

Do Minimum Wage Increases Lower the Probability that
Low-Skilled Workers Will Receive Fringe Benefits?

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This paper investigates the effect of minimum wages on the probability that low-skilled workers in the U.S. receive employer health insurance, retirement benefits, and sick leave. Using cross-state variation in state minimum wages to identify minimum wage effects, the paper finds that increases in minimum wages are associated with decreases in the probability that low-skilled workers are eligible for pensions and health insurance, at least at higher levels of the minimum wage. For example, a \$0.50 increase in the minimum wage from its 1999 level is estimated to decrease pension eligibility of less educated workers by 6.8 points and their health insurance eligibility by 3.9 points. No effect or small increases in pension and health insurance eligibility are found when the real minimum wage is very low. The reductions in total compensation that occur with large increases in the minimum wage, or even with smaller increases at higher levels of the minimum wage, lower the size of the employment response that would be expected in response to a given increase in the minimum wage. Such reductions clearly also have an impact on worker well-being that offsets, at least to some extent, the gains that individual workers may realize as a result of an increase in the minimum wage.

Keywords: Minimum Wage, Fringe Benefits, Nonwage Compensation

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Neither economists nor interested lay people need much introduction to the bottom line reached by some recent work on the effects of minimum wage increases on employment. Journal articles and books, as well as the national media, have reported the empirical studies that have found that increases in the minimum wage seem to have had at most only small negative employment effects. Prominent contributors to this literature have, in fact, emphasized the frequency with which higher minimum wages seem to be associated with insignificant, or even positive, changes in employment (Card and Krueger [1995]). No negative employment effect is an anomaly with respect to the standard labor market model which predicts a decline in the employment of low-wage workers in response to a minimum wage increase.¹

As is recognized in the literature, however, the result that enforced wage increases would result in no employment change is inconsistent with the standard model only if total compensation does not adjust to compensate for the wage increase. If non-wage benefits were reduced sufficiently to offset fully the wage increases due to a higher minimum wage, no employment effects are predicted by the standard model.² It is also possible that minimum wage increases are not fully offset by decreases in other forms of compensation but that they are partially offset. In this

¹Other studies do find the predicted negative employment effects. For example, see Linneman [1982], Neumark and Wascher [1992] and, more recently, Abowd, Kramarz, and Margolis [1999].

²Wessels [1980] presents a more complete model augmented by fringe benefit supply and demand and labor force participation which shows that minimum wage increases can be fully offset by benefit decreases only with perfectly inelastic labor supply. This result is due to the fact that the marginal value of the reduced benefits to workers is greater than its marginal cost to the firm if we assume firms were previously providing the optimal level of benefits. Assuming that labor supply is not perfectly elastic, however, offsets, even if not full, can be made by benefit reductions. The difference between worker valuation and firm costs of these reductions is not expected to be large enough to produce significant negative employment effects when employers are able reduce benefits costs by the full dollar amount of the wage increase.

case, policymakers still require estimates of the magnitude of benefit reductions in order to assess the impact of a minimum wage change on workers' well-being.

Although Card and Krueger [1995] survey more than 75 studies of the minimum wage, they report only three that deal specifically with the effect of the minimum wage on fringe benefits. Card and Krueger [1994] investigate the effect of the New Jersey minimum wage increase on the provision of free or reduced-price meals by fast food employers and find no significant effects. Earlier work by Wessels [1980] found only a small percentage of New York retail stores reported reducing fringe benefits in response to a minimum wage increase in 1957. Somewhat larger negative effects were found by Alpert [1986]. Each of these studies is, however, limited in terms of sample or benefits considered. Both the Card and Krueger and the Alpert studies look specifically at the restaurant industry. Card and Krueger look only at free and reduced-price meals. Alpert was forced to rely on data aggregated to urban or non-urban settings for four regions for four years, or only 32 observations. Wessels considers retailing in New York state and simply reports the number of firms reporting fringe benefit offsets in response to the minimum wage increase.

Although the effect of the minimum wage on fringe benefit provision is not well-documented, Gruber [1994] provides evidence that the imposition of a mandate for one form of compensation is accompanied by offsetting reductions in another component of compensation. Specifically, he finds that mandated maternity benefits are offset approximately one-for-one by wage reductions for affected groups. The finding of significant shifting of the cost of mandated benefits suggests that further research into the effect of minimum wage increases on other

components of compensation may be crucial for understanding the full impact of minimum wage legislation on the labor market.

The reason for the thinness of the literature examining minimum wage effects on non-wage components of compensation is almost certainly scarcity of data on fringe benefits and not a lack of interest by economists. Nonetheless, there are some untapped sources of data on fringe benefits that can be used to investigate the effect of the minimum wage on the receipt of fringe benefits by low-skilled workers. In this paper, I examine the effect of minimum wage laws on the receipt by low-skilled workers of employer-provided fringe benefits, using the 1988 and 1993 Current Population Survey, Survey of Employee Benefits. Specifically, I ask whether higher minimum wages reduce the probability that workers are eligible for paid pensions, health insurance through the employer, and sick leave.

I will use state-level variation in the minimum wage to identify minimum wage effects on benefits for low-skilled workers relative to higher-skilled workers. Such variation arises due to state minimum wages that are higher than the Federal minimum. Comparing effects across the wage distribution or at higher and lower levels of education assures that any minimum wage effect observed for low-skilled workers is not merely a trend in benefits that affects all workers that is also correlated with minimum wage changes.

DATA

The primary data for this project come from the 1988 and 1993 Current Population Survey's Survey of Employee Benefits. In May 1988 and April 1993, one half of those working for pay in the CPS sample were asked supplemental questions about the fringe benefits received

on the job. The full sample used in this study consists of 27,447 full-time (defined to be 35 hours or more per week) wage and salary workers from these surveys who were over age 18, not students, and for whom none of the key dependent or explanatory variables of the analysis were missing.³ Means of some of the key control variables are reported in Table 1 below.

Table 1 Means CPS, 1988 and 1993 Workers Age \geq 18	
Real Minimum Wage (\$1989) ^a	3.62
Real Wage (\$1989) ^a	11.15
Years of Education	13.21
Experience	38.49
Nonwhite Dummy	0.10
Male Dummy	0.59
Union Dummy	0.18
Year 1993 Dummy	0.44
Unemployment Rate	5.96
Number of Observations	27447
^a Converted to 1989 dollars using the CPI-U. For the real wage variable, the sample size is 25,499.	

In these two CPS surveys, data are available on sick leave and pension offerings on the job, as well as employer offerings and employee eligibility for health insurance and health insurance coverage. The variable representing whether the firm offers and the employee is eligible for health insurance is taken from the following questions: “Does your employer offer a health insurance plan to any of its employees?” and “Why are you not covered by this plan?”

³The wage variable is missing for 1948 of these observations. When possible, all 27,447 observations are used; otherwise, the sample size is 25,499.

“Ineligible?” The sick leave variable is constructed from the question, “On your job, do you get any paid sick leave or sickness insurance?” The pension variable is constructed from a series of detailed questions to reflect whether the worker was eligible for any type of paid pension, thrift, savings plan, deferred profit sharing, stock plan or other retirement plan from the employer.

These CPS supplements are two of the very few surveys that collect data on all three of these non-wage benefits for individual workers. Other CPS supplements do not include data on all three of these benefits and, as detailed in Currie and Yelowitz [1999], changes in the CPS questionnaire after 1993 render time trends charted across that year of questionable reliability.

The CPS does not include data on the dollar amount of benefits offered. Nonetheless, these data do allow one to draw inferences about the effect of minimum wages on the probability of receiving each of these benefits.

In order to control for state-level differences in labor markets that could be correlated with both the state minimum wage and fringe benefits eligibility in the state, I supplement the CPS data with state-level data drawn from the Bureau of Labor Statistics State and Area Current Employment Statistics and Local Area Unemployment Statistics. BLS variables include state unemployment rate, average manufacturing wage in the state, and state-level employment, as well as five years of lagged data for each of these variables.

MINIMUM WAGE LEVELS

As discussed above, I will use minimum wage variation across states to identify the relationship between minimum wages and the fringe benefits of low-skilled workers. It is important to note therefore that the period 1988-1993 did see substantial variation in the real

minimum wage across and within states. As shown in Table 2, in 18 of 102 (including D.C.) possible cases over the two years, a state minimum wage was higher than the federal minimum and therefore binding.

