Minimum Wages, Sickness Absenteeism, and non-Sickness Absenteeism

by

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Abstract

Absenteeism is a nonwage component of compensation valued by workers and costly for employers to provide. Higher minimum wages may cause employers to try to reduce worker absenteeism to reduce costs, but, from a labor supply perspective, higher minimum wages exert a substitution effect against absenteeism and an income effect towards it. This paper presents new evidence on the relationship between absenteeism and minimum wages using the limited panel aspect of data from the 1979-2007 Merged Outgoing Rotation Groups of the Current Population Survey. We estimate that higher minimum wages reduce overall absenteeism among young men and women, but not other demographic groups. We find that higher minimum wages are generally associated with lower rates of non-sickness absenteeism but higher rates of sickness absenteeism. The shift towards sickness absenteeism is notable in light of recent work showing that employers punish biologically based absenteeism differently than other types of absenteeism.

JEL: J22, J32, J38

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I. Introduction

This paper examines the relationship between absenteeism and the minimum wage. Proponents of minimum wages have frequently claimed that higher minimum wages would reduce absenteeism, but the theoretical basis for this claim is not clear. From a labor supply perspective, higher minimum wages exert a substitution effect against absenteeism, and an income effect towards it. However, other forces may be at work. Literature dating at least back to Shapiro and Stiglitz (1984) suggests that shirking should be negatively related to the wage paid by the firm because higher wages increase the value of being employed relative to being unemployed. Of course, not all absenteeism can be equated with shirking. Vacations, for example, are often scheduled in advance with the consent of the employer. In addition, recent research by Ichino and Moretti (2009) suggests that employers can and do distinguish between and punish differentially absenteeism that has a biological basis and absenteeism that does not.

Aside from being of inherent interest, the relationship between minimum wages and absenteeism is important because there is still disagreement regarding the empirical effects of minimum wages on employment. One possible explanation for this lack of agreement is that employers reduce nonwage compensation sufficiently to offset the negative effect of higher minimum wages on employment. Absenteeism -- unscheduled or scheduled flexibility in work hours -- can be thought of as one such element of nonwage compensation.[2] Alternatively, some observers suggest that higher minimum wages reduce voluntary absenteeism, going so far as to suggest that such productivity enhancement might explain "why there is little evidence of job loss associated with minimum wage increases" (Employment Policy Institute 2008).[3]

Research on the relationship between minimum wages and absenteeism is sparse. One early empirical analysis, cited in Krueger (1994), is that of Reynolds and Gregory (1965), whose "careful field study of productivity responses to the minimum wage suggested that turnover and absenteeism declined in response to minimum wage hikes." However, relatively little empirical work on the question has been done since. A few studies have examined the effects of U.S. city living wage

[2] K. I. Simon and Kaestner (2004) found no evidence that higher minimum wages lead to reduced fringe benefits. Bucila (2008)) found some evidence of a negative but statistically imprecise effect of minimum wages on employer-provided health benefits.

[3] Non-academic examples include Haussamen (2009), Schmidt (2005), Shure (2002), Keystone Research Center (n.d.), and Bounds(2004).

legislation on absenteeism. Although valuable, these studies are based on limited samples of individuals.[4]

Most studies of absenteeism focus on sickness absenteeism in European countries with government-financed sickness absence schemes, and examine the relationship between sickness absence and economic incentives. Such studies include Barmby et. al. (1991), Barmby et. al. (1994), Barmby et. al. (2002), and Johnson and Palme (1996).[5] Most recently, Ercolani and Robson (2006), using British data, estimated that the introduction of the National Minimum Wage in the UK reduced sickness absence by about 0.2 percentage points, or by about 7.4%.

This paper estimates the effect of minimum wages on absenteeism using data from the NBER's monthly outgoing rotation extracts of the Current Population Survey (CPS-MORG). Although not without limitations, the CPS -MORG data have the advantages of being nationally representative of the US workforce and of allowing the researcher to observe each individual in the sample twice, one year apart. The ability to match observations one year apart allows us to control for fixed effects that might be correlated with the minimum wage. The CPS-MORG also provides sufficient sample size to estimate the effects of minimum wages even when we allow for flexible, state-specific trends in absenteeism, and even when we use data only for workers who earn the minimum wage. The large sample size means that we are not forced to rely on difference-in-difference estimation, which could impose strong and empirically false restrictions on the data, and thus lead to biased and inconsistent estimates of the effects of minimum wages on absenteeism.

The paper is organized as follows. Section II reviews the theoretical literature on absenteeism. Section III describes our data. Section IV discusses our empirical strategy and Section V presents the findings. Section VI concludes with a brief summary and some suggestions for future research.

II. Theory

Absenteeism is not inherently inefficient. One common reason for absenteeism is worker health (Taylor 1981), particularly among women (Vistnes 1997; Ichino and Moretti 2009). More generally, some degree of flexibility in work hours is desirable in a world of uniform work schedules where job match-specific capital is important and hiring and job mobility are costly (Allen 1983). One of the earliest approaches is Allen (1981a), who modeled absenteeism within a static labor supply framework in which workers contract with firms for a certain number of hours, *t(c)*, but on any given

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[4] Neumark and Adams (2000) characterized the evidence in Pollin and Luce (1998), the "best-known work on living wages," as "purely anecdotal" (p. 11).

[5] Financial incentives could cause workers to show up inefficiently (Press 2004).

day fluctuations in the value of non-market time could cause a worker to wish to supply $t(w) < t(c)$ hours of time, the marginal cost of absence being equal to the market wage, w. The theoretical effect of w on absenteeism is ambiguous due to the usual offsetting income and substitution effects.[6]

Allen (1981b) and Allen (1983) modeled absenteeism within Rosen's (1974) hedonic framework as arising from a demand for workplace flexibility. Workers select from among jobs offering the combination of wages and flexibility that maximizes their utility subject to a zero-profit constraint on firms. Workers who place a high value on flexible work hours sort into firms that can provide flexibility at low cost, and in equilibrium, earn lower wages. The hedonic equilibrium model predicts an unambiguously negative relationship between wages and absenteeism that arises from endogenous sorting of workers with higher demands for flexibility into firms that provide that flexibility at lower cost.

Agency Considerations

It is sometimes argued that employers might respond to higher minimum wages by adopting stricter attendance standards. Barmby et. al. (1994) interpret absenteeism as a form of shirking that might be deterred by paying a wage higher than the worker's next best labor market opportunity. Firms fire workers for excess absenteeism, who then incur the cost of unemployment, job search, and the loss of the quasi-rent. The higher the wage paid by the firm, the lower the probability of absenteeism. However, minimum wages may make it more difficult to enforce attendance standards because they will probably increase the wage premium necessary to deter absenteeism.

Higher minimum wages may also make it more difficult for firms to extract higher levels of worker effort via an upward-sloping age-earnings profile as suggested by Lazear (1981). In such an arrangement, the wage performs a bonding function firm. Firms pay workers less than their spot value of marginal product early on and more than their spot value of marginal product later on. Workers who are caught shirking are dismissed and thus forfeit both the principal and any interest on their bond. A binding minimum wage makes it more costly for the firm to provide the worker with a positively sloped age-earnings profile.[7]

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[6] Absence penalties may also be introduced. Brown and Sessions (1996) extend Allen's (1981a) labor supply approach to include sick pay.

[7] In his review of the literature, Katz (1986) notes that bonding arrangements are more likely to be found when search and turnover are more costly, and when workers are more highly skilled. It is precisely because of their low levels of and rates of skill accumulation that minimum wages would complicate the minimal bonding arrangements for minimum wage earners.

Lazear's (1981) model assumes that shirking is detected with certainty and that all shirkers are immediately dismissed. It is not inconceivable that firms might wish to use less extreme mechanisms for disciplining workers.[8] Minimum wages make it more difficult for employers to punish minimum wage workers who exhibit high ("excess") absenteeism in the form of lower wages or slower wage growth. If it is too costly for employers to fire or reduce their use of such workers, workers might choose the same or higher rates of absenteeism in response to an increase in the minimum wage.

Biologically Based Absenteeism

The discussion of agency issues raises the question of what constitutes shirking. Although the employer knows whether a worker is absent, they may not always know the reason for the absence. In a recent paper, Ichino and Moretti (2009) argue that employers are less likely to interpret women's absenteeism as evidence of shirking because women's absenteeism is more likely to result from health shocks than men's. Using data for personnel employed by a large Italian bank, they found that women's absenteeism, in contrast to men's, exhibits a 28-day cycle, which they interpret as being rooted in biology, namely the menstrual cycle (p. 184). They developed a model of statistical discrimination in which employers cannot directly observe individual productivity and so use absenteeism (among other factors) to predict productivity and set wages. Absenteeism is a function of health shocks and the propensity to shirk. Absenteeism is a noisier signal of shirking for women than for men because both men and women experience non-menstrual health shocks, but only women experience menstrual health shocks. Ichino and Moretti (2009) predicted and found that men's absenteeism is more severely punished than that of women.

If employers are less likely to punish absenteeism that has a biological basis as Ichino and Moretti (2009) contend, employers should be less inclined to punish workers who exhibit average levels of absenteeism due to illness than due to other reasons. Given a choice between being absent for non-illness and illness-related reasons, workers have an incentive to choose the latter, particularly when higher minimum wages increase the value of employment relative to non-employment.

Workers can and do lie about the reasons for their absenteeism.[9] For example, Thoursie (2004) found that the number of men who reported being sick increased in order to watch a certain sporting

[8] The firm could also punish the worker by reducing hours worked, but this, too, is costly.

[9] See, for example, http://www.wikihow.com/Call-in-Sick-when-You-Just-Need-a-Day-Off. Employers could require evidence from a doctor, or workers might exhibit symptoms (e.g., sneezing, coughing) that allow employers to distinguish true sickness absenteeism, at least in certain cases. We expect CPS respondents to answer truthfully when they are truly absent due to sickness. Whether those CPS respondents who are not

event on television. Higher minimum wages may increase the incentive for workers to falsely claim that a given incidence of absenteeism is due to illness in order to reduce the chance of being sanctioned.

The CPS-MORG data include information on workers' self-reported reason for worker absenteeism, and, in particular, whether the worker was absent due to vacation, illness, or due to other reasons. Unfortunately, our data do not permit us to determine whether absent workers are in fact ill. Nonetheless, we can examine whether minimum wages lead to a shift away from non-sickness towards sickness absenteeism, independently of the veracity of workers' claims.

To summarize, absenteeism in the form of both scheduled and unscheduled flexibility in hours worked is valuable to workers and costly for firms to provide. An increase in the minimum wage could induce firms to try to offset the increase in wage costs by reducing that flexibility. The simplest way for firms to do this would be to reduce the scheduled component of absenteeism, namely vacations. Depending on the relative strength of the opposing income and substitution effects of a higher minimum wage, workers might try to resist the reduction in absenteeism by taking more unscheduled absenteeism. Because employers can be expected to punish excess absenteeism, workers might try to reduce the likelihood of punishment by taking their unscheduled absenteeism for reasons of illness – either truthfully or otherwise.

III. Data

Our data are taken from the NBER's monthly outgoing rotation samples (rotations 4 and 8) of the Current Population Survey (CPS-MORG) for the years 1979 through 2007. We construct two samples. The first is called the *pooled sample*, and contains all employed individuals who meet certain criteria to be described shortly. The second dataset, called the *panel sample,* contains individuals employed in rotation 4 whom we are able to match to their rotation 8 data and are also employed in rotation 8.[10]

One important advantage of the CPS-MORG is the availability, for hourly workers, of a measure of hourly wages, which excludes tips, commissions, and overtime. For observations in which no hourly measure was available, we computed hourly wages by dividing the weekly wage by usual

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telling the truth characterize their absenteeism in the same way to the survey and their employer cannot be determined, but seems plausible.

[10]The matching is based on household and person identifiers, gender, age, race and ethnicity, gender, marital status, and veteran status. Individuals cannot be matched between July 1984 and September 1985, or between June 1994 and August 1995 due to changes in the sample. We deleted the small fraction of cases in which the match was not unique.

hours worked per week. Unfortunately, the weekly wage measure prior to 1994 explicitly included tips, commissions, and overtime while the one after 1994 excluded them. Year effects, included in every specification, should help control for this change in definition. However, we also check the robustness of our findings by estimating models of absenteeism separately for hourly and non-hourly workers.

