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The Federal Minimum Wage

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*The Effects of the Minimum Wage on the
Youth Employment and School Enrollment*

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MPA Capstone

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April 2013

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Table of Contents

Executive Summary3

Economic Theory and the Minimum Wage (Standard Model)5

Introduction/Background4

Review of the Literature7

Research Design11

Analysis and Results13

Limitations17

Conclusion.....18

 References..... 20

 Supplemental Material..... 21

Executive Summary

The minimum wage has been a prominent topic of discussion among labor economists. According to Neumark and Wascher, the minimum wage has been a core element of public policy for several decades. The effects of minimum wage were brought back to light during the State of the Union address by President Obama, in which he proposed increasing the minimum wage to \$9.00, a 24% increase.

This capstone project contributes to the discussion in determining the effects of the change in minimum wage on the youth population. The study uses aggregate data spanning nineteen years, from 1985 and 1990 to 2007. The youth population is divided into four mutually exclusive categories of youth activity distinguished by employment status and enrollment status. The data are analyzed with the help of a time-series regression model.

The results of the time series regression analysis suggests that, in general, the state of the economy has a higher effect on the youth enrollment and youth employment rather than the change in the minimum wage, over the time period 1985, 1990-2007. The change in the minimum wage only affected one group of youth - the proportion of individuals enrolled in school and not employed. Other groups were not affected by the change in the minimum wage. Furthermore, this study finds a statistically significant relationship between change in the minimum wage and the change in the youth labor force participation rate. The conclusion is that, overall, as the minimum wage goes up, fewer teenagers participate in the labor force.

Introduction/Background

The minimum wage is one of the most studied aspects of labor economics, and has been a core element of public policy for several decades.¹ By definition the minimum wage is a “Wage rate established by collective bargaining or by government regulation, specifying the lowest rate at which workers may be employed. A legal minimum wage is one mandated by government for all workers in an economy, with few exceptions. Privately negotiated minimum wages determined by collective bargaining apply to a specific group of workers in the economy, usually in specific trades or industries.”²

Originally, minimum wages were proposed as a way to combat the propagation of “sweatshops” in mainly, the manufacturing sector. These sweatshops employed a large number of women and young workers and paid them what was, at the time, considered as substandard wages. However, over the years proponents of minimum wages increasingly advocated them as a way to help individuals and/or households achieves self-sufficiency. Thus, coverage of minimum wage laws was extended to men and to workers in most low-paid occupations.

The modern minimum wage, combined with compulsory arbitration of labor disputes, originated in the 1890s in New Zealand and Australia. In 1909 Britain established trade boards to set minimum wage rates in certain trades and industries.³ However, the United Kingdom did not have a nationally legislated minimum wage until 1999. In the United States, the minimum wage evolved from a weak set of state-specific laws targeted at women in the early 1900s, to a combination of federal, state, and local minimum wage laws with broad coverage, which is presently implemented. The national

¹ “Minimum Wages,” Neumark and Wascher, Page 1

² [Definition of “Minimum Wage”](#)

³ [Definition of “Minimum Wage”](#) (Concise Encyclopedia)

minimum wage in the United States was introduced as the part of the Fair Labor Standards Act (FLSA) of 1938.

The minimum wage has a strong social appeal among the public. The public is generally concerned about the ability of free markets to provide equity among the least abled members of the labor force. For some people, the obvious solution to this concern is to redefine the wage structure politically to achieve a socially preferable distribution of income. Thus, minimum wage laws have usually been judged against the criterion of reducing poverty.⁴

Generally speaking, the goals of the minimum wage are accepted as proper; however, there is a great deal of disagreement as to whether the policy is effective in attaining its existing goals. The subject remains highly controversial on the political scene. The debate over the increase in minimum wage continues, as on February 12th, 2013, President Obama, in his State of the Union address, pressed to raise the hourly rate to \$9 an hour, from its current \$7.25. The change, a 24% increase in the federal minimum wage, should it become law, would boost the wages of 15 million Americans, according to the White House⁵.

