Minimum Wages, Employer-Provided Health Insurance and the Nondiscrimination Law

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Abstract

This paper exploits cross-state and federal variation in minimum wages to investigate the impact of minimum wage changes on employer-provided health insurance. In contrast to the existing empirical literature, I consider an environment where some firms are constrained by nondiscrimination laws that govern the provision of health insurance. For these firms, increases in the minimum wage reduce the probability that workers, including those who make above the minimum wage, will receive employer-provided health insurance. For firms not covered by the nondiscrimination law only low-skilled workers experience a reduction in health insurance after a minimum wage increase.

Introduction

Most of the existing empirical research on the economic consequences of minimum wage laws has focused on the effects of such laws on the availability of jobs for low wage workers. Despite decades of study, this vast literature[1] has yet to reach a consensus concerning the employment consequences of minimum wage changes. One drawback of this focus is that it provides too narrow a basis for policy evaluation. Employment contracts are multidimensional agreements which, in addition to providing wages, furnish workers with numerous non-wage (or fringe) benefits, including flexible working hours, training, health insurance, pensions, and paid leave. As long as the wage and non-wage portion of total compensation are substitutes, firms can respond to mandates that increase the wage portion of compensation by reducing the non-wage component.

Health insurance is the largest and most expensive of the non-legally required benefits offered by firms. According to the Employer Costs for Employee Compensation series from the Employment Cost Index survey, the average hourly cost of providing health insurance in 1993 was $1.22 or 6.8% of total compensation. Furthermore, more than half of all full-time workers without a high school education receive health insurance through their employer. Thus there is scope for reducing total compensation by reducing the availability or generosity of health insurance in response to minimum wage increases.

There is a small but growing empirical literature on the relationship between the minimum wage and the provision of fringe benefits[2]. The standard approach for determining the relationship between minimum wage increases and the provision of health insurance is a difference in

difference methodology where high wage workers serve as a control group to guard against unmeasured factors that may be correlated with minimum wage increases. I argue that this methodology is flawed due to nondiscrimination rules that govern the provision of health insurance. Nondiscrimination rules in section 105 of the Internal Revenue Tax Code state that in order to receive tax-exempt status for the health insurance plans of highly compensated employees, self-insured firms must offer health insurance plans that do not discriminate in favor of highly compensated employees (Collins 1999)[3,4]. As Gruber (1998:7) notes, for firms covered under the nondiscrimination rules: "… it is impossible to selectively offer insurance to only some employees, without making it a workplace wide option." This is in contrast with other fringe benefits, such as vacation days, sick leave, or on-the-job training, where the firm can tailor offerings to individual workers. For firms covered by the nondiscrimination rule, all employees are potentially affected if the firm alters its availability or generosity of health insurance in response to a change in the minimum wage. This implies, for these firms, that it would be incorrect to use employees earning above the minimum wage as a control group as is common in the literature on the minimum wage and non-wage compensation.

I argue that the minimum wage, by constraining the compensation package employers can offer, lowers the receipt of employer-provided health insurance. However which groups of workers lose coverage depends on if the firm is subject to the nondiscrimination law. Using data from the March Current Population Survey for 1988-1993, this paper exploits cross-state and federal variation in the minimum wage and finds in firms covered by the nondiscrimination law, employer-provided health insurance coverage is reduced for all workers following an increase in the minimum wage. Firms not covered by the nondiscrimination law, however, can tailor their

health insurance offerings to individual employees. For these firms, reductions in the availability of health insurance are therefore concentrated among low-skilled workers.

Previous Literature

The idea that firms will respond to increases in the minimum wages by reducing the non-wage portion of compensation has been investigated previously by Royalty (2000) and Simon and Kaestner (2004). Both papers examine an array of benefits. The fringe benefits Royalty investigates are health insurance, pensions, and sick leave. Using two years of data from the 1988 and 1993 Current Population Survey's Survey of Employee Benefits and cross-state variation in the minimum wage, she finds no effect on fringe benefit eligibility for small increases in the minimum wage. However, she demonstrates that minimum wage increases of at least $0.50, decrease the probability that low-skilled workers are eligible for pensions and health insurance.[5] Simon and Kaestner include health insurance and pensions in their analysis. They use data from the Annual Demographic Surveys of the Current Population Survey. Both cross-state and federal changes in the minimum wage are used to identify minimum wage effects. In the end they conclude that minimum wages have had no discernible effect on fringe benefit provision. Under their empirical framework, the significant negative relationship they find between health insurance and the minimum wage in some specifications is due to unmeasured state-year factors that are correlated with the minimum wage.

My analysis differs from these papers in a key way. Both Royalty and Simon and Kaestner employ a difference-in-differences methodology. Under this approach the difference in fringe benefit receipt for a group of low-wage workers likely to be affected by an increase in the

minimum wage (the treatment group) is compared to the change in fringe benefit provisions for mid-wage workers unlikely to be impacted by the minimum wage (the control group). These authors argue the minimum wage has an impact on the provision of non-wage benefits if and only if the coefficient on the treatment group is more negative (less positive) than the control group. It is made clear in these papers that this methodology depends on two key assumptions: "Obviously, this specification relies heavily on the adequacy of the "control group" and the assumption that time effects are the same for high- and low-wage workers." (Simon and Kaestner 2004:56) This difference-in-differences framework is employed regardless of whether the outcome variable is a benefit that the firm may individually tailor, like sick leave, or a benefit that is governed by the nondiscrimination clause, like health insurance. As mentioned earlier, however, the nondiscrimination rule makes near minimum wage workers an invalid control group when analyzing a benefit that cannot be individually tailored, such as employer-provided health insurance. Accordingly, unlike prior scholarship, I will explicitly take into account the ways in which the nondiscrimination rule impacts the potential relationship between the minimum wage and the receipt of employer-provided health insurance.

