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EMPLOYMENT EFFECTS OF THE 2009 MINIMUM WAGE INCREASE: EVIDENCE FROM STATE COMPARISONS OF AT-RISK WORKERS

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Employment Effects of the 2009 Minimum Wage Increase: Evidence from State Comparisons of At-Risk Workers

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Abstract: In July, 2009, the U.S. Federal minimum wage was increased from $6.55 to $7.25. Individuals in some states were unaffected by this increase, since the state minimum wage already exceeded $7.25. We use this variation, as well as variation in the actual amount of the increase, to make comparisons of the employment of "at-risk" workers across states with their peers and within states with workers arguably unaffected by the increase. Our data come from the 2009 CPS, four and five months before and after the increase. We find evidence that the employment of some at-risk demographic groups declined as a result of the minimum wage increase, but the impacts are not statistically significant. We also find that the employment changes were not responsive to the actual amount of the increase.

Key Words: Minimum Wage

JEL Codes: J08, J21, J38

I. INTRODUCTION

The federal minimum wage was constant for nearly a decade following the 1997 increase to $5.15 per hour. During that time period, its real value declined by more than a quarter and the proportion of hourly workers working at the minimum wage fell by two-thirds to just 2.3% in 2007 (BLS, 2010). The statutory minimum was then increased by more than 40% in three stages in 2007, 2008, and 2009. The last increase, which was effective July 24, 2009, boosted the minimum from $6.55 to $7.25. As is obvious, the timing of this increase, which was determined legislatively in early 2007, was potentially problematic, since it occurred in the middle of the recession. [1]

While the employment effects of minimum wage legislation are straightforward in simple models of the labor market[2], the research literature has been less settled. The controversial analyses of the New Jersey-Pennsylvania state minimum wage difference (Card and Krueger, 1993) reported a positive employment effect of an increase, a finding that was cited by President Clinton in support of legislation to increase the minimum wage level in 1996 and 1997. Subsequent research by Neumark and Wascher (1999) and by Card and Krueger (1999) substantially weakened the evidence for a positive effect. But other anomalous findings appear in industry and state-based studies of Card (1992) and Katz and Krueger (1992). In separate lines of research, Deere, Murphy, and Welch (1995) and Hoffman and Trace (2009)

[1] Between January and December 2009, the unemployment rate increased from 7.7% to 10.0%.
[2] A frequently-cited 1979 survey of professional and business economists found that 90% "generally agreed "or "agreed with provisions" that "a minimum wage increases unemployment among young and unskilled workers" (Kearl et al, 1979). This survey precedes the less-settled empirical literature of the past two decades.

both found evidence that minimum wage increases were associated with a decline in the relative employment of demographic groups (young, less educated, etc) more likely to be affected by a change in the minimum wage. Deere, Murphy, and Welch apply this approach to the 1990-1991 increase with national data, while Hoffman and Trace focused on the impact of the 1996 and 1997 federal increase on New Jersey and Pennsylvania.[3]

In this paper, we adapt the approach of Deere, Murphy, and Welch and Hoffman and Trace to examine the impact of the 2009 increase in the minimum wage. We take advantage of the fact that some states already had a minimum wage that exceeded $7.25 per hour as of early 2009 and had no further increase in 2009. As a result, the 2009 minimum wage increase affected workers in some states, but not others. As we show, the two groups of states are quite similar in their "pre-treatment" characteristics. Thus, a comparison of employment changes across the states provides a simple way to identify the likely impact of this minimum wage increase. To analyze the impact of the increase in the minimum wage, we examine a series of "difference-in-difference" style comparisons: cross-state comparisons for workers likely to be potentially affected by the increase in the minimum wage; within-state comparisons for workers likely to be differently affected by a change in the minimum wage; and a difference-in-difference-in-difference comparison that looks at impacts both within and across the states.

