



THE IMPACT OF MINIMUM WAGE INDEXING:

Employment and Wage Evidence
from Oregon and Washington

Eric Fruits, Ph.D.
Economics International Corp.

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The Employment Policies Institute (EPI) is a nonprofit research organization dedicated to studying public policy issues surrounding employment growth. In particular, EPI research focuses on issues that affect entry-level employment. Among other issues, EPI research has quantified the impact of new labor costs on job creation, explored the connection between entry-level employment and welfare reform, and analyzed the demographic distribution of mandated benefits. EPI sponsors nonpartisan research that is conducted by independent economists at major universities around the country.

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Dr. Fruits has published peer-reviewed papers on a wide range of topics in economics, finance, and regulation. His op-eds and letters have been published in a variety of places, including *The Economist*. In addition to consulting, he has been a professor at Portland State University, the University of Southern California, Indiana University, and the Claremont Colleges, where he has taught business, economics, finance, and statistics courses.

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I N S T I T U T E

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Executive Summary

Minimum wage increases are a hot-button issue in many states. On the one hand, the minimum wage is often cited as a textbook example of how price floors create surpluses in which too many workers chase too few jobs, especially among those applicants with the fewest skills. On the other hand, proponents of raising the minimum wage suggest that increases are virtually painless. Because minimum wage increases can be politically challenging to implement, many states have introduced minimum wage indexing. With indexing, the minimum wage increases automatically each year based on some measure of inflation.

The goal of this research is to evaluate quantitatively the economic effects of minimum wage indexing, with a focus on Oregon and Washington's experience. Impacts are quantified by how they affect (1) employment and (2) hourly wages for hourly workers.

The project uses wage data from the annual March Current Population Surveys (CPS) covering the period 2003–2008 for Oregon, Washington, and their neighboring states (California, Idaho, and Nevada). This in-

formation covers the period in which both Oregon and Washington have indexed their minimum wages. The data provide sufficient detail for individuals in Oregon, Washington, and other states; thus, differences in and changes to the wage and employment distribution can be tested statistically.

The model used in this study accounts for the possibility that factors affecting whether an individual is employed also affect the hourly wage earned. Rather than assuming that younger individuals are differentially affected by the minimum wage and minimum wage indexing, this study tests and quantifies minimum wage impacts by age.

Key Findings

Higher minimum wages in Oregon and Washington are associated with reduced employment: Regression results indicate that Oregon and Washington's higher minimum wages are associated with a statistically significant reduced probability of being employed.

Younger members of the labor force are more likely to be adversely affected by increases in the minimum wage and minimum wage indexing: Oregon and Wash-

ington's indexing policy produces annual increases in the minimum wage that, in turn, are likely to increase unemployment, especially among the young.

Higher minimum wages have no statistically significant impact on wages of Oregon and Washington hourly wage earners: Regression results indicate that,

controlling for employment impacts, increasing minimum wages has no statistically or economically significant impact on income. Thus, minimum wage indexing imposes employment costs with no measurable income benefits.

Employment Policies Institute

Impact of Minimum Wage Indexing on Employment and Wages: Evidence from Oregon and Washington

Minimum wage increases are a contentious issue in many states. Because minimum wage increases can be politically challenging to implement, many states have introduced minimum wage indexing. With indexing, the minimum wage increases automatically each year based on some measure of inflation. Washington voters were the first to adopt an indexing provision, voting in 1998 to increase the state's minimum wage to \$6.50 per hour by January 1, 2000. Starting in 2001, the state's Department of Labor and Industries began making annual adjustments to the minimum wage each year based on the federal Consumer Price Index (CPI). In January 2009, Washington's minimum wage increased to \$8.55 an hour, or \$2.00 more than the federal minimum wage of \$6.55.

In November 2002, Oregon voters passed Measure 25, which increased Oregon's minimum wage to \$6.90 per hour effective January 1, 2003. In addition to the increase, the ballot measure requires the State's Bureau of Labor and Industries to annually adjust the minimum wage for inflation based on a rise in the CPI. The annual adjustment is to be calculated every September, rounded to the nearest five cents, and becomes effective the following January. In January 2009, Oregon's minimum wage increased to \$8.40 an hour, or \$1.85 more than the federal minimum wage.

In addition to Washington and Oregon, eight other states increase the minimum wage in line with some measure of inflation: Arizona, Colorado, Florida, Missouri, Montana, Nevada, Ohio, and Vermont. The cities of San

Francisco, California, and Santa Fe, New Mexico, also have minimum wage indexing.