The individual-level data were merged to data on minimum wages at the federal and state levels. The minimum wage is equal to the maximum of the federal minimum wage and, if applicable, the state minimum wage in effect at the time of the survey. Individuals are defined to earn the minimum wage if their reported or computed hourly wage is less than or equal to the minimum wage plus 10 cents. All dollar amounts are deflated by the CPI with a base of December 2006. Both the pooled and panel datasets exclude individuals who usually worked fewer than 10 hours per week or were self-employed. To reduce measurement error, we exclude individuals with real wages less than $1.80.

The bulk of our analysis is focused on estimating the effects of minimum wages on absenteeism using data only on minimum wage workers. However, we also experimented with estimates based on comparisons with a control group of workers who earned more than the minimum wage, defined to include those who earned $20 per hour or less -- roughly, the 75th percentile.

Figure 1 shows trends in real average minimum and hourly wages over the data period. The mean hourly wage falls slightly at the start of the data period, remains around $16 per hour until 1996, and then rises to about $18.50 at the end of the data period. The real minimum wage trends downward between 1979 and 1989, and has fluctuated around a mean of about $6 since then.

A. Defining Absenteeism

The CPS defines an individual to be absent when he or she reports being employed but not at work during the reference week. However, many spells of absenteeism last less than a week. Such shorter spells are arguably more likely to be sensitive to changes in the minimum wage than long-term spells. Fortunately, we can construct measures of partial-week absenteeism for full-time workers. In particular, the CPS asks those who usually work at least 35 hours per week whether, and if so, why they worked fewer than 35 hours during the survey week. For these individuals, we define absenteeism as a fraction of usual weekly hours for full-time workers, equal to zero for those who worked at least 35 hours during the survey week, equal to unity for those who were absent the entire week, and otherwise equal to the difference between usual and actual hours worked during the survey week divided by usual weekly hours. It is on this measure that we focus. For completeness, though, we present some results for full-week absenteeism.

As already noted, the CPS-MORG includes information on each worker's reason for absence. The distinction between vacation absenteeism and other types of absenteeism is potentially important because vacations are typically scheduled jointly by the firm and worker, and therefore do not reflect a demand for unscheduled leisure. If firms try to reduce worker absenteeism in response to higher minimum wages, the vacation component may be the most obvious place to look. However, workers may try to resist in the form of higher rates of unscheduled absenteeism. As discussed earlier, Ichino and Moretti (2009) suggest that employers treat absenteeism with a biological basis differently than other types of absenteeism. Workers who are absent therefore may be more likely to claim—either truthfully or otherwise – that they are absent due to illness. We therefore divide absenteeism into three components: vacation, sickness, and non-sickness.[11]

We exclude from the sample individuals whose absenteeism could be traced to demand factors, including those laid off, involved in a labor dispute, with a new job to begin within 30 days, with a job beginning or ending during the week, and those absent due to slack work, material shortages, and plant repair.[12]

B. Trends in Absenteeism

Figure 2 shows trends in absenteeism and its components between 1979 and 2007. As can be seen, absenteeism trends downward over our data period. A break in each series that coincides with changes in the CPS questionnaire is seen between 1993 and 1994. The year effects that we include in all models will help control for any otherwise unexplained trends in absenteeism.

Table 1 contains absenteeism rates by gender and demographic group for individuals who earned the minimum wage. Younger men and women include those under age 30, and older those 30 and above. Less-educated individuals have less than a high school degree and better-educated individuals have a high school degree or better.

[11] For the purposes of this paper, we interpret a worker's stated reason for absence as that one that they gave to their employer. Changes in the CPS questionnaire in 1994 added considerable detail to the list of reasons. Individuals who are absent due to vacation or illness are clearly identified both before and after the change, but changes in the coding of non-vacation absenteeism made comparisons of this component problematic. In order to use information over the entire 1979-2007 period, we concentrate on just the vacation, sickness and non-sickness components.

[12] We also exclude the relatively small number of individuals coded as being absent, yet having worked positive hours during the survey week.

Sickness absenteeism, seen in row 1, accounts for slightly less than 1/3 of overall absenteeism (row 6), and just over half of all non-vacation absenteeism (row 5). The mean rate of absenteeism due to sickness for men as a whole averaged 1.53% over the period. Sickness absenteeism was higher among older men than younger men (1.78% versus 1.31%), and higher among less-educated than better-educated men (1.75% versus 1.40%). Sickness absenteeism among women as a whole is about 2.23%, higher among older than younger women (2.57% versus 1.79%), and higher among less-educated women than better-educated women (2.87% versus 1.95%).

Vacation absenteeism, shown in row 4, averages 1.89% for men as a whole, and accounts for about 40% of absenteeism. Vacation absenteeism is higher for older men than younger men (2.11% versus 1.68%), and higher among better-educated men than less-educated men (2.09% versus 1.56%). Vacation absenteeism among women as a whole averages 2.96%; as is the case of men, it is higher among older than younger workers (3.53% versus 2.22%) and among better-educated than less-educated workers (3.30% versus 2.18%).

How plausible are our measures of absenteeism? One way to answer this question is to examine the seasonality of the various measures. **Figure 3** shows the seasonal pattern of absenteeism based on estimates of equation (1) for men and women as a whole. January is the omitted month. Our measure of vacation absenteeism display a strong July peak. (We do not know why the seasonality should be stronger for women than for men.) **Figure 4** shows the seasonal patterns of the non-vacation components of absenteeism. Our measure of sickness absenteeism has a July trough, more so for women than for men. The fact that these monthly patterns accord with our intuition increases our confidence in our measures.

Table 2 contains summary statistics for the pooled and panel data. There are about 300,000 pooled observations and about 55,000 panel observations.[13] The pooled data are weighted by earnings weight and, following Neumark et al. (2004), the panel data are weighted by earnings weight divided by the probability of a match.[14] The panel sample is slightly more white and female and slightly less college educated than the pooled sample.

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[13] The match rate was about 50 percent. Keep in mind that each individual from the panel sample contributes two observations to the pooled sample. By construction, the panel sample does not include rotation 8 observations from 1979 or rotation 4 observations from 2007. In addition, the panel sample conditions on being employed in both rotations 4 and 8.

[14] We estimated logit models for the probability of a match as a function of age and education indicators. The new weights do not account for selection on unobservables.

IV. Empirical Strategy

Our analysis focuses on estimating the effects of minimum wages on absenteeism using data only on minimum wage workers. Consider the linear probability model for absenteeism given by:

$$Absent_{it} = \beta_0^{MIN} X_{it} + \beta_1^{MIN} \ln(W_t^{MIN}) + \Upsilon^{MIN} MONTH + \Phi^{MIN} STATE \times YEAR + \varepsilon_{it} \quad (1)$$

where $Absent_{it}$ is the fraction of usual weekly hours absent and lies between 0 and 1, X_{it} is a vector of individual covariates, and W_t^{MIN} is the real value of the minimum wage deflated using the CPI to December 2006 dollars, all for individual *i* at time *t*. The covariates in X_{it} include dummy variables for education, age, and race as categorized in **Table 2**. The superscript "*MIN*" is retained to emphasize that the data refer only to minimum wage workers (more on this shortly).

A. Panel Estimation

Our primary goal in this paper is to identify the effects of minimum wages on individual behavior. Equation (1) may not identify those effects because ε_{it} may be correlated with the minimum wage. Assume that the error term can be written as:

$$\varepsilon_{it} = u_{it} + \nu_i$$

where ν_i is an individual-level fixed effect and u_{it} has the usual desirable properties. The direction of bias incurred by estimating equation (1) depends on the correlation between the fixed effect and the minimum wage. For example, if employers responded to higher minimum wages by letting less reliable workers go and replacing them with more reliable workers, then $corr(\ln W_t^{MIN}, \nu_i) < 0$, which would generate a negative correlation between minimum wages and absenteeism. Alternatively, if higher minimum wages attracted less reliable workers into the labor force and employers did not find it profitable to weed them out, a positive relationship between absenteeism and the minimum wage could result.

Conditional on being employed, the individual fixed effect can be differenced out by estimating the effects of *changes* in the minimum wage on *changes* in worker absenteeism between rotations 4 and 8. The principle estimation equation in this paper is:

$$\Delta Absent_{i,4,8} = \beta^{MIN} X_{i,4} + \beta_1^{MIN} \Delta \ln(W_{4,8}^{MIN}) + \Upsilon^{MIN} MONTH + \Phi^{MIN} STATE \times YEAR + \Delta u_{i,4,8} \quad (2)$$

where $\Delta Absent_{i,4,8}$ is the change in absenteeism between rotations 4 and 8, $\Delta \ln W_{4,8}^{MIN}$ is the log change in the real minimum wage between rotations 4 and 8, and $\Delta u_{i,4,8}$ is the component of the error term that remains after differencing out the fixed effect. As can be seen, equation (2) is not merely the first difference of equation (1) because it includes $X_{i,4}$ instead of $\Delta X_{i,4,8}$. Most covariates are fixed for most people, and therefore would drop out of the model. Empirically, we could reject the null hypothesis that $X_{i,4}$ does not enter the model at high levels of significance, and therefore retain it.

We define minimum wage workers as a function of their hourly wage in rotation 4, a practice consistent with Neumark et al. (2004). The fact that workers who earn the minimum wage in rotation 4 do not necessarily earn the minimum in rotation 8 is not crucial; what is crucial is that their hourly wage growth be related to minimum wage. We found that hourly wage growth was strongly and positively related to minimum wage growth for workers who earned the minimum wage in rotation 4, with smaller effects for those who earned more than the minimum (results not shown to reduce clutter).

Although equation (2) is our primary focus, this does not mean that estimates of equation (1) are not of interest. Estimates of equation (1) are informative as to whether absenteeism is related to the minimum wage, *mutatis mutandis*, that is, allowing the underlying composition of the labor force to vary in response to the minimum wage. We therefore present a limited set of results for the model estimated using pooled data.

B. Identifying Variation

Burkhauser et al. (2000) showed that the method used to control for macroeconomic conditions can have a material impact on the estimated effects of minimum wages on economic behavior. We follow Neumark et al. (2004) by including a complete set of state x year dummy variables in equation (2).[15] The effects of the minimum wage are therefore identified solely through within-state, within-year variation in minimum wages, potentially (28 years x 51 states=) 1428 state-year observations.[16] Our approach is conservative in the sense that the state x year effects explain about 95 percent of the variation in the real minimum wage, meaning that we are identifying the effects of minimum wages on absenteeism with the remaining 5 percent. Standard errors are clustered at the state x year level, thus allowing for heteroscedasticity across state x year cells and arbitrary correlation of the error term between individuals within a state and year.

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[15] Angrist and Pischke (2008) suggest that robustness of the results to the inclusion of state-year trends is desirable (pp. 238-39).

[16] The large number of state x year effects is the reason we use the linear probability model.

We usually cannot reject on the basis of Chow tests the null hypothesis that the 1428 fixed effects are jointly equal to zero at conventional levels of statistical significance.[17] Indeed, we often could not reject the null hypothesis that state effects alone were jointly equal to zero in models that included state-and-year (as opposed to state x year) effects. We are not entirely surprised; although the state x year effects do not drop out in the differenced form of the model (as they would if we restricted the year effects to enter linearly), differencing can be expected to reduce the influence of factors that vary within a state between any two years. However, eliminating the state x year effects may introduce bias and inconsistency, a point that we examine empirically in some detail when we compare our results with those obtained from models that control for year effects only.

C. Differences in Differences

Difference-in-difference (DD) and difference-in-difference-in-difference (DDD) are techniques in which the effect of a policy variable, here the minimum wage, is estimated by comparing the effects of that variable on the outcomes of those who are affected by that policy (the treated) with the outcomes of those who are not (the control). By contrast, this paper estimates the effect of minimum wages on absenteeism using data only on workers who earn the minimum wage. Because DD and DDD are popular, we think that it is important to justify our approach.[18] We present a limited set of DDD estimates in which the control group includes those who earned more than $0.10 more than the minimum wage but less than 20 (December 2006) dollars per hour. Numerous differences emerged, not only in terms of magnitude, but occasionally in terms of algebraic sign as well. Further analysis suggests that DDD imposes strong econometric restrictions on the data that are often rejected, leading us to conclude that the DDD estimates are biased and inconsistent, and that results based on minimum wage workers alone are preferable. Rather than clutter the paper with these results, we focus on estimates obtained using minimum wage workers only, and discuss a subset of DDD results in **Section V.F**.

