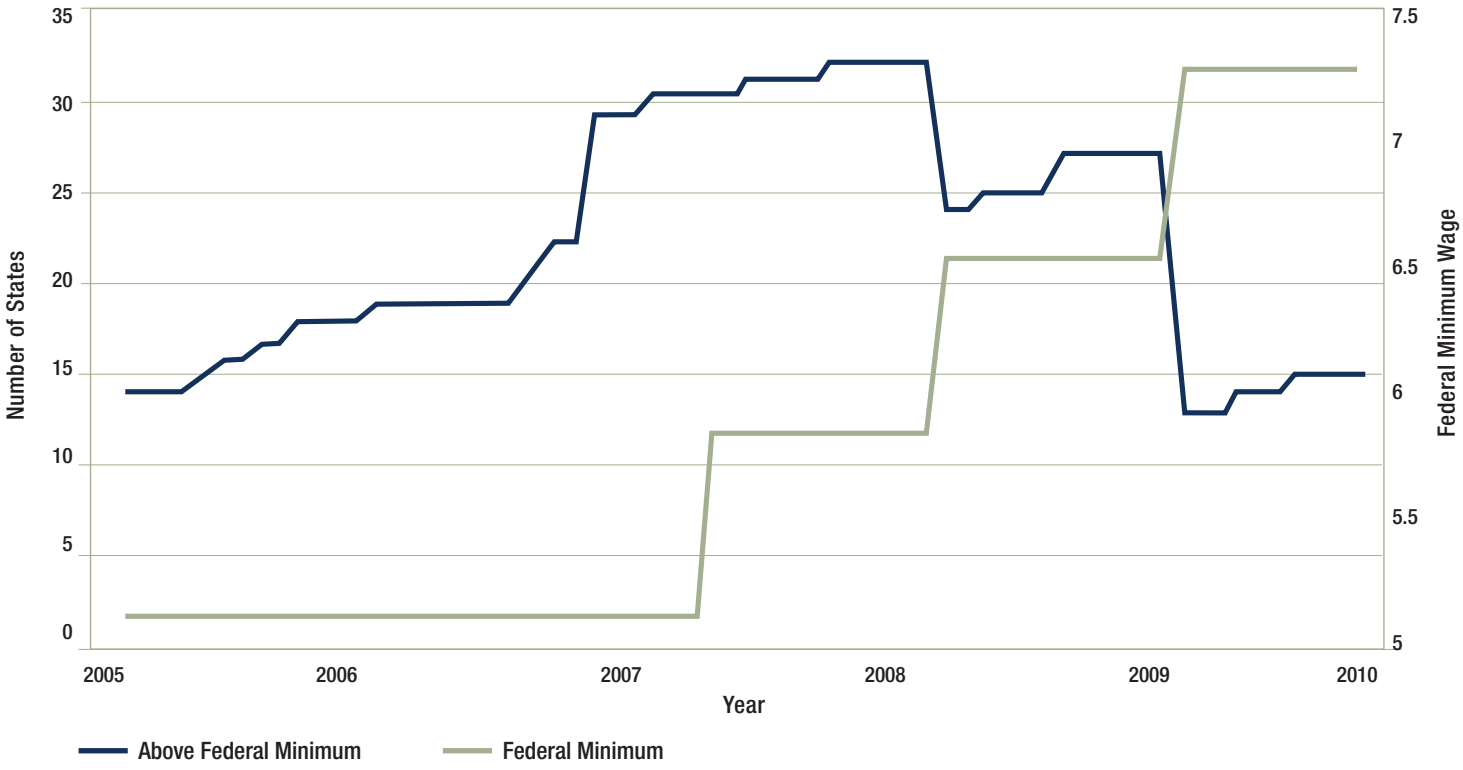
The Data and Econometric Approach

The data used to estimate the effects of the federal minimum wage hikes are drawn from the monthly Current Population Surveys collected between January 2005 and April 2010. Table 1 in the appendix provides summary statistics for the sample and the variables used in our analysis. The sample includes 121,986 teens in the 50 states plus the District of Columbia (henceforth, "the 51 states"). The employment rate for teens (defined as the number of teens employed divided by the number of teens in the population) dropped from 39.1 percent in 2005 to 31.5 percent in 2009. Over the same time period, the federal minimum wage was rising, but because some states had minimum wages that exceeded the federal level, the rate of growth in the effective minimum wage differed across the states.