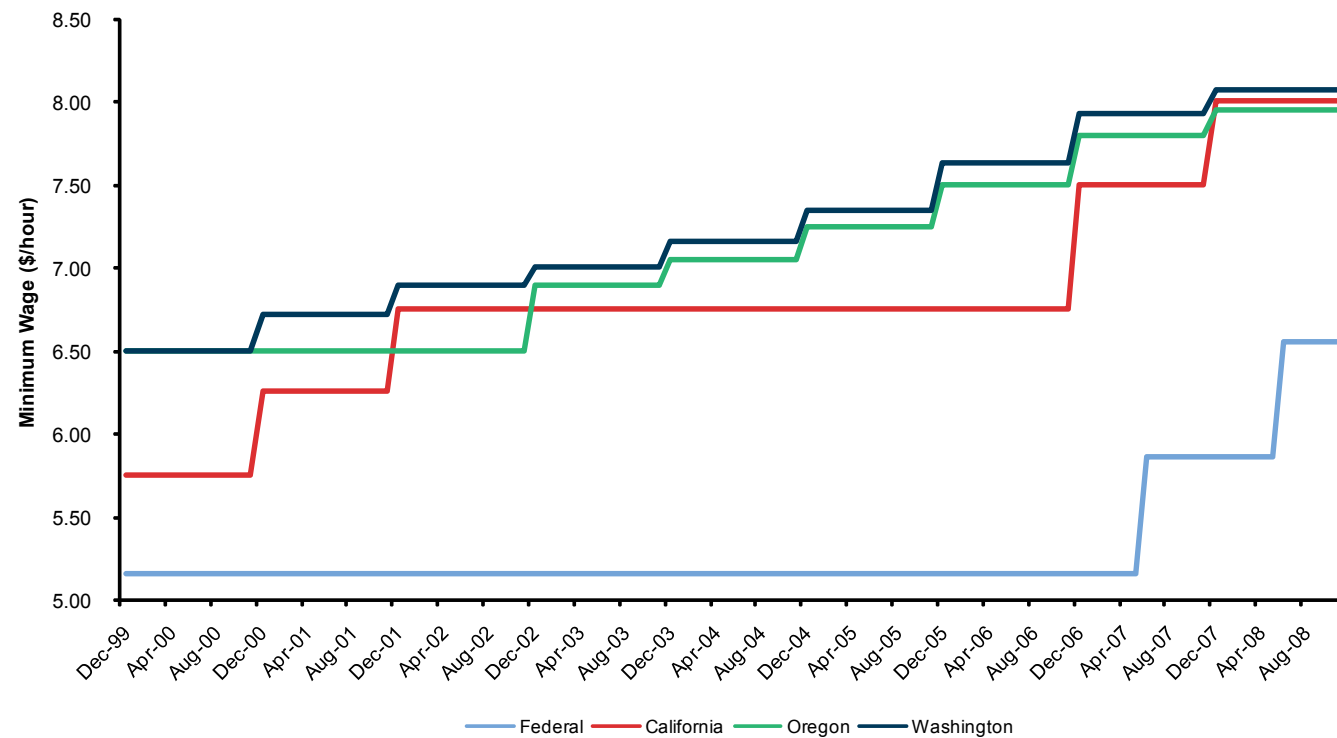
Neoclassical economists cite the minimum wage as a textbook example of how price floors create surpluses in which too many workers chase too few jobs. These job impacts chiefly affect younger and less skilled applicants. Signaling theory suggests that high or increasing minimum wages send signals to business that a state may have other regulations that are unfavorable to businesses. In this way, even employers who do not hire low-wage workers would prefer to locate or expand in states with more favorable minimum wages and other business regulations. In contrast, proponents of raising the minimum wage suggest that increases are virtually painless. Proponents argue that businesses may exert market power in labor or product markets or that increased labor costs are costlessly passed on to consumers or other businesses.

The goal of this research is to evaluate quantitatively the economic effects of minimum wage indexing, with a focus on Oregon and Washington's experiences. Impacts are quantified by how they affect (1) employment and (2) hourly wages for hourly workers.

The project uses wage data from the annual March Current Population Surveys (CPS) covering the period 2003–2008 for Oregon, Washington, and their neighboring states (California, Idaho, and Nevada). This information covers the period in which Oregon and Washington both indexed their minimum wage rates. The data provide sufficient detail for individuals in Oregon, Washington, and other states that differences in and changes to the wage and employment distribution can be tested statistically. Minimum wages for California,

¹Idaho's minimum wage is equal to the federal rate; Nevada began indexing in November 2006.

Figure 1: Minimum Wage Rates, California, Oregon, Washington, and Federal, 2000–2008



Oregon, and Washington, and the federal rate are shown in Figure 1.¹

The model used in this study accounts for the possibility that factors affecting whether an individual is employed also affect the hourly wage earned.

Background and Previous Research

Friedman (1953) suggests that debates on the minimum wage are based on differences in predictions or beliefs about how well a minimum wage would help attain a particular income or employment goal. He notes that those in favor of increasing minimum wages believe that the increases reduces poverty by raising the incomes of those receiving less than the increased minimum wage. In many cases, proponents also believe that some workers receiving the minimum wage also may experience increased incomes. Proponents believe that the increased

incomes occur without any counterbalancing increase in the number of people entirely unemployed or employed less advantageously than they otherwise would be. For example, Lester (1946) hypothesizes that it would be possible that a higher minimum wage would not have the negative employment consequences predicted by neoclassical economics.

Friedman (1953) notes that opponents of increasing minimum wages believe that doing so would increase poverty by increasing the number of people who are unemployed or employed less advantageously and that this more than offsets any favorable effect on the wages of those who remain employed. For example, Stigler (1946) hypothesizes that if a minimum wage is effective, one of the potential effects is that workers whose services are worth less than the minimum wage are discharged and are unemployed or, retired, or enter unregulated fields of employment (the “shadow economy”).

Low wage workers make up a relatively small portion of employment in the Pacific Northwest. For example, in Oregon, approximately 25 percent of the workforce are employed in a “low-wage” job, and less than 5 percent of the workforce have “low-wage” jobs as their *only* employment.² Oregon and Washington have persistently had high unemployment rates. In many of the past 30 years, Oregon and Washington have ranked in the top 10 states for unemployment. In addition to the states’ high and annually increasing minimum wages, several other factors explain these states higher and persistent unemployment. For example, both Oregon and Washington have relatively “generous” unemployment benefits. In addition, Oregon and Washington have relatively high rates of in-migration, adding to competition for employment opportunities. Oregon has a reputation for rigid employment laws and health insurance mandates that add to firms’ costs of growing their workforces.

Much of the earlier empirical research supports the hypothesis that increasing minimum wages are associated with reduced employment. For example, Peterson (1957) is one of the first empirical studies of the minimum wage. He found that in each of the three industries evaluated (sawmills, men’s cotton garments, and seamless hosiery) minimum wages reduced employment. Peterson (1959, 1960) finds that in retail, laundry, and dry cleaning industries, higher retail wages for women are associated with reduced employment of women. Gallasch (1975) and Gardner (1981) find some evidence that the agricultural minimum wage causes negative employment and positive wage effects.³

Studies focusing on teenage employment are relatively consistent in finding that a 10 percent increase in the minimum wage would be associated with a 1 percent to 4 percent decrease in teenage employment.⁴ Research suggests that minimum wage impacts may take a year to affect employment. For example, Currie and Fallick (1996) find that employed individuals who were affected by an increase in the minimum wage are less likely to be employed a year later, even after accounting for the fact that workers employed at the minimum wage may differ from their peers in unobservable ways.