V. Results

Because there is no reason to expect absenteeism behavior among men and women to be identical, we estimate the models separately for each. We also estimate the models separately for younger (under 30) and older workers (30 and above), and less-educated (less than a high school degree) and better-educated (a high school degree or better) workers to assess how the estimated effects of

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[17] These tests, not presented to reduce clutter, did not correct for clustering of the error term, which biases the tests in favor of rejection of the null.
[18] We used DD and DDD estimation in our unpublished (2009) working paper.

minimum wages vary across important demographic groups. We also estimate the model separately for single and married women and, for a subset of years, by presence of own children at home.

A. Main Findings

Panel estimates of the effects of minimum wages on absenteeism are contained in **Table 3**. The dependent variable is equal to the change in part-and-full week absenteeism among full-time workers, measured as a percentage of usual hours worked. The numbers in the table are the estimated coefficients on the log change in the real minimum wage. Row 1 contains estimated coefficients for sickness absenteeism. Each 5% increase in the minimum wage – about a standard deviation -- is estimated to increase men's sickness absenteeism by 1.3 percentage points, which with a clustered standard error of 0.5 is statistically significant at the 1% level. The estimated effect for younger men is 0.6 percentage points (se=.4), which is statistically significant only at the 13% level, and for older men 1.9 percentage points (se=.8), which is statistically significant at the 2% level. Interestingly, the estimated effect for better-educated men is larger than for those less-educated, 1.3 points (se=.8) versus 0.8 points (se=.6), the former statistically significant at the 8% level.

Each 5% increase in the minimum wage is estimated to increase women's sickness absenteeism by 0.7 percentage points, with a standard error of 0.5. The statistical insignificance of this estimated effect is due to the fact that the estimated effect for younger women is negative, a decline of 1.1 percentage points (se=.7) while that for older women is positive, an increase of 1.2 percentage points (se=.6), the latter statistically significant at the 3% level. The estimated effects are positive for both better and less-educated women (0.9 and 0.8 percentage points), but with standard errors of 0.5 and 1.3, only the former is statistically significant at the 9% level.

In contrast to the mostly positive estimated effects of minimum wages on sickness absenteeism, the estimated effects on non-sickness absenteeism are mostly negative. Each 5% increase in the minimum wage is estimated to reduce men's non-sickness absenteeism by 1.4 percentage points, with a standard error of 0.8, an effect that is statistically significant only at the 11% level. As can be seen, though, the estimated effects for younger and older men differ dramatically. Younger men's non-sickness absenteeism is estimated to decline by 3 percentage points (se=1.2), an effect that is statistically significant at the 3% level,. By contrast, older men's absenteeism is estimated to rise by a small and statistically insignificant 0.3 percentage points (se=1.3). The estimated effects for better- and less-educated men are also opposite in sign at -2.4 (se=.9) and +1.1 (se=1.6) percentage points, the former statistically significant at the 1% level. The estimated effects for women are also negative with the exception of those better-educated.

Row 4 contains the estimated coefficients for vacation absenteeism. The estimated coefficient for men as a whole is negative but statistically not significant (-.097, se=.14). Looking at the subgroups, the estimated coefficients for older and less-educated men are positive and insignificant, and those for younger and better educated men are negative, the last statistically significant at the 7% level. The estimated coefficients are also negative and statistically significant for younger women (-.324, se=.17) and less-educated women (-.351, se=.12).

Estimates of the effect of minimum wages on non-vacation, non-sickness absenteeism and all non-vacation absenteeism are shown for completeness in rows 3 and 5.

The net effects of minimum wages on overall absenteeism are contained in row 6. Each 5% increase in the minimum wage is estimated to reduce young men's overall absenteeism by 2.4 percentage points (se=1.3), an effect that is statistically significant at the 7% level. The estimated coefficients for older and less-educated men are positive but their standard errors are nearly as large as the point estimates. The estimated coefficients are negative for younger women and positive for the other 3 groups of women; none is statistically significant. For men and women as a whole, the net estimated effects of a 5% increase in the minimum wage are tiny – on the order of 0.1 percentage points – and swamped by the standard error (1.2 and 0.7 points).

To summarize, the major effect of minimum wages is not so much on the overall level of absenteeism as on its composition. Higher minimum wages are generally associated with higher rates of sickness absenteeism and lower rates of non-sickness absenteeism; the only exception is for younger women, which estimated effect on sickness absenteeism is negative and statistically significant.

It seems unlikely that higher minimum wages should increase the incidence of illness. Rather, it seems more likely that higher minimum wages make it more likely that workers will be absent due to illness holding constant their state of health. Before we discuss this change in composition at greater length, though, we present additional results and robustness checks.

B. Additional Results for Women

To investigate whether the effects of minimum wages on women's absenteeism depend on marital status, we next estimate the models separately for single and married women. We also estimate the models by presence of children, information on which is available for the years 1984-1993 and 1999:11-2006. The results are shown in **Table 4.** Focus for now on the results in the left-hand columns for part-and-full week absenteeism; the results for full-week absenteeism in the right-hand columns will be discussed (briefly) later.

The estimated effects of minimum wages on absenteeism differed between single and married women. Each 5% increase in the minimum wage is estimated to increase single women's sickness absenteeism by 1.4 percentage points with a standard error of 0.7, an effect that is statistically significant at the 5% level. The same 5% increase in the minimum wage is estimated to increase married women's sickness absenteeism by a statistically insignificant 0.3 percentage points. It appears that the positive estimated effect for women as a whole in **Table 3** is due to the behavior of single women rather than married women.

Among single women, the estimated effect of minimum wages on sickness absenteeism is more positive for those with children than those without children. Among married women, though, the estimated effects are negative for both those with and without children. The switch in sign, presumably due to the restriction of the time frame, while not a plus, is less troubling in light of the statistical insignificance of the estimated effect for married women as a whole.

The estimated effect on single women's non-sickness absenteeism is positive and statistically insignificant: each 5% increase in the minimum wage is estimated to increase sickness absenteeism by 0.3 percentage points with a standard error of 0.8. The large positive estimated coefficient for single women with children (0.8946) is noisy (se=.9165), but the estimated effect for single women as a whole is more similar to the smaller and more precisely (albeit still statistically insignificant) effect for those without children.

Each 5% increase in the minimum wage is estimated to reduce non-sickness absenteeism among married women by -1.6 percentage points with a standard error of 0.7, statistically significant at the 2.1% level. The estimated coefficients by presence of children are also both negative: -0.7148 (se=.2474) for those with children, statistically significant at the 0.4% level, and -0.6269 (se=.4021), statistically significant at the 12% level, for those without children. Again, the magnitudes of the point estimates and their standard errors, combined with the restricted time period for which information on the presence of children is available, make us hesitant to draw firm conclusions.

The main takeaway from **Table 4** is that the positive estimated effects of minimum wages on women's sickness absenteeism appears to be due to the behavior of single women, and the negative estimated effects non-sickness absenteeism to the behavior of married women.

C. Full Week Absenteeism

The CPS officially categorizes a worker as being absent from work only if they report being employed but not at work during the survey week. Although much absenteeism that may be affected by minimum wages is likely to last less than a week, there is one advantage of the full-week measure of absenteeism: unlike our part-and-full week measures, it is available for individuals who work fewer than 35 hours per week, in other words, for those who work part time.

Estimates of the effects of minimum wages on full-week absenteeism are contained in **Table 5**. As might be expected, the estimated effects of minimum wages on full-week absenteeism are smaller than those for part-and-full week absenteeism. The estimated effects on men's sickness absenteeism (row 1) are still positive for younger and older men, but are statistically insignificant. The estimated effects are small, negative, and statistically insignificant when the data are divided by education group. The estimated effects on non-sickness absenteeism (row 2) have the same algebraic signs as those for part-and-full week absenteeism in most cases, but none is statistically significant. The estimated effects on full-week vacation absenteeism are all positive but insignificant, offset in part by negative estimated effects on the non-vacation component of non-sickness absenteeism (row 3), which are negative and statistically significant for younger and better educated men at the 1% and 6% levels.

The estimated effects on women's full week sickness absenteeism are all positive, and those for older and better educated women statistically significant at the 5% and 1% levels. The estimated effects for women's non-sickness absenteeism are all negative, but none is statistically significant. However, the estimated effect for married women – see the right-most columns of **Table 4** – is significant at the 3% level.

To summarize, higher minimum wages are estimated to increase full-week sickness absenteeism among both men and women as a whole, the estimates being more consistent across demographic subgroups and statistically more precise for women. With the exception of men's full week vacation absenteeism, the estimated effects on full week non-sickness absenteeism are qualitatively similar to those estimated for the part-and-full week measure.

The remainder of the paper focuses on estimates for the part-and-full week measures of absenteeism, which does not impose the stringent lower bound of a week on absenteeism from work.

D. Hourly Workers

Our estimates indicate that higher minimum wages lead to higher rates of sickness absenteeism among men and women. One source of concern could be that the opportunity cost of time is not measured well for non-hourly workers. In addition, concern could arise that some of the workers we have defined to be earning the minimum wage might be misclassified due to measurement error in hours worked, which we used to construct our measure of hourly pay for those not paid by the hour.

We therefore estimated the absenteeism regressions separately for hourly and non-hourly workers based on their pay status in rotation 4.[19]

Estimates by hourly pay status are presented in **Table 6**. We present the results for men in **Part A** and those for women in **Part B.** Estimates for hourly workers are contained in the left-hand columns and those for non-hourly workers in the right-hand columns. Looking first at sickness absenteeism (row 1), it can be seen that the estimated coefficients for hourly paid men are all positive, as are those for all but less-educated non-hourly men. The estimated coefficients for hourly and non-hourly women's sickness absenteeism (row 7) have precisely the same pattern of signs as for women as a whole: negative for younger women and positive for the other groups. Not all algebraic signs are the same for hourly and non-hourly paid workers. In particular, the estimated effect of minimum wages on non-sickness absenteeism among less-educated men is positive, large, and statistically significant for non-hourly workers and negative and insignificant for hourly workers. For the most part, though, the pattern of estimated effects between hourly and non-hourly workers is similar.

The bottom line is that the positive estimated effects of minimum wages on sickness absenteeism, and negative effects on non-sickness absenteeism, are not an artifact of measurement error in the wage or errors in measuring the opportunity cost of non-market time. In addition, we estimate negative effects of minimum wages on non-sickness absenteeism for hourly workers in all demographic subgroups.

E. Year Fixed Effects

Chow tests generally do not allow us to reject the null hypothesis that the 1428 state x year effects are jointly equal to zero. Indeed, we usually could not reject the null hypothesis that state-only fixed effects were jointly equal to zero. This could cause some readers to wonder whether those effects ought to be included in the model.

Our motivation for including state x year effects is to control as completely as possible for macroeconomic conditions and other state-level, time-varying omitted factors. The state x year effects are exogenous and so including them in the regression does not bias the other estimated coefficients even if they do not belong in the model, albeit at the cost of reduced efficiency. On the other hand, excluding the state x year effects when they do belong *will* introduce bias and inconsistency. The question is whether the potential efficiency gained by using a less comprehensive set of controls outweighs the potential bias introduced.

[19] Tests for equality of the estimated effects were carried out, but do not add substantially to a qualitative assessment of the estimates and so are suppressed to reduce clutter.

We estimated models in which we included only year effects and compare those estimates with those obtained in models that include state x year effects. We conduct Hausman-like tests in which the state x year effects and year-only effects models are estimated simultaneously and we test the null hypothesis that the estimated effects of minimum wages are the same in the two models. The results are contained in **Table 7.**

To save space and reduce strain on the reader, we report the findings for just the sickness and non-sickness components of absenteeism corresponding to the regressions reported in rows 1 and 2 of **Table 3**, repeated for convenience in rows 1 and 4 of **Table 7**. Focus first on the results for sickness absenteeism, seen in rows 1 through 3. Generally speaking, the magnitude of the estimated effects of minimum wages is smaller in the year effects models (row 2) than in the models that include state x year effects. For example, the estimated coefficient on the log change in the minimum wage is 0.0451, with a standard error of 0.0511, compared with an estimated coefficient of 0.2504 and a standard error of 0.0963 in the state x year effects model. Looking in row 3, we can reject the null hypothesis that the two estimated coefficients are equal at the 1% level. We can also reject the null hypothesis for younger and older men at the 5% and 7% levels. We do not reject the null hypothesis in the case of either better or less-educated men. We also do not reject the null hypothesis for women, but notice that the estimated effects of minimum wages on sickness absenteeism are not as severely attenuated as they are for men. For example, the estimated effects are positive and statistically significant for older and better-educated women at the 5% and 6% levels.