Empirical Specifications

I examine the effect of the minimum wage on the availability of employer-provided health insurance using an approach that has become standard in the "new" minimum wage research.[6] This approach exploits cross-state variation in minimum wages to avoid attributing to the minimum wage influences from unmeasured variables common to all observations in a particular year. State may set minimum wages higher than the federal minimum wage. If firms respond to higher minimum wages by reducing nonwage benefits, in any given year a state with an

increased minimum wage should have a larger percentage of employees without health insurance from their employers than a state whose minimum wage is equal to the federal minimum wage. Furthermore, if two states increase their minimum wage, then the state with the larger increase should see a larger impact. This hypothesis is tested using the following probit model:

$$(1) \qquad P(HI_{ijt} = 1) = F\{\alpha + \beta_1 MW_{jt} + \beta_2 X_{ijt} + \beta_3 S_j + \beta_4 T_t + \varepsilon_{ijt}\}$$

In equation (1), HI_{ijt} is a dichotomous variable that equals one if individual "i" in state "j" in year "t" receives employer-provided health insurance and zero otherwise; MW_{jt} is the real value of the minimum wage; X_{ijt} is a vector of demographic and industry controls which the literature on employer-provided health insurance (Woodbury 1983; Gruber and Poterba 1999; Gruber and Lettau 2000; Dranove *et al* 2000) have established to be important. Included as demographic controls are: age, age squared, race (black, white), union status, and education (no high school, high school graduate, some college, college graduate, advanced degree). Also included are a complete set of interaction terms between marital status (married, unmarried), gender (male, female), and presence of own children (none, only preschoolers, only school aged children, and both preschool and school aged children). These variables are included to capture the possibility that the individual has access to insurance though her spouse, as well as to control for the fact that the value of health insurance is increasing with the number of children (Buchmueller 1996). The number of workers (0-24, 25-99, 100-499, 500-999, over 1000) employed by the firm and a set of 46 industry controls capture benefit provision differences on the firm side. State unemployment rates are also included in X_{ijt}. S_j and T_t are state and year fixed effects.

Equation (1) uses state level variation in the minimum wage and receipt of employer-provided health insurance from year to year to identify the effect of the minimum wage. Federal variation in the minimum wage, which is of larger magnitude than state variation, is subsumed by the year fixed effects. According to Burkhauser, Wittenburg and Couch (2000), federal variation in the minimum wage is responsible for 90% of the total variation in the minimum wage between the years 1979 and 1992. Omitting the time-specific effects enables the use of both state-year and year-to-year variation in the minimum wages. Hence, each model will be estimated with and without year fixed effects.

Equation (1) can also be estimated with the minimum wage variable interacted with a complete set of skill category (high school dropouts, high school graduates, education beyond high school) dummy variables. This alternative regression equation can be written as follows:

$$(2) \quad P(HI_{ijt} = 1) = F\{\beta_1 MW*NoHS_{ijt} + \beta_2 MW*HS_{ijt} + \beta_3 MW*BHS_{ijt} + \beta_4 X_{ijt} + \beta_5 S_j + \beta_6 T_t + \varepsilon_{ijt}\}$$

In equation (2) $NoHS_{ijt}$, HS_{ijt}, BHS_{ijt} are mutually exclusive dummy variable for high school dropout, high school graduate and post-secondary education respectively. The X_{ijt} vector is the same as in equation (1) and includes a full set of educational dummy variables. This specification will show if minimum wage increases disproportionately impact the receipt of employer-provided health insurance for low-skilled workers. For firms covered by the nondiscrimination law the reduction of health insurance should be similar across skill categories since these firms must offer all workers the same health insurance. For firms not restricted by the nondiscrimination law, low-skilled workers should be disproportionately impacted.

As mentioned in the introduction, the nondiscrimination law only affects firms that self-insure (Collins 1999). The data do not identify if firms are self-insured; however, firm size has been shown to be the best predictor for self-insurance status. Larger firms are much more likely to self-insure than their smaller counterparts because their large size better shields them from risk. According to data from the National Employer Health Insurance Survey, in 1993, 20.9% of all establishments self-insured. Only 4.5% of establishments with less than 50 employees self-insured, while 85% of establishments with 1,000 or more employees did so (Park 2000). Thus, firm size is used as a proxy for self-insurance status and equation (2) will be estimated separately for large firms (at least 500 workers) and small firms (fewer than 500 workers).

For those small firms not covered by the nondiscrimination law we can test the following claim. Assume that the minimum wage only affects the receipt of health insurance for low-skilled workers in firms that are not subject to the nondiscrimination law, and that it has no effect on high-skilled workers in these firms. The effect of the minimum wage will therefore be captured by the difference between coefficients β_1 and β_3. Identifying the effect of the minimum wage in this manner guards against picking up trends in employer-provided health insurance that affect all workers (in small firms) and are therefore unlikely to be caused by the minimum wage but are correlated with minimum wage changes. For large firms minimum wage changes can directly impact the benefit provision for high-skilled workers and this interpretation is invalid. For these firms the reduction in health insurance should be similar across skill levels and therefore the difference between the coefficients β_1 and β_3 should be statistically insignificant.

The Data

The data for this paper are drawn from the 1988-93, Annual Demographic Survey of the Current Population Survey (CPS), a national survey conducted by the Census Bureau that gathers information on health insurance, income and other socioeconomic variables.[7] Appended to the CPS records is information on the state and federal minimum wage in January of each year as well as information on the state unemployment rate drawn from the Bureau of Labor Statistics Current Local Area Unemployment Statistics. To be included in the sample, the respondent must be currently working full-time with reported earnings above zero and not be self-employed or in the public sector[8]. The sample was also restricted to the working-age (18-64) non-student population.