We find weak evidence of negative effects of the minimum wage increase for some at-risk groups. For example, employment of teens in states with an increase fell by more than teens in the other states and also fell by more than individuals in treatment group states who

[3] Deere, Murphy, and Welch make casual comparisons between differential exposure and the subsequent changes in employment for different groups. Hoffman and Trace use a more explicit difference-in-difference approach.

were essentially immune to the minimum wage increase. But the difference is in no instances close to statistical significance. Employment of workers with less than a high school degree is essentially unaffected; none of our estimates are substantively large. Moreover, when we compare employment impacts to the actual monetary change in the minimum wage, taking advantage of the fact that some states had increases smaller than the statutory $0.70 increase because of pre-existing minimum wage laws, we find no evidence at all of a systematic negative relationship. We conclude that the July, 2009 increase in the minimum wage did not have a negative effect on the employment of at-risk workers.

The plan of this paper is as follows. The next section briefly reviews the empirical literature on the new economics of the minimum wage. Our data and methods are presented in Section III. Results are presented in Section IV.

II. EMPLOYMENT EFFECTS OF THE MINIMUM WAGE

The lengthy and extensive economic literature on the employment effects of the minimum wage includes aggregate time-series studies (Brown, Gilroy, and Kohen, 1983), state-level analyses (Card, 1992), industry-level analyses (Katz and Krueger, 1992), studies of particular at-risk groups (Deere, Murphy, and Welch, 1995; Hoffman and Trace, 2009), and the well-known NJ-PA fast-food industry comparison analyzed of Card and Krueger (1994, 2000), Neumark and Wascher (2000), and Michl (2000). As most observers of this literature appreciate, the simple textbook prediction –that a downward-sloping demand curve for labor implies a negative impact of a minimum wage on the employment of workers whose equilibrium wage is less than the new minimum– has sometimes been difficult to confirm in

practice. Among the prominent difficulties in empirical work are controlling for other simultaneous labor market and demographic influences, since minimum wage increases inevitably occur over time as the economy is changing. Contrary findings are more common in industry-focused studies than in those that examine the effects on specific demographic groups.

A very full discussion of these many approaches and their findings is in Neumark and Wascher (2009). They conclude that traditional economic theory is right far more often than it is wrong when it comes to the employment effects of the minimum wage. They cite 102 studies, of which "nearly two-thirds give a relatively consistent (although by no means always statistically significant) indication of negative employment effects… while only eight give a relatively consistent indication of positive employment effects" (p. 121). They further note that 28 of the 33 studies they regard as most credible and most studies focusing on least-skilled groups find negative impacts.

The most recent increases in the minimum wage have drawn the attention of Mulligan (2010a, b).[4] In the first paper, he argues that the minimum wage impact is visible in the decline in part-time employment during the second half of 2009. Specifically, he argues that the time-series relationship between the loss of full-time jobs and the number of part-time jobs shifts more or less simultaneously with the 2009 increase. Part-time employment stops increasing and actually falls following the increase through the rest of the 2009, rather than increasing at what he identifies as the prevailing rate of one new part-time job for every five full-time job lost.

[4] Both contributions are posts to *The New York Times* Economix blog, rather than full-length academic papers.

In the second paper, he again focuses on part-time employment, but now uses a state-based comparison similar to, though not identical to, the categorization we use below (see footnote 7 for details). Here he examines changes in the ratio of part-time to full-time employment for states that did and did not have a minimum wage increase after July 1, 2009. He finds that this ratio increases in both groups of states, but that the increase is greater in states with no further minimum wage increase in four of the five months following the increase. The difference does not appear to be large and no indication of statistical significance is presented. He concludes that the evidence is "consistent with the hypothesis that the federal increase caused part-time job losses in the affected states, but not in the others."

III. DATA AND METHODS

Our analysis examines the employment effects of the 2009 increase in the minimum wage in all 50 states and the District of Columbia. We compare employment rates in February and March 2009 with those in November and December 2009 as a function of the change in the minimum wage over this time period. Prior to the July 24, 2009 increase, 33 states had a minimum wage less than $7.25 and thus were directly affected by the increase.[5] DC and Illinois already had, as of 2008, a minimum wage above the mandated 2009 level, but further increased their minimum at about the same time as the federal increase. The remaining 16 states had a minimum wage above $7.25 as of early 2009 and had no further increase and thus were unaffected by the increase in the Federal minimum.[6] We treat the 35 states (including DC) with an increase in the minimum wage between February and December, 2009 as the

[5] For more details, including a listing of states, see Appendix Table 1.