Economic Theory and the Minimum Wage (Standard Model)

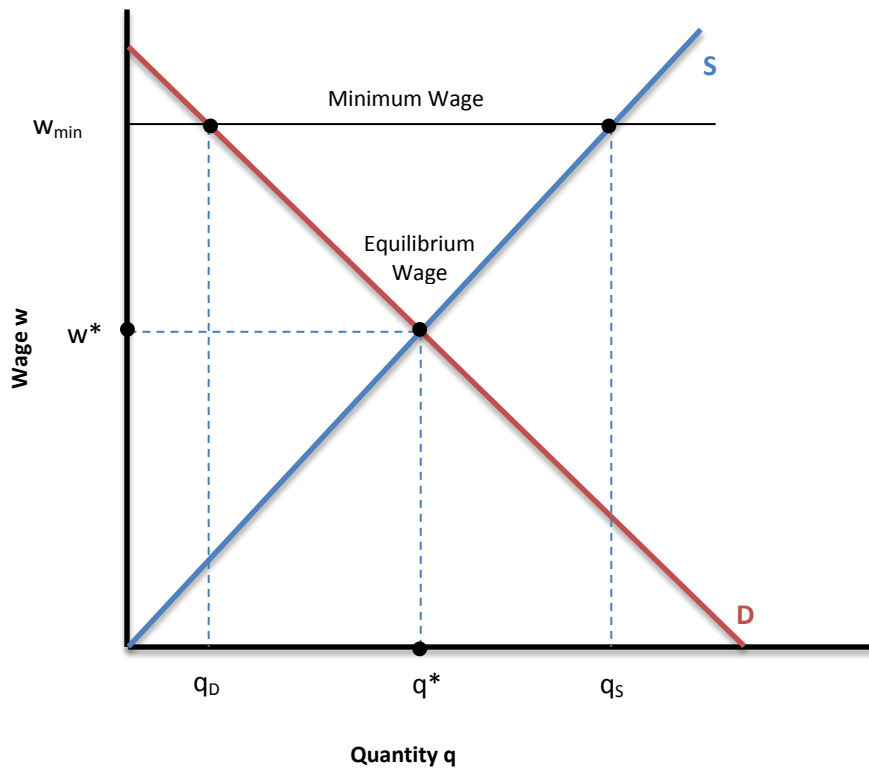
According to the most introductory or mainstream economics textbooks increasing the minimum wage decreases the employment of minimum wage workers,⁶ by setting a wage higher than the equilibrium which would result from demand and supply.

⁴ [The New Palgrave Dictionary of Economics](#)

⁵ [White House](#)

⁶ Borjas, George J. *Labor Economics*. 6th ed

Figure 1: Labor Market with a Minimum Wage



Source: Author's drawing of labor market with a minimum wage

If the government does not regulate “free market” supply and demand, in theory, will equilibrate at their intersection. Firms pay a wage of W^* and hire Q^* amount of workers, while intersecting at the equilibrium point. The horizontal black line w_{min} represents the government imposed minimum wage (price floor), below, which the price of labor cannot fall. Equilibrium in this case is not achieved. At w_{min} , also known as the minimum wage, there at q_s amount of workers willing to work, but only q_c workers are demanded. The difference between q_s and q_d is the unemployment which results from a minimum wage. With an existing minimum wage or price floor, workers are getting a higher wage of w_{min} , but overall there are fewer workers hired. Generally speaking, a minimum wage increases the input costs of firms (the price of hiring/retaining an additional worker goes up), which means they hire fewer workers to cut costs. Under this classical labor economic model, the

costs of hiring the least qualified people goes up. Firms, who were once willing to hire unskilled workers for low wages, will no longer hire lesser-skilled workers. Their productivity does not match the imposed higher wage.⁷

In summary, standard economic theory predicts that employment is reduced as a result of the minimum wage. Such reduction in employment is the classic main source of economic costs, resulting from increases in the minimum wage. As the literature shows, this effect can be small in the overall economy. There are, however, two other criticisms which have more empirical validity.

A second criticism of the minimum wage is that certain groups of people, especially the young and low-skilled, often those with lower levels or quality of education, are affected strongly while most workers are unaffected. An increase in unemployment among the young or low skilled workers can lead to various social problems and a lack of future job skills or connection to the labor force. The effect on enrollment in school is important in this case.

A third criticism is that the minimum wage is not a poverty program. Most minimum wage workers are secondary workers (not the major wage earner) in households not in poverty, and few of these workers are heads of household. That is, the minimum wage is a badly targeted program. The usual prescription is an Earned Income Tax Credit, targeting benefits to low wage workers with families, but the point is that the minimum wage is promoted as something it is not—help for the poor.

Review of the Literature

In 1977, the Minimum Wage Study Commission (MWSC) undertook a review of the existing research on the minimum wage in the United States (and Canada). The focus was to estimate likely impact of indexing the minimum wage to inflation and providing a separate, lower, minimum wage

⁷ Borjas, George J. *Labor Economics*. 6th ed

for younger workers. It took MWSC four years and cost them \$17 million. In their independent summary of the research reviewed in the MWSC, Brown, Gilroy, and Kohen, three economists involved in producing the report, distinguished between employment effects on: teenagers (ages 16-19). The authors concluded that a ten percent increase in the minimum wage reduced youth employment, most reliably, between zero and 1.5 percent, young adults (ages 20-24), where they believed the employment impact is “negative and smaller than that for teenagers”; and adults, where the “direction of the effect...is uncertain in the empirical work as it is in the theory.”⁸ Their summary of the theoretical and empirical research through the late 1970s suggested that any "disemployment" effects of the minimum wage were small and almost exclusively limited to teenagers and possibly other younger workers.