The analysis years were chosen for a number of reasons. First, Lee (1999), Royalty (2000) and Simon and Kaestner (2004) each provide evidence that the minimum wage was binding for a subset of workers during this time period. Second, there was considerable variation in the state minimum wages during these years. In January 1989, 12 states had a minimum wage that differed from the federal minimum wage. By 1990, 16 states had minimum wage greater than the federal minimum wage. Furthermore, in 1989 legislation was enacted which increased the federal minimum wage from $3.35 to $4.25.[9] Table 1 shows the nominal minimum wage in each state for the time period under study as well the average ratio of the state minimum wage to the state median wage for the sample. In all instances the higher minimum wage (state or federal) is used. Finally, changes in the design of the CPS rendered longer sampling frames infeasible. In 1988 the health insurance questions were altered and the CPS itself was redesigned in 1994 (Polivka 1996).[10]

The key health insurance questions in the CPS are as follows: "Was [the employee] covered by a private health insurance plan in [the employee's] own name?" If the respondent answered in the affirmative to this question, they were asked the following follow-up question: "Was this health insurance plan offered through [the employee's] current or former employer or union?" Thus a positive response to both questions implies the worker has health insurance from her employer in her own name (as opposed to being covered by a spousal plan). The nesting of the questions means it is impossible to distinguish if a negative response to the first question implies the firm did not make health insurance available to that employee or the firm offers health insurance but the employee declined the firm's coverage.[11]

A Preliminary Look at the Data

Table 2 contains summary statistics for the entire sample (column 2), workers in states that have a minimum wage above the federal minimum wage (column 3) and workers in states where the minimum wage equals the federal minimum wage (column 4). Workers in states with high minimum wages account for only 17.1% of the sample. States with a minimum wage above the federal minimum wage have a higher percentage of workers with employer-provided health insurance (70.6% vs. 68.5%). This would appear to be inconsistent with the argument that a higher minimum wage decreases the likelihood of receiving employer-provided health insurance. However, while the average worker is more likely to have employer-provided health insurance in a high minimum wage state, high school dropouts are less likely to have employer-provided health insurance in high minimum wage states (50.5% vs. 52.5%). Thus, there is preliminary support for the hypothesis that firms respond to higher minimum wages by reducing the

availability or generosity of health insurance. It is clear that workers in states with high minimum wages are not identical to their federal minimum wage counterparts. States with higher minimum wages also tend to have higher average wages, lower unemployment rates, fewer married individuals, fewer minorities, smaller firms and a smaller retail trade sector. All of these factors, except firm size, are correlated with higher rates of employer-provided health insurance.

Empirical Results - Employer-Provided Health Insurance

A simple comparison of averages will, of course, fail to control for the other determinants of the receipt of employer-provided health insurance. Accordingly, multiple regression analysis is necessary. Table 3 shows the results from estimating Equation (1). The odd numbered columns omit the year dummies so identification is from both state and federal variation in the minimum wage. Even numbered columns contain year fixed effect and subsume the federal variation in the minimum wage. Since the magnitude of raw probit coefficients are not interpretable, all tables present marginal effects for the continuous variables and discrete changes in predicted probability for the dummy variables holding all other variables at their means. There is some evidence that increasing the minimum wage reduces the likelihood that workers will receive employer-provided health insurance. For all firms the estimates suggest that a $1.00 increase in the minimum wage reduces the probability of receiving employer-provided health insurance by 4.1 percentage points when both changes in the state and federal minimum wages are used to identify the impact of minimum wage changes and 2.5 percentage points when variation in the minimum wage is driven by state-level changes in the minimum wage. The magnitude of this effect is larger and more robust for small firms, which are not covered by the nondiscrimination

law, than for large firms. The year fixed-effects indicate that the likelihood of receiving employer-provided health insurance declined monotonically over the sample period.

The receipt of employer-provided health insurance is more common in large and unionized firms. The relationship between education and the likelihood of receiving employer-provided health insurance varies dramatically by firm size. As shown in columns 5 and 6, in small firms, which are free to tailor health insurance plans to their employees, education is a strong predictor of receipt of health insurance. Moving from high school dropout (the omitted category) to having an advanced degree increases the likelihood of receiving employer-provided health insurance by 21 percentage points. For large firms (columns 3 and 4) moving from the lowest education category to the highest education category increases the likelihood of receiving employer-provided health insurance by only nine percentage points. The fact that additional educational attainment implies a large increase in the receipt of health insurance in small firms but a small increase in large firms suggests that the nondiscrimination laws do indeed restrict the ability of large firms to offer workers with different skill levels different health insurance offerings[12].

Table 4 reports the results from estimating models on receipt of employer-provided health insurance where the impact of the minimum wage on health insurance is allowed to vary by skill level. Columns 1 and 2 of Table 4 display the results from estimating Equation (2) with and without year-fixed effects. In the model that excludes the year-fixed effects, the minimum wage variable is negative and statistically significant for workers in the lower skill levels. The coefficient estimates suggest that a $1.00 increase in the minimum wage would reduce the probability of receiving employer-provided health insurance by about 9.7 percentage points for

the average high school dropout, and 3.7 percentage points for workers with a high school degree. When time-specific effects are included in the model, the minimum wage interaction variables maintain their signs. However this specification suggests that increasing the minimum wage only impacts health insurance for the least skilled workers. When time-specific effects are included the minimum wage effect is only identified through the relatively small number of observations in which state minimum wages change.