To isolate the employment effect of a minimum wage hike from other factors, we will rely on a well-established empirical technique initiated by Burkhauser, Couch and Wittenburg (BCW 2000). Namely, we will make use of the fact that minimum wages differ across states and there is substantial variation across states in the timing of minimum wage hikes. Figure 1 illustrates the extent of the variation since the year 2000.

- In January 2005, 14 states had minimum wages in excess of the federal minimum wage of $5.15.
- By January 2008, 32 states had minimum wages above the federal minimum of $5.85.
- With the federal minimum wage hike to $7.25 in July 2009, only 13 states had minimum wages above the federal minimum. Subsequent state legislation led to 15 states with minimum wages above the federal level by April 2010.

Figure 1: Number of States Above Federal Minimum Wage



This illustrates that state-specific mandates have caused significant inter-state variation in the rate of growth in the minimum wage over the past decade. It is this variation in the growth of the minimum wage that we use to identify the employment effects of minimum wage hikes.

BCW (2000) use the following econometric model to estimate the effect of minimum wage hikes:

$$E_{it} = \alpha_0 + MW_{it}\beta + X_{it}\gamma + Y_{it}\theta + M_{it}\varphi + S_i\delta + \varepsilon_{it}$$

Where the subscripts i and t represent state and month, respectively; E is the teen employment rate; MW is the log of the effective minimum wage (i.e., the greater of the federal or state minimum wage); X is a vector of explanatory variables controlling for labor market conditions in the state; Y is a vector of year dummies; M is a vector of month dummies; S is a vector of state dummies, and ε_{it} is an error term. The effect of the minimum wage on employment is measured by β. The elasticity of employment with respect to wages is calculated as $\beta/\bar{E}$ where $\bar{E}$ is the average teen employment rate over the sample period. If the employment elasticity is 0.2, a 10 percent increase in the minimum wage causes a 2 percent decrease in the number of teens employed.

In addition to controlling for state, year, and month fixed effects in the empirical analysis, we control for each state's unemployment rate for prime-aged (25-54) males, the teen share of the state's population, and the natural log of the states' real average adult (18 and over) wage. These additional controls match those used by BCW 2000.

Estimates of Employment Elasticities

Table 2 in the appendix presents the results of several specifications of the regression model for the employment rate. Specifications (1)-(3) are all estimated with the ordinary least squares (OLS) model. T-statistics are calculated using robust standard errors corrected for clustering of residuals by state. Specification (1) is identical to equation (1) except that the year dummies are excluded. Specification (2) adds the year dummies as controls. Similar to the results in BCW (2000), we find that the addition of year dummies significantly reduces the estimated effect of minimum wage hikes and the

employment elasticity drops from -0.53 to -0.19. By including year dummies, the regression is forced to rely primarily on inter-state differences in employment growth relative to inter-state differences in the minimum wage to identify the effect of changes in the minimum wage.[1] Without the year dummies included, the estimated effect of minimum wage hikes would be overstated if factors that we have not controlled for are causing teen employment to trend downward while the minimum wage is gradually increasing over time.

The third specification adds the 12-month lag of the log minimum wage as a control to allow for the possibility that the changes in the minimum wage have a lagged effect on employment. The implied elasticity from this specification is -0.32.[2] Specifications (4) and (5) are identical to (2) and (3) except that they allow for state-specific heteroskedasticity in the error terms.[3] These corrections have only a modest impact on the estimated elasticities.

Overall, among the specifications that include controls for year effects, the elasticity estimates range from -0.19 to -0.32 with the estimates at the high end of the range generated by the specifications that control for lagged effects. The estimated effects are not sensitive to whether we control for state specific heteroskedasticity, though the precision of the estimates improves.