Some studies find little evidence of employment losses.⁵ In fact, in contrast to the predictions of neoclassical economic theory, some studies find that employment increases as the minimum wage increases. For example, all seven of the studies in Card and Krueger (1995) find that higher minimum wages lead to increase employment, but in only two of the studies are the increases statistically significant.⁶ Typically, these studies rely on ad hoc theories that assume employers exercise market power in the labor market or the product market. In other words, as noted by Neuberger (1997), the approach taken by Card and Krueger (1995) assumes that employers have the power to set wages or prices in a relatively uncompetitive market rather than a theory that assuming that employers take wages and prices as given in a relatively competitive market.

Recent studies are more consistent with the neoclassical theory that increasing minimum wages tend to be associated with decreased employment. Neumark and

²Moore and Peniston (2005) consider anyone who earned less than \$8 an hour in 2003 to be a “low wage” worker.

³Adilov (2008) provides an overview of several key empirical studies on the effects of the minimum wage on employment and discusses the controversy related to the empirical methods and the findings.

⁴See, for example, Brown (1988); Neumark and Wascher (1992, 1994, 2000, 2008); Kim and Taylor (1995); Williams (1993). For international comparisons, see Abowd et al. (2000); Neumark et al. (2004).

⁵See, for example, Katz and Krueger (1992); Card (1992a,b).

⁶See also Card (1992b); Katz and Krueger (1992); Card and Krueger (1994) for earlier versions of the studies provided in Card and Krueger (1995).

Wascher (2006) review more than 90 empirical studies on the employment effects of minimum wages that was spurred by the “new minimum wage research” of Card, Katz, and Krueger. Neumark and Wascher find that the overwhelming majority of the studies surveyed give a relatively consistent—although not always statistically significant—indication of the negative employment effects of minimum wages. Moreover, among the studies providing the most credible evidence, almost all indicate negative employment effects. More recently, Wessels (2007) applied one of the models outlined in Card and Krueger (1995) to the 1996–1997 federal minimum wage increase and found that increases in the minimum wage significantly lowered teenage employment rates.

Some studies hypothesize that the impacts of minimum wage increases are passed through to consumers via higher prices. For example, Aaronson and French (2006) find that food prices at limited service restaurants increase in the two months following a minimum wage increase. In contrast, other studies, such as Katz and Krueger (1992) find no relationship between output prices and minimum wage increases.

Oregon and Washington

Peterson (1959) revisits one of the first studies of the impact of minimum wage on employment, a study of Oregon retail stores in 1913–1915. Minimum wage rates for females employed in Oregon retail stores became effective between October 1913 and February 1914. The minimum wage differed by age, level of experience, and location. Women over 18 or with more experience had a higher minimum wage than younger and inexperienced women. Women in the City of Portland had a higher minimum wage than women working elsewhere in the state. Peterson (1959) finds that female retail employment declined in the wake of the minimum wage law and that female payrolls declined. In other words, the decline in

female employment was not counterbalanced by increases in wages to the remaining working women.

Singell and Terborg (2007) note that Oregon and Washington voter initiatives raised the minimum wage over three successive years by approximately 37 percent in both states. Using monthly Bureau of Labor Statistics (BLS) wage data, Singell and Terborg (2007) find that Oregon and Washington’s successive minimum wage increases lowered employment growth in Oregon and Washington. Eating and drinking establishments experienced more significant impacts than the hotel and lodging industry. Earlier studies note that employment effects of the minimum wage are sensitive to the wage distribution in the industry prior to the introduction of the minimum wage (Neumark et al., 2004; Yuen, 2003). Because wages in eating and drinking establishments typically are lower than in the hotel and lodging industry, Singell and Terborg’s (2007) findings are consistent with these earlier studies.

In addition to the BLS wage data, Singell and Terborg (2007) evaluate want ads collected from the *Portland Oregonian* and the *Seattle Times* for specific eating and drinking and hotel and lodging jobs over the same period as the employment data. Want-ad regressions indicate that the minimum wage initiatives reduced the number of job vacancies (and related hiring efforts), particularly for those jobs for which the minimum wage is relatively binding.

Hypothesis and an Empirical Test

The approach taken in this study is to test two related hypotheses regarding the impact of increasing minimum wages on employment and wages. The primary innovations that are offered in the current study are to evaluate the impacts of indexing the minimum wage to some measure of inflation and the use of statistical

Table 1: Descriptive Statistics

	Mean	Std. Dev.	Obs.
All Observations			
Hourly wage	1.00	4.38	115,483
Labor force	0.50	0.50	186,285
Unemployed	0.04	0.20	186,285
Age	32.88	21.32	186,285
Black	0.05	0.22	186,285
Never married	0.48	0.50	186,285
High school or higher	0.56	0.50	186,285
Bachelor's degree or higher	0.17	0.38	186,285
Graduate degree	0.05	0.22	186,285
Food occupation	0.03	0.16	186,285
Retail occupation	0.02	0.15	186,285
California	0.59	0.49	186,285
Idaho	0.08	0.28	186,285
Nevada	0.12	0.32	186,285
Oregon	0.09	0.29	186,285
Washington	0.12	0.32	186,285
Workers With Hourly Wage > 0			
Hourly wage	14.63	9.00	7,885
Age	37.92	13.26	7,885
Black	0.05	0.22	7,885
Never married	0.33	0.47	7,885
High school or higher	0.82	0.39	7,885
Bachelor's degree or higher	0.17	0.37	7,885
Graduate degree	0.03	0.18	7,885
Food occupation	0.08	0.27	7,885
Retail occupation	0.06	0.24	7,885
California	0.52	0.50	7,885
Idaho	0.10	0.30	7,885
Nevada	0.13	0.34	7,885
Oregon	0.10	0.30	7,885
Washington	0.15	0.35	7,885