As discussed earlier, we should expect the impact of minimum wage changes to differ by coverage under the nondiscrimination law. Specifically, for large firms (covered by the nondiscrimination law), whatever changes the firm makes to its health insurance plans must by law affect all employees. In contrast small firms (to whom the nondiscrimination law does not apply) have the freedom to focus the reduction in benefits on the group whose compensation costs are most affected by a minimum wage increase. We can investigate these hypotheses by estimating equation (2) separately for large and small firms.[13] Column 3 contains the results for large firms when both state and federal variation in the minimum wage is used for identification. Coefficient estimates suggest a $1.00 increase in the minimum wage causes a 5.3 percentage point reduction for high school dropouts and a 2.7 percentage point reduction for workers with some post secondary education. These estimates are not statistically different from each other. In the previous literature, without taking into account the nondiscrimination law, the fact that high-skilled workers (the control group) are impacted by the minimum wage would lead one to falsely conclude that minimum wage increases are unrelated to health insurance provision. When the nondiscrimination law is considered, this specification suggests an increase in the minimum wage reduces the likelihood of receiving employer provided health insurance by a similar

amount irrespective of worker type. When federal variation in the minimum wage is removed (column 4) then it appears as if minimum wage changes do not impact the receipt of health insurance at large firms.

In column 5 the sample is restricted to workers in firms with fewer than 500 employees. For these firms, minimum wage changes disproportionately impacts low-skilled workers. A $1.00 increase in the minimum wage reduces the receipt of employer-provided health insurance by 11.3 percentage points for high school dropouts and has no impact on workers with at least some college. When year dummies are added (column 6) the pattern of low-skilled workers facing a large reduction in receipt of health insurance persists with a statistically significant 9.2 percentage point decline for the lowest skilled workers and insignificant declines for the mid and high-skilled workers. The estimates for the lowest skilled workers are significantly different than those for the highest skilled worker at the 10% level. The fact that minimum wage changes have no impact on high-skilled workers in firms not covered by the nondiscrimination rules suggest that there are no important unmeasured factors which are correlated with minimum wage changes and the receipt of employer-provided health insurance.

Since the nondiscrimination law requires health insurance to be altered at the firm level, firms whose workforce is predominantly low wage workers should find it more attractive to adjust their health insurance plans than firms that employ a limited number of low wage workers. Even for firms not covered by the nondiscrimination law, transaction costs may make altering health insurance a more attractive option for firms with a large share of low-skilled workers. To investigate this hypothesis the sample was restricted to workers in industries where at least 15%

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of the industry workforce consists of high school dropouts[14]. Table 5 presents the relationship between the minimum wage and the receipt of employer-provided health insurance for workers in predominantly low-skilled industries. These results parallel the results in Table 4 but the response of the receipt of employer-provided health insurance is larger when the sample is restricted to low wage industries[15]. For instance, column (2) suggests that probability that the average low-skilled worker in a low-skilled industry will receive employer-provided health insurance is decreased by 10.5 percentage points following a $1.00 increase in the minimum wage. The corresponding estimate for all industries was a decrease of 7.6 percentage points. In firms covered by the nondiscrimination law, both high school dropouts and high school graduates are affected by increases in the minimum wage however the results are not significant when year dummies are included. In firms not subject to the nondiscrimination law, low-skilled workers are the only group negatively affected by an increase in the minimum wage. Even in the more restrictive model, where the federal minimum wage changes are subsumed by the year dummies, minimum wages significantly reduce the likelihood of low-skilled workers receiving employer-provided health insurance in low-skilled industries.

The CPS also contains information on the share of the health insurance plan paid by the employees (all, part, or none). One mechanism for reducing expenditures on employees is to require workers to directly bear part (or all) of the cost of health insurance. In Table 6 the dependent variable is an indicator variable that equals one if the worker receive a health insurance plan with no employee contribution from her firm and zero otherwise.[16] The results from this analysis are similar to those obtained when the dependent variable is simply the receipt of health insurance. In firms covered by the nondiscrimination laws workers of all skill levels are

less likely to receive generous health insurance coverage when the minimum wage increases. In small firm that have the flexibility to require increased contributions from low-skilled workers while continuing to require no contributions from high-skilled worker, the likelihood of having a health insurance plan without an employee contribution is reduced for only low-skilled workers. For instance, the final column (which includes both state and year fixed effects), implies that a $1.00 increase in the minimum wage has no impact on the generosity of health insurance for high-skilled workers but reduces the likelihood of receiving no cost health insurance by 8.6 percentage points for high school dropouts in small firms.

Robustness Check

The analysis thus far has been predicated on the assumption that changes in the minimum wage are uncorrelated with unmeasured factors that vary by state-year and influence the receipt of employer-provided health insurance.[17] A simple comparison of states with high and low minimum wages ignores differences in employer-provided health insurance across states that may result from differing economic conditions, Medicaid/AFDC eligibility, or state government policies which may be correlated with the state's minimum wage change. To correct for this potential correlation, a second minimum wage measure was created. This new measure is the ratio of the minimum wage in each state in a given year to the median wage in that state in that year (relative minimum wage).[18] This variable captures how binding the minimum wage is. The closer the measure is to one the closer the minimum wage is to the median wage and the more likely employers will change their behavior in response to changes in the minimum wage. The set of states with the highest minimum wage differs from the set of states with the most binding minimum wage (see Table 1). The five states with the most binding minimum wages are

Mississippi, New Mexico, Arkansas, Idaho, and Oregon. Of these only Oregon has a minimum wage greater than the federal minimum wage. Replacing the original minimum wage variable with this relative minimum wage variable is equivalent to estimating the main specification with a different set of control states (those states with relatively nonbinding minimum wages). It is unlikely that whatever omitted factors are correlated with living in a high minimum wage state are also correlated with living in a state with a binding minimum wage.