Table 2 State Minimum Wage Levels ^a												
States with Minimum Wages Exceeding the Federal Minimum State Minimum Wage Rate (Nominal \$)											Federal Minimum (Nominal \$)	
1988	AK	CT	DC ^b	HI	MA	ME	MN	NH	RI	VT		3.35
	3.85	3.75	4.18	3.85	3.65	3.65	3.55	3.55	3.65	3.55		
1993	AK	CT	DC ^b	HI	IA	NJ	OR	RI				4.25
	4.75	4.27	4.68	5.25	4.65	5.05	4.75	4.45				

^aSource: [The Book of the States 1994-95](#).
^bThe minimum wage in the District of Columbia differed by occupation and industry, ranging from a low of 3.50 to a high of 4.85 in 1988 and from 3.90 to 5.45 in 1993. The reported values are the average of the minimum and maximum of the range in each year.

Also notable is that fact that the federal minimum wage of 1988 is, in real terms, exceptionally low relative to historic levels. The constant nominal federal minimum throughout the 1980's, coupled with inflation over that period, combined to produce a real federal minimum wage lower than any year since 1955. The ratio of the minimum wage relative to average production wages illustrates this point even more vividly, with 1989 being the nadir of the preceding long-term downward trend in this ratio (Bernstein and Schmitt, 2000). The historically low level of the federal minimum wage raises the question as to whether this very low minimum wage and some of the state-level minimum wages which barely exceeded the federal level in 1989 were, in fact, binding. If the minimum wage has no “bite,” – that is, if workers would not be paid less than the minimum wage even in the absence of minimum wage legislation – then we

would not expect to see any negative effect of minimum wage levels on the fringe benefits of low-skilled workers.

The work of other researchers provides some evidence that minimum wage effects were smaller in 1988-1989, suggesting that the mandated minimum wage may not have been binding at that historically low level. For example, in Lee's analysis of the effects of federal minimum wage levels on measured wage inequality, we see that the strong relationship between movements in the 5th and 10th percentiles relative to the median wage and trends in the real minimum wage are not apparent in the years 1987-1989. While the real minimum continues to fall, the 5th and 10th percentiles relative to the median wage flatten out over that period, suggesting that the minimum wage had dipped low enough to have little effect in those years (Lee [1999], see in particular Figure 2). Hamermesh [1993] raises a similar question when interpreting time-series studies of minimum wage effects on employment in his textbook on labor demand. Specifically, he suggests that the smaller minimum wage effects obtained from studies that include more recent data might be explained by the extremely low levels of the minimum wage in the 1980s.⁴

Substantial state-level variation does exist in this period, however, producing minimum wage levels in at least some states that are much more likely to be binding. For example, the minimum wage in some states exceeded the federal minimum by as much as 15% in 1988 and

⁴Card and Krueger [1995], p. 182., question this interpretation of these studies, pointing out that most of the time series studies used a measure of the minimum wage relative to the average wage and adjusted by coverage levels. They argue that the minimum wage measure should therefore already account for the relative level of the minimum wages. This adjustment does not, however, account for possible non-linearities in minimum wage effects that might be expected if the minimum wage drops to a level where it is not binding.

24% in 1993. Additionally, although still relatively low by historical standards, by 1993 the federal minimum had increased twice in nominal terms since 1988 and was 4% higher in real terms. In contrast, the average real manufacturing wage across states declined by 5% over this period. To account for possible differences in the effect of the minimum wage on benefits at different levels of the minimum wage, I test for nonlinearities in the minimum wage effect.

BENEFITS ELIGIBILITY OF LOW-SKILLED WORKERS

It is also important to note that, although low-skilled workers are significantly less likely than high-skilled workers to receive each of these three fringe benefits, a substantial fraction of low-wage workers are eligible for benefits. For example, 67% of full-time workers earning less than \$7.00/hour in the sample were eligible for employer health insurance, 48% for sick leave, and 38% for pension benefits. Table 3 presents incidence data for each of these benefits for various subgroups of workers categorized by years of education and wage level. It is clear that there is some room for reducing fringe benefits in response to minimum wage increases.

Table 3 Incidence of Eligibility for Fringe Benefits CPS, 1988 and 1993 Workers Age \geq 18			
	Pension	Health Insurance	Sick Leave
All Full-time Workers	62%	83%	68%
Full-time Workers Earning \leq \$7.00/ hour	38%	67%	48%
Full-time Workers Earning $>$ \$7.00/hour	56%	92%	59%
Full-time Workers with Education \leq 12	56%	78%	59%
Full-time Workers with Education $>$ 12	69%	88%	77%

The figures presented in Table 3 for low-skilled workers are higher than implied by the popular notion that low-wage workers receive virtually no fringe benefits. Eligibility for benefits is extended to a substantial fraction of low-skilled workers. Even if we lower the wage cutoff to \$5.00/ hour, we still find that 51% are eligible for health insurance, 24% for pensions, and 32% for sick leave. This is less surprising than it might at first seem when we consider the regulations governing the tax-advantaged status of fringe benefits. Many benefits—employer-paid health insurance and pensions, for example—are not subject to individual income taxes as long as the firm meets certain non-discrimination regulations imposed by the IRS. The details of these non-discrimination regulations are complicated and change over time but the bottom line is that participation in fringe benefits programs cannot be limited to high-wage workers.⁵ Exemptions to the required participation percentages are allowed for certain classes of workers such as those

⁵See Carrington, McCue, and Pierce (1999) for an examination of the effect of non-discrimination rules on compensation and for more details about these regulations.

with low tenure at the firm or part-time workers. Such distinctions with respect to wages are not allowed: employers are not free to offer benefits to high-wage workers but not low-wage workers indiscriminately if they want to maintain the tax-advantaged status of the benefit. The IRS non-discrimination rules would therefore be expected to increase the proportion of low-skilled workers who are eligible for fringe benefits.

It is also useful to note here that the multivariate analysis that follows does not allow wage cutoffs much lower than \$7.00 nor education levels of < 12 due to small cell sizes and the large number of control variables that are necessary in the analysis. The preceding discussion suggests, however, that these groupings of workers which include more than the very lowest-paid workers or the very least educated are reasonable in this context. The “ripple” or “spillover” effects of minimum wages on the wages of workers previously earning above the minimum wage that have been documented (see Neumark, Schweitzer, and Wascher [2000], for example) are expected to be even more exaggerated in this context. IRS non-discrimination rules make it difficult for employers to make benefits’ eligibility decisions on an individual worker basis. Although the rules allow for some valid restrictions on benefits’ eligibility based on job tenure or hours of work, eligibility clearly cannot be determined only on the basis of wage levels. Relatively large “benefit reduction spillovers” to somewhat higher-skilled workers may therefore be expected if the relative value to firms of reducing benefits in response to minimum wage increases becomes large enough.

EFFECTS IN THE RAW DATA

Simple tabulations of these data indicate that minimum wage increases may indeed reduce the probability that low wage workers receive non-wage benefits, at least in the case of health insurance and pensions. Figures 1-4 graph the change in the proportion of workers by state who are eligible for health insurance (Figures 1 and 3) and paid pensions (Figures 2 and 4) against the real change in the effective minimum wage in the state over the period 1988-1993. Figures 1 and 2 plot the data for workers who earn \$7/hour or less (in 1989 dollars) and Figures 3 and 4 plot the data for workers who earn \$10/hour or more (also 1989 dollars). These graphs illustrate that for low wage workers larger minimum wage increases in a state are associated with larger losses in health insurance and pension eligibility in that state, while that is not the case for more highly paid workers. The comparison of trends by state for more highly paid workers provides some initial evidence that Figures 1 and 2 are not merely tracking state-specific trends that are correlated with minimum wage changes. By charting within-state differences in benefit eligibility against minimum wage changes, these figures also control for state fixed effects that could be associated with both a higher minimum wage level and a lower benefits eligibility rate.⁶ Analogous graphs for sick leave (not shown), however, do not show a similar pattern. The raw data show very little association of any kind for either low- or high-wage workers between minimum wages and sick leave.

Differences across states or differential changes within states over time in the distribution of workers by education or demographic characteristics could affect the conclusions that we draw

⁶Graphs of benefit levels by state in each of the two years against minimum wage levels show a very similar pattern to those portrayed in the graphs presented here.

from these figures, if such differences affect the prevalence of fringe benefits in the workforce and are correlated with levels or changes in the minimum wage. Differences in or changes in state economic conditions could raise similar problems. To address these issues, I move to an empirical model that can account for such factors.

MODEL

General models of human capital suggest that a worker's fringe benefits, as a non-wage component of workers' compensation, will be determined, at least in part, by the same human capital variables that enter a standard wage equation. Characteristics of the worker's firm may also play an important role in the determination of benefits since benefits' administration may involve significant fixed costs. In the case of health insurance, loading fees are lower for large firms, lowering the cost of providing health insurance for workers at larger firms.