Estimates for non-sickness absenteeism are reported in rows 4 through 6. Again, the estimated effects in the year effects models tend to be smaller in magnitude than in the state x year effects models. Examining row 6, the null hypothesis that the estimated effects are equal is rejected for younger men at the 2% level, for better-educated men at the 6.3% level, and for older and less-educated women at the 6% and 0.7% levels.

Summarizing, the case for estimating year-effects rather than state x year effects models relies on increasing precision and not introducing bias. Although the standard errors in year-effects models are generally smaller than those estimated in the state x year models, the estimated effects of minimum wages are attenuated relative to the state x year models. Importantly, we can reject the null hypothesis that estimates from models that include only year effects are unbiased in a large number of cases. We therefore prefer estimates from the state x year models.

F. DDD Estimation

Consider the DDD model given by:

$$\Delta Absent_{i,4,8} = \beta^{MIN} M_{i,4} X_{i,4} + \beta^{>MIN}(1-M_{i,4})X_{i,4} + \beta_1 M_{i4} + \beta_2 \Delta \ln(W_{4,8}^{MIN}) + \beta_3 M_{i,4} \times \Delta \ln(W_{4,8}^{MIN})$$
$$+ \Upsilon^{MIN} M_{i,4} MONTH + \Upsilon^{>MIN}(1-M_{i,4}) MONTH + \Phi STATE \times YEAR + \Delta u_{i,4,8}$$

(3)

where $M_{i,4}$ is equal to 1 for individuals who earn an hourly wage equal to or less than the minimum wage plus \$0.10 in rotation 4 and zero otherwise, and where the estimated coefficient β_3 is equal to the DDD effect of minimum wages on absenteeism. We chose as our comparison group those who earn more than the minimum wage but less than \$20 per hour (in December 2006 dollars).

Notice that the estimated effects of the control variables are allowed to differ for minimum (*MIN*) and above-minimum (>*MIN*) earners. Therefore, only one remaining restriction distinguishes the DDD and non-DDD estimated effects of minimum wages: that of equal state x year effects. Relaxing this last remaining restriction is equivalent to estimating the model separately for minimum and above-minimum earners. To see why this assumption may be problematic, note that the restriction of equal state x year effects is equivalent to assuming that the within-state x year means are identical for minimum-wage and above-minimum earners, who are measurably different.[20]

Under the null hypothesis that the state x year effects are identical for minimum and above-minimum wage workers, the effects of minimum wages estimated using minimum wage workers alone are unbiased and consistent but possibly inefficient, while DDD estimates are unbiased, consistent, and efficient. Under the alternative hypothesis, DDD are biased and inconsistent. We can therefore carry out a Hausman-type test in which we compute unrestricted DDD estimates of the effects of minimum wages by estimating equation (2) separately for minimum wage and above-minimum workers and compare those estimates with the restricted DDD estimates based on equation (3). Under the null hypothesis, the unrestricted and restricted estimates are equal.[21]

A second test of the restrictions imposed by DDD is to examine the fixed effects themselves. In many if not most situations, the assumption of equal fixed effects is a maintained hypothesis. However, with data on 51 states over a period of 28 years, we can test the implications of this

[20] For example, 16.5% of workers who earn above the minimum but less than \$20/hour are college graduates, compared with just 7.2% of minimum-wage workers. Workers under age 20 make up 26% of minimum wage earners, compared with just 5.7% of above-minimum earners. Blacks and Hispanics make up 27% of minimum wage earners, compared with 23.5% of above-minimum earners.

[21] We do not show the unrestricted estimates for above-minimum wage earners, usually small and statistically insignificant, to reduce clutter. The unrestricted difference-in-differences are typically very close to the minimum-wage-only estimated effects shown in the tables.

restriction. According to the null hypothesis, the state and year effects are identical for minimum and above-minimum workers:

$$\Phi^{MIN} = \Phi^{>MIN} \tag{4}$$

Consider, then, the linear regression model:

$$\phi_{s,t}^{MIN} = \alpha_0 + \alpha_1 \phi_{s,t}^{>MIN} + \zeta_{s,t} \tag{5}$$

where $\phi_{s,t}^{MIN}$ and $\phi_{s,t}^{>MIN}$ are the elements of Φ^{MIN} and $\Phi^{>MIN}$ for state *s* in year *t*.[22] The null hypothesis in equation (4) is equivalent to:

$$\begin{aligned} \alpha_0 &= 0 \\ \alpha_1 &= 1 \end{aligned} \tag{6}$$

We compute F-tests for the restrictions embodied in equation (6). Because the right-hand-side variable in equation (5) is measured with error, we use state x time and state x time squared as instruments. We also cluster the standard errors on state, the effect of which is to modestly inflate the standard errors of the estimated coefficients.[23]

The findings are contained in **Table 8**. Again, we present results for just the sickness (rows 1 through 4) and non-sickness (rows 5 through 8) components of absenteeism. The estimated DDD coefficient is equal to -0.0260, opposite in sign from the effect of 0.2504 estimated using only minimum wage workers, and the standard error is equal to 0.0390. We can reject the null hypothesis that the unrestricted and restricted DDD estimated coefficients are equal at the 0.3% level (row 3). We can also reject the null hypothesis that the state x year effects fixed are equal for minimum and above-minimum earners at the 1% level (row 4).

For younger men, the restricted estimated DDD coefficient of -0.0888 is statistically significant at the 6% level and is also opposite in sign from that estimated using data only on minimum wage workers. Again, we can reject the null hypothesis that the restricted and unrestricted DDD coefficients are equal at the 4.2% level. We cannot reject the null hypothesis of equal state x year effects for minimum and above-minimum earners for younger men at conventional levels of statistical significance. This failure can be traced to a lack of statistical precision; a plot of the two sets of fixed effects (not shown to save space) reveals little evidence of a relationship.

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[22] We specified the fixed effects for those who earn more than the minimum to be the "independent" variable because they have smaller variance, thus increasing the estimated slope coefficient and reducing the F-statistics for the null hypothesis.

[23] We also carried out Chow tests for the restriction in equation (4). The Chow test is a much less discriminating test. In addition, rejection of the null hypothesis requires a relatively large loss of explanatory power due to the restriction, which is difficult in light of the large number (1428) of restrictions being tested.

We can also reject the null hypothesis that the restricted and unrestricted DDD estimated effects of minimum wages on sickness are equal for older men at the 2% level, for better-educated men at the 5% level, and for less-educated men at the 8.9% level. For women, we can reject the null hypothesis that the unrestricted and restricted DDD estimated effects are equal at the 8.5% level for older women, but not at conventional levels for the other subgroups. Again, though, the restricted and unrestricted DDD estimates for women are more similar than they are for men.

Taken as a whole, though, the results suggest that the DDD model in equation (3) imposes strong restrictions on the data that are often rejected by the data. DDD estimates of the effects of minimum wages on non-sickness absenteeism, seen in rows 6-8, fare little better. For this reason, we prefer estimates based on minimum wage workers alone.

G. Pooled Results

We have focused thus far on panel estimates of the effects of minimum wages on absenteeism that difference out individual-level fixed effects that might be correlated with the minimum wage. For example, higher minimum wages could draw into the labor force individuals with a lower (or higher) propensity to be absent, or allow employers to more easily find workers willing to be present during the survey week. However, estimation using pooled data is still informative as to whether absenteeism is negatively related to the minimum wage, *mutatis mutandis*.

Table 9 contains the pooled results. The estimated coefficients on sickness absenteeism are all positive, and are statistically significant for older and less-educated men. Each 5% increase in the minimum wage is estimated to increase the probability of older men's sickness absenteeism by 0.74 percentage points with a standard error of 0.2 percentage points. The estimated effects for less-educated men are of a similar magnitude. The estimated effects on women's sickness absenteeism, although positive, are not statistically significant. The pooled estimates are smaller in magnitude that the panel estimates, a finding that is consistent with the notion that higher minimum wages attract workers into employment (or keep workers in employment) who are less likely to be absent due to sickness.

The pooled estimated effects of minimum wages on non-sickness absenteeism are negative for younger and better-educated men and women, statistically significant so for better-educated men. The estimated effects are positive for less-educated men and women. The estimated effects on overall absenteeism (row 6) are negative for younger and better-educated men and women, and are statistically significant for both groups of younger men. The estimated effect on older men's overall absenteeism is positive and statistically significant, but only 38% as large as the panel point estimate. The estimated effects on women's overall absenteeism are of mixed sign and are not statistically significant, and most are also a fraction of the magnitude of the panel estimate.

There are two main conclusions from the estimates based on pooled data. First, estimates based on pooled data are generally attenuated relative to those using panel data, and suggests that the composition of the workforce responds to the minimum wage. Second, even allowing for changes in the composition of the labor force, the evidence regarding the relationship between minimum wages and absenteeism is mixed, with negative effects for younger and better educated men, but positive for older and less-educated men. For neither men nor women as a whole does it appear that higher minimum wages lead to lower rates of absenteeism.

H. Discussion

Absenteeism – scheduled or unscheduled flexibility in hours worked per week -- is a non-wage component of employee compensation that is both valued by workers and costly for employers to provide.[24] From the worker's point of view, higher minimum wages exert a substitution effect against absenteeism but an income effect towards it. From the employer's point of view, higher minimum wages would cause them to respond by attempting to reduce costly absenteeism. Our estimates suggest that higher minimum wages generally do not affect the overall rate of absenteeism, but do alter its composition: they increase sickness absenteeism while (usually) reducing absenteeism for non-sickness reasons. Assuming that higher minimum wages do not lead to deterioration in worker health, the question naturally arises why higher minimum wages affect the composition in absenteeism in this way.[25]

Higher minimum wages raise the value of employment from the point of view of workers. If employers fire or otherwise punish workers for excess absenteeism, workers can be expected to alter their behavior to reduce the likelihood of punishment. One way that workers can reduce the chance of being fired for excess absenteeism is by being absent less frequently.[26] However, Ichino and Moretti's (2009) research suggests that workers who convince their employer that their absenteeism has a biological basis are less likely to be punished. The positive estimated effect of minimum wages on absenteeism due to illness and negative estimated effect on absenteeism due to other reasons could

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[24] Coles et al. (2007), using French data, estimate that each percent (*not* percentage point) increase in the rate of absenteeism is worth 23.2 million Euros per year (p. 282).
[25] If anything, higher wages should increase the consumption of health-related goods and services, and thus reduce absenteeism due to sickness.
[26] Higher minimum wages could increase the value of employment relative to unemployment if the reduction in labor demand increased the cost of locating a new job.

reflect an attempt by workers to maintain flexibility of hours worked while not increasing the chance of being punished for excess absenteeism.[27]

If higher minimum wages lead workers to substitute towards sickness absenteeism in order to reduce the likelihood of being sanctioned by their employer, such substitution should be more plausible for workers who exhibit higher rates of sickness absence in the first place. For example, illness should be a more plausible excuse for absenteeism for older men and women, which rates average 1.78% and 2.57% (row 1 of **Table 1**) than for younger men and women (1.31% and 1.79%). Indeed, the estimated effects of minimum wages on sickness absenteeism are larger for older men and women than younger men and women (row 1 of **Table 3**).

The same pattern does not hold between better and less-educated workers. However, the connection between education and the propensity to be ill is not as clear as it is with age. On the one hand, better-educated workers can be expected to have higher levels of health human capital and lead generally healthier lives. On the other hand, they also have higher levels of expected lifetime wealth with which to purchase health goods and services that may be complementary with time off from work.[28]

Single and married women have similar rates of sickness absenteeism of 2.18% and 2.29%. We do not know why the positive estimated effects of minimum wages on sickness absenteeism among women can be traced primarily to the behavior of single women (row 1 of **Table 4**). However, single women with children have an average rate of sickness absenteeism of 2.6%, compared with a sickness rate of just 1.6% among single women without children. Although missing data results in the estimated effects of absenteeism by presence of children being noisy, the estimated effects are more positive for single women with children: 0.4418 (se=.3571) versus 0.1833 (se=.2163).