In Table 3 in the appendix, the same specifications are estimated using teens with less than 12 years of education. In this group, we expect that the minimum wage will have a greater effect because workers in this group are less likely to have the skills necessary to command wages in excess of the minimum and thus are likely to hold jobs that are more vulnerable to minimum wage hikes.

As with the broader sample, inclusion of year effects substantially reduces the estimated effects of minimum wages on employment (from -0.86 to -0.26). Also, allowing for state-specific heteroskedasticity has little effect on the estimated elasticities. Among the four specifications that include year effects, the range of estimates is between -0.26 and -0.39 with estimates at the higher end of the range generated by the models that allow for lagged effects of minimum wage hikes. However, we cannot reject the hypothesis that the coefficients on the lagged minimum wage are significantly different from zero in the restricted sample. As predicted, the estimated effects of the minimum wage hikes are magnified when the sample is restricted to teens with less than 12 years of education.

The Employment Effects of the Minimum Wage Hikes

Because many states had minimum wages that exceeded the federal minimum, the impact of the 2007-09 federal hikes varied across states. To examine the effect on teen employment in each state, we use the regression models from Specification (4) to estimate the change in teen employment for each state caused by the federal minimum wage hikes. This specification allows for state-specific heterogeneity in the error terms but does not allow for lagged effects of the minimum wage. As noted earlier, allowing for lagged effects increased the estimated employment effects, but there is mixed statistical evidence on whether lagged effects should be included for the two samples we consider.

To estimate the employment effects, we divide states into three categories based upon whether the federal minimum wage was binding between January 2007 and April 2010. The federal minimum wage is defined as binding in a state if and

[1] If we used annual data instead of monthly data, it would be impossible to estimate the employment effects of minimum wage increases without inter-state differences in the growth of the minimum wage with year effects included because the federal minimum wage would be perfectly collinear with the year dummies. With monthly data, the minimum wage is not perfectly collinear with the year dummies and "within-year" variation in employment growth would assist in identification of the employment effects of minimum wage changes, even with month dummies included.

[2] This is calculated as the sum of the coefficients on log (minimum wage) and its lag divided by the employment rate.

[3] BCW (2000) also allow for state-specific serial correlation. We considered that specification as well, but the hypothesis of no serial correlation cannot be rejected. The hypothesis of no state-specific heteroskedasticity is rejected at the .01 level, however.

only if it is greater than or equal to the state minimum wage dictated by the state's legislation. If the state has a minimum wage above the federal minimum, then the state minimum wage is binding (and the federal minimum is not). The three groups of states we consider and the assumed effects of the federal hikes on the state's minimum wage are as follows:

1. States where all three federal minimum wage hikes were binding. This includes the 19 states where the federal minimum was binding from January 2007 through April 2010 (Alabama, Georgia, Idaho, Indiana, Kansas, Kentucky, Louisiana, Missouri, Nebraska, North Dakota, Oklahoma, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, West Virginia, and Wyoming). For these states, we assume that the federal minimum wage hikes caused the effective minimum wage to rise by $2.10.

2. States where the 2009 hike was binding, but the 2007 hike was not. This includes the 13 states where the state minimum was binding in January 2007 but the federal minimum becomes binding before April 2010 (Arizona, Arkansas, Delaware, Florida, Maryland, Minnesota, Missouri, Montana, North Carolina, New Jersey, New York, Pennsylvania, and Wisconsin). For example, in New York, the state minimum wage was $7.15 in January 2007; beginning in July 2009, the federal minimum wage became binding when it increased to $7.25. Consequently, for New York we assume that the federal minimum wage hike caused a $0.10 increase in the minimum wage. In general, for this group, the assumed effect of the federal minimum wage hikes will lie greater than $0.00 but less than $2.10.