The reduced-form linear probability model of eligibility for fringe benefits is then:

$$F_{it} = X_{it}\beta + Y_t\beta_y + S_{it}\beta_S + L_{it}\beta_L + L_{it}Y_t\beta_{LY} + M_{it}\beta_M + L_{it}M_{it}\beta_{LM} + \epsilon_{it}$$

F_{it} is a dummy variable indicating eligibility for a particular fringe benefit. The vector X_{it} includes human capital variables expected to determine a worker's compensation as well as demographic variables expected to affect a worker's demand for fringe benefits. Firm characteristics such as firm size are also included in X_{it} to capture the effect of firm characteristics on costs such as benefits' administration that may affect the provision of fringe benefits. Y_t is a dummy variable for 1993. S_{it} is a vector of state-level variables such as the state unemployment rate and the average manufacturing wage in the state. These variables control for

the average manufacturing wage in the state and state economic conditions that could influence compensation levels.⁷ L_{it} is a measure of low-skill status intended to describe workers who are most likely to be affected by minimum wage increases and M_{it} is the minimum wage measure. The minimum wage measure, M_{it} , is the federal minimum for the year unless the worker's state minimum is higher in a given year, in which case M_{it} is equal to the state minimum. All wage measures are in 1989 dollars. I use two different measures of low-skill status, L_{it} : (1) high school education or less; and (2) real wage less than or equal to \$7.00.⁸

Since we observe only whether or not workers receive benefits, I will estimate the probability that a workers is eligible for benefits using a linear probability model. The effect of the minimum wage will be captured by β_{LM} . The inclusion of controls for the state minimum wage level and the average manufacturing wage in the state helps to assure that the minimum wage measure - low-skill interaction does not merely pick up state-level differences in the generosity of fringe benefits or other differences in levels of compensation across states and that differences in relative wage levels across states are taken into account. Identifying the minimum wage effect from the coefficient on the interaction of the measure of low-skill status with the minimum wage measure guards against picking up trends in benefits provision that affect all

⁷In a footnote I also report results from models that include state fixed effects. However, the large number of control variables that are necessary, small cell sizes, and only two years of data suggest caution in using this specification.

⁸Issues of sample selection caused by any disemployment effects of the minimum wage are deferred for future research. Since I do not account for such possible sample selection, I do not use definitions of low-skill status by experience since the distribution of experience among workers is expected to be more strongly affected by selection than the distribution of education. For the same reason, I defer for future work a study of the relationship of minimum wages, fringe benefits, and part-time work.

workers and are therefore unlikely to be caused by minimum wage changes but which are correlated with minimum wage changes. Additionally, the inclusion of an interaction between low-skill status and year assures that the minimum wage interaction with low-skill status is not merely picking up secular changes in the probability that low-skilled workers are eligible for fringe benefits that are correlated with the minimum wage increases over the period.

RESULTS

Tables 4 - 6 report the results from linear probability models of the determination of eligibility for employer pensions, health insurance, and sick leave.⁹ I report in parentheses robust standard errors that allow the error terms to be correlated within states.¹⁰ These models include very general specifications of both education and experience effects. I find important nonlinearities in both of these dimensions. As shown in Figure 5, labor market experience increases eligibility rather dramatically up to five years of experience.¹¹ For example, eligibility for pensions increases 3.7 points with each year of experience up to five years. The effect of experience on benefits decreases substantially after five years of experience, becoming almost

⁹The results reported in Tables 4-6 are obtained from a sample that excludes workers in the District of Columbia (D.C.). D.C. workers are excluded because in the years covered by the sample D.C. workers were subject to a wide range of minimum wages depending on their occupation and industry (see footnote to Table 2). The results show no notable differences if, instead of excluding D.C. workers, I include them and use as the minimum wage variable for D.C. either the average of the range, the minimum of the range, or the maximum of the range.

¹⁰Moulton [1986] shows the potential importance of such intragroup correlation when some explanatory variables are aggregated to the group level.

¹¹The figures graph the results for the specification in column 3 of Tables 4-6 using the definition of low-skilled by education of high school or less and including a quadratic in the minimum wage. Results of the other specifications are similar in this dimension.

flat by 15 years of experience. As shown in Figure 6, education effects are also nonlinear, although in this case the most important nonlinearity appears to be a jump up in the probability of benefits eligibility at education levels greater than 12.

These results as well as the estimates for many of the coefficients are reported in Tables 4, 5, and 6. The tables show that the effect of other standard control variables is generally as expected. In results not presented, I also see a positive effect of firm size, as expected.

The key results for this analysis are reported in the bolded rows of Tables 4 - 6 with results for eligibility for pensions reported in Table 4, for health insurance reported in Table 5, and for sick leave reported in Table 6. I report coefficients on interactions of the state-level minimum wage and an indicator for low-skill status. Models are presented for two different measures of low-skill status – education less than or equal to 12 and real wage less than or equal to \$7.00.

EDUCATION	0.025 (0.003)	0.019 (0.003)	0.025 (0.003)	0.019 (0.003)
(EDUCATION -12)*DUMMY =1 IF EDUCATION > 12	-0.003 (0.003)	-0.005 (0.003)	-0.003 (0.003)	-0.005 (0.003)
HIGH SCHOOL DUMMY (= 1 IF EDUCATION HS OR LESS)	-0.024 (0.011)	-0.017 (0.007)	-0.029 (0.012)	-0.017 (0.007)
EXPERIENCE	0.037 (0.005)	0.025 (0.005)	0.037 (0.005)	0.025 (0.005)
(EXPERIENCE -5) * DUMMY=1 IF EXPERIENCE > 5	-0.032 (0.007)	-0.024 (0.007)	-0.032 (0.007)	-0.024 (0.007)
(EXPERIENCE-10)*DUMMY=1 IF EXPERIENCE > 10	-0.001 (0.007)	0.001 (0.008)	-0.001 (0.007)	0.001 (0.008)
(EXPERIENCE-15)*DUMMY=1 IF EXPERIENCE > 15	-0.002 (0.005)	-0.001 (0.005)	-0.002 (0.005)	-0.001 (0.005)
EXPERIENCE ≤ 5 DUMMY	-0.025 (0.020)	-0.022 (0.020)	-0.024 (0.020)	-0.022 (0.020)
EXPERIENCE ≤ 10 DUMMY	-0.025 (0.017)	-0.024 (0.017)	-0.025 (0.017)	-0.024 (0.017)
EXPERIENCE ≤15 DUMMY	-0.013 (0.013)	-0.007 (0.013)	-0.013 (0.013)	-0.007 (0.013)
HS DUMMY *	-0.010 (0.010)	---	-0.027 (0.013)	---
YEAR 1993 DUMMY	0.004 (0.009)	0.013 (0.007)	0.010 (0.009)	0.015 (0.008)
STATE MINIMUM WAGE ^B	-0.005 (0.021)	-0.033 (0.019)	-0.096 (0.061)	-0.055 (0.057)
AVERAGE MANUFACTURING WAGE IN STATE	0.005 (0.004)	0.002 (0.004)	0.005 (0.004)	0.002 (0.004)
STATE UNEMPLOYMENT RATE	-0.004 (0.002)	-0.006 (0.002)	-0.004 (0.002)	-0.006 (0.002)
LOW WAGE DUMMY *	---	-0.011 (0.015)	---	-0.021 (0.018)
STATE MINIMUM WAGE ^B SQUARED	---	---	0.125 (0.075)	0.031 (0.065)
HS DUMMY *	-0.008	---	0.210	---
STATE MINIMUM WAGE^B	(0.029)		(0.097)	
LOW WAGE DUMMY *	---	-0.070	---	0.046
STATE MINIMUM WAGE^B		(0.035)		(0.119)
HS DUMMY *	---	---	-0.304	---
STATE MINIMUM WAGE^B SQUARED			(0.109)	
LOW WAGE DUMMY	---	---	---	-0.160
STATE MINIMUM WAGE^B SQUARED				(0.128)
TEST FOR LINEAR AND QUADRATIC INTERACTION WITH MIN WG = 0				
F-STAT (PROB > F)	---	---	8.56 (0.001)	8.07 (0.001)
N	27447	25499	27447	25499
R2	0.355	0.365	0.355	0.365

^ALINEAR PROBABILITY MODELS, ALSO INCLUDING MALE DUMMY, NONWHITE DUMMY, UNION DUMMY, DUMMIES FOR REGION, DUMMIES FOR FIRM SIZE, AND A CONSTANT.
^BSTATE MINIMUM WAGE DEFINED AS AMOUNT BY WHICH THE STATE MINIMUM EXCEEDS THE 1988 FEDERAL MINIMUM (IN \$1989).