Although other interpretations of the data are possible, there is some evidence that sickness due to absenteeism responds more positively for groups of workers who have higher rates of sickness absence on average.

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[27] Kevin Tsui suggested an analogy with student absenteeism: Students are more likely to claim that they or a family member is ill when they miss a test than when they miss a regular class.

[28] An increase in the minimum wage presumably has a greater impact on the lifetime wealth of less-educated individuals than on the lifetime wealth of better-educated individuals. However, individuals who earn the minimum wage may face liquidity constraints that prevent them from completely smoothing their consumption paths. The higher sensitivity of sickness absenteeism to minimum wages among better-educated workers could reflect a greater willingness to take advantage of a relaxed liquidity constraint.

VI. Suggestions for Future Research

The question naturally arises whether higher minimum wages make workers more likely to stay away from work when they were in fact ill, or to claim they were ill when they were in fact well. Unfortunately, the CPS data do not appear to contain information sufficient to detect whether this is in fact the case. This does not mean we did not try. For example, **Figures 3 and 4** show that individuals are more likely to be absent due to illness during colder months. Because true leisure is presumably more valuable for most workers during warmer months than colder months, we tested whether minimum wages affected sickness absenteeism disproportionately during warmer months, which, if it occurred, would suggest that at least part of the estimated positive effects reflect a relabeling of behavior rather than a change in underlying behavior. However, neither the season-specific estimated effects of minimum wages nor the estimated seasonal patterns of absenteeism were sufficiently precise to allow us to reject the null hypothesis that minimum wages had proportional effects on absenteeism in warmer and colder months.[29] Additional research is clearly necessary to resolve the question of whether higher minimum wages are inducing greater worker shirking.

The estimated effects of minimum wages on absenteeism in the pooled data are smaller in magnitude than in the pooled data for both men and women, implying that the unobserved quality of the labor force varies as a function of the minimum wage. Additional research is necessary to improve our understanding of how the minimum wage affects labor force transitions among workers with different propensities to be absent.

The question also arises whether and if so, how, the labor market punishes absenteeism, both at the individual level and at the level of the demographic group. Answering this question is important because it seems counterintuitive that employers would have to – or choose to – put up with higher absenteeism when the minimum wage rises. One of us (Simon) is currently investigating the "effect" of absenteeism and minimum wages on transitions between employment and non-employment.

More generally, additional research is necessary regarding the demand for flexibility of work hours in the U.S. economy in the labor force as a whole. For example, the current paper is silent regarding the effect of wages on absenteeism for workers who earn more than the minimum. A better

[29] We estimated regressions for the change in absenteeism simultaneously with regressions for the level of absenteeism in rotation 8. The effects of minimum wages were permitted to vary between winter months (October through March) and summer months. We tested whether the ratio of the estimated winter and summer minimum wage effects was equal to the ratio of the level of winter and summer month effects. We were not able to reject the null hypothesis for vacation, sickness, or non-sickness absenteeism.

understanding of the relationship between full-time or overtime work schedules and absenteeism is needed. Also of potential interest is the effect of labor market institutions on the absence decision of workers in the U.S.. For example, Ichino and Riphahn (2005) and Olsson (2009) found that employment protection provisions increases absenteeism using Italian and Swedish data. Extending this analysis to the U.S. could be fruitful. Finally, there are substantial geographic differences in labor market conditions in the U.S.; the question arises whether absenteeism is sensitive to those differences.

References

Allen, S.G., 1981a. An Empirical Model of Worker Attendance. *Review of Economics and Statisics*, 71, 1-17.

Allen, S.G., 1981b. Compensation, Safety, and Absence: Evidence from the Paper Industry. *Industrial and Labor Relations Review*, 34, 207-218.

Allen, S.G., 1983. How Much Does Absenteeism Cost? *Journal of Human Resources*, 18(3), 379-393.

Angrist, J.D. and Pischke, J., 2008. *Mostly Harmless Econometrics: An Empiricist's Companion*, Princeton University Press. Available at: http://press.princeton.edu/titles/8769.html [Accessed May 28, 2009].

Barmby, T.A., Ercolani, M.G. and Treble, J.G., 2002. Sickness Absence: An International Comparison. *Economic Journal*, 112, F315-331.

Barmby, T.A., Orme, C.D. and Treble, J.G., 1991. Worker Absenteeism: An Analysis Using Microdata. *Economic Journal*, 101, 214-219.

Barmby, T.A., Sessions, J. and Treble, J.G., 1994. Absenteeism, Efficiency Wages, and Shirking. *Scandanavian Journal of Economics*, 96(4), 561-566.

Bounds, G., 2004. Argument for Minimum-Wage Boost. *Wall Street Journal*. Available at: http://online.wsj.com/article/SB109088061651474326.html [Accessed February 5, 2009].

Brown, S. and Sessions, J.G., 1996. The Economics of Absence: Theory and Evidence. *Journal of Economic Surveys*, 10, 23-53.

Bucila, L., 2008. *Employment Based Health Insurance and the Minimum Wage*, Clemson University, Clemson SC.

Bucila, L. and Simon, C., 2009. Do Higher Minimum Wages Reduce Absenteeism? Evidence from the CPS-MORG 1979-2007.

Burkhauser, R.V., Couch, K.A. and Wittenburg, D.C., 2000. A Reassessment of the New Economics of the Minimum Wage Literature with Monthly Data from the Current Population Survey. *Journal of Labor Economics*, 18(4), 653-680.

Coles, M. et al., 2007. Pay, Technology, and the Cost of Worker Absenteeism. *Economic Inquiry*, 45(2), 268-285.

Employment Policy Institute, 2008. *EPI Issue Guide: Minimum Wage*,

Ercolani, M.G. and Robsin, M., 2006. Does Raising the Pay of Low-Wage Workers Reduce their

Rate of Sickness Absence? Evidence from the Impact of Minimum Wage Legislation. *Working Paper*.

Haussamen, B., 2009. Supporting a Minimum Wage Increase. Available at: http://www.raiseminwage.org/id24.html [Accessed February 5, 2009].

Ichino, A. and Moretti, E., 2009. Biological Gender Differences, Absenteeism, and the Earnings Gap. *American Economic Journal*, 1(January).

Ichino, A. and Riphahn, R.T., 2005. The Effect of Employment Protection on Worker Effort: Absenteeism During and After Probation. *Journal of the European Economic Association*, 3(1), 120-143.

Johnson, P. and Palme, M., 1996. Do Economic Incentives Affect Work Absence? Empirical Evidence Using Swedish Micro Data. *Journal of Public Economics*, 59, 195-218.

Katz, L.F., 1986. Efficiency Wage Theories: A Partial Evaluation. *NBER Macroeconomics Annual*, 1, 235-276.

Keystone Research Center, KRC Minimum Wage Fact Sheet. Available at: http://www.keystoneresearch.org/presspdf/KRC_minwage_fact_sheet.pdf [Accessed February 5, 2009].

Krueger, A.B., 1994. *The Effect of the Minimum Wage When it Really Bites: A Reexamination of the Evidence from Puerto Rico*, Cambridge, MA.

Lazear, E.P., 1981. Agency, Earnings Profiles, Productivity, and Hours Restrictions. *The American Economic Review*, 71(4), 606-620.

Neumark, D. and Adams, S., 2000. *Do Living Wage Ordnances Reduce Urban Poverty?*, Cambridge, MA.

Neumark, D., Schweizer, M. and Wascher, W., 2004. Minimum Wage Effects Throughout the Wage Distribution. *Journal of Human Resources*, 39(2), 425-450.

Olsson, M., 2009. Employment protection and sickness absence. *Labour Economics*, 16(2), 208-214.

Pollin, R. and Luce, S., 1998. *The Living Wage: Building a Fair Economy*, New York, NY: The New York Press.

Press, A., 2004. Do Your Boss a Favor and Call in Sick. *MSNBC*. Available at: http://www.msnbc.msn.com/id/4808226/.

Reynolds, L.G. and Gregory, P., 1965. *Wages, Productivity, and Industrialization in Puerto Rico*, Homewood, IL: Richard Irwin, Inc.

Rosen, S., 1974. Hedonic Prices and Implicit Markets; Product Differentiation in Pure Competition. *Journal of Political Economy*, 82(1), 391-407.

Schmidt, S., 2005. *Raising North Carolina's Minimum Wage*, NC Justice Center. Available at: http://www.ncjustice.org/assets/library/426_issuebriefminwage3.pdf [Accessed February 5, 2009].

Shapiro, C. and Stiglitz, J.E., 1984. Equilibrium Unemployment as a Worker Discipline Device. *The American Economic Review*, 74(3), 433-444.

Shure, J., 2002. New Jersey Needs a Living Wage and a Higher Minimum Wage. *New Jersey Policy Perspective*. Available at: http://www.njpp.org/com_wages.html [Accessed February 5, 2009].

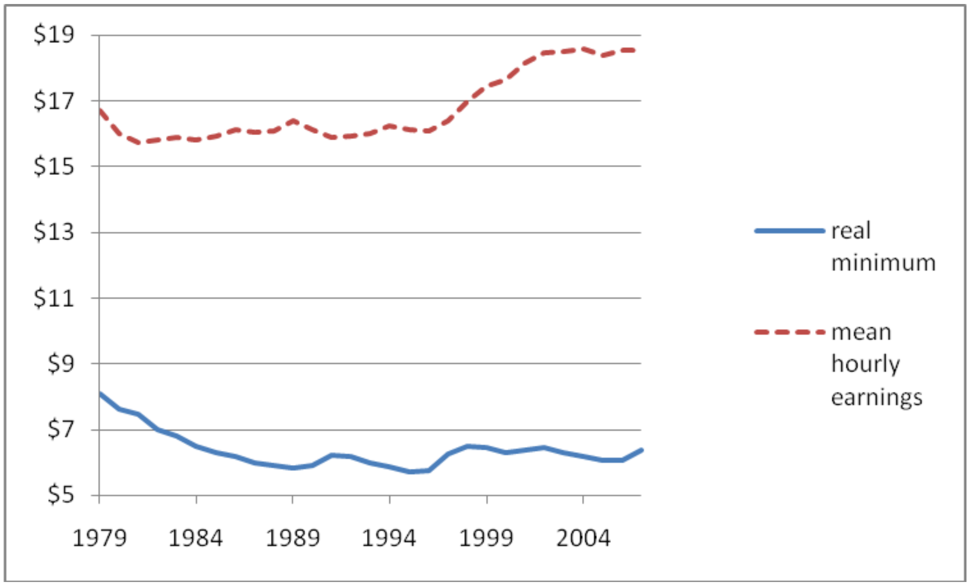
Simon, K.I. and Kaestner, R., 2004. Do Minimum Wages Affect Non-Wage Job Attributes? Evidence on Fringe Benefits. *Industrial and Labor Relations Review*, 58(1), 52-70.

Taylor, D.E., 1981. Absences from Work among Full-Time Employees. *Monthly Labor Review*, 104(3), 68-70.

Thoursie, P.S., 2004. Reporting sick: are sporting events contagious? *Journal of Applied Econometrics*, 19(6), 809-823.

Vistnes, J.P., 1997. Gender Differences in Days Lost from Work Due to Illness. *Industrial and Labor Relations Review*, 50(2), 304-323.

Figure 1. Real Minimum and Mean Real Hourly Wage



Note: Figures in CPI-corrected December 2006 dollars.