[6] Eight of these states increased their minimum wage effective January 1, 2009. As a result, they had no increase in the time frame analyzed. Many of the state increases reflect laws that index the minimum to the CPI.

treatment group and the other 16 states as a control group.[7] We then compare employment rates before and after the increase to examine the impact of the minimum wage increase on employment for selected groups more likely to be affected.

We use a difference-in-difference approach to examine the employment impact of the Federal minimum wage increase. We use three types of comparisons involving the two groups and two time periods: (1) a cross-state comparison, $DID_C = (E_{2T}^j - E_{1T}^j) - (E_{2C}^j - E_{1C}^j)$, where E^j is the employment rate of some group j whose employment is likely to be affected by the minimum wage increase, 1 and 2 identify the time periods, and T and C identify the treatment group and control group states; (2) a within-state comparison, $DID_W = (E_{2T}^j - E_{1T}^j) - (E_{2T}^k - E_{1T}^k)$, where k is some other group whose employment is likely to be unaffected by the minimum wage increase; and (3) a difference-in-difference-in-difference comparison, $DIDID = [(E_{2T}^j - E_{1T}^j) - (E_{2T}^k - E_{1T}^k) - [(E_{2C}^j - E_{1C}^j)] - [(E_{2C}^k - E_{1C}^k)]$. The cross-state estimate measures whether the employment of at-risk workers (e.g., teenagers or less educated workers) in the treatment and control states was differently affected. The within-state comparison examines whether the employment of workers with different risk exposure to the minimum wage was differently affected within the treatment group states. The DIDID comparison examines whether differences by exposure within state differ across the treatment and control states. This measure is particularly useful as a method to check for bias in the other two measures.

[7] This is a slightly different classification of states than is reported by EPI (2010), which indicates that 19 states were unaffected by the July 24, 2009 increase. Our coding focuses on changes in the effective minimum wage between Feb. and Nov., 2009. Reclassified states include DC, IL, and KY, all of whom increased their minimum wage July 1. For analytical purposes, it doesn't matter whether the increase reflects a change in federal minimum wage or the state minimum wage.

The two DID estimates have a natural interpretation in the context of a regression as the estimated coefficient on the interaction of time period two and a treatment status dummy variable. Let β_{jC} be the treatment effect for some demographic group estimated across states and let β_{jW} be the corresponding treatment effect estimated within a state for the same group relative to some other unaffected group k. If the two control groups are valid, then β_{jC} should be very similar to β_{jW} and both should be unbiased estimates of the true effect. If, however, a variable is omitted that is correlated with treatment status and affects the outcome, standard omitted variable bias is present. For example, the within-state treatment effect will be biased if some variable Z is omitted that differentially affects employment of group j relative to group k in the treatment states in period 2;[8] the cross-state estimator will be biased if some omitted factor affects employment of group j differently in the two groups of states in period two.

One way to assess the extent of this bias is to estimate a "pseudo" within-state treatment effect identical to DID_W, but estimated for j and k workers in the control states where neither group is treated by a minimum wage increase.[9] The true minimum wage treatment effect here is zero, so evidence of a non-zero effect is a measure of the omitted variable bias. If the group j v k bias due to omitted Z is identical in T and C, the DIDID corrects for this because, as can be seen in the DIDID formula above, the second half of the equation is exactly the pseudo within-state treatment effect.

[8] In a regression, $E(\beta_w) = \beta_w + \beta_z \times \theta_{ZT}$, where θ_{ZT}, is the parameter on Z from the auxiliary regression of T, the treatment variable, on X and Z.

[9] It is also possible to estimate a pseudo between-state DID for group k, a group untreated in the treatment states.