EDUCATION	0.023 (0.003)	0.018 (0.003)	0.023 (0.003)	0.018 (0.003)
(EDUCATION -12)*DUMMY=1 IF EDUCATION > 12	-0.012 (0.003)	-0.014 (0.003)	-0.012 (0.003)	-0.012 (0.003)
HIGH SCHOOL DUMMY (= 1 IF EDUCATION HS OR LESS)	-0.030 (0.007)	-0.015 (0.006)	-0.035 (0.008)	-0.015 (0.006)
EXPERIENCE	0.026 (0.006)	0.016 (0.006)	0.026 (0.006)	0.016 (0.006)
(EXPERIENCE -5) * DUMMY=1 IF EXPERIENCE > 5	-0.023 (0.007)	-0.017 (0.007)	-0.023 (0.007)	-0.017 (0.007)
(EXPERIENCE-10)*DUMMY=1 IF EXPERIENCE > 10	-0.003 (0.005)	-0.001 (0.005)	-0.003 (0.005)	-0.001 (0.005)
(EXPERIENCE-15)*DUMMY=1 IF EXPERIENCE > 15	0.001 (0.003)	0.003 (0.004)	0.001 (0.003)	0.003 (0.004)
EXPERIENCE ≤ 5 DUMMY	-0.014 (0.017)	-0.011 (0.016)	-0.013 (0.017)	-0.011 (0.016)
EXPERIENCE ≤ 10 DUMMY	-0.019 (0.015)	-0.019 (0.014)	-0.020 (0.015)	-0.019 (0.014)
EXPERIENCE ≤15 DUMMY	0.001 (0.009)	0.007 (0.009)	0.0005 (0.009)	0.007 (0.009)
HS DUMMY *	-0.017 (0.010)	—	-0.032 (0.012)	—
YEAR 1993 DUMMY	-0.011 (0.007)	0.002 (0.007)	0.001 (0.007)	0.008 (0.007)
STATE MINIMUM WAGE ^B	0.007 (0.042)	-0.004 (0.019)	-0.149 (0.058)	-0.072 (0.036)
AVERAGE MANUFACTURING WAGE IN STATE	0.003 (0.002)	0.001 (0.002)	0.003 (0.002)	0.001 (0.002)
STATE UNEMPLOYMENT RATE	-0.005 (0.002)	-0.007 (0.002)	-0.005 (0.002)	-0.007 (0.002)
LOW WAGE DUMMY *	—	-0.029 (0.014)	—	-0.039 (0.019)
STATE MINIMUM WAGE ^B SQUARED	—	—	0.211 (0.107)	0.095 (0.055)
HS DUMMY *	0.038	—	0.240	—
STATE MINIMUM WAGE^B	(0.032)	—	(0.063)	—
LOW WAGE DUMMY *	—	0.030	—	0.153
STATE MINIMUM WAGE^B	—	(0.066)	—	(0.152)
HS DUMMY *	—	—	-0.278	---
STATE MINIMUM WAGE^B SQUARED	—	—	(0.075)	---
LOW WAGE DUMMY	—	—	—	-0.172
STATE MINIMUM WAGE^B SQUARED	—	—	—	(0.188)
TEST FOR LINEAR AND QUADRATIC INTERACTION WITH MIN WG = 0				
F-STAT (PROB > F)	—	—	7.23 (0.002)	0.51 (0.604)
N	27447	25499	27447	25499
R2	0.253	0.273	0.253	0.273

^ALINEAR PROBABILITY MODELS, ALSO INCLUDING MALE DUMMY, NONWHITE DUMMY, UNION DUMMY, DUMMIES FOR REGION, DUMMIES FOR FIRM SIZE, AND A CONSTANT.
^BSTATE MINIMUM WAGE DEFINED AS AMOUNT BY WHICH THE STATE MINIMUM EXCEEDS THE 1988 FEDERAL MINIMUM (IN \$1989).

EDUCATION	0.033 (0.002)	0.028 (0.002)	0.033 (0.002)	0.027 (0.002)
(EDUCATION -12)*DUMMY=1 IF EDUCATION > 12	-0.010 (0.003)	-0.007 (0.003)	-0.010 (0.003)	-0.007 (0.003)
HIGH SCHOOL DUMMY (= 1 IF EDUCATION HS OR LESS)	-0.072 (0.013)	-0.051 (0.011)	-0.074 (0.013)	-0.051 (0.011)
EXPERIENCE	0.025 (0.006)	0.015 (0.006)	0.025 (0.006)	0.015 (0.006)
(EXPERIENCE -5) * DUMMY=1 IF EXPERIENCE > 5	-0.015 (0.006)	-0.008 (0.006)	-0.015 (0.006)	-0.008 (0.006)
(EXPERIENCE-10)*DUMMY=1 IF EXPERIENCE > 10	-0.006 (0.007)	-0.003 (0.007)	-0.006 (0.007)	-0.003 (0.007)
(EXPERIENCE-15)*DUMMY=1 IF EXPERIENCE > 15	-0.003 (0.004)	-0.001 (0.005)	-0.003 (0.004)	-0.001 (0.005)
EXPERIENCE ≤ 5 DUMMY	0.003 (0.022)	0.004 (0.021)	0.003 (0.022)	0.004 (0.020)
EXPERIENCE ≤ 10 DUMMY	0.011 (0.018)	0.010 (0.018)	0.011 (0.018)	0.010 (0.018)
EXPERIENCE ≤15 DUMMY	0.008 (0.014)	0.014 (0.014)	0.008 (0.014)	0.014 (0.14)
HS DUMMY *	-0.014 (0.012)	—	-0.021 (0.017)	—
YEAR 1993 DUMMY	-0.011 (0.011)	-0.017 (0.012)	-0.003 (0.012)	-0.013 (0.013)
STATE MINIMUM WAGE ^B	-0.018 (0.040)	0.024 (0.024)	-0.120 (0.076)	-0.016 (0.075)
AVERAGE MANUFACTURING WAGE IN STATE	0.011 (0.005)	0.006 (0.004)	0.011 (0.005)	0.006 (0.004)
STATE UNEMPLOYMENT RATE	-0.005 (0.003)	-0.005 (0.003)	-0.005 (0.003)	-0.005 (0.003)
LOW WAGE DUMMY *	—	0.008 (0.014)	—	0.011 (0.015)
STATE MINIMUM WAGE ^B SQUARED	—	—	0.138 (0.102)	0.056 (0.081)
HS DUMMY *	0.049	—	0.144	---
STATE MINIMUM WAGE^B	(0.037)	—	(0.132)	---
LOW WAGE DUMMY *	—	0.004	—	-0.015
STATE MINIMUM WAGE^B	—	(0.050)	—	(0.103)
HS DUMMY *	—	—	-0.130	—
STATE MINIMUM WAGE^B SQUARED	—	—	(0.152)	—
LOW WAGE DUMMY	—	—	—	-0.026
STATE MINIMUM WAGE^B SQUARED	—	—	—	(0.118)
TEST FOR LINEAR AND QUADRATIC INTERACTION WITH MIN WG = 0				
F-STAT (PROB > F)	—	—	0.87 (0.427)	0.03 (0.971)
N	27447	25499	27447	25499
R2	0.207	0.220	0.207	0.220

^ALINEAR PROBABILITY MODELS, ALSO INCLUDING MALE DUMMY, NONWHITE DUMMY, UNION DUMMY, DUMMIES FOR REGION, DUMMIES FOR FIRM SIZE, AND A CONSTANT.

^BSTATE MINIMUM WAGE DEFINED AS AMOUNT BY WHICH THE STATE MINIMUM EXCEEDS THE 1988 FEDERAL MINIMUM (IN \$1989).

The first two columns of each table allow only for a linear effect of the minimum wage. As discussed above, however, the very low level of the federal minimum wage in 1988 may not have been binding. More generally, the minimum wage could have different effects on eligibility for benefits depending on its level. To account for this possibility, the last two columns of each table also include the square of the minimum wage and an interaction between the low-skill indicator and the square of the minimum wage.

In the linear specifications, it appears that the minimum wage has an effect only on the pension eligibility of low-wage workers. In that model the minimum wage - low-skill interaction is negative and significant. That is, relative to higher wage workers, low-wage workers in states with higher minimum wages were significantly worse off with respect to eligibility for pensions than low-wage workers in states with lower minimum wages. In the linear model with the low-wage definition of low-skilled, a \$1.00 increase in the minimum wage is estimated to reduce the pension eligibility of low-wage workers by 7 percentage points. Other estimates for the linear specification are statistically insignificant.