Figure 2. Trends in Absenteeism, 1979-2007

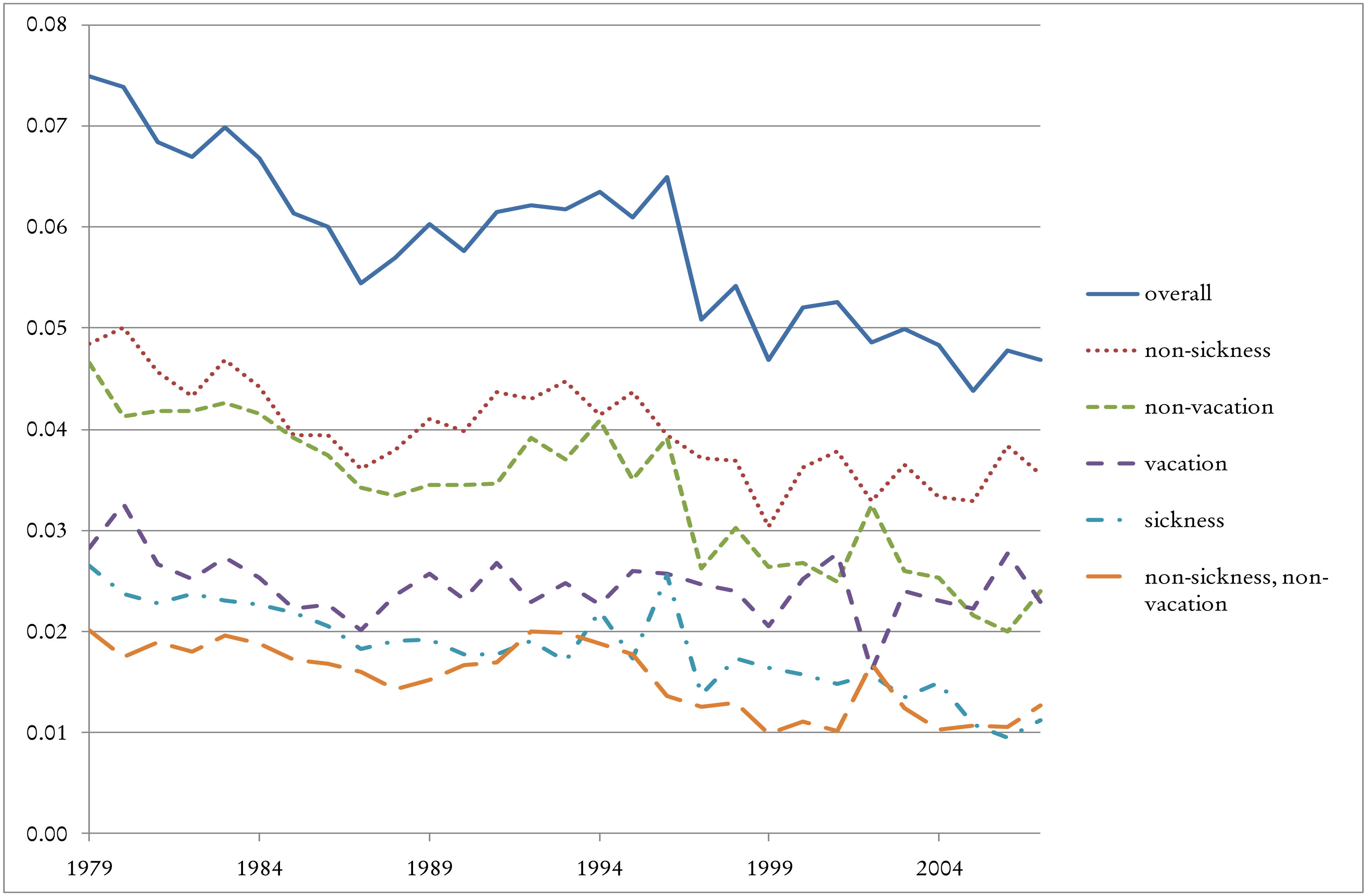


Figure 3 Monthly Pattern of Selected Components of Absenteeism, Relative to January

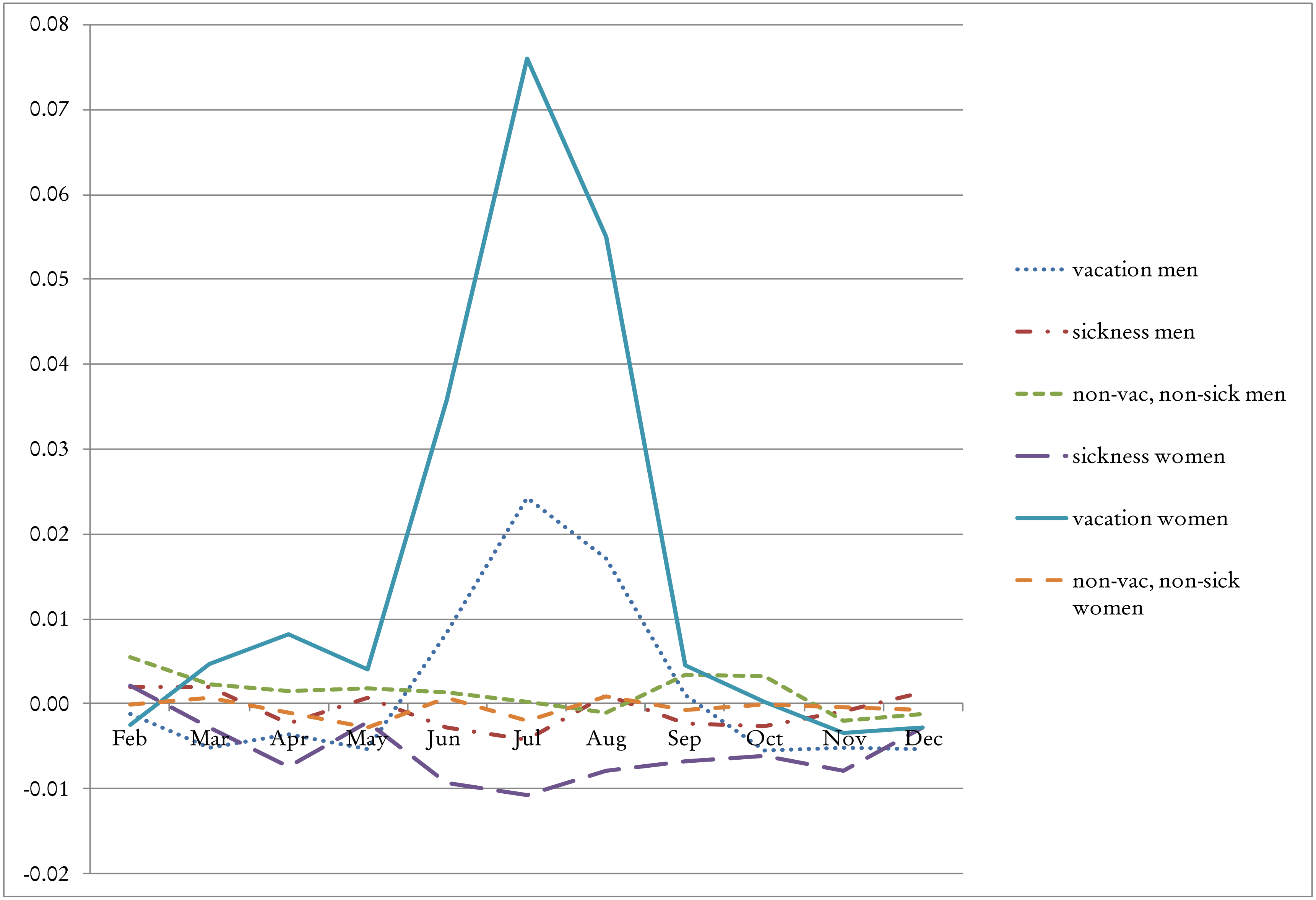


Figure 4. Monthly Pattern of Sickness and Non-Vacation, Non-sickness Absenteeism, Relative to January

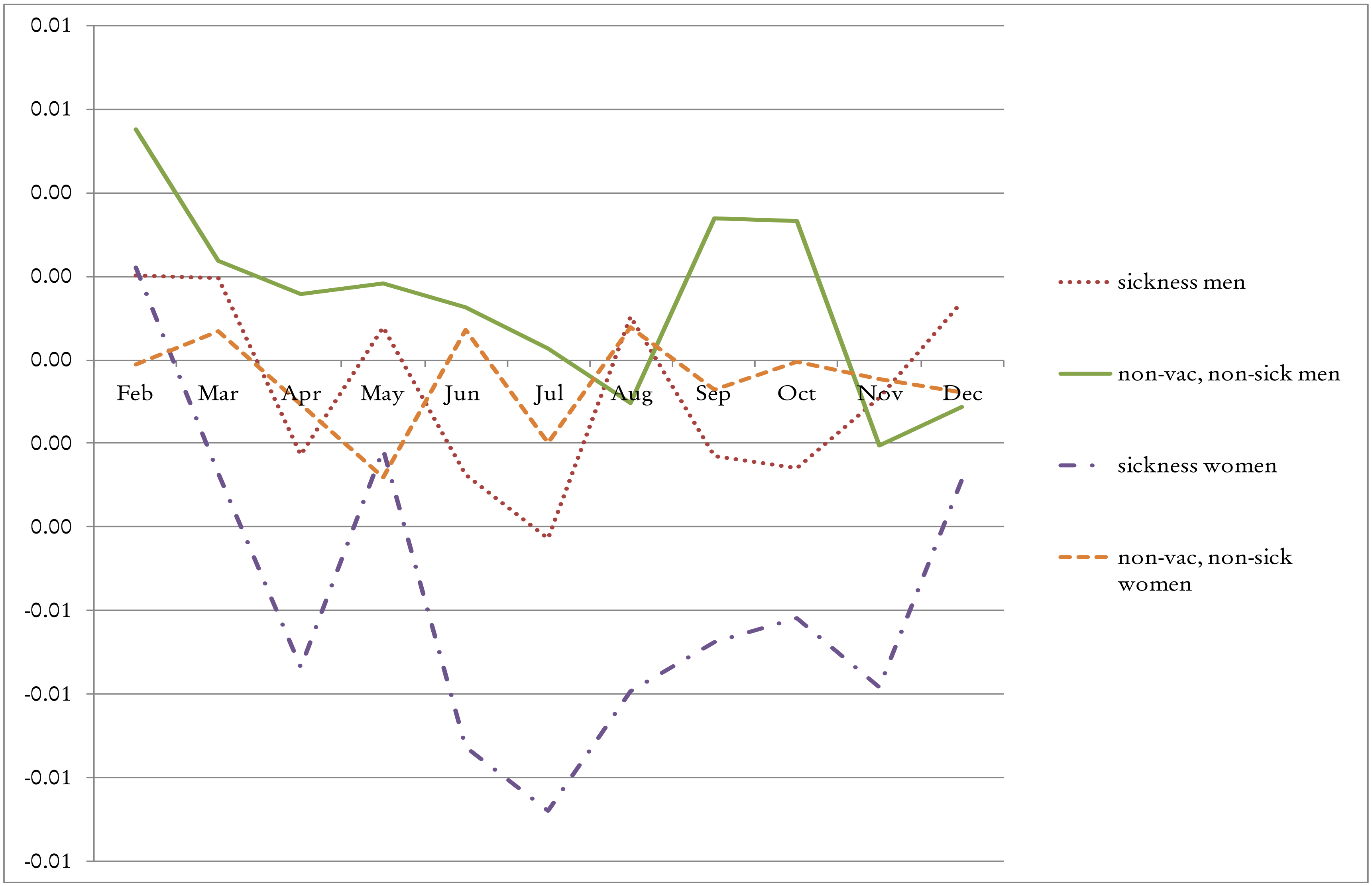


Table 1. Part and Full Week Absenteeism: Means and Standard Deviations

Means and Standard Deviations, Absenteeism

		Male					Female				
		All	Younger	Older	High education	Low education	All	Younger	Older	High education	Low education
1	Sickness	0.0153	0.0131	0.0178	0.0140	0.0175	0.0223	0.0179	0.0257	0.0195	0.0287
		(0.1109)	(0.0993)	(0.1225)	(0.1063)	(0.118)	(0.1304)	(0.1123)	(0.1427)	(0.1219)	(0.1479)
	Non-sickness										
2	All	0.0314	0.0315	0.0312	0.0324	0.0297	0.0483	0.0434	0.0520	0.0512	0.0418
		(0.1598)	(0.1573)	(0.1626)	(0.1619)	(0.1563)	(0.1973)	(0.1839)	(0.207)	(0.2034)	(0.1826)
3	Non-vacation	0.0125	0.0147	0.0101	0.0115	0.0141	0.0187	0.0212	0.0167	0.0181	0.0199
		(0.0965)	(0.1027)	(0.0889)	(0.0925)	(0.1027)	(0.1164)	(0.1237)	(0.1104)	(0.115)	(0.1196)
4	Vacation	0.0189	0.0168	0.0211	0.0209	0.0156	0.0296	0.0222	0.0353	0.0330	0.0218
		(0.1293)	(0.1212)	(0.1377)	(0.1347)	(0.1197)	(0.1628)	(0.1395)	(0.1784)	(0.1713)	(0.1411)
5	All Non-vacation	0.0278	0.0277	0.0279	0.0255	0.0316	0.0410	0.0391	0.0424	0.0376	0.0486
		(0.1457)	(0.1415)	(0.1502)	(0.1397)	(0.1548)	(0.1724)	(0.1648)	(0.178)	(0.1654)	(0.1872)
6	Overall	0.0467	0.0446	0.0490	0.0464	0.0472	0.0706	0.0613	0.0777	0.0707	0.0704
		(0.192)	(0.1838)	(0.2008)	(0.1914)	(0.1932)	(0.2319)	(0.2118)	(0.246)	(0.2328)	(0.2299)

Note: Means and standard deviations of absenteeism rates as measured as a fraction of usual weekly hours from the pooled 1979-2007 CPS-MORG data. Younger workers include those under 30, and older workers 30 and over. Better-educated workers include those with a high school degree or better, and less-educated workers those with less than a high school degree.