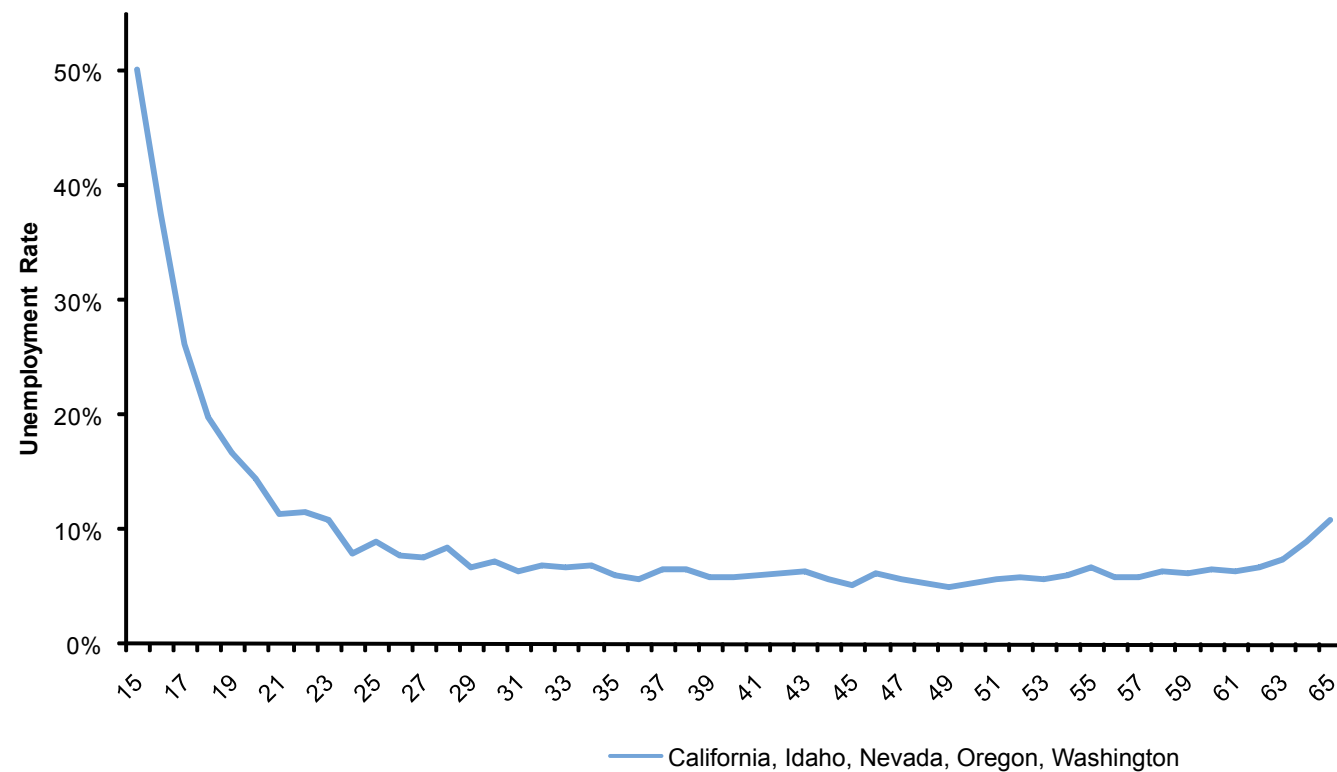
controls to simultaneously account for employment and wage impacts. The null hypotheses are as follows:

1. There is a negative relationship between the minimum wage and employment. In other words, increases in the minimum wage are associated with decreases in employment.

2. After accounting for employment effects, there is a positive relationship between the minimum wage and hourly workers’ hourly wages.

As noted earlier, several published studies have found that increasing minimum wages are associated with

Figure 2: Age and Unemployment Rates, Ages 15–65, 2003–2008



decreased employment and increased wages for those who are employed. The approach in this study is an extension of these earlier studies (Brown, 1988; Neumark and Wascher, 1992, 1994, 2000; Kim and Taylor, 1995; Williams, 1993; Currie and Fallick, 1996). The following sections describe data used and a two-step procedure described by Heckman (1979), Maddala (1983), and Amemiya (1985) that first examines the employment impacts and then examines the factors determining the hourly wage for hourly workers. Specifically, the following are examined:

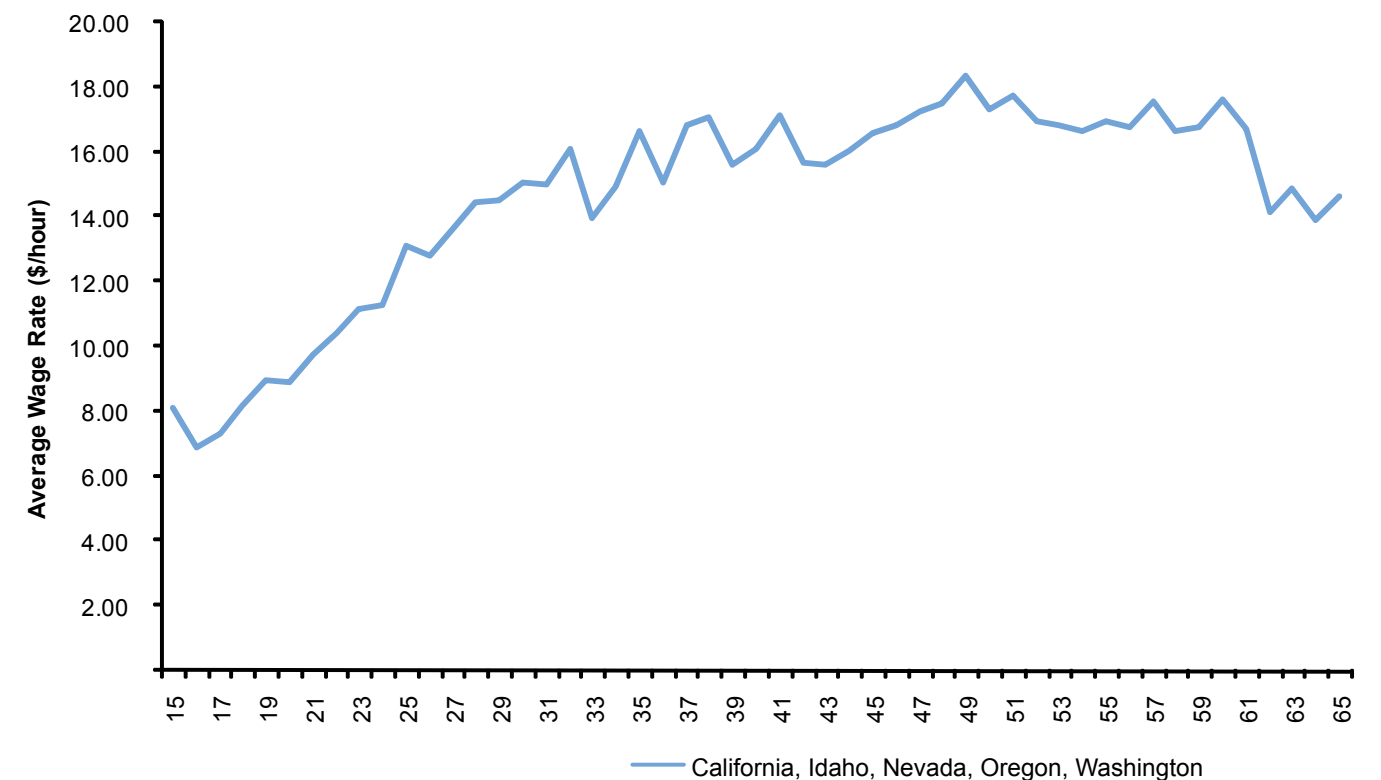
1. Whether the probability that an individual is employed is a function of individual and state-specific characteristics.
2. The extent to which the minimum wage affects hourly wages after controlling for the interdependence between employment and wages.

The project uses wage data from the annual March Current Population Surveys (CPS) covering the period 2003–2008 for Oregon, Washington, and their neighboring states (California, Idaho, and Nevada). This information covers the period in which Oregon and Washington both indexed their minimum wage rates. The data provide sufficient detail for individuals in Oregon, Washington, and other states; thus, differences in and changes to the wage and employment distribution can be tested statistically.

The data include variables measuring individual demographic and employment characteristics. Descriptive statistics are provided in Table 1. The variables used in this analysis are described in the appendix.

Hourly wage is the dependent variable of interest and is the dependent variable in the impact regression. Whether

Figure 3: Age and Hourly Wage Rates, Ages 15–65, 2003–2008



an individual is *employed* is a dependent variable in the selection regression and an independent variable in the impact regression. Both employment and wages are a function of several factors. To evaluate the relationships between the minimum wage and employment and hourly wages, it is important to control for other factors that may explain employment and wages. For example, *age* is widely cited as a factor that determines both employment (Figure 2) and wages (Figure 3),⁷ as minimum wage workers tend to be young. In the U.S., workers under age 25 represent only about one-fifth of hourly-paid workers and make up half of those paid the federal minimum wage or less.⁸ Thus, *youth* is an indicator variable to control for the differential impacts of age on younger workers. Oregon’s employment department has similarly concluded that

“undoubtedly, many of the state’s low-wage workers are also young” (Moore and Peniston, 2005). Similarly, *senior* is an indicator variable to control for the differential impacts of age on older workers.

Female workers are more likely to earn the minimum wage. While the percentage of workers earning the minimum wage does not vary much across the major race and ethnicity groups, many researchers believe race to be an important factor affecting employment and wages, and whether an individual earns the minimum wage. Education is positively related to wages and employment. *Never married* workers, who tend to be young, are more likely than married workers to earn the federal minimum wage or less. This variable controls for both age and for

⁷See the appendix for a discussion of employment and unemployment as used in this study.

⁸See Bureau of Labor Statistics (2009a) for information on U.S. workers.

other unobservable characteristics that may affect employment and wages. By major occupation, the highest proportion of workers earning at or below the federal minimum wage is in service occupations, especially *food preparation and service* and *retail*. The data used include control variables to take into account unobservable state factors; *year* accounts for year-to-changes in the economy that are independent of changes to the minimum wage. While such measures are imperfect, Burkhauser et al. (2000) suggest that alternative variables such as macroeconomic factors are inappropriate.

Model and Results

The model used in this study accounts for the possibility that factors affecting whether an individual is employed also affect the hourly wage earned. First, a probit model explaining the employment status is estimated, and the fitted values from the probit model are included in the wage equation using ordinary least squares as follows. Results are presented in Table 2.⁹

- Step 1: For all individuals in the labor force estimate the probit with the following equation:

EMPLOYED = X₁ β₁ + MINWAGE β₂ + u₁ (1)

- Step 2: Add the fitted values from Step 1 into the ordinary least squares regression, where FIT denotes the fitted values from Step 1.