As a robustness check the main model (Equation 2) was re-estimated with this new minimum wage variable. The coefficients on the key variables from this model can be found in Table 7. The same findings emerge under this specification of the minimum wage. For firms covered by the nondiscrimination law, when variation in both state and federal minimum wage is used, then, as the minimum wage becomes more binding, workers of all skill levels are less likely to have employer-provided health insurance. In fact when the relative minimum wage variable is used, high-skilled workers in large firms show reduced receipt of health insurance even when the federal variation in the minimum wage is subsumed by the year fixed effects. In contrast, the health insurance of high-skilled workers in firms not governed by the nondiscrimination law is unaffected when the minimum wage becomes more binding. This finding persists if only state-level variation in the minimum wage is used to identify impacts. [19]

Conclusion

This paper argues that minimum wage laws create incentives for firms to substitute between wage and non-wage benefits. Indeed, the fact that employers may respond to increases in the minimum wage by decreasing the availability of non-wage benefits may explain why empirical

researchers find it difficult to detect an economically significant relationship between the minimum wage and employment. Previous research has also found little evidence of a reduction of employer-provided health insurance following minimum wage changes. However this research has not address the heterogeneity in firms arising from the fact that some firms are constrained by nondiscrimination laws while others are not.

Using data from the 1988-93 waves of the March CPS, this paper demonstrates that minimum wages influence the number of individuals who receive employer-provided health insurance. For firms subject to the nondiscrimination law, it appears that the nondiscrimination law is binding and workers of all skill-levels see reduced availability of health insurance following a minimum wage change. For uncovered firms only low-skilled workers have reduced health insurance. This finding is in contrast to research that does not focus on the nondiscrimination law and concludes that minimum wages have no effect on the prevision of health insurance. In addition, it appears that industry composition matters. Workers in predominantly low-skilled industries experience the largest declines in the likelihood of receiving employer-provided health insurance following a minimum wage increase, while the minimum wage has no impact on health insurance for workers in high-skilled industries. This analysis is significant because an increase in the minimum wage has the same consequence for employers as an increase in the cost of health insurance as both constrain the compensation package that employers can offer. Since a consistent series of data on health insurance costs is not readily available, variation in minimum wages over time may help explain trends in employer-provided health insurance.

Finally, these findings contribute to the debate about why so many working Americans lack health insurance (Farber and Levy 2000; Field and Shapiro 1993). The United States is unique among developed nations in its reliance on employers to provider health insurance for the majority of it citizens. This insurance has been implicitly subsidized by the federal government since a 1943 Internal Revenue Service ruling made compensation in the form of health insurance excludable from taxable income. Despite the favorable tax treatment of health insurance, the majority of uninsured adults are in families with at least one employed worker (EBRI 2000). The results of this paper are consistent with the argument that the interaction of the minimum wage and the nondiscrimination provisions of the tax code have the unintended consequence of reducing the receipt of employer-provided health insurance. If individuals in our society— especially low income individuals—are denied the advantages of subsidized health insurance, it may be time to reexamine our reliance on employer-provided health insurance.

Table 1: State Minimum Wages.

	1988	1989	1990	1991	1992	1993	Average min. wage /median wage
Fed. Min. Wage	3.35	3.35	3.35	3.80	4.25	4.25	
Alabama							.499
Alaska	3.85	3.85	3.85	4.30	4.75	4.75	.423
Arizona							.414
Arkansas							.506
California		4.25	4.25	4.25			.470
Colorado							.370
Connecticut	3.75	4.25	4.25	4.25		4.27	.392
Delaware							.344
Florida							.430
Georgia							.391
Hawaii	3.85	3.85	3.85	3.85		5.25	.481
Idaho							.504
Illinois							.350
Indiana							.392
Iowa			3.85	4.25	4.65	4.65	.474
Kansas							.368
Kentucky							.428
Louisiana							.455
Maine	3.65	3.65	3.75	3.85			.390
Maryland			3.75				.393
Massachusetts	3.65	3.75	3.75				.360
Michigan							.337
Minnesota	3.55	3.85	3.95	4.25			.425
Mississippi							.541
Missouri							.419
Montana							.495
Nebraska							.419
Nevada							.422
New Hampshire	3.55	3.65	3.75	3.85			.385
New Jersey						5.05	.304
New Mexico							.550
New York							.351
North Carolina							.427
North Dakota							.435
Ohio							.356
Oklahoma							.391
Oregon			4.25	4.75	4.75	4.75	.500
Pennsylvania		3.70	3.70				.396
Rhode Island	3.65	4.00	4.25	4.25	4.45	4.45	.472
South Carolina							.410
South Dakota							.484
Tennessee							.436
Texas							.457
Utah							.416
Vermont	3.55	3.65	3.75	3.85			.429
Virginia							.364
Washington		3.85	4.25	4.25			.412
West Virginia							.417
Wisconsin			3.65				.433
Wyoming							.410
Number above fed.	9	12	16	12	4	7	

Note: All entries are equal to the federal minimum wage unless otherwise noted.
Sources: Acemoglu and Pischke (1999) pg. 38; State Labor Laws, Monthly Labor Review (various year) 1988-1993 March CPS.