As discussed above, in 1988 the real federal minimum wage was quite low relative to its historical level and some previous evidence suggests that the legislated federal minimum wage may not have been binding at that time. The quadratic specifications of columns 3 and 4 of these three tables address that possibility, allowing the effect of the minimum wage on benefits eligibility to vary with the level of the minimum wage. Such nonlinearities turn out to be quite important in understanding minimum wage effects on pensions and health insurance. This is made most clear in Figures 7 and 8 where the estimated minimum wage effects for low-skilled workers for the quadratic model are graphed. We see that raising the minimum wage from the

lowest level observed in the sample (approximately \$3.50 in 1989 dollars) is associated with either no change in eligibility for benefits or a small increase in eligibility. As the minimum wage increases, however, the further increases are associated with substantial decreases in eligibility for pensions and health insurance eligibility. The tables that follow also report the F-test for the joint significance of the linear and squared interaction with the low-skill indicator. The two are jointly significant in both pension models and in the health insurance model with the interaction with low education level. Although not statistically significant, the minimum wage effect on health insurance for low-wage workers implies a very similar profile (graphed in Figure 8) to the profile implied by its significant effect for low-education workers (graphed in Figure 7).

Figures 7 and 8 give a good overview of the overall shape of the quadratic effect of minimum wages on the eligibility of low-skilled workers for benefits, particularly the negative effect that occurs as the level of the minimum wage increases. Since the minimum wage is in 1989 dollars, it may be more difficult, however, to see immediately where nominal minimum wage levels fall on the graph and to grasp whether the downward sloping portion of the estimated profile is the most relevant. Therefore, the following table presents the estimated effects from the quadratic model with the interaction with low-education level for various levels of the federal minimum wage.

It is clear from Table 7 that there are economically significant negative effects on pension and health insurance eligibility at relevant levels of the minimum wage. For example, a \$0.50 increase in the minimum wage from its 1999 level is predicted to decrease pension eligibility of less educated workers by 6.8 points and health insurance eligibility by 3.9 points. These are

substantial losses. At lower levels of the minimum wage, however, the effects are not nearly so dramatic.

Table 7 Percentage Point Change in Eligibility for Benefits with Minimum Wage Increase				
Federal Minimum (Nominal)		Pension Eligibility ^a	Health Insurance Eligibility ^a	Sick Leave Eligibility ^b
1988: \$3.35 (\$3.51 \$1989)	\$0.50 increase	0.029	0.051	0.040
	\$1.00 increase	-0.094	-0.038	0.014
1993: \$4.25 (\$3.65 \$1989)	\$0.50 increase	-0.013	0.012	0.021
	\$0.75 increase ^c	-0.077	-0.035	0.008
1999: \$5.15 (\$3.83 \$1989)	\$0.50 increase ^c	-0.068	-0.039	-0.002
^a Significant at 0.01 level or less. ^b Insignificant. (P-value 0.43). ^c The effects of larger increases are not reported since such increases would be out of sample. The maximum sample value for the real minimum wage is \$4.51.				

Starting from the 1988 federal minimum, a \$0.50 increase is actually estimated to have a positive effect. For the low education definition of low-skilled the downward sloping portion of the curve for health insurance and pensions begin at a minimum wage level of approximately \$3.80 in 1989 dollars (or \$5.07 in 1999 dollars).¹² Over the relevant range, large negative effects are estimated to occur when the minimum wage increase is relatively large, even when the starting point is very low or when even small increases occur from a relatively high starting point.

As is clear from both the figures and the tables, the effect of the minimum wage on pension eligibility is consistently stronger and more significant than the effect on either health

¹²For the low wage definition of low-skilled, the maximum of the curve occurs at a lower minimum wage in the case of pensions and at a higher level for health insurance (Figure 8).

insurance or sick leave. In the linear specification, we see a negative effect only for pensions. Although it is possible that employers could reduce any or all of these benefits in response to a minimum wage increase, there is no reason that all benefits would have to be reduced proportionately. There are many reasons to speculate that eligibility for pensions may be less valuable to low-skilled workers than health insurance or sick leave. Workers are already covered by social security insurance and may consider that adequate for their retirement. Low-skilled workers may have high discount rates and pension compensation is deferred while health insurance and sick leave represent current compensation. Pension eligibility is lower at all levels of the minimum wage than eligibility for the other two benefits, suggesting perhaps that deferred compensation is valued less by workers in general. Although I can merely speculate as to the reasons that the estimated effects are stronger for pensions, the substantial differences in the size of the minimum wage effect for different types of benefits suggests the need for further work on workers' valuation of different types of benefits and possible differences in the value of various benefits by workers of different skill levels.

SPECIFICATION CHECKS

Before drawing any conclusions in a study of this sort, it is important to establish that the variable representing the minimum wage “treatment” is associated with wage increases for the groups identified as experiencing benefit losses. Minimum wage increases could have no wage effects, if, for example, wages in the states which increased the minimum already had such high wage levels that the increase had no “bite.” If the increases in the minimum wage had no wage effects, we would not expect any fringe benefit decreases as a result.

Wage equations that include the level of the minimum wage and the low-education - minimum wage interaction as well as those with the quadratic model do indicate positive and significant wage effects associated with the minimum wage. Additionally the quadratic models show the same pattern but in the opposite direction as the fringe benefit models. That is, the wage models also show that the wage effects are stronger (in this case positive) at higher levels of the minimum wage. However, the magnitude of the estimated effect on wages varies substantially across specifications. For example, although the wage effects of minimum wages are significant and positive in each case, the size of the effect varies considerably with the addition of industry dummies or state fixed effects. Since they are consistent with respect to sign and significance, I interpret the wage regression results as evidence that the minimum wage does have some “bite” at least at the higher levels observed in the sample. Given the considerable differences in the magnitude of the estimates across specifications of the wage regressions, however, I cannot compare the size of the wage effects directly to the size of the benefit reductions estimated below.

A second critical aspect of a study of this sort is the validity of the comparisons which are used to draw inferences. In this study, conclusions are based on the coefficient on an interaction of low-skill status and a state-level measure of the effective minimum wage. The estimated minimum wage effect therefore reflects the differential effect that minimum wage changes have on the fringe benefits of workers more likely to be affected by a minimum wage as compared to workers less likely to be affected. In order for the estimates to be biased, there would have to be omitted variables that affect the fringe benefits of low-skilled workers differently from high-skilled workers that are also correlated with differences across states and across time in the minimum wage. Many possible such omitted variables will be accounted for by the interaction of

low-skill status and a year dummy included in all of the models presented. For example, if the well-documented widening of the wage gap in the U.S. over the period is also evident in fringe benefits, then a secular increase in minimum wages affecting low-skilled workers could be correlated with the unknown factors causing this growing dispersion. The interaction between the year dummy and the indicator for low-skill will account for increases in inequality over time that are caused by unmeasured factors. I control for differences across states using the (uninteracted) level of the minimum wage, the average manufacturing wage in the state, and the unemployment rate in the state. I have also used a variety of other state level variables such as lagged values of unemployment rates, employment, and average manufacturing wages to control for state economic conditions and other differences across states.¹³ The estimates are also not sensitive to the exclusion of particular states or groups of states such as New England.

In order to assure that the comparison between lower- and more highly-skilled workers and the variation in minimum wages across states is useful, I have also run a variety of specification checks. For example, demand for fringe benefits across these groups may vary with income since we expect that benefits are a normal good and with tax rates since fringe benefits enjoy a tax advantage since they are excluded from taxable income. To account for this, I have also estimated models that control for income levels and state tax rates, with no notable effect on the results. I have also defined low-wage using different wage cutoffs. Again, the results are very similar, though in some cases the standard errors are larger.

¹³I have also run specifications with state fixed effects. Some states must be dropped when all of the necessary control variables are included in the regression. Given the small cell sizes available I do not report these results except to note that the qualitative results are similar but the estimates have larger standard errors.