Although the Federal minimum wage increased from $6.55 to $7.25 per hour, some states had a minimum wage in place in early 2009 between these two wage levels and, in addition, some states with a 2008 minimum above $7.25 increased their state minimum simultaneously with the Federal increase, but by less than $0.70. As a result, the magnitude of the treatment varies across the treatment states. The range of these atypical increases is from $0.10 in Alaska, Delaware, New Jersey, New York, and Pennsylvania to $0.60 in Wisconsin and Missouri.[10] Plausibly, the treatment effect ought to be some increasing function of the actual change in the effective minimum wage. Thus we also estimate a model of employment changes using the actual change in the minimum wage, ΔMW^j, as the key independent variable.

Our data come from the Current Population Survey for February, March, November, and December 2009, four and five months before and four and five month after the July 24, 2009 federal minimum wage increase. We use February and March as the period one sample and November and December as the period two sample. We restrict our sample to individuals between ages 16 and 59. The treatment group includes 211,674 individuals and the control group includes 116,714, roughly equally divided between pre- and post-minimum wage increase. We use primarily age and education to classify workers. As "at-risk" workers, we use workers age 16-19 and age 16-24 not in college, and workers with less than a high school education. We use prime-age workers (here, male, age 30-49 with some post-secondary education) and college-educated workers as groups unlikely to be affected by the minimum wage.

[10] New Mexico had an increase between 2008 and 2009 of $0.95, but this was implemented Jan, 1, 2009.

Sample means for the two period one (pre-treatment) samples are shown in Table 1. On most dimensions, the two groups look quite similar: age, educational attainment, and the proportion male are virtually identical. The control group states, which include Arizona, California, Colorado, and New Mexico, are more heavily Hispanic and have a lower proportion of blacks.[11] The employment rates for persons in the two groups of states are virtually identical.

IV. FINDINGS

The Cross-state estimates (DID_C) for the period before and after the 2009 federal minimum wage increase are presented in Table 2. The top two panels show the before and after employment rates for workers in the treatment states and in the control states. The bottom panel shows the difference-in-difference estimate. The t-statistics shown are for tests of no difference for the relevant employment rates. Males age 30-49 with more than a high school degree are treated as a barometer of general employment changes since they are likely to have a very low proportion of minimum wage workers. As seen in the far right column, the employment rate for this group fell by 1.2 percentage points in the treatment states and by .3 percentage points in the control group states. The DID estimator equals -0.009 with a t-statistic of 1.31. This suggests that the economic conditions worsened somewhat more in the treatment group states, but with substantial variation. In light of the results presented below, this result is interesting.

The various at-risk groups are shown in columns (2) - (6). The employment rate for

[11] Arizona, California, and New Mexico were, respectively, 30.1%, 36,6%, and 44.9% Hispanic and 4.2%, 6.7%, and 3.0% black in 2008, compared to the national average of 15.1% and 12.3%,

teens not in college fell by nearly 2.4 percentage points in the treatment states and by 0.9 percentage points in the control group states. The DID estimate is a meaningful -1.46 percentage points, approximately a six percent decline, but the different has a t-statistic of 1.27. Note, though, that the baseline employment of these teens is lower in the control group states than in the treatment states (difference equals 2.0 percentage points, t-statistic = 2.48). This is consistent with a possible minimum wage effect, since the minimum wage at baseline is higher in the control group states.

Employment changes for 16-24 year olds (again, excluding those with at least some college education) follow the same pattern. The employment rate fell by 2.3 percentage points in the treatment states and about one percentage points in the control group states. The resulting difference, -1.22 percentage points, is just a bit less than for the teens; the t-statistic is virtually identical and again not statistically significant at conventional levels. Just as for the teens, the baseline employment rate is higher in the treatment group states. The difference is statistically significant (t=2.96).

The next two groups, workers with less than a high school degree and non-teen workers with less than a high school degree, show much weaker effects of the minimum wage increase. The DID estimates are -0.41 percentage points and -0.37 percentage points, respectively, just about one-quarter of the DID estimate for the two groups of younger workers. The corresponding t-statistics are between .30 and .50, far below statistical significance.