Table 2: Means (and Standard Deviations) by Minimum Wage, 1988-1993, CPS

	Entire Sample	States above Federal Minimum Wage	States at Federal Minimum Wage
Real Minimum Wage	2.88 (.199)	3.16 (.192)	2.83 (.150)
Minimum Wage/Average Hourly Wage	.415 (.053)	.428 (.051)	.412 (.052)
% With Health Insurance	68.7% (.46)	70.6% (.46)	68.5% (.46)
% With Health Insurance (High School Dropouts)	52.1% (.50)	50.5% (.50)	52.5% (.50)
State Unemployment Rate	6.26% (1.50)	5.54% (1.38)	6.40% (1.48)
Age	37.1 (11.1)	36.9 (11.1)	37.2 (11.1)
Wage	$17,758 (13,004)	$18,795 (13,506)	$17,554 (12,892)
% With Public Insurance	4.1% (.20)	4.1% (.20)	4.1% (.19)
% Married	60.9% (.49)	58.3% (.49)	61.4% (.48)
% With Children	43.3% (.50)	41.7% (.49)	43.7% (.50)
% Black	10.2% (.30)	4.8% (.21)	11.2% (.32)
% Female	41.7% (.49)	40.5% (.49)	41.9% (.49)
Highest Grade Attended	13.0 (2.68)	13.1 (2.94)	13.0 (2.59)
Low Tenure	16.1% (.37)	17.0% (.38)	16.0% (.37)
% In Manufacturing	27.5% (.45)	28.2% (.45)	27.3% (.45)
% In Professional Service	16.0% (.37)	15.7% (.36)	16.1% (.37)
% In Other Service	10.3% (.30)	10.6% (.31)	10.2% (.31)
% In Retail Trade	15.3% (.36)	14.7% (.35)	15.4% (.36)
25-99 Employees	16.0% (.37)	17.2% (.38)	15.8% (.36)
100-499 Employees	17.0% (.38)	17.1% (.38)	17.0% (.38)
500-999 Employees	6.2% (.24)	6.2% (.24)	6.2% (.24)
Over 1000 Employees	38.6% (.49)	36.2% (.48)	39.0% (.49)
Observations	240,675	41,132	199,543

Notes: Manufacturing includes durable and non-durable goods; Professional service includes hospital and other medical, education, social and other professional service; Other service included private household, business and repair, personal services, and entertainment. All monetary values are expressed in real (1982-84=100) terms. The samples are weighted using population weights

Table 3: Estimates of the Effects of Minimum Wages on Employer-Provided Health Insurance.

	(1)	(2)	(3)	(4)	(5)	(6)
	All Firms	All Firms	Large Firms	Large Firms	Small Firms	Small Firms
Minimum Wage	-0.041	-0.025	-0.027	-0.018	-0.049	-0.028
	(0.009)**	(0.014)+	(0.008)**	(0.015)	(0.013)**	(0.017)+
High School	0.116	0.117	0.064	0.064	0.143	0.144
	(0.008)**	(0.008)**	(0.006)**	(0.006)**	(0.010)**	(0.010)**
Some College	0.135	0.136	0.074	0.075	0.171	0.172
	(0.011)**	(0.011)**	(0.007)**	(0.007)**	(0.013)**	(0.013)**
College	0.167	0.168	0.100	0.100	0.210	0.211
	(0.008)**	(0.008)**	(0.006)**	(0.006)**	(0.012)**	(0.011)**
Beyond College	0.164	0.164	0.089	0.089	0.220	0.220
	(0.009)**	(0.009)**	(0.007)**	(0.007)**	(0.011)**	(0.011)**
Union	0.121	0.121	0.069	0.068	0.161	0.161
	(0.008)**	(0.008)**	(0.007)**	(0.007)**	(0.012)**	(0.012)**
25-99 Employees	0.150	0.151			0.191	0.191
	(0.003)**	(0.003)**			(0.004)**	(0.004)**
100-499 Employees	0.206	0.207			0.273	0.273
	(0.003)**	(0.003)**			(0.004)**	(0.004)**
500-999 Employees	0.217	0.217				
	(0.003)**	(0.003)**				
> 1000 Employees	0.290	0.290	0.016	0.016		
	(0.004)**	(0.004)**	(0.004)**	(0.004)**		
1989		-0.012		-0.017		-0.006
		(0.006)+		(0.006)**		(0.008)
1990		-0.019		-0.022		-0.013
		(0.007)**		(0.006)**		(0.009)
1991		-0.018		-0.022		-0.011
		(0.007)*		(0.007)**		(0.009)
1992		-0.021		-0.020		-0.020
		(0.011)*		(0.009)*		(0.014)
1993		-0.048		-0.047		-0.043
		(0.009)**		(0.008)**		(0.012)**
Observations	240,675	240,675	105,818	105,818	134,857	134,857

+ Statistically significant at the .10 level;* at the .05 level; **at the .01 level.

Estimates were obtained using Probit model and standard errors have been correct for clustering at the state level. Regression models include the following additional variables: age; age squared; indicators for being white, black, 15 controls for family structure, 45 industry controls, state fixed effects, and the state unemployment rate. Results are weighted to reflect population averages.

Table 4: Estimates of the Effects of Minimum Wages on Employer-Provided Health Insurance by Skill Level.

	(1)	(2)	(3)	(4)	(5)	(6)
	All Firms	All Firms	Large Firms	Large Firms	Small Firms	Small Firms
Minimum Wage* No High School	-0.097 (0.033)**	-0.076 (0.035)*	-0.053 (0.022)*	-0.036 (0.023)	-0.113 (0.043)**	-0.092 (0.046)*
Minimum Wage* High School	-0.037 (0.010)**	-0.015 (0.013)	-0.024 (0.011)*	-0.007 (0.015)	-0.045 (0.012)**	-0.021 (0.016)
Minimum Wage* Beyond High School	-0.026 (0.017)	-0.004 (0.019)	-0.027 (0.012)*	-0.009 (0.015)	-0.021 (0.024)	0.003 (0.024)
High School	-0.041 (0.100)	-0.044 (0.101)	-0.008 (0.077)	-0.009 (0.076)	-0.036 (0.117)	-0.043 (0.119)
Some College	-0.041 (0.133)	-0.044 (0.129)	0.017 (0.070)	0.016 (0.069)	-0.064 (0.167)	-0.069 (0.164)
College	0.015 (0.129)	0.012 (0.126)	0.056 (0.063)	0.054 (0.062)	-0.001 (0.165)	-0.007 (0.162)
Beyond College	0.019 (0.127)	0.015 (0.124)	0.041 (0.065)	0.039 (0.064)	0.025 (0.162)	0.018 (0.159)
Union	0.136 (0.008)**	0.136 (0.008)**	0.088 (0.007)**	0.088 (0.007)**	0.168 (0.010)**	0.168 (0.010)**
25-99 Employees	0.172 (0.003)**	0.172 (0.003)**			0.215 (0.004)**	0.215 (0.004)**
100-499 Employees	0.237 (0.003)**	0.237 (0.003)**			0.310 (0.005)**	0.310 (0.005)**
500-999 Employees	0.243 (0.003)**	0.243 (0.003)**	-0.016 (0.004)**	-0.015 (0.004)**		
Over 1000 Employees	0.331 (0.004)**	0.331 (0.004)**				
State Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	No	Yes	No	Yes	No	Yes
Observations	240,675	240,675	105,818	105,818	134,857	134,857

+ Statistically significant at the .10 level;* at the .05 level; **at the .01 level.