3. States where none of the federal minimum wage hikes were binding. This includes the 19 states where the state minimum was binding from January 2007 through April 2010 (Alaska, California, Colorado, Connecticut, the District of Columbia, Hawaii, Iowa, Illinois, Massachusetts, Maine, Michigan, New Hampshire, New Mexico, Nevada, Ohio, Oregon, Rhode Island, Vermont, and Washington). These states were not directly affected by the minimum wage hikes since the federal minimum wage was never binding. For these states, we assume that the federal minimum wage hikes had no effect on the state's minimum wage.

Employment Effects for All Teens Ages 16–19

Using the above assumptions about how each state's minimum wage was affected by the federal minimum wage hikes, we estimate the effect on teen employment in each state. The estimates are performed by generating predicted employment for two different levels of the minimum wage: the minimum wage in effect in April 2010 and the minimum wage that would be in effect had the federal hikes not occurred. We generate these predictions for the most recent year of data (May 2009 through April 2010). This allows us to get an estimated effect averaged across 12 months of the year.

Table 4 on page 10 presents the results for the sample of teens without any restrictions on educational attainment. For the 19 states where all three of the federal hikes were binding, we estimate that teen employment would be 6.9 percent higher if the minimum wage had remained at $5.15. These 19 states together had a teen population of 5.2 million and the employment losses for the group amount to approximately 98,000 jobs lost. For the 13 states where the federal hikes were only partially binding, there is considerable variation in the effect the hike had on their own minimum wages (ranging from as little as $0.04 in Florida to as much as $1.10 in Maryland, Minnesota, and North Carolina). Given the relatively modest effects of these hikes on the minimum in these states, it's not surprising that the employment effects directly tied to the federal minimum are rather small. We estimate, that for these 13 states that had a total teen population of 5.5 million, employment was reduced by 1.1 percent, and approximately 17,000 jobs were lost.

For the remaining 19 states (including the District of Columbia), the states had mandated minimum wages above the federal minimum wage, and thus the estimated effect of the federal hikes on employment is zero.[4]

For the U.S. as a whole, we estimate that the federal minimum wage hikes reduced teen employment by 2.5 percent translating to approximately 114,400 fewer employed teens.

[4] This should not be interpreted to suggest that a state with a minimum wage set above the federal minimum wage experienced no adverse impact on employment. The study did not address that question.

Employment Effects for Teens with Less Than 12 Years of Education

Table 5 on page12 provides a summary of the same analysis of employment effects for teens with less than 12 years of education. As with our earlier analysis, we use the regression specification that allows for state-specific heteroskedasticity but does not include lagged effects (see Specification (4) of Table 3 in the Appendix).

Among the 19 states where all three federal minimum wage hikes were binding, there are approximately 3.4 million teens with less than 12 years of education, and an average of 19.7 percent were employed over the May 2009-April 2010 period. We estimate that the $2.10 federal minimum wage hike reduced the number of these teens employed by 81,749 or 12.4 percent. In the 13 states where the hikes were only partially binding, the number of teens employed dropped by 13,298 (2.0 percent).

Table 4. Estimated Effect of 2007-2009 Federal Minimum Wage Hikes on Teen (16-19) Employment