At least one additional control to assure the comparability of low-skilled and high-skilled workers in the case of health insurance eligibility is suggested by the literature on the effect on private insurance coverage of recent Medicaid expansions (Cutler and Gruber [1996], Shore-Sheppard [1997], Shore-Sheppard, Buchmueller, and Jensen [1998]). These studies explore “crowd out,” or the effect that increasing eligibility for Medicaid may have had on eligibility for and take-up of employer-provided private insurance. Eligibility for Medicaid expanded significantly over the sample period. Studies of crowd out suggest that some employers may have discontinued their employer health insurance in response to these expansions since more low-wage workers were made eligible for Medicaid. Expansions occurred differentially across states and could have been correlated with minimum wage changes. The expansions were also much more likely to have affected low-wage than high-wage workers. Therefore, using data on the estimated fraction of children eligible for Medicaid by state and year, I have also attempted to control for Medicaid eligibility by state in order to assure that the minimum wage effects found above are not due to omitted variables associated with state Medicaid expansions.¹⁴ I find that the fraction eligible for Medicaid and minimum wages, both state-level variables that increased over this period on average, are highly correlated and that these variables are collinear enough that

¹⁴These data were graciously provided by Lara Shore-Sheppard. The fraction eligible measure is estimated by using the CPS data on a national sample, and separately applying the Medicaid rules in each state and year, to each child to determine individual eligibility. The fraction of the national sample of children eligible according to the rules of each state is then based on the number of children calculated to be eligible. Note that this fraction is not the actual fraction of children in the state that are eligible because that would also vary with the income distribution of the state. This measure varies only with the variation in the rules for each state and changes over time in those rules.

it is not possible to estimate separate effects with these data.¹⁵ However, since we also see even stronger minimum wage effects on the pensions of low-skilled workers, fringe benefits not expected to be affected by Medicaid expansions, I do not interpret this as evidence against a minimum wage effect on employer health insurance.

EXPECTED COST OF BENEFITS REDUCTION

One drawback of the CPS data is that it is only possible to examine the incidence of each fringe benefit. It would be preferable to have data on the level of the employer contribution for each benefit but no such dataset is available. Nonetheless, it is possible to estimate the expected cost savings to employers of the estimated fringe benefit reduction associated with a minimum wage increase by using aggregated data on benefit costs. Estimates of the expected cost of any benefits reductions are important for gauging the effect of the minimum wage on worker well-being. It is also critical to understand the net effect on workers' total compensation in order to interpret the literature on employment effects of the minimum wage.¹⁶ I estimate the expected employer cost of health insurance, pension, and sick leave coverage using the Employer Costs for Employee Compensation (ECEC) series from the Employment Cost Index survey. These estimates, in combination with the estimate of the change in the probability of receiving each benefit that is associated with a \$1 increase in the minimum wage, will provide evidence of the magnitude in dollars of the fringe benefit reductions associated with minimum wage increases.

¹⁵The fraction eligible and the minimum wage and interactions of both with low-skill status are jointly but not individually significant when all are included in the models.

¹⁶See Holzer et. al. [1991] for a discussion of reasons employers may not be able to offset fully the minimum wage increase.

The ECEC provides data on the average hourly cost of each component of fringe benefits for the civilian labor force and by occupation and industry. The civilian averages for 1993 (in 1989 dollars) are presented in Table 8 below. These figures represent the average cost of provision of the benefit for all workers, whether or not the benefit is received by the worker. The conditional average cost given provision of the benefit is, therefore, the ECEC average cost divided by the probability of receiving the benefit. Using probabilities of eligibility (reported in row two) for each benefit estimated from the CPS for all workers (both full- and part-time since the ECEC data includes both full- and part-time workers), I estimate a conditional average cost for each benefit given that it is offered. These estimates are reported in row three of Table 8. The first thing to note about these figures is that benefits costs are large enough to provide offsets to relatively large minimum wage increases. If an employee goes from being eligible to ineligible for all three benefits and initially receives benefits equal to the average received in the civilian workforce, his total compensation would decrease by \$2.63, far more than enough to offset the \$0.90 increase in the federal minimum that occurred between 1988 and 1993.

Using the estimates of this paper, I can also calculate the expected average benefit cost reductions for low-skilled workers due to the reduction in health insurance, pension, and sick leave benefits in response to the minimum wage. Using the estimates from specifications defining low-skill status as low education and including the quadratic minimum wage variables, we find that a \$1.00 increase in the minimum wage from the 1988 federal level decreases the probability of a full-time worker being eligible for employer health insurance by 3.8 points and for pensions by 9.4 points. The estimate for sick leave is a positive (though insignificant) 1.4 point.

Table 8 Hourly Costs of Fringe Benefits and Expected Cost of Benefit Reduction Full-time, Low Education Workers				
	Pension	Health Insurance	Sick Leave	Total
Average Hourly Cost 1993, Civilian Workforce, \$1989 from ECEC	0.60	1.05	0.16	1.81
Probability Eligible 1993, All Workers (Full- and Part-time) from CPS	0.58	0.78	0.63	
Average Hourly Cost Conditional on Being Eligible	1.03	1.35	0.25	2.63
Δ Probability with \$1 Increase in Minimum Wage, Full-time Workers, Col. 3 of Table 5, 4 or 6 from 1988 Federal Minimum	-0.094	-0.038	0.014	
Average Hourly Decrease in Benefits Costs with \$1 Increase in Minimum Wage	0.10	0.05	0.00	0.15

These probability changes multiplied by the conditional cost of benefits in row three of Table 8 produce the expected cost reductions for these three benefits for this group of low-skilled workers that is reported in row five of Table 8. Keep in mind that this is an average across all workers with low education, many of whom will not be affected by a change in the minimum wage. The expected reduction in compensation of \$0.015/hour associated with a \$1 increase in the minimum wage in these three benefits must therefore be considered substantial.

The expected value of the reduction in benefits calculated above can only be interpreted as an attempt to identify whether these reductions are economically significant and not a robust estimate of the magnitude of this effect for several reasons. First, the CPS data do not provide data on the cost of these benefits so the average cost for the civilian workforce is used in the calculation. But just as low-skilled workers have a lower incidence of fringe benefits, so we expect that the level of benefits provided will be lower. ECEC data do show that lower-wage

occupations also receive lower levels of benefits on average. Without data on the fringe benefit costs of individual workers, it is not possible to estimate the expected reduction in fringe benefits associated with a minimum wage increase specifically for low-skilled workers.

Additionally, pensions, health insurance and sick leave do not represent the full menu of benefits available to workers. According to the ECEC, these three benefits comprise approximately 57% of the total spent by employers on average for voluntarily-provided non-wage compensation (as opposed to legally-required benefits). Reductions may, of course, also occur in benefits such as paid vacation time or employer-provided life insurance which we cannot track in the CPS.¹⁷ The CPS does not allow estimation of fringe benefit reductions for the full menu of benefits provided by employers.

Also, as noted above, although the effects on benefits are robust across different models using the same definition for low-skill status, the magnitude of the effect for wage increases is sensitive to the specification. Since I cannot calculate with confidence the expected wage increase associated with a higher minimum wage using these data, I cannot calculate the expected wage offset implied by the estimates obtained here. More detailed data on the dollar value of benefits for individual workers or for specific jobs are clearly needed to pursue these questions further.

HOW ARE BENEFITS BEING REDUCED BY EMPLOYERS?

In order to measure the net benefits of minimum wage increases as well as the winners and losers with respect to this policy change, it may also be helpful to know more about the

¹⁷According to the ECEC, the two largest components of voluntarily-provided benefits not included here are paid vacation and paid holidays which together comprise another 26% of average voluntary non-wage benefits.

mechanisms through which firms reduce fringe benefits in response to changes in the minimum wage. For example, do firms continue to offer benefits but to fewer employees by changing their eligibility requirements? Do we see the exit and entry of firms with different compensation structures? Do firms simply quit offering benefits to any of their employees? Each of these possibilities may suggest different policy responses to declines in health insurance availability or pension provision resulting from increases in the minimum wage.

In order to shed some light on the source of benefit eligibility declines, I use the CPS information on whether health benefits or pension benefits are offered to any worker at the respondent's firm and whether the respondent is eligible for such coverage, given that the benefit is offered.¹⁸ I compare the separate effects of the minimum wage on the offering of the benefit and on conditional eligibility to the results obtained above where eligibility is not conditional on the firm offering the benefit to any workers. (That is, in the case of unconditional eligibility, a worker is not eligible if the firm does not offer the benefit at all or if she or he is ineligible for the offered benefit.) The distinction between a firm's offering and the conditional eligibility of the worker is available for health insurance and pension coverage. No such breakdown is available in the CPS for sick leave. Table 9 presents the proportion of workers represented in each of these categories.