WAGE = X₃ β₃ + FIT β₄ + MINWAGE β₅ + u₂ (2)

Discussion

The probit regression presented in Table 2 indicates that higher minimum wages are associated with a statistically

significant reduced probability of being employed, but they do not have a significant impact on hourly wages. To illustrate the magnitude of the employment impacts, the fitted value of the probit model is recalculated under the assumption that every state is subject to the federal minimum wage, which is no higher than any of the state minimum wages in the study. Figure 4 shows that if Oregon and Washington were subject to the lower federal minimum wage, the unemployment rate (as measured in this study) would be more than 2 percentage points lower. Over the period 2003–2008, Oregon’s average employment rate was 9.0 percent; if Oregon’s minimum had been equal to the lower federal minimum wage rate, then the state’s unemployment rate would have been 6.2 percent. Similarly, over the same period, Washington’s average employment rate was 8.4 percent; if Washington’s minimum had been equal to the lower federal minimum wage rate, then the state’s unemployment rate would have been 5.6 percent.

As predicted by neoclassical theory, Oregon and Washington’s relatively high minimum wages disproportionately affect younger workers (under 25 years of age). The high minimum wage rates triggered by annual indexing result in an unintended dilemma for these lower skilled applicants: Their inexperience makes them unemployable at the higher minimum wage, but they cannot get experience to justify the higher wage.

Table 3 illustrates the impacts of indexing on youth unemployment over time. As Oregon and Washington’s minimum wages increase over time relative to the federal minimum, the states’ youth unemployment increases relative to what it would have been otherwise. The exception to the increasing differential in unemployment

⁹This study employs two methods. One method incorporates the fitted values from the probit model in the hourly wage model; these results are presented in Figure 4. The second method calculates the inverse Mill’s ratio, which is incorporated in the hourly wage model. The results for both methods are virtually identical, and only the results from the first method are reported. Results from the second method are available from the author.

Table 2: Regression Results

Dependent Variable: Employed				
Method: ML - Binary Probit (Quadratic hill climbing)				
Included observations: 93816				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
Intercept	-112.061	13.566	-8.260	0.00
Year	0.057	0.007	8.307	0.00
Female	-0.110	0.012	-8.895	0.00
Black	-0.310	0.025	-12.274	0.00
Never married	-0.190	0.017	-11.219	0.00
High school	0.298	0.016	18.931	0.00
Bachelor’s degree	0.186	0.019	9.829	0.00
Graduate	0.139	0.032	4.327	0.00
Youth	-2.037	0.110	-18.518	0.00
Senior	1.829	0.286	6.400	0.00
Age	0.001	0.001	1.072	0.28
Youth * Age	0.087	0.005	16.457	0.00
Senior * Age	-0.032	0.004	-7.513	0.00
California	0.039	0.023	1.717	0.09
Idaho	0.028	0.062	0.445	0.66
Nevada	0.018	0.055	0.330	0.74
Washington	0.055	0.026	2.087	0.04
Minimum wage	-0.102	0.026	-3.961	0.00
McFadden R-squared	0.07	Mean dependent var	0.92	
S.D. dependent var	0.27	S.E. of regression	0.27	
Akaike info criterion	0.52	Sum squared resid	6592.13	
Schwarz criterion	0.52	Log likelihood	-24475.47	
Hannan-Quinn criter.	0.52	Restr. log likelihood	-26240.18	
LR statistic	3529.42	Avg. log likelihood	-0.26	
Prob(LR statistic)	0.00	Total obs	93816	
Obs with Dep=0	7541			
Obs with Dep=1	86275			

is in 2008, when the federal minimum wage increased to \$5.85 an hour. focus on Oregon and Washington’s experience. Impacts are quantified by how they affect (1) employment and (2) hourly wages for hourly workers.

Conclusion

The goal of this research is to evaluate quantitatively the economic effects of minimum wage indexing, with a The project uses wage data from the annual March Current Population Surveys for Oregon, Washington, and their neighboring states and covers the period in

Table 2: Regression Results				
Dependent Variable: LOG(Hourly Wage)				
Method: Least Squares				
Included observations: 7885				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	-106.597	11.832	-9.009	0.00
Fitted value from probit	-3.076	0.447	-6.876	0.00
Year	0.055	0.006	9.050	0.00
Female	-0.206	0.012	-17.219	0.00
Black	-0.202	0.032	-6.342	0.00
Never married	-0.149	0.018	-8.513	0.00
High school	0.445	0.027	16.408	0.00
Bachelor's degree	0.289	0.017	17.287	0.00
Graduate	0.234	0.029	8.088	0.00
Food	-0.355	0.017	-20.326	0.00
Retail	-0.244	0.020	-12.204	0.00
Youth	-4.196	0.727	-5.775	0.00
Senior	9.005	1.483	6.072	0.00
LN(Age)	0.227	0.023	9.786	0.00
Youth * LN(Age)	1.288	0.232	5.548	0.00
Senior * LN(Age)	-2.244	0.357	-6.291	0.00
California	0.080	0.017	4.618	0.00
Idaho	-0.046	0.049	-0.922	0.36
Nevada	0.072	0.045	1.613	0.11
Washington	0.101	0.019	5.218	0.00
LN(Minimum wage)	-0.139	0.140	-0.995	0.32
R-squared	0.35	Mean dependent var		2.54
Adjusted R-squared	0.34	S.D. dependent var		0.51
S.E. of regression	0.41	Akaike info criterion		1.06
Sum squared resid	1323.33	Schwarz criterion		1.08
Log likelihood	-4151.73	Hannan-Quinn criter.		1.06
F-statistic	207.76	Durbin-Watson stat		1.56
Prob(F-statistic)	0.00			

which Oregon and Washington both indexed their respective minimum wage rates. The regression models used in this study account for the possibility that factors affecting whether an individual is employed also affect the hourly wage earned.