Estimates were obtained using Probit model and standard errors have been correct for clustering at the state level. Regression models include the following additional variables: age; age squared; indicators for being white, black, 15 controls for family structure, 45 industry controls, and the state unemployment rate. Vectors of state and year fixed effects are included as indicated. Results are weighted to reflect population averages.

Table 5: Estimates of the Effects of Minimum Wage Changes on Employer-Provided Health Insurance in Low-Skilled Industries.

	(1)	(2)	(3)	(4)	(5)	(6)
	All Firms	All Firms	Large Firms	Large Firms	Small Firms	Small Firms
Minimum Wage* No High School	-0.128 (0.029)**	-0.105 (0.031)**	-0.078 (0.035)*	-0.061 (0.042)	-0.131 (0.031)**	-0.107 (0.037)**
Minimum Wage* High School	-0.039 (0.014)**	-0.014 (0.019)	-0.054 (0.021)*	-0.035 (0.038)	-0.027 (0.017)	-0.001 (0.018)
Minimum Wage* Beyond High School	-0.032 (0.031)	-0.006 (0.033)	-0.026 (0.026)	-0.006 (0.040)	-0.040 (0.034)	-0.013 (0.029)
High School	-0.123 (0.091)	-0.128 (0.093)	0.006 (0.106)	0.004 (0.106)	-0.148 (0.085)+	-0.153 (0.086)+
Some College	-0.109 (0.144)	-0.115 (0.141)	-0.057 (0.110)	-0.061 (0.108)	-0.068 (0.146)	-0.074 (0.142)
College	-0.049 (0.149)	-0.056 (0.146)	0.001 (0.102)	-0.004 (0.101)	-0.018 (0.153)	-0.025 (0.149)
Beyond College	-0.057 (0.150)	-0.065 (0.147)	0.005 (0.105)	0.001 (0.104)	-0.039 (0.152)	-0.049 (0.147)
Union	0.161 (0.016)**	0.161 (0.016)**	0.092 (0.011)**	0.092 (0.012)**	0.202 (0.024)**	0.202 (0.024)**
25-99 Employees	0.188 (0.004)**	0.188 (0.004)**			0.218 (0.005)**	0.218 (0.005)**
100-499 Employees	0.265 (0.004)**	0.265 (0.004)**			0.322 (0.006)**	0.322 (0.006)**
500-999 Employees	0.282 (0.004)**	0.282 (0.004)**				
> 1000 Employees	0.351 (0.006)**	0.351 (0.006)**	0.021 (0.007)**	0.021 (0.008)**		
State Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	No	Yes	No	Yes	No	Yes
Observations	105,420	105,420	41,084	41,084	64,336	64,336

+ Statistically significant at the .10 level;* at the .05 level; **at the .01 level.

Estimates were obtained using Probit model and standard errors have been correct for clustering at the state level. Regression models include the following additional variables: age; age squared; indicators for being white, black, 15 controls for family structure, 45 industry controls, and the state unemployment rate. Vectors of state and year fixed effects are included as indicated. Results are weighted to reflect population averages.

Table 6: Estimates of the Effects of Minimum Wages on Contribution Free Employer-Provided Health Insurance.

	(1)	(2)	(3)	(4)	(5)	(6)
	All Firms	All Firms	Large Firms	Large Firms	Small Firms	Small Firms
Minimum Wage* No High School	-0.112 (0.037)**	-0.067 (0.041)	-0.050 (0.036)	0.013 (0.038)	-0.120 (0.036)**	-0.086 (0.040)*
Minimum Wage* High School	-0.055 (0.016)**	-0.005 (0.017)	-0.069 (0.019)**	-0.005 (0.019)	-0.043 (0.017)*	-0.004 (0.017)
Minimum Wage* Beyond High School	-0.041 (0.020)*	0.007 (0.019)	-0.059 (0.019)**	0.003 (0.021)	-0.028 (0.022)	0.010 (0.019)
Observations	240,675	240,675	105,818	105,818	134,857	134,857
State Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	No	Yes	No	Yes	No	Yes

+ Statistically significant at the .10 level;* at the .05 level; **at the .01 level.

Estimates were obtained using Probit model and standard errors have been correct for clustering at the state level. Regression models include the following additional variables: age; age squared; indicators for being white, black, 15 controls for family structure, 45 industry controls, and the state unemployment rate. Vectors of state and year fixed effects are included as indicated. Results are weighted to reflect population averages.

Table 7: Estimates of the Effects of Minimum Wages on Employer-Provided Health Insurance by Skill Level Controlling for Median Hourly Wage.