Card and Krueger

Arguably, the most influential of the studies using a natural experiment was David Card and Alan Krueger's 1994 “Minimum Wages and Employment: A Case Study of the Fast Food Industry in New Jersey and Pennsylvania” paper on the impact on fast-food employment of the 1992 increase in the New Jersey state minimum wage. In advance of the increase, Card and Krueger gathered information (via telephone survey) on fast-food restaurants in New Jersey and neighboring Pennsylvania. The researchers surveyed employers after the increase had gone into effect and then compared the change in employment in New Jersey's restaurants (the minimum wage treatment group) with what happened in Pennsylvania (the control group). The standard model of the labor market would have implied that relative employment should have decreased in New Jersey. They

⁸ Brown, Gilroy, and Kohen (1982), p. 524

found "no evidence that the rise in New Jersey's minimum wage reduced employment at fast-food restaurants in the state."⁹

Card and Krueger further expanded their initial research in the 1995 book *Myth and Measurement: The New Economics of the Minimum Wage*. The researchers updated and reanalyzed earlier studies with new data, generally concluding that the older results of negative results on employment are subject to many statistical errors. When the authors correct for statistical errors (e.g. autocorrelation and small sample size) earlier studies become statistically insignificant or show small/no negative on employment. Overall, their detailed review of studies using a variety of methods and datasets to examine restaurant workers, retail employment, and teenagers, concluded that the negative employment effects of minimum wage laws are minimal if not non-existent.¹⁰

Neumark and Wascher

Myth and Measurement also inspired a considerable response from economists more critical of the minimum wage. One of the most fervent critics of Card and Krueger were David Neumark and William Wascher. In their book "Minimum Wages" they brought together much of this critique, with an emphasis on their own work. David Neumark and William Wascher attempted to recreate and verify results by Card and Krueger by using payroll records from a sample of large fast food restaurant chains in order to verify employment. The authors concluded that the minimum wage increases were followed by decreases in employment. Overall, they found a four percent decrease on employment, and reported that "the estimated disemployment effects in the payroll data are often statistically significant at the 5- or 10- percent level although there are some estimators and subsamples that yield insignificant—although almost always negative" employment effects. In

⁹ Card and Krueger (1994), p. 792

¹⁰ *Myth and Measurement*

Neumark and Wascher's evaluation, the most credible recent research on the minimum wage, has built on the earlier time-series analysis, which informed the main conclusions of the Minimum Wage Study Commission (MWSC). This new generation of time-series analysis typically applies modern econometric techniques to state-level data on teenagers. It is also worth noting, that it may sometimes apply to less educated workers. Neumark and Wascher's conclusion is that "...the preponderance of evidence supports the view that minimum wages reduce the employment of low-wage workers."¹¹ Moreover, Neumark and Wascher state: "Although the wide range of estimates is striking, the oft-stated assertion that the new minimum wage research fails to support the traditional view that the minimum wage reduces the employment of low-wage, workers is clearly incorrect. Indeed, in our view, the preponderance of the evidence points to disemployment effects."¹² Neumark and Wascher found that out of the 33 studies "providing the most credible evidence; 28 (85 percent) of these point to negative employment effects."¹³

There are also various hypotheses on employment effects concerning interaction between schooling, employment, and the minimum wage. For example, in time series data extending through the 1970s, Mattila (1978), tended find positive effects of the minimum wage on school enrollment, which suggests that raising the minimum wage prompts teenagers to remain in school, to increase their likelihood of gaining employment in the covered sector in the future. However, there is also an opposite view on the relation between change in the minimum wage and school enrollment and employment among youth. Neumark and Wascher in their book "Minimum Wages" suggest that the higher minimum wage leads some teenagers to leave school and look for jobs in the covered sector. The authors further elaborate that the high-skilled teenagers, who are most likely to be enrolled in school, may choose to enter the labor market, rather than enroll (or remain enrolled) in school.