Regression results indicate that higher minimum wages are associated with a statistically significant reduced probability of being employed. Indexing the minimum wage produces annual increases in the minimum wage that, in turn, are likely to increase unemployment, especially among the young. In addition, regression

Figure 4: Unemployment Impacts of Minimum Wage Above Federal Minimum Wage, Oregon and Washington, 2003–2008

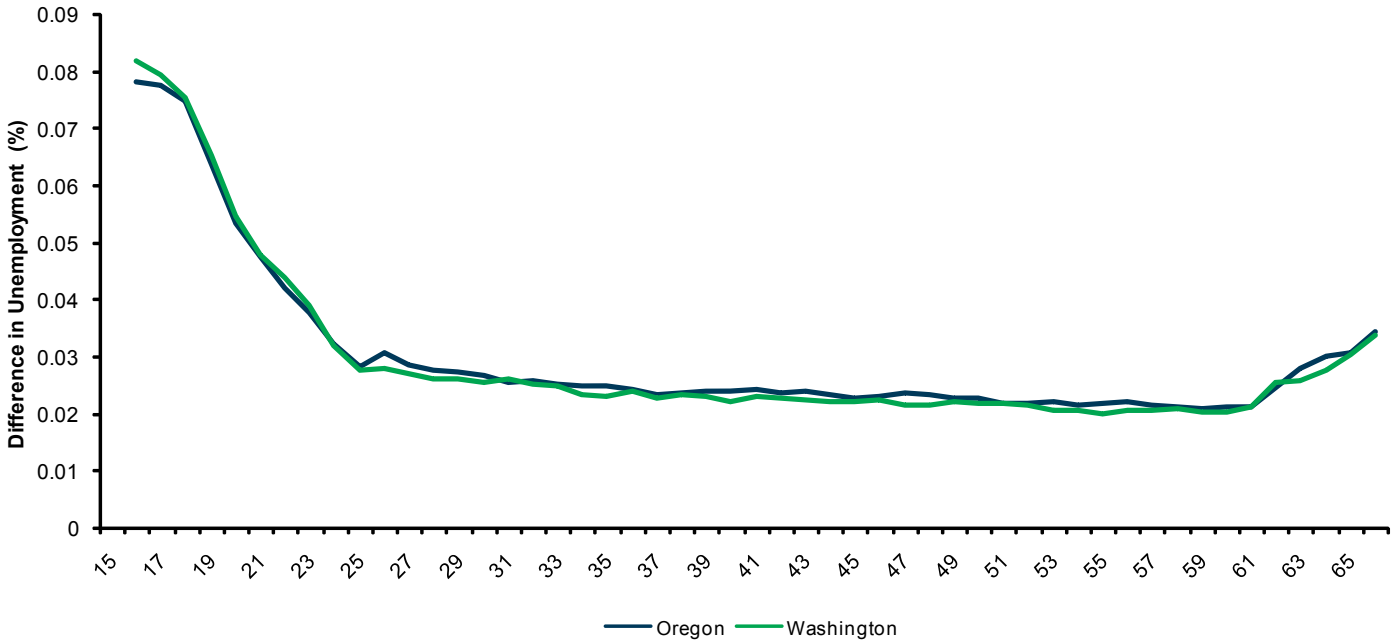


Table 3: Unemployment Impacts of Minimum Wage Indexing on Workers Under Age 25, Oregon and Washington, 2003–2008						
Oregon				Washington		
Year	Unemployment Rate	Unemployment Rate if State Minimum = Federal Minimum	Difference	Unemployment Rate	Unemployment Rate if State Minimum = Federal Minimum	Difference
2003	20.7%	16.3%	4.4%	21.0%	16.3%	4.7%
2004	21.0%	16.2%	4.8%	19.5%	14.7%	4.8%
2005	20.0%	14.9%	5.1%	18.5%	13.4%	5.0%
2006	18.9%	13.5%	5.4%	18.9%	13.2%	5.7%
2007	18.9%	12.8%	6.0%	17.7%	11.6%	6.0%
2008*	16.4%	11.9%	4.4%	17.1%	12.3%	4.8%
2003-08 Average	19.5%	14.5%	5.0%	18.8%	13.7%	5.2%

results indicate that, controlling for employment impacts, increasing minimum wages have no statistically or economically significant impact on wages. It is clear that the costs of reduced employment associated with minimum wage indexing are not offset by higher wages throughout the wage distribution. Thus, minimum wage indexing imposes employment costs with no measurable income benefits.

Appendix

The data in this study include the following variables measuring individual demographic and employment characteristics.

- *Hourly wage* Hourly earnings individual's current job (hourly workers only).
- *Labor force* Dummy variable equal to 1 for individual in the labor force, 0 otherwise.
- *Employed* Dummy variable equal to 1 for individual in the civilian labor force who is not unemployed, 0 otherwise; an individual is considered to be unemployed if he or she is in the civilian labor force and has either (1) lost a job or (2) stated that he or she wants a regular job now. Note that these definitions differ slightly from those used by the Bureau of Labor Statistics (2009b); thus, employment and unemployment in this study are not directly comparable to the statistics reported by the Bureau of Labor Statistics.
- *Age* Age, in years, of the individual.
- *Youth* Dummy variable equal to 1 for individual younger than 25 years of age, 0 otherwise.
- *Senior* Dummy variable equal to 1 for individual older than 60 years of age, 0 otherwise.
- *Female* Dummy variable equal to 1 for female individual, 0 otherwise.
- *Black* Dummy variable equal to 1 for black individual, 0 otherwise.
- *Never married* Dummy variable equal to 1 for never married individual, 0 otherwise.
- *High school* Dummy variable equal to 1 for individual completing high school or higher education, 0 otherwise.
- *College* Dummy variable equal to 1 for individual completing bachelor's degree or higher education, 0 otherwise.
- *Graduate* Dummy variable equal to 1 for individual completing a graduate degree, 0 otherwise.
- *Occupation* Dummy variables equal to 1 for individual employed in specific occupation, 0 otherwise. Occupations: (1) food preparation or food services, (2) retail.
- *State* Dummy variables equal to 1 for individual's state of residence, 0 otherwise. States: Oregon, California, Washington, Idaho, Nevada.
- *Minimum wage* Legal hourly minimum wage in individual's state of residence at the time of the annual March CPS.

References

Aaronson, D. and French, E. (2006). *Output Prices and the Minimum Wage*. Employment Policies Institute, Washington, DC.