Linear probability models of the same form as those for unconditional eligibility presented above reveal that some portion of the estimated (unconditional) eligibility effect is due to effects

¹⁸This approach follows that used by Farber and Levy [2000] in their study of trends in employer health insurance.

on the conditional eligibility that a workers is eligible for the benefit given that it is offered at the firm

Table 9 Percentage of Workers Whose Firms Offer Benefits to Any Employees at the Firm and Conditional Eligibility of Workers Given Benefits Offered to Any Employees		
	Offered at Worker's Firm	Worker Eligible Given Offered
Health Insurance	87%	97%
Pension	71%	90%

but that the bulk of the unconditional eligibility effect is due to the effect of the minimum wage on the probability that a firm will offer the benefit at all. The quadratic interaction is significant in the conditional eligibility model only for pensions where low-skilled defined as low education. The quadratic interaction terms are jointly significant for the firm's offering of the benefit in the same three models in which it was significant for unconditional eligibility. This may, in part, simply be a result of the fact that, as illustrated in Table 9, there are very few workers in the sample who are not eligible for the benefit given that it is offered by the firm, especially in the case of health insurance. This in turn may reflect the fact that non-discrimination regulations, render firm eligibility policies a relatively small margin along which to change compensation packages; however, it may also again reflect the need for more data and more detailed data. Though I find some evidence that reductions in benefits occur via more stringent eligibility requirements for benefits that exclude low-skilled workers, it appears that most of the estimated effects occur through a lower probability of the offering of benefits by firms with lower-skilled workforces. It would interesting to determine whether some of these reductions have occurred, as has been suggested in the popular press, through the growth of the outsourcing industry and

temporary help firms composed largely of low-skilled workers who are not offered fringe benefits. This question cannot be answered with this dataset.

INTERPRETATION AND CONCLUSIONS

Low-skilled workers are eligible for fringe benefits through their employers, albeit with lower probability than their high-skilled counterparts. These fringe benefits offer a mechanism for employers to reduce compensation in response to a legislated increase in the minimum wage. The results of this paper suggest that employers do reduce the probability that low-skilled workers will be eligible for health insurance and pensions as the minimum wage is increased, at least at higher levels of the minimum wage or for large increases in the minimum wage. I find no such reductions in sick leave. Any reduction in fringe benefits clearly has an impact on worker well-being that offsets, at least to some extent, the gains that individual workers may realize as a result of an increase in the minimum wage. Such reductions in total compensation also lower the size of the employment response that would be expected in response to a given increase in the minimum wage.

Data on fringe benefits are notoriously hard to come by and the data used in this study are not ideal. For example, the CPS tracks only whether or not the worker is eligible for the benefit, not its cost to the employer. These data do suggest, however, that low-skilled workers may see benefits reductions as minimum wages increase. The evidence presented here and the clear implications of such findings indicate that this empirical issue is indeed worth pursuing, especially as more or better data become available.