Effect of Federal Minimum Wage Hikes						
State	Teen population	Teen employment	Teen employment rate[a]	Change in state's effective minimum wage[b]	% change in teen employment	Change in teen employment[c]
States Where Federal Minimum Wage Hikes Increased State Minimum Wage by $2.10						
Alabama	253,348	66,114	26.1%	$2.10	7.2%	4,790
Georgia	528,478	108,819	20.6%	$2.10	9.2%	9,992
Idaho	83,268	30,113	36.2%	$2.10	5.2%	1,574
Indiana	405,734	97,584	24.1%	$2.10	7.9%	7,671
Kansas	156,436	66,769	42.7%	$2.10	4.4%	2,958
Kentucky	212,547	71,296	33.5%	$2.10	5.6%	4,019
Louisiana	237,089	60,935	25.7%	$2.10	7.4%	4,483
Mississippi	174,613	30,915	17.7%	$2.10	10.7%	3,301
Nebraska	103,798	48,774	47.0%	$2.10	4.0%	1,963
North Dakota	32,508	13,852	42.6%	$2.10	4.4%	615
Oklahoma	201,584	66,340	32.9%	$2.10	5.7%	3,811
South Carolina	249,200	52,766	21.2%	$2.10	8.9%	4,712
South Dakota	44,787	22,027	49.2%	$2.10	3.8%	847
Tennessee	336,638	77,504	23.0%	$2.10	8.2%	6,365
Texas	1,422,740	389,722	27.4%	$2.10	6.9%	26,900
Utah	161,348	59,465	36.9%	$2.10	5.1%	3,051
Virginia	456,046	120,338	26.4%	$2.10	7.2%	8,623
West Virginia	87,943	22,903	26.0%	$2.10	7.3%	1,663
Wyoming	29,611	12,847	43.4%	$2.10	4.4%	560
Subtotal	5,177,715	1,419,082	27.4%	$2.10	6.9%	97,896

Table 4. (Continued)

States Where Federal Minimum Wage Hikes Increased State Minimum Wage by Less Than $2.10						
Arizona	342,702	73,922	21.6%	$0.35	1.3%	937
Arkansas	149,366	38,757	25.9%	$1.00	3.2%	1,226
Delaware	50,260	14,756	29.4%	$0.10	0.3%	39
Florida	912,789	215,723	23.6%	$0.04	0.1%	279
Maryland	297,543	87,790	29.5%	$1.10	3.1%	2,707
Minnesota	250,041	108,324	43.3%	$1.10	2.1%	2,275
Missouri	322,627	109,887	34.1%	$0.20	0.5%	499
Montana	46,573	11,968	25.7%	$0.35	1.1%	127
New Jersey	493,641	125,647	25.5%	$0.10	0.3%	379
New York	1,081,814	228,545	21.1%	$0.10	0.4%	831
North Carolina	527,045	133,236	25.3%	$1.10	3.6%	4,794
Pennsylvania	709,016	230,666	32.5%	$0.10	0.2%	544
Wisconsin	312,883	132,995	42.5%	$0.75	1.4%	1,889
Subtotal	5,496,300	1,512,217	27.5%	$0.37	1.1%	16,526
States Where Federal Minimum Wage Hikes Did Not Affect State Minimum Wage						
Alaska	40,572	14,976	36.9%	$0.00	0.0%	0
California	2,197,577	457,970	20.8%	$0.00	0.0%	0
Colorado	244,238	68,340	28.0%	$0.00	0.0%	0
Connecticut	201,109	62,835	31.2%	$0.00	0.0%	0
District of Columbia	24,842	2,889	11.6%	$0.00	0.0%	0
Hawaii	64,809	15,361	23.7%	$0.00	0.0%	0
Illinois	765,096	196,901	25.7%	$0.00	0.0%	0
Iowa	175,999	83,690	47.6%	$0.00	0.0%	0
Maine	68,957	24,849	36.0%	$0.00	0.0%	0
Massachusetts	391,445	113,608	29.0%	$0.00	0.0%	0
Michigan	595,149	177,602	29.8%	$0.00	0.0%	0
New Hampshire	70,671	25,754	36.4%	$0.00	0.0%	0
New Mexico	111,732	28,423	25.4%	$0.00	0.0%	0
Nevada	130,074	30,208	23.2%	$0.00	0.0%	0
Ohio	653,232	217,776	33.3%	$0.00	0.0%	0
Oregon	178,568	50,038	28.0%	$0.00	0.0%	0
Rhode Island	63,725	21,732	34.1%	$0.00	0.0%	0
Vermont	34,931	14,721	42.1%	$0.00	0.0%	0
Washington	317,412	92,601	29.2%	$0.00	0.0%	0
Subtotal	6,330,138	1,700,272	26.9%	$0.00	0.0%	0
United States	17,004,153	4,631,571	27.2%	$0.76	2.5%	114,422