Table 2. Summary Statistics, Pooled and Matched Data		
	Pooled	Matched
Variable	Mean	Mean
Male	0.382	0.365
Female	0.618	0.635
Single	0.392	0.381
Kids	0.032	0.028
Married	0.226	0.254
Kids	0.065	0.067
Education		
0-9 years	0.105	0.109
9-11 years	0.274	0.277
High school grad	0.356	0.375
Some college	0.193	0.179
College+	0.072	0.060
Age		
15-19	0.264	0.264
25-29	0.105	0.088
30-34	0.083	0.080
35-39	0.069	0.075
40-44	0.061	0.070
45-49	0.050	0.060
50-54	0.044	0.055
55-59	0.039	0.050
60-64	0.031	0.037
65+	0.046	0.054
Industry		
agriculture	0.041	0.038
durables	0.029	0.029
finance	0.027	0.027
mining & constr	0.017	0.013
non-durables	0.050	0.054
public admin	0.018	0.018
services	0.338	0.346
transp & utilities	0.020	0.018
Occupation		
agriculture	0.001	0.001
clerical	0.158	0.166
crafts	0.026	0.025
laborers	0.098	0.095
machinists	0.028	0.026
operatives	0.104	0.107
professional	0.063	0.063
services	0.446	0.439
Race		
Black	0.136	0.136
Hispanic	0.137	0.123
Other	0.038	0.035
Wages		
Ln(real minimum)	1.867	-0.017
standard deviation	0.118	0.046
Observations	298,857	54,937

Note: Minimum wage variable for matched data is log change. Omitted categories: Age: 20-24; Industry: trade; Occupation: sales; Race: white.

Table 3. Panel Estimates, Part and Full-Week Absenteeism

		Male					Female				
		All	Younger	Older	High education	Low education	All	Younger	Older	High education	Low education
1	Sickness	0.2504	0.1232	0.3732	0.2675	0.1520	0.1471	-0.2154	0.2477	0.1799	0.1504
		(0.0963)	(0.0813)	(0.1658)	(0.1509)	(0.1117)	(0.0934)	(0.1483)	(0.1136)	(0.1053)	(0.2516)
	Nonsickness										
2	All	-0.2731	-0.5993	0.0506	-0.4712	0.2149	-0.1310	-0.1641	-0.2285	0.0202	-0.4544
		(0.1693)	(0.2449)	(0.2691)	(0.1779)	(0.3127)	(0.0934)	(0.2419)	(0.1026)	(0.1203)	(0.1565)
3	Nonvacation	-0.1761	-0.3730	-0.0565	-0.2655	-0.0751	-0.0368	0.1601	-0.0950	0.0177	-0.1032
		(0.0823)	(0.2037)	(0.0525)	(0.1454)	(0.0611)	(0.046)	(0.1789)	(0.049)	(0.0645)	(0.0986)
4	Vacation	-0.0970	-0.2263	0.1070	-0.2056	0.2900	-0.0942	-0.3241	-0.1335	0.0025	-0.3512
		(0.1385)	(0.1605)	(0.2422)	(0.1126)	(0.292)	(0.0824)	(0.167)	(0.0989)	(0.1038)	(0.116)
5	All Non-vacation	0.0743	-0.2499	0.3167	0.0020	0.0769	0.1104	-0.0553	0.1527	0.1976	0.0471
		(0.1385)	(0.2246)	(0.1942)	(0.2379)	(0.1172)	(0.1054)	(0.235)	(0.1229)	(0.1278)	(0.2597)
6	Overall	-0.0226	-0.4761	0.4238	-0.2037	0.3668	0.0161	-0.3795	0.0192	0.2002	-0.3041
		(0.2353)	(0.2668)	(0.4085)	(0.2672)	(0.3119)	(0.1406)	(0.2826)	(0.1694)	(0.1689)	(0.2839)

Note: This table reports coefficients on the log change in the real minimum wage in linear models for absenteeism among workers who earn the minimum wage. Each coefficient is from a regression specific to that demographic group and type of absenteeism. The dependent variable is equal to the change in absenteeism as a fraction of usual weekly hours worked and is limited to full-time workers. All models contain detailed controls for age, education, race, industry and occupation, and include a complete set of state x year fixed effects. Standard errors are clustered on state x year cell.

Table 4. Additional Results for Women

	Part and Full Week						Full Week					
	Single			Married			Single			Married		
	All	Kids	No Kids	All	Kids	No Kids	All	Kids	No Kids	All	Kids	No Kids
1 Sickness	0.2861	0.4418	0.1833	0.0539	-0.0971	-0.1290	0.0905	0.3899	0.0764	0.2266	0.1810	0.4832
	(0.1467)	(0.3571)	(0.2163)	(0.1173)	(0.2029)	(0.1102)	(0.0545)	(0.3337)	(0.0766)	(0.1526)	(0.2094)	(0.3328)
Non-sickness												
2 All	0.0525	0.8946	0.0754	-0.3288	-0.7148	-0.6269	0.0162	0.6690	-0.0259	-0.1736	-0.0244	-0.3119
	(0.1502)	(0.9165)	(0.1528)	(0.1423)	(0.2474)	(0.4021)	(0.0781)	(0.3167)	(0.0843)	(0.0799)	(0.1588)	(0.2096)
3 Non-vacation	0.0051	-0.0192	0.0292	-0.0247	-0.2027	0.0173	0.0247	0.3373	-0.0228	-0.0337	-0.0042	-0.1219
	(0.0787)	(0.668)	(0.058)	(0.0559)	(0.0952)	(0.1041)	(0.0466)	(0.2404)	(0.0513)	(0.0421)	(0.0645)	(0.1078)
4 Vacation	0.0475	0.9138	0.0463	-0.3042	-0.5121	-0.6443	-0.0086	0.3318	-0.0030	-0.1399	-0.0203	-0.1901
	(0.1263)	(0.8865)	(0.1498)	(0.1408)	(0.24)	(0.3946)	(0.0644)	(0.2502)	(0.0643)	(0.0776)	(0.1551)	(0.2077)
5 All Non-vacation	0.2911	0.4226	0.2124	0.0293	-0.2999	-0.1117	0.1152	0.7272	0.0535	0.1929	0.1769	0.3614
	(0.1706)	(0.7614)	(0.2352)	(0.1265)	(0.2204)	(0.1668)	(0.066)	(0.419)	(0.0763)	(0.1604)	(0.2093)	(0.3613)
6 Overall	0.3386	1.3364	0.2587	-0.2749	-0.8120	-0.7560	0.1067	1.0590	0.0505	0.0530	0.1566	0.1713
	(0.2206)	(0.9093)	(0.2775)	(0.1884)	(0.3186)	(0.4203)	(0.0931)	(0.4674)	(0.0965)	(0.1882)	(0.2797)	(0.4474)

Note: This table reports coefficients on the log change in the real minimum wage in linear models for absenteeism among workers who earn the minimum wage. Each coefficient is from a regression specific to that demographic group and type of absenteeism. The regressions for single and married women as a whole ("all") are estimated using the entire 1979-2006 period; due to missing information, the regressions for women with or without children are restricted to 1984-93 and 1999:11-2006. The dependent variable in the left-hand columns is equal to the change in absenteeism as a fraction of usual weekly hours worked and is limited to full-time workers. The dependent variable in the right-hand columns is the change in absenteeism status (a dummy variable for absence during the survey week) and applies to both part and full time workers. All models contain detailed controls for age, education, race, industry and occupation, and include a complete set of state x year fixed effects. Standard errors are clustered on state x year cell.

Table 5. Panel Estimates, Full-Week Absenteeism

		Male					Female				
		All	Younger	Older	High education	Low education	All	Younger	Older	High education	Low education
1	Sickness	0.0447	0.0545	0.1447	-0.0177	-0.0076	0.1530	0.0277	0.2310	0.2045	0.1022
		(0.0709)	(0.1055)	(0.1249)	(0.0557)	(0.0833)	(0.0696)	(0.0403)	(0.1178)	(0.0762)	(0.1302)
	Nonsickness										
2	All	-0.0637	-0.0701	0.1238	-0.1414	0.0409	-0.0625	-0.0851	-0.0405	-0.0389	-0.1306
		(0.1121)	(0.1253)	(0.1988)	(0.1428)	(0.1283)	(0.0565)	(0.0975)	(0.0704)	(0.0696)	(0.0971)
3	Nonvacation	-0.1154	-0.1884	0.0477	-0.1683	-0.0302	-0.0055	0.0061	-0.0101	-0.0456	0.0822
		(0.0427)	(0.0714)	(0.0325)	(0.0904)	(0.0517)	(0.0355)	(0.0584)	(0.0422)	(0.0489)	(0.0427)
4	Vacation	0.0517	0.1183	0.0761	0.0270	0.0711	-0.0570	-0.0912	-0.0304	0.0067	-0.2129
		(0.0999)	(0.0984)	(0.1963)	(0.1127)	(0.1321)	(0.0466)	(0.0813)	(0.0587)	(0.0505)	(0.0905)
5	All Non-vacation	-0.0707	-0.1339	0.1924	-0.1860	-0.0377	0.1475	0.0339	0.2209	0.1589	0.1845
		(0.0861)	(0.133)	(0.1288)	(0.1128)	(0.0965)	(0.0744)	(0.0746)	(0.1157)	(0.0885)	(0.1376)
6	Overall	-0.0190	-0.0156	0.2685	-0.1590	0.0333	0.0906	-0.0573	0.1905	0.1656	-0.0284
		(0.1457)	(0.1656)	(0.3029)	(0.1715)	(0.1557)	(0.09)	(0.1042)	(0.1324)	(0.1009)	(0.1762)

Note: This table reports coefficients on the log change in the real minimum wage in linear models for absenteeism among workers who earn the minimum wage. Each coefficient is from a regression specific to that demographic group and type of absenteeism. The dependent variable is the change in absenteeism status and applies to both part and full time workers. All models contain detailed controls for age, education, race, industry and occupation, and include a complete set of state x year fixed effects. Standard errors are clustered on state x year cell.