Abowd, J. M., Kramarz, F., Lemieux, T., and Margolis, D. N. (2000). Minimum Wages and Youth Employment in France and the United States. In Blanchflower, D. G. and Freeman, R. B., editors, *Youth Employment and Joblessness in Advanced Countries*, pages 427–472. University of Chicago Press, Chicago, IL.

Adilov, N. (2008). “Minimum Wages and Employment: An Overview of Empirical Evidence.” *Journal of Collective Negotiations*, 32(1):41–49.

Amemiya, T. (1985). *Advanced Econometrics*. Harvard University Press, Cambridge, MA.

Brown, C. (1988). “Minimum Wage Laws: Are they Overrated?” *Journal of Economic Perspectives*, 2(3):133–145.

Bureau of Labor Statistics (2009a). “Characteristics of Minimum Wage Workers: 2008.” <http://www.bls.gov/cps/minwage2008.htm>, retrieved March 31, 2009.

Bureau of Labor Statistics (2009b). “How the Government Measures Unemployment.” http://www.bls.gov/cps/cps_htgm.htm, retrieved April 13, 2009.

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

Card, D. E. (1992a). “Do Minimum Wages Reduce Employment? A Case Study of California, 1987–89.” *Industrial and Labor Relations Review*, 46(1):38–54.

Card, D. E. (1992b). “Using Regional Variation in Wages to Measure the Effects of the Federal Minimum Wage.” *Industrial and Labor Relations Review*, 46(1):22–37.

Card, D. E. and Krueger, A. B. (1994). “Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania.” *American Economic Review*, 84(4):773–793.

Card, D. E. and Krueger, A. B. (1995). *Myth and Measurement: The New Economics of the Minimum Wage*. Princeton University Press, Princeton, NJ.

Currie, J. and Fallick, B. C. (1996). “The Minimum Wage and the Employment of Youth: Evidence from the NLSY.” *Journal of Human Resources*, 31(2):404–428.

Friedman, M. (1953). *Essays in Positive Economics*. University of Chicago Press, Chicago, IL.

Gallasch, H. F. (1975). “Minimum Wages and the Farm Labor Market.” *Southern Economic Journal*, 41(3):480–491.

Gardner, B. (1981). “What Have Minimum Wages Done in Agriculture?” In Rottenberg, S., editor, *The Economics of Legal Minimum Wages*. American Enterprise Institute, Washington, DC.

Heckman, J. J. (1979). “Sample Selection Bias as a Specification Error.” *Econometrica*, 47(1):153–162.

Katz, L. F. and Krueger, A. B. (1992). “The Effect of the Minimum Wage on the Fast-Food Industry.” *Industrial and Labor Relations Review*, 46(1):6–21.

Kim, T. and Taylor, L. J. (1995). “The Employment Effect in Retail Trade of California’s 1988 Minimum Wage Increase.” *Journal of Business & Economic Statistics*, 13(2):175–182.

Lester, R. A. (1946). “Shortcomings of Marginal Analysis for Wage-Employment Problems.” *American Economic Review*, 36(1):63–82.

Maddala, G. S. (1983). *Limited Dependent and Qualitative Variables in Econometrics*. Cambridge University Press, Cambridge, UK.

Moore, E. and Peniston, B. (2005). “Oregon’s Low Wage Workers.” Oregon Employment Department, Salem, OR.

Neuberg, L. G. (1997). “Review: *Myth and Measurement: The New Economics of the Minimum Wage*.” *Southern Economic Journal*, 63(3):832–834.

Neumark, D., Schweitzer, M., and Wascher, W. (2004). “Minimum Wage Effects throughout the Wage Distribution.” *Journal of Human Resources*, 39(2):425–450.

Neumark, D. and Wascher, W. (1992). “Employment Effects of Minimum and Subminimum Wages: Panel Data on State Minimum Wage Laws.” *Industrial and Labor Relations Review*, 46(1):55–81.

Neumark, D. and Wascher, W. (1994). “Employment Effects of Minimum and Subminimum Wages: Reply to Card, Katz, and Krueger.” *Industrial and Labor Relations Review*, 47(3):497–512.

Neumark, D. and Wascher, W. (2000). “Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania: Comment.” *American Economic Review*, 90(5):1362–1396.

Neumark, D. and Wascher, W. (2006). “Minimum Wages and Employment: A Review of Evidence from the New Minimum Wage Research.” *NBER Working Paper No. W12663*, National Bureau of Economic Research, Cambridge, MA.

Neumark, D. and Wascher, W. L. (2008). *Minimum Wages*. MIT Press, Cambridge, MA.

Peterson, J. M. (1957). “Employment Effects of Minimum Wages, 1938–50.” *Journal of Political Economy*, 65(5):412–430.

Peterson, J. M. (1959). “Employment Effects of State Minimum Wages for Women: Three Historical Cases Re-examined.” *Industrial and Labor Relations Review*, 12(3):406–422.

Peterson, J. M. (1960). “Employment Effects of Minimum Wages: Reply.” *Industrial and Labor Relations Review*, 13(2):264–273.

Singell, L. and Terborg, J. (2007). “Employment Effects of Two Northwest Minimum Wage Initiatives.” *Economic Inquiry*, 45(1):40–55.

Stigler, G. J. (1946). “The Economics of Minimum Wage Legislation.” *American Economic Review*, 36(3):358–365.

Wessels, W. J. (2007). “A Reexamination of Card and Krueger’s State-Level Study of the Minimum Wage.” *Journal of Labor Research*, 28(1):135–146.

Williams, N. (1993). “Regional Effects of the Minimum Wage on Teenage Employment.” *Applied Economics*, 25(12):1517–1528.

Yuen, T. (2003). “The Effect of Minimum Wages on Youth Employment in Canada: A Panel Study.” *Journal of Human Resources*, 38(3):647–672.

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