Notes

a Employment Rate = Teen employment/teen population.
b The assumed effects of the federal minimum wage hikes on the state's minimum wage depends on whether the state had a minimum wage that exceeded the federal minimum. For states that did not have a minimum wage exceeding the federal minimum wage any time between January 2007 and April 2010, the assumed effect of the federal minimum wage hike is $2.10. For states whose minimum exceeded the federal minimum from January 2007 through April 2010, the assumed effect is zero. For those states whose minimum was at or below the federal minimum starting some time after January 2007 through April 2010, the assumed effect of the federal hike is somewhere between $0 and $2.10 depending on how much of the increase can be attributed to the federal minimum wage hikes.
c Estimated effects of federal minimum wage hikes on employment are based on Specification (4) from Table 2.

Table 5. Estimated Effect of 2007-2009 Federal Minimum Wage Hikes on Teen (16-19) Employment for Those With Less Than 12 years of Education

Effect of Federal Minimum Wage Hikes						
State	Teen population	Teen employment	Teen employment rate[a]	Change in state's effective minimum wage[b]	Change in teen employment[c]	% change in teen employment
States Where Federal Minimum Wage Hikes Increased State Minimum Wage by $2.10						
Alabama	164,244	31,641	19.3%	$2.10	12.6%	4,002
Georgia	363,690	50,747	14.0%	$2.10	17.5%	8,861
Idaho	55,696	16,316	29.3%	$2.10	8.3%	1,357
Indiana	278,600	59,000	21.2%	$2.10	11.5%	6,788
Kansas	103,052	37,457	36.3%	$2.10	6.7%	2,511
Kentucky	144,610	32,921	22.8%	$2.10	10.7%	3,523
Louisiana	155,555	32,517	20.9%	$2.10	11.7%	3,790
Mississippi	118,967	14,803	12.4%	$2.10	19.6%	2,899
North Dakota	19,950	6,757	33.9%	$2.10	7.2%	486
Nebraska	68,305	27,540	40.3%	$2.10	6.0%	1,664
Oklahoma	138,485	35,385	25.6%	$2.10	9.5%	3,374
South Carolina	168,930	26,561	15.7%	$2.10	15.5%	4,116
South Dakota	30,181	12,992	43.0%	$2.10	5.7%	735
Tennessee	220,172	34,338	15.6%	$2.10	15.6%	5,364
Texas	877,771	151,672	17.3%	$2.10	14.1%	21,387
Utah	96,002	26,597	27.7%	$2.10	8.8%	2,339
Virginia	274,491	45,763	16.7%	$2.10	14.6%	6,688
West Virginia	56,052	10,168	18.1%	$2.10	13.4%	1,366
Wyoming	20,453	7,810	38.2%	$2.10	6.4%	498
Subtotal	3,355,207	660,987	19.7%	$2.10	12.4%	81,749
States Where Federal Minimum Wage Hikes Increased State Minimum Wage by Less Than $2.10						
Arizona	209,627	32,807	15.7%	$0.35	2.3%	739
Arkansas	90,516	12,851	14.2%	$1.00	7.4%	957
Delaware	33,598	8,364	24.9%	$0.10	0.4%	33
Florida	554,066	78,176	14.1%	$0.04	0.3%	218
Maryland	166,367	31,260	18.8%	$1.10	6.2%	1,950
Minnesota	165,640	59,066	35.7%	$1.10	3.3%	1,942
Missouri	227,709	65,140	28.6%	$0.20	0.7%	454
Montana	31,721	7,319	23.1%	$0.35	1.5%	112
New Jersey	284,413	51,771	18.2%	$0.10	0.5%	281
New York	616,402	82,969	13.5%	$0.10	0.7%	610
North Carolina	344,063	56,171	16.3%	$1.10	7.2%	4,033
Pennsylvania	442,059	119,780	27.1%	$0.10	0.4%	437
Wisconsin	196,754	67,523	34.3%	$0.75	2.3%	1,531