The within-state estimates (DID_W) and the DIDID estimates are shown in Table 3. For both treatment and control groups, we compared the employment rate of teenagers not in

college with that of male workers age 30-49 with at least some college, assuming that this latter group is largely unaffected by the minimum wage increase. We also compare the employment rate changes of workers with completed education less than a high school degree with that for all workers, age 20-59, with at least some college education. For the teen v prime-age males comparison, we find that the employment rate for teens fell by 1.2 percentage points more than for the 30-49 year old males, a difference that is nearly statistically significant at the 10% 7% level (t=1.44). We find absolutely no evidence that employment rate changes differed between the less educated and more educated workers. Interestingly, both of the within-state DID effects are very similar in magnitude to the cross-state estimates in Table 2 (-0.015 v -0.012 for teens and -0.004 v 0.005 for the less educated workers).

The corresponding pseudo-treatment effects for the control states are shown in the second panel of the table. In the control states, the employment rates of teens fell by 0.9 percentage points and that for prime-age males fell by 0.3 percentage points. The DID estimate for these workers in the control states is half its magnitude in the other states and has a t-statistic of 0.55. By level of education, the employment rate actually fell more sharply for more educated workers (-0.084) than for less educated (-0.003). The resulting difference, though, has a t-statistic of 0.49, far from statistical significance. Finally, the DIDID estimates at the bottom of the table show a decline in employment for teens of .57 percentage points. For less educated workers, the decline is essentially zero. Neither of these estimates is statistically significant (t=0.43 and 0.01).

Thus, the pattern in these two kinds of comparisons is of generally negative effects of the minimum wage on employment, especially for teens and other younger workers without any college education. The size of the effects is not inconsiderable and the various estimates are generally consistent with one another. But none of the effects are estimated with sufficient precision. We find no meaningful effects at all for less educated workers.

As already noted, the treatment effect varied across states, because some had a state minimum wage between the old and new federal level and because some states implemented their own increases. Twenty five states had an increase of exactly $0.70, while 10 had increases between $0.10 and $0.60. Table 4 reports on regressions of the form $E_{js} = \beta_0 + \beta_1 Treat_{js} + \beta_2 Time2_j + \delta \Delta MW_{js} + \mu_{js}$, where Treat and Time2 are dummies for treatment status and time period and ΔMW_{js} is the actual minimum wage increase for worker j in state s between February and November, 2009. ΔMW_{js} equals zero in period one, in the control group states, and for the groups in Table 2 that are plausibly unaffected by the increase in the minimum wage. The table reports estimates for both cross-state and within-state estimates. The cross-state estimates are for the same at-risk demographic group in both sets of states, while the within-state estimates are for that demographic group and an "untreated," not at-risk demographic group in that state.[12] For teens, the comparison group is males, age30-49, with some post-secondary education. For workers without a high school degree, the comparison group is persons through age 59 with some post-secondary education.

[12] Because of this, the estimated treatment coefficient has an entirely different interpretation in the two regressions. In the cross-state model, it is the baseline difference in employment between, say, teens or less educated workers in the two groups of states. In the within-state model, the estimate is the difference between teens and prime-age males or less and more educated workers. The R^2 is much higher in these latter models, because of the large baseline difference that is explained by the treatment variable.

The results for the minimum wage change variable show no support at all for a negative employment impact. The estimated coefficient is actually positive and statistically significant for two of the cross-state comparisons (teens and persons with less than a high school degree) and the within-state model for all workers with less than a high school degree. Taken literally, these estimates suggest that the $0.75 increase in the minimum would increase employment of teens by 1.88 percentage points and the employment of less educated workers by 1.37 to 1.82 percentage points. Two of the other estimates are negative, but they both have t-statistics well under 1.0. The other coefficient in the model are sensible, with employment falling significantly by 1.5 to 2.5 percentage points for young workers and for less educated workers between early and late 2009. The large treatment group effects in the within-state estimates capture the substantial employment rate differences between older and younger workers and between more and less educated workers.