Table 6. Panel Estimates, Part and Full Week Absenteeism by Hourly Paid Status

		Hourly					Non-Hourly				
		All	Younger	Older	High education	Low education	All	Younger	Older	High education	Low education
A. Males											
1	Sickness	0.3584	0.1931	0.6613	0.3209	0.2573	0.1769	0.0328	0.2679	0.1838	-0.1970
		(0.1547)	(0.1367)	(0.3751)	(0.2083)	(0.1881)	(0.1202)	(0.1406)	(0.1933)	(0.138)	(0.2414)
	Nonsickness										
2	All	-0.4006	-0.5911	-0.0966	-0.6060	-0.2555	0.0982	-0.8604	0.4785	-0.4689	1.3762
		(0.1863)	(0.277)	(0.1788)	(0.3055)	(0.199)	(0.3375)	(0.7913)	(0.4123)	(0.2986)	(0.7648)
3	Nonvacation	-0.1808	-0.2592	-0.0111	-0.3624	-0.0656	-0.3018	-0.7130	-0.0499	-0.4484	-0.3784
		(0.1181)	(0.1835)	(0.0595)	(0.2769)	(0.1002)	(0.1615)	(0.6516)	(0.0654)	(0.2573)	(0.2413)
4	Vacation	-0.2198	-0.3319	-0.0855	-0.2436	-0.1899	0.4000	-0.1473	0.5285	-0.0205	1.7546
		(0.1422)	(0.2464)	(0.1703)	(0.176)	(0.1862)	(0.268)	(0.4874)	(0.3951)	(0.1462)	(0.6872)
5	All Non-vacation	0.1776	-0.0661	0.6503	-0.0415	0.1918	-0.1249	-0.6802	0.2179	-0.2647	-0.5754
		(0.2086)	(0.2381)	(0.4131)	(0.3845)	(0.184)	(0.1996)	(0.663)	(0.1988)	(0.2967)	(0.3173)
6	Overall	-0.0421	-0.3980	0.5648	-0.2851	0.0018	0.2751	-0.8276	0.7464	-0.2851	1.1792
		(0.2749)	(0.3315)	(0.4686)	(0.4149)	(0.2627)	(0.3467)	(0.7846)	(0.4307)	(0.3315)	(0.8355)
B. Females											
7	Sickness	0.1608	-0.2770	0.3616	0.1552	0.1297	0.1880	-0.2496	0.1820	0.2567	0.5136
		(0.1394)	(0.1631)	(0.1801)	(0.1564)	(0.3113)	(0.152)	(0.4865)	(0.1635)	(0.1988)	(0.6826)
	Nonsickness										
8	All	-0.0893	-0.3369	-0.0583	-0.0058	-0.2054	-0.3063	0.6585	-0.6226	-0.1408	-0.7787
		(0.1043)	(0.3095)	(0.1142)	(0.1539)	(0.1585)	(0.2071)	(0.5517)	(0.2486)	(0.213)	(0.7571)
9	Nonvacation	-0.1050	-0.0104	-0.1141	-0.0100	-0.0852	-0.0109	0.4171	-0.1680	0.0009	-0.4407
		(0.0676)	(0.204)	(0.0694)	(0.0936)	(0.1226)	(0.1052)	(0.3893)	(0.1489)	(0.1331)	(0.4547)
10	Vacation	0.0158	-0.3264	0.0558	0.0042	-0.1202	-0.2955	0.2414	-0.4546	-0.1417	-0.3380
		(0.079)	(0.1827)	(0.0967)	(0.1237)	(0.0938)	(0.1769)	(0.3804)	(0.2191)	(0.1634)	(0.5947)
11	All Non-vacation	0.0558	-0.2875	0.2475	0.1452	0.0445	0.1771	0.1675	0.0141	0.2576	0.0729
		(0.1566)	(0.265)	(0.1941)	(0.187)	(0.3204)	(0.1905)	(0.7298)	(0.2129)	(0.2427)	(0.7958)
12	Overall	0.0715	-0.6139	0.3034	0.1494	-0.0757	-0.1183	0.4089	-0.4405	0.1159	-0.2650
		(0.1753)	(0.3597)	(0.2178)	(0.2229)	(0.3297)	(0.2768)	(0.8149)	(0.3186)	(0.2933)	(01.0083)

Note: This table reports coefficients on the log change in the real minimum wage in linear models for absenteeism among workers who earn the minimum wage. Each coefficient is from a regression specific to that demographic group, type of absenteeism, and hourly pay status in rotation 4. The dependent variable is equal to the change in absenteeism as a fraction of usual weekly hours worked and is limited to full-time workers. All models contain detailed controls for age, education, race, industry and occupation, and include a complete set of state x year fixed effects. Standard errors are clustered on state x year cell.

Table 7. Robustness Check: Year Effects Estimates for Sickness and Non-sickness Absenteeism

		Male					Female				
		All	Younger	Older	High education	Low education	All	Younger	Older	High education	Low education
	Sickness Absenteeism										
1	State x Year	0.2504	0.1232	0.3732	0.2675	0.1520	0.1471	-0.2154	0.2477	0.1799	0.1504
		(0.0963)	(0.0813)	(0.1658)	(0.1509)	(0.1117)	(0.0934)	(0.1483)	(0.1136)	(0.1053)	(0.2516)
2	Year	0.0451	-0.0345	0.1074	0.0640	0.0352	0.0780	-0.0715	0.1404	0.1098	0.0157
		(0.0511)	(0.0544)	(0.073)	(0.0639)	(0.071)	(0.0551)	(0.0617)	(0.0699)	(0.0583)	(0.1363)
3	H0: Equality of (1) and (2)										
	Chi square stat	6.68	4.13	3.29	2.36	1.18	1.03	1.21	1.51	0.70	0.59
	prob value	(0.0098)	(0.0421)	(0.0696)	(0.1249)	(0.2776)	(0.311)	(0.2722)	(0.2192)	(0.4011)	(0.4431)
	Non-sickness Abseneeism										
4	State x year	-0.2731	-0.5993	0.0506	-0.4712	0.2149	-0.1310	-0.1641	-0.2285	0.0202	-0.4544
		(0.1693)	(0.2449)	(0.2691)	(0.1779)	(0.3127)	(0.0934)	(0.2419)	(0.1026)	(0.1203)	(0.1565)
5	Year	-0.1141	-0.1392	-0.1032	-0.1988	0.0011	0.0040	0.1356	-0.0506	0.0378	-0.0515
		(0.07)	(0.1139)	(0.0783)	(0.0825)	(0.1134)	(0.0636)	(0.1101)	(0.0804)	(0.0764)	(0.1126)
6	Equality of (1) and (2)										
	Chi square stat	1.22	5.46	0.38	3.46	0.61	3.14	1.84	3.63	0.03	7.29
	prob value	(0.27)	(0.0195)	(0.5392)	(0.063)	(0.433)	(0.0765)	(0.1745)	(0.0569)	(0.8578)	(0.0069)

Note: This table reports the estimated effects of minimum wages on part and full week absenteeism for full-time workers. The models include only year (rather than state x year) effects, but are otherwise identical to those seen in Table 3. Standard errors are clustered on state x year cell.

Table 8. Robustness Check: DDD Estimates for Sickness and Non-sickness Absenteeism

		Male					Female				
		All	Younger	Older	High education	Low education	All	Younger	Older	High education	Low education
	Sickness Absenteeism										
1	State x Year	0.2504	0.1232	0.3732	0.2675	0.1520	0.1471	-0.2154	0.2477	0.1799	0.1504
		(0.0963)	(0.0813)	(0.1658)	(0.1509)	(0.1117)	(0.0934)	(0.1483)	(0.1136)	(0.1053)	(0.2516)
2	DDD	-0.0260	-0.0888	0.0164	-0.0370	-0.0269	0.0415	-0.0529	0.0840	0.0699	-0.0145
		(0.039)	(0.0466)	(0.0547)	(0.0488)	(0.0626)	(0.0376)	(0.0488)	(0.0488)	(0.0388)	(0.0848)
3	H0: Equality of DDD and unrestricted effects										
	Chi square stat	9.29	4.14	5.79	4.00	2.88	1.83	1.25	3.01	1.65	0.43
	prob value	(0.0023)	(0.042)	(0.0161)	(0.0455)	(0.0896)	(0.1757)	(0.2645)	(0.0828)	(0.1992)	(0.5122)
4	H0: Equal fixed effects										
	F statistic	5.08	1.78	2.64	1.42	4.71	4.46	6.80	1.92	0.48	4.58
	prob value	(0.0098)	(0.1788)	(0.081)	(0.2523)	(0.0133)	(0.0166)	(0.0024)	(0.1576)	(0.6205)	(0.0149)
	Non-sickness Absenteeism										
5	State x Year	-0.2731	-0.5993	0.0506	-0.4712	0.2149	-0.1310	-0.1641	-0.2285	0.0202	-0.4544
		(0.1693)	(0.2449)	(0.2691)	(0.1779)	(0.3127)	(0.0934)	(0.2419)	(0.1026)	(0.1203)	(0.1565)
6	DDD	-0.0456	-0.0807	-0.0078	-0.1123	0.0737	0.0371	-0.0499	0.0649	0.0494	-0.0319
		(0.0508)	(0.079)	(0.0615)	(0.0633)	(0.0859)	(0.0507)	(0.0802)	(0.0641)	(0.055)	(0.1238)
7	H0: Equality of DDD and unrestricted effects										
	Chi square statistic	2.07	4.90	0.04	5.22	0.15	3.47	0.51	7.42	0.03	6.72
	prob value	(0.1501)	(0.0269)	(0.8321)	(0.0223)	(0.6954)	(0.0624)	(0.4754)	(0.0064)	(0.8561)	(0.0095)
8	H0: Equal fixed effects										
	Chi square stat	3.05	3.10	6.70	5.00	5.52	1.49	4.98	4.61	2.35	16.27
	prob value	(0.0563)	(0.0537)	(0.0027)	(0.0105)	(0.0068)	(0.2356)	(0.0107)	(0.0145)	(0.1055)	(0.)

Note: The coefficients in rows 2 and 4 are equal to the estimated value of β_3 in equation 3, that is, the restricted DDD estimated effect of minimum wages on absenteeism. The comparison group is workers who earn more than the minimum wage but fewer than $20 (December 2006) per hour. Standard errors are clustered on state x year cell. Rows 3 and 7 report tests for equality of the restricted and unrestricted DDD estimates (not reported here to reduce clutter) from separate estimation of equation 2 for minimum and above-minimum workers. All models control for state x year fixed effects. Rows 4 and 8 report tests for equality of the unrestricted DDD state x year fixed effects for minimum wage and above-minimum workers.

Table 9. Pooled Estimates of Part and Full Week Absenteeism

		Male					Female				
		All	Younger	Older	High education	Low education	All	Younger	Older	High education	Low education
1	Sickness	0.0699	0.0046	0.1475	0.0299	0.1529	0.0240	0.0262	0.0235	0.0126	0.0422
		(0.0225)	(0.0273)	(0.039)	(0.0286)	(0.0549)	(0.0254)	(0.0393)	(0.0321)	(0.032)	(0.0541)
	Nonsickness										
2	All	-0.0367	-0.1046	0.0141	-0.1260	0.0883	-0.0261	-0.0748	0.0087	-0.0542	0.0219
		(0.0344)	(0.0654)	(0.0373)	(0.0404)	(0.058)	(0.0366)	(0.0571)	(0.0483)	(0.0444)	(0.0571)
3	Nonvacation	-0.0108	-0.0356	0.0136	-0.0326	0.0320	0.0277	0.0005	0.0481	0.0182	0.0408
		(0.0212)	(0.0318)	(0.0288)	(0.0277)	(0.0316)	(0.0228)	(0.0424)	(0.0246)	(0.025)	(0.0431)
4	Vacation	-0.0258	-0.0690	0.0005	-0.0934	0.0563	-0.0537	-0.0753	-0.0394	-0.0724	-0.0189
		(0.0319)	(0.0575)	(0.0327)	(0.0361)	(0.0483)	(0.0273)	(0.0375)	(0.0389)	(0.0347)	(0.0443)
5	All Non-vacation	0.0591	-0.0310	0.1610	-0.0027	0.1849	0.0517	0.0267	0.0716	0.0308	0.0830
		(0.0305)	(0.0402)	(0.0486)	(0.0357)	(0.0647)	(0.0355)	(0.0624)	(0.0413)	(0.0398)	(0.071)
6	Overall	0.0332	-0.1000	0.1615	-0.0961	0.2412	-0.0020	-0.0486	0.0322	-0.0416	0.0641
		(0.0416)	(0.0672)	(0.0569)	(0.046)	(0.085)	(0.0431)	(0.0703)	(0.0567)	(0.0502)	(0.0809)

Note: This table reports coefficients on the real minimum wage in linear models for absenteeism among workers who earn the minimum wage. Each coefficient is from a regression for specific to that demographic group and type of absenteeism. The dependent variable is equal to absenteeism as a fraction of usual weekly hours worked and is limited to full-time workers. All models contain detailed controls for age, education, race, industry and occupation, and include a complete set of state x year fixed effects. Standard errors are clustered on state x year cell.