Subtotal	3,362,934	673,197	20.0%	$0.38	2.0%	13,298
States Where Federal Minimum Wage Hikes Did Not Affect State Minimum Wage						
Alaska	27,709	7,590	27.4%	$0.00	0.0%	0
California	1,243,274	111,958	9.0%	$0.00	0.0%	0
Colorado	152,941	28,219	18.5%	$0.00	0.0%	0
Connecticut	110,799	22,782	20.6%	$0.00	0.0%	0
District of Columbia	16,235	721	4.4%	$0.00	0.0%	0
Hawaii	33,671	3,224	9.6%	$0.00	0.0%	0
Illinois	465,099	97,209	20.9%	$0.00	0.0%	0
Iowa	112,473	45,006	40.0%	$0.00	0.0%	0
Maine	42,732	10,802	25.3%	$0.00	0.0%	0
Massachusetts	238,346	59,971	25.2%	$0.00	0.0%	0
Michigan	368,619	72,667	19.7%	$0.00	0.0%	0
New Hampshire	43,504	13,733	31.6%	$0.00	0.0%	0
New Mexico	73,729	14,125	19.2%	$0.00	0.0%	0
Nevada	89,318	16,005	17.9%	$0.00	0.0%	0
Ohio	437,629	119,348	27.3%	$0.00	0.0%	0
Oregon	116,097	20,734	17.9%	$0.00	0.0%	0
Rhode Island	37,932	9,409	24.8%	$0.00	0.0%	0
Vermont	23,299	7,968	34.2%	$0.00	0.0%	0
Washington	205,362	46,628	22.7%	$0.00	0.0%	0
Subtotal	3,838,767	708,098	18.4%	$0.00	0.0%	0
United States	10,556,908	2,042,282	19.3%	$0.79	4.7%	95,048

Summary

This study found that the federal minimum wage hikes that drove the minimum wage from $5.15 to $7.25 between July 2007 and July 2009 led to significant employment losses for teens. In the 19 states where the effective minimum wage was increased by $2.10, we estimate that teen employment dropped by 6.9 percent, and approximately 98,000 jobs were lost. For the teen population with less than 12 years of education completed, teen employment dropped by 12.4 percent, and approximately 82,000 jobs were lost. These estimates are fairly conservative in the sense that they do not account for lagged effects of minimum wage hikes. If the lagged effects are accounted for, the estimates would be substantially greater.

Notes

a Employment rate = teen employment/teen population
b The assumed effects of the federal minimum wage hikes on the state's minimum wage depends on whether the state had a minimum wage that exceeded the federal minimum. For states that did not have a minimum wage exceeding the federal minimum wage any time between January 2007 and April 2010, the assumed effect of the federal minimum wage hike is $2.10. For states whose minimum exceeded the federal minimum from January 2007 through April 2010, the assumed effect is zero. For those states whose minimum was at or below the federal minimum starting some time after January 2007 through April 2010, the assumed effect of the federal hike is somewhere between $0 and $2.10, depending on how much of the increase can be attributed to the federal minimum wage hikes.
c Estimated effects of federal minimum wage hikes on employment are based on Specification (4) from Table 3.

References

Burkhauser, Richard V.; Couch, Kenneth A.; and Wittenburg, David C. "A Reassessment of the New Economics of the Minimum Wage Literature with Monthly Data from the Current Population Survey." Journal of Labor Economics 18 (October 2000): 653-680.

Appendix

Table 1. Sample Means

Variable[a]	Sample Period		
	January 2005-April 2010	2005	2009
Employment Rate (% of population employed)			
All teenagers[b]	36.4%	39.1%	31.5%
Teenagers with less than 12 Years education	28.9%	31.6%	23.8%
Log state minimum (natural log of the greater of the state or federal minimum)	1.85	1.72	1.97
State unemployment rate (state's unemployment rate for prime-aged males)[c]	4.87%	3.65%	8.33%
State teen share (share of state's population aged 16-19)	5.51%	5.51%	5.45%
Log of real adult wage (age 18 and older in December 2009 dollars)	2.78	2.77	2.80
Number of Teens in Sample			
All teenagers	121,986	23,029	22,739
Teenagers with less than 12 years of education	78,116	15,009	14,199
Number of states	51	51	51
Number of state-month Observations	3,264	3,264	3,264

Notes

a Weighted means of all variables using underlying state populations in each CPS survey.
b Teenagers are defined as 16-19 year olds.
c Prime aged is defined as 25-54 years old.