Because we were concerned about the five states with a $0.10 increase in the minimum wage and whether effects for them might distort an otherwise negative relationship, we re-estimated the model excluding those states. The estimated minimum wage coefficient is shown at the bottom of the table. These estimates do confirm that the three positive and statistically significant estimated employment effects of the change in the minimum wage were due to these states; the estimated effects are now effectively zero in each case and none are statistically significant.

Finally, we re-estimated the regression models corresponding to the estimates presented in Tables 2 and 3, adding control for the average unemployment rate in February and

March, 2009. The unemployment rate measure is always negative and statistically significant, but it barely affects the DID estimates. For example, the DID estimate for teens in Table 2 is -0.0146 (t=1.27); with control for the unemployment rate, the estimate is -0.0121 with a t-statistic of 1.05. The estimated coefficient also decreases in absolute value for workers age 16-24 (from -0.0126 to -0.0117) and for all the groups of workers with less than a high school degree.[13]

V. SUMMARY

In this paper, we took advantage of the existence of state minimum wage laws that in many cases established a legal minimum that exceeded the new mandated 2009 federal minimum wage of $7.25. We paid particular attention to this and also to the timing of increases in state minimums, most of which occurred January 1, 2009, to identify states with no increase in the effective minimum between early and late 2009 and those states with an increase. We examined employment before and after the increase for plausibly at-risk demographic groups, comparing them to demographic groups largely not at risk. One such comparison group were otherwise identical workers in control group states, while another was more skilled workers in the treated states. For these groups, we computed difference-in-difference estimates of the impact of the minimum wage increase. We also combined the two kinds of control groups to compute difference-in-difference-in-difference estimates. Finally, because the actual treatment effect varied across treated workers due to pre-existing minimum wage levels in some states, we used a regression counterpart to the DID models to examine the marginal impact of an increase in the minimum wage.

[13] These results are available on request.

While we do find evidence that the employment rate for teens and workers age 16-24 with no post-secondary schooling fell in states where the minimum wage rose relative to their peers in other states and relative to unaffected workers in their own states, these changes are not statistically significant at even the 10% level. The sample sizes are relatively large, so it is probably inappropriate to blame sample size issues for the lack of significance. Moreover, we find that the labor market declined more severely for prime-age more educated males in the states where the minimum wage increased than in the other states, something that could well have been reflected in more adverse results for the less-skilled younger workers. For several different groups of individuals without a high school degree, we find no evidence whatsoever for a negative employment effect. Here, the effects are very small in magnitude and t-statistics are in the 0.3-0.6 range. On the whole, both the cross-state and within-state comparisons yield similar results.

When we adjust for the actual change in the minimum wage using a regression equivalent to the DID models, we find three anomalous positive and statistically significant estimates and three very small and statistically insignificant estimates. Further analysis suggests that the positive effects are largely the result of disproportionate impacts in states with only a $0.10 increase in the minimum wage, a group that includes NY and NJ.

Studies of previous minimum wage increases, especially those focusing more broadly on at-risk demographic groups, have often found negative effects of the minimum wage. But we do not find any consistent evidence of such an effect of the 2009 increase. Often, one thinks of a booming economy as an ideal time in which the minimum wage can be increased without

particularly adverse effects. In an economy like that in 2009, one would almost certainly expect to find impacts. But the results are quite clear across a number of reasonable comparisons and they are robust. We simply do not find any evidence of a statistically significant negative impact of the 2009 minimum wage increase.