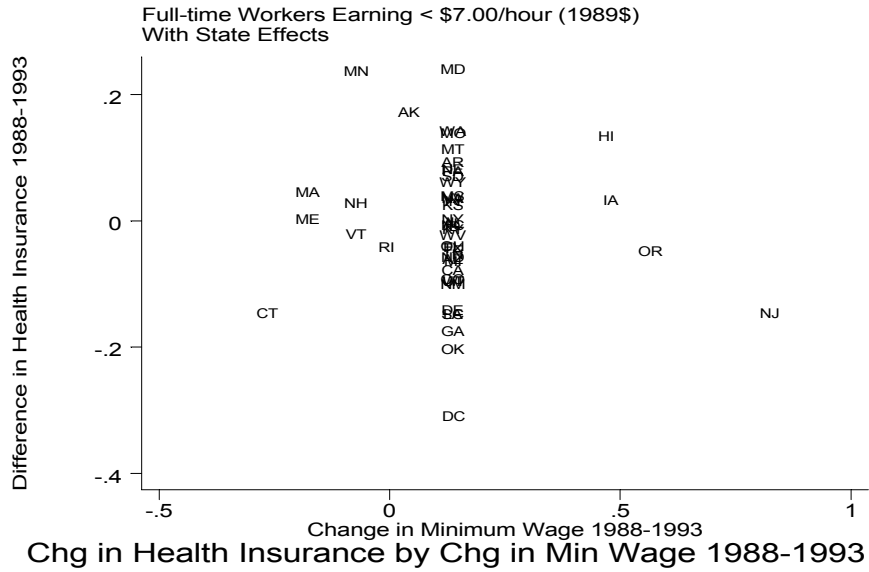


Figure 1

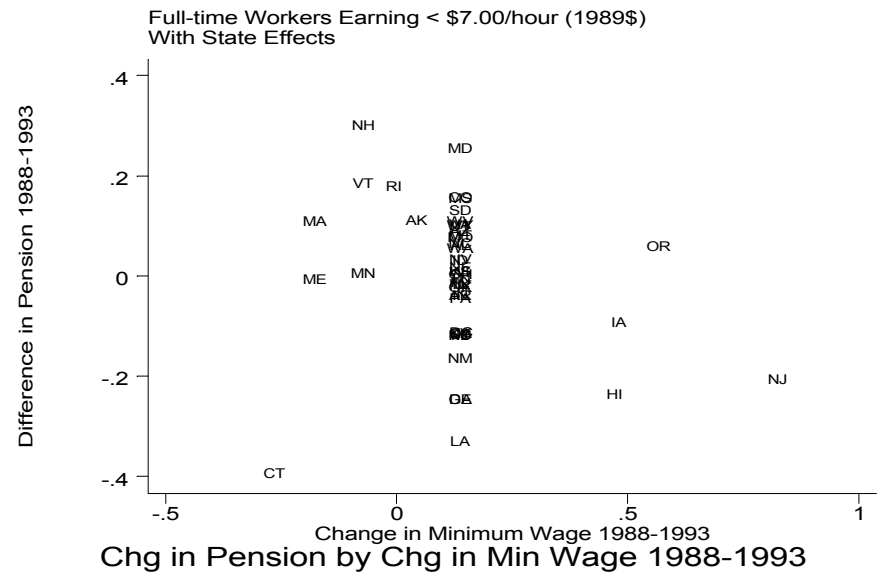


Figure 2

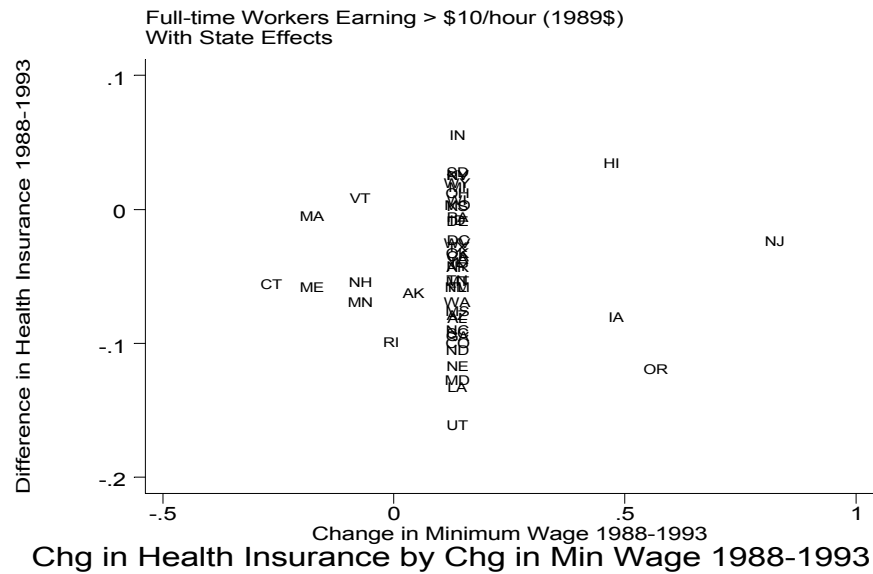


Figure 3

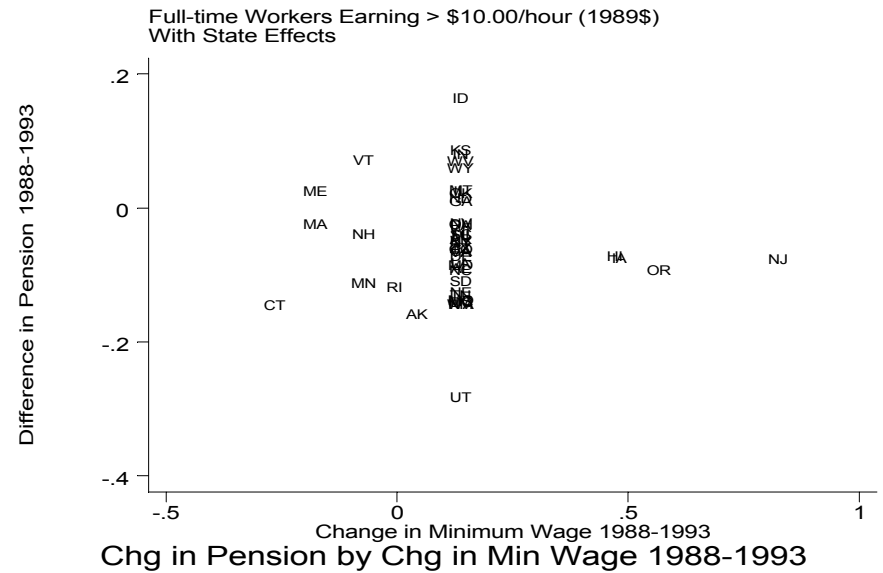


Figure 4

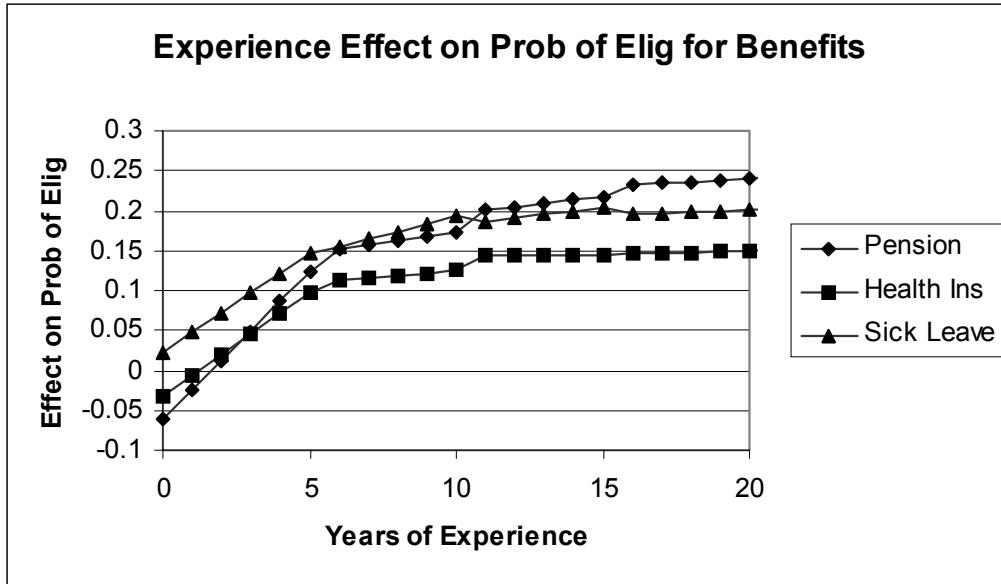


Figure 5

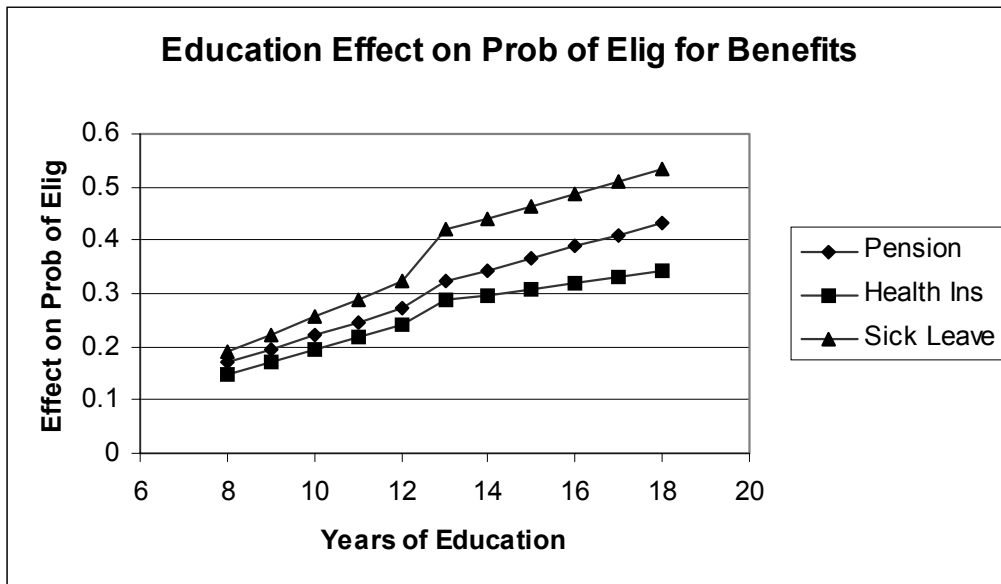


Figure 6

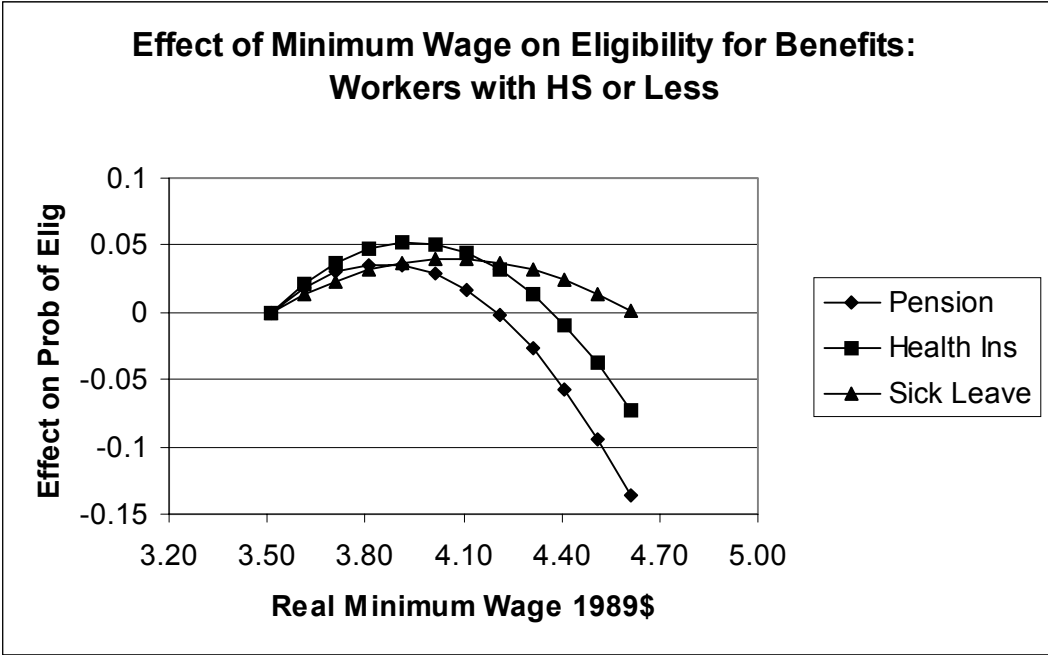


Figure 7

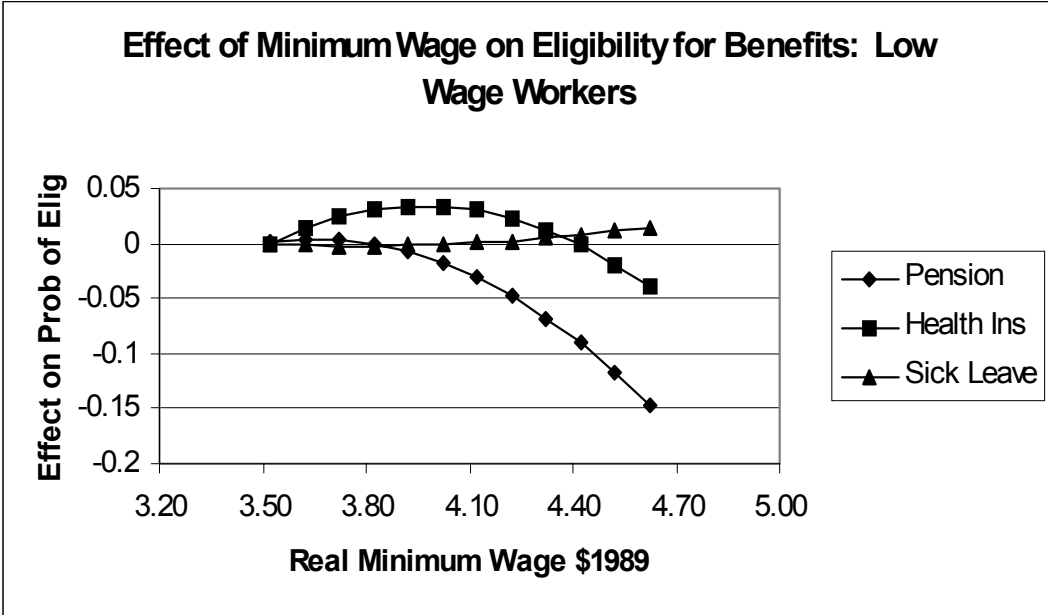


Figure 8

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