Appendix

Table 2. Effects of Minimum Wage on the Ratio of Teenage (ages 16-19) Employment to Teenage Population: January 2005-December 2009					
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Log state minimum	-0.175	-0.0631	-0.0364	-0.0553	-0.0283
	(-10.1)	(-2.06)	(-1.10)	(-2.06)	(-0.98)
Log state minimum lagged one year			-0.0685		-0.0769
			(-2.01)		(-2.62)
State unemployment rate	-0.491	-0.286	-0.279	-0.285	-0.275
	(-8.07)	(-3.94)	(-3.83)	(-4.26)	(-4.10)
Share of teenagers	-0.0179	-0.0179	-0.0128	-0.0262	-0.0152
	(-0.10)	(-0.10)	(-0.075)	(-0.17)	(-0.097)
Log adult wage	-0.144	-0.123	-0.125	-0.116	-0.118
	(-4.17)	(-3.58)	(-3.62)	(-3.70)	(-3.77)
Observations	3264	3264	3264	3264	3264
State dummies	Yes	Yes	Yes	Yes	Yes
Month dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	No	Yes	Yes	Yes	Yes
R2	0.50	0.50	0.50	--	--
Estimated elasticity	-0.526	-0.190	-0.316	-0.167	-0.317
P-values for hypothesis tests					
Coefficients on minimum wage and lag (min. wage)=0	—	—	0.02	—	0.004
Error terms are homoskedastic across states	—	—	—	0.000	0.000
Error terms are autocorrelated within each state	—	—	—	0.43	0.45

Notes

Columns (1)-(3) are estimated using OLS. Columns (4) and (5) are estimated using GLS correcting for state-specific heteroskedasticity. T-statistics are in parentheses. For the OLS models, robust standard errors corrected for clustering by state are used for calculation of t-statistics.

Appendix

Table 3. Effects of Minimum Wage on the Ratio of Teenage (Ages 16-19) Employment to Teenage Population Among Those with Less than 12 Years of Education: January 2005-April 2010					
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Log state minimum	-0.217	-0.0661	-0.0527	-0.0712	-0.0567
	(-11.1)	(-1.95)	(-1.39)	(-2.36)	(-1.75)
Log state minimum lagged one year			-0.0343		-0.0413
			(-1.05)		(-1.24)
State unemployment rate	-0.374	-0.120	-0.117	-0.0852	-0.0796
	(-5.35)	(-1.46)	(-1.41)	(-1.13)	(-1.06)
Share of teenagers	-0.0584	-0.0561	-0.0535	-0.0991	-0.0926
	(-0.29)	(-0.28)	(-0.27)	(-0.56)	(-0.52)
Log adult wage	0.0199	0.0459	0.0451	0.0390	0.0380
	(0.51)	(1.19)	(1.16)	(1.11)	(1.08)
Observations	3264	3264	3264	3264	3264
State dummies	Yes	Yes	Yes	Yes	Yes
Month dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	No	Yes	Yes	Yes	Yes
R^2	0.46	0.47	0.47	--	--
Estimated elasticity	-0.857	-0.261	-0.344	-0.281	-0.387
P-values for hypothesis tests					
Coefficients on minimum wage and lag (min wage)=0	—	—	0.06	—	0.03
Error terms are homoskedastic across states	—	—	—	0.000	0.000
Error terms are autocorrelated within each state	—	—	—	0.98	0.95

Notes

Columns (1)-(3) are estimated using OLS. Columns (4) and (5) are estimated using GLS correcting for state-specific heteroskedasticity. T-statistics are in parentheses. The OLS standard errors used for calculation of t-statistics are corrected for clustering by state.

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