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Table 1. Sample Means, Individuals Age 15-59 by Pre-Treatment Status

	Control States	Treatment States
Age	37.6	37.4
Age 16-19	.094	.092
Age 16-24	.193	.192
Age 30-49	.449	.450
Black	.053	.130
Hispanic	.147	.116
Male	.488	.488
Not HS graduate	.173	.176
College graduate	.274	.257
Employment rate	.684	.686
Number of Observations	58,575	105,823

Source: Feb. and Mar. 2009 CPS

Table 2. Cross-State DID Estimates of Impact of 2009 Minimum Wage Increase on Employment Rate

	Age 16-19 (no college)	Age 16-24 (no college)	Educ<HS (All)	Educ<HS (Non-Teen)	Educ<HS (Non-teen Males)	Male, Age 30-49 (Educ > HS Grad)
Treatment States						
Before						
Mean	0.2762	0.3854	0.3668	0.5411	0.6344	0.8780
Std. Dev	0.0049	0.0043	0.0035	0.0052	0.0068	0.0029
N	8,286	12,726	18,600	9,355	4,945	12,960
After						
Mean	0.2525	0.3623	0.355	0.5341	0.6299	0.8659
Std. Dev	0.0049	0.0044	0.0035	0.0051	0.0068	0.0030
N	7,876	12,173	18,316	9,518	4,985	12,724
Difference	-0.0237	-0.0231	-0.0118	-0.0070	-0.0045	-0.0121
t-stat	3.42	3.78	2.37	0.96	0.46	2.90
Control States						
Before						
Mean	0.2560	0.3640	0.3588	0.5403	0.6335	0.8759
Std. Dev	0.0065	0.0058	0.0047	0.0069	0.0093	0.0038
N	4,484	6,800	10,237	5,145	2,663	7,501
After						
Mean	0.2469	0.3534	0.3511	0.5370	0.6190	0.8727
Std. Dev	0.0065	0.0059	0.0049	0.0070	0.0094	0.0039
N	4,381	6,630	9,685	5,039	2,656	7,518
Difference	-0.0091	-0.0106	-0.0077	-0.0033	-0.0145	-0.0032
t-stat	0.99	0.78	1.14	0.34	1.09	0.59
DID_C (T-C)	-0.0146	-0.0125	-0.0041	-0.0037	0.0100	-0.0089
t-stat	1.27	1.22	0.49	0.29	0.61	1.31

Source: CPS, Feb/Mar and Nov/Dec 2009

Table 3. Within-State DID and Cross-State DIDID Estimates of Impact of 2009 Minimum Wage Increase on Employment Rate

	Age 16-19 (no college)	Age 30-49, Male, Ed > HS Degree	DID_W	Educ < HS Grad (Non-Teen)	Educ > HS Degree	DID_W
Treatment States						
Before	0.2762	0.8780		0.5411	0.7863	
After	0.2525	0.8659		0.5341	0.7742	
Difference	-0.0237	-0.0121	-0.0116	-0.0070	-0.0121	0.0052
t-statistic	3.42	2.90	1.44	0.96	4.94	0.68
Control States						
Before	0.2560	0.8759		0.5403	0.7824	
After	0.2469	0.8727		0.5370	0.7740	
Difference	-0.0091	-0.0032	-0.0059	-0.0033	-0.0084	0.0051
t-statistic	0.99	0.59	0.55	0.34	2.60	0.49
DIDID (T-C)	Difference	t-statistic				
Age 16-19 v Age 30-	-0.0057	0.43				
Educ < HS v Ed > HS	0.0001	0.01				

Note: ** = statistically significant at 5% level; * = statistically significant at 10* level.
Source: CPS, Feb/Mar and Nov/Dec 2009

Table 4. Cross-State and Within-State Regression Estimates Using Change in Minimum Wage (Standard Errors in Parentheses)