	(1)	(2)	(3)	(4)
	Large Firms	Large Firms	Small Firms	Small Firms
Relative Minimum Wage * No High School	-0.335 (0.135)*	-0.247 (0.156)	-0.789 (0.132)**	-0.683 (0.171)**
Relative Minimum Wage * High School	-0.289 (0.087)**	-0.197 (0.111)+	-0.411 (0.100)**	-0.299 (0.151)*
Relative Minimum Wage * Beyond High School	-0.195 (0.077)*	-0.100 (0.109)	-0.130 (0.129)	-0.019 (0.176)
State Dummies	Yes	Yes	Yes	Yes
Year Dummies	No	Yes	No	Yes
Observations	105,818	105,818	134,857	134,857

+ Statistically significant at the .10 level;* at the .05 level; **at the .01 level.
Estimates were obtained using Probit model and standard errors have been correct for clustering at the state level. Regression models include the following additional variables: age; age squared; indicators for being white, black, 15 controls for family structure, 45 industry controls, and the state unemployment rate. Vectors of state and year fixed effects are included as indicated. Results are weighted to reflect population averages.

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[1] See Card and (1995) for an overview.

[2] The benefit that has received the most attention is on-the-job training. Hashimoto (1982) uses time-series variation in the minimum wage and finds support for the prediction that increases in the minimum wage reduce on-the-job training for white men. Two recent papers have used cross-state variation in the minimum wage to investigate this issue. Neumark and Wascher (2001) conclude that minimum wages significantly reduce the amount of training received by young workers. Acemoglu and Pischke (1999), in contrast, do not find that minimum wages reduce the extent of training.

[3] More specifically, non-highly compensated employees must constitute at least 50 percent of the group of eligible employees; at least 90 percent of the non-highly compensated employees must be eligible for a plan that is at least 50 percent as valuable as the plan made available to the highly compensated employee with the most valuable benefit; and the plan must not contain any eligibility provision that suggests discrimination in favor of highly compensated employees. A plan also qualifies if at least 80 percent of non-highly compensated employees benefit from the plan. (Gruber 1998)

[4] The distinction between self-insured and third-party-insured health plans is based on risk. Employers that are responsible for the underlying insurance risk are considered self-insured even if a third-party company

administers the health insurance plan. Employers have an incentive to self-insure because firms that self-insure are exempt from their state's health insurance mandates.

[5] Royalty's analysis focuses on how the minimum wage affects eligibility for fringe benefits. This paper, in contrast, focuses on how the minimum wage affects the number of workers who receive (*i.e.* are eligible and accept) health insurance from their employers. As such it implicitly includes potential channels of minimum wage influence on employer-provided health insurance that the Royalty paper does not address, such as requiring the employee to bear a larger portion of health insurance costs or switching to less generous plans.

[6] The "new" minimum wage research began in 1992 with Neumark and Washer's study of the minimum wage and teenage employment. Previous empirical studies used time series data and compared changes in the real value of the federal minimum wage to changes in some output measure at the national level.

[7] There is some debate over the reference year for the health insurance questions in the CPS. This paper treats them as if they refer to current year's health insurance status. As Currie and Yelowitz write, "Many analysts have concluded that people tend to answer them as if they referred to contemporaneous or more recent health insurance status." (Currie and Yelowitz 1999:6) Results are robust (but lower in magnitude) to treating respondents as if their answers refer to the previous calendar year. These models are equivalent to assuming that respondents provide information about current year health insurance but that firms are only able to respond to increases in the minimum wage with a lag.

[8] The nondiscrimination law only applies to full-time workers. It is possible that firms shift low-skilled workers to part-time positions in order to deny them health insurance. Results, not shown, provide little support for this hypothesis.

[9] The increase in the federal minimum wage occurred in two steps. The minimum wage increased from $3.35 in 1989 to $3.80 in 1990 and to $4.25 in 1991. Information on the history, value and laws regarding the minimum wage can be found on the U.S. Department of Labor Wage and Hour Division website: *http://www.dol.gov/dol/esa/public/whd_org.htm*

[10] See Currie and Yelowitz (1999) for a discussion of these changes and their impact on the estimates of the uninsured.

[11] There are data sets that allow one to distinguish between these two cases. The Employment Benefit Survey conducted periodically by the CPS contains this information. Unfortunately, this dataset is unavailable for the years under study.

[12] A recent paper by Carrington *et al* (2001) exploits data on within firm variance in wage and non-wage compensation to show that nondiscrimination rules are binding for firms *i.e.* they limit within firm inequality in benefit provision.

[13] It would not be appropriate to re-estimate Equation (2) and include as additional variables the minimum wage variables interacted with firm size dummy variables. This specification would imply that the impact of additional education attainment is the same in large and small firms. The results in Table 3 demonstrate that the impact of education attainment (and other control variables) on the receipt of health insurance clearly differs by firm size.

[14] This produces a sample where 22% of the workers are high school dropouts. Result are robust to alterative cut-offs.

[15] In the sub sample of high-skilled industries, the minimum wage variable is insignificant at the .05 level in all specifications. Altering the health insurance of all employees is too costly a margin of adjustment in industries without a significant low wage population. The fact the minimum wage variables are

insignificant in these specifications, suggests that there are no unmeasured factors which are correlated with minimum wage changes and receipt of employer-provided health insurance.

[16] Information about generosity of workplace health insurance is only provided for individuals that accept health insurance from their employees. Thus the appropriate sample is all workers (not restricted to only those workers with employer-provided health insurance). It is possible that in response to an increased minimum wage, employers reduce the generosity of health insurance and as result some workers now reject their firm's offer of insurance. This channel would be omitted if the sample was restricted to only those with health insurance from their employers.

[17] There is a small literature on the political economy of state minimum wage laws. This literature concludes that ideological factors are the dominant force behind state minimum wage laws (Waltman and Pittman 2002).

[18] Median wage was calculated from a weighted average of the median hourly wage for full-time and part-time workers in each state assuming full-time workers work 2000 hours a year (40 hours worked per week times 50 weeks worked per year) and part-time workers work 1000 hours a year (20 hours per week for 50 weeks).

[19] Results (not shown) suggest that workers also receive less generous health insurance as the minimum wage becomes more binding.