Sample and Variable	Age 16-19 (not in college)		Educ<HS (All)		Educ<HS (Non-teen Males)	
ALL STATES	Cross-State	Within-State[a]	Cross-State	Within-State[b]	Cross-State	Within-State[b]
Constant	.2650** (.0059)	.8819** (.0032)	.3644** (.0043)	.7875** (.0017)	.6268** (0.0086)	.7859** (.0018)
Treatment State or Group	.0063 (.0070)	-.6115** (.0048)	-.0006 (.0051)	-.4244** (.0032)	-.0111 (.0101)	-.1467** (.0058)
Time 2	-.0273** (.0075)	-.0198** (.0044)	-.0192** (.0055)	-.0145** (.0025)	-.0012 (.0110)	-.0113** (.0025)
ΔMW	.0251* (.0146)	.0152 (.0109)	.0243** (.0106)	.0182** (.0076)	-.0181 (.0207)	-.0048 (.0132)
Number of Observations	25,099	41,846	56,758	150,901	15,249	123,995
Adjusted R^2	0.006	0.379	0.001	0.149	0.004	0.009
WITHOUT AK, DE, NJ, NY, PA						
ΔMW	-.0061 (.0168)	-.0034 (.0123)	.0039 (.0121)	.0030 (.0083)	-.0109 .0234)	.0020 (.0108)
Number of Observations	22,141	33,757	50,243	121,616	13,696	106,957

[a] Control group is male, age 30-49, education > high school degree, in treatment state.
[b] Control group is education > high school degree, in treatment state.

Note: ** = statistically significant at 5% level; * = statistically significant at 10* level.

Source: CPS, Feb/Mar and Nov/Dec 2009

Appendix Table 1. Effective State Minimum Wage Rates 2008 and 2009

	7/24/2008	1/1/2009	7/24/2009
Alabama	$6.55	$6.55	$7.25
Alaska	$7.15	$7.15	$7.25
Arizona	$6.90	$7.25	$7.25
Arkansas	$6.55	$6.55	$7.25
California	$8.00	$8.00	$8.00
Colorado	$7.02	$7.28	$7.28
Connecticut	$7.65	$8.00	$8.00
DC	$7.55	$7.55	$8.25
Delaware	$7.15	$7.15	$7.25
Florida	$6.79	$6.79	$7.25
Georgia	$6.55	$6.55	$7.25
Hawaii	$7.25	$7.25	$7.25
Idaho	$6.55	$6.55	$7.25
Illinois	$7.75	$7.75	$8.00
Indiana	$6.55	$6.55	$7.25
Iowa	$7.25	$7.25	$7.25
Kansas	$6.55	$6.55	$7.25
Kentucky	$6.55	$6.55	$7.25
Louisiana	$6.55	$6.55	$7.25
Maine	$7.25	$7.25	$7.25
Maryland	$6.55	$6.55	$7.25
Massachusetts	$8.00	$8.00	$8.00
Michigan	$7.40	$7.40	$7.40
Minnesota	$6.55	$6.55	$7.25
Mississippi	$6.55	$6.55	$7.25
Missouri	$6.65	$6.65	$7.25
Montana	$6.55	$6.55	$7.25
Nebraska	$6.55	$6.55	$7.25
Nevada	$6.85	$6.85	$7.55
New Hampshire	$7.25	$7.25	$7.25
New Jersey	$7.15	$7.15	$7.25
New Mexico	$6.55	$7.50	$7.50
New York	$7.15	$7.15	$7.25
North Carolina	$6.55	$6.55	$7.25
North Dakota	$6.55	$6.55	$7.25
Ohio	$7.00	$7.30	$7.30
Oklahoma	$6.55	$6.55	$7.25
Oregon	$7.95	$8.40	$8.40

Pennsylvania	$7.15	$7.15	$7.25
Rhode Island	$7.40	$7.40	$7.40
South Carolina	$6.55	$6.55	$7.25
South Dakota	$6.55	$6.55	$7.25
Tennessee	$6.55	$6.55	$7.25
Texas	$6.55	$6.55	$7.25
Utah	$6.55	$6.55	$7.25
Vermont	$7.68	$8.06	$8.06
Virginia	$6.55	$6.55	$7.25
Washington	$8.07	$8.55	$8.55
West Virginia	$6.55	$6.55	$7.25
Wisconsin	$6.65	$6.65	$7.25
Wyoming	$6.55	$6.55	$7.25

Source: Labor Law Center.com, http://www.laborlawcenter.com/t-State-Minimum-Wage-Rates.aspx and state web sites.