¹¹ Neumark and Wascher (2008), p. 104

¹² Neumark and Wascher (2008), p. 138

¹³ Neumark and Wascher (2008), p. 121

Further, these teenagers will displace some relatively lesser-skilled teenagers in the work force; mitigating overall employment loss associated with the minimum wage and will “mask” the employment declines among the less-skilled teenagers.¹⁴

Recent Studies

The recent study by Jonathan Meer and Jeremy West, “Effects of the Minimum Wage on Employment Dynamics,¹⁵” argues that the effect of the minimum wage should be more apparent in employment dynamics than in levels. The researchers used reduced-form estimation in a state panel difference-in-differences identification strategy to conclude that the minimum wage “substantially reduces gross hiring of new employees;” however, Meer and West did not find any effect on gross separations (the rate of separation from service per 100 full-time workers, sometimes referred to as “turnover index”¹⁶). Furthermore, the authors conclude that “while the minimum wage has no significant effect on total employment, increases in the legal wage floor directly reduce long-run job growth. Meer and West find “no effect on the employee reallocation rate, nor on entry or exit of establishments.”

Another very recent study by Joseph J. Sabia, Richard V. Burkhauser, and Benjamin Hansen, “Are the Effects of Minimum Wage Increases Always Small? New Evidence from a Case Study of New York State,¹⁷” estimated the effect of the 2004-2006 New York State minimum wage increase from \$5.15 to \$6.75 per hour on the employment rates of 16-to-29 year-olds without a high school diploma. The authors concluded that, using difference-in-difference approach, the New York City minimum wage increase is associated with a 20.2 to 21.8 percent reduction in the employment of younger less-educated individuals, with the largest effects for those ages 16-24. Their results

¹⁴ Neumark and Wascher (2008), p. 209

¹⁵ Meer and West

¹⁶ [Gross separation](#)

¹⁷ Sabia, Burkhauser, and Hansen

provide evidence that large state minimum wage increases can have substantial adverse labor demand effects for younger less-experienced, less-educated individuals.

Meta-Analysis

Meta-studies are “studies of studies” that use a set of well-defined statistical techniques to pool the results of a large number of separate analyses. Meta-study techniques effectively increase the amount of data available for analysis and can provide a much sharper picture of statistical relationships than is possible in any individual study. It is also helpful in identifying patterns among studies, or any other potentially interesting relationships.

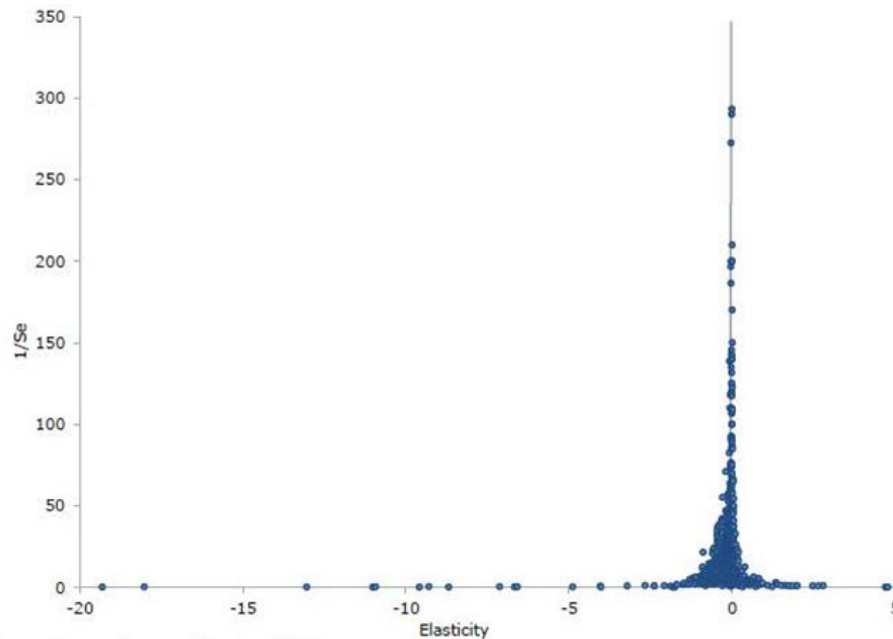
Hristos Doucouliagos and T. D. Stanley (2009) conducted a meta-study of 64 minimum-wage studies published between 1972 and 2007, measuring the impact of minimum wages on teenage employment in the United States. Doucouliagos and Stanley plotted every employment estimate contained in these studies (over 1,000 in total), weighing each estimate by its statistical precision, they found that the most precise estimates were heavily clustered at or near zero employment effects.¹⁸

Overall, the funnel graph of minimum wage employment elasticities is roughly funnel-shaped, the left hand side has many more points, especially at lower parts of the graph. Further, positive employment elasticities are reported, they are observed less frequently (24 percent) (Figure 2). According to the researchers, the top 148 elasticities (10 percent) have an average of -0.02, which is not practically different than zero, the top four have average of -0.008, also not significant, and the

¹⁸ Doucouliagos and Stanley (2008), page 59-60

most precise estimate is negative but not significantly different from zero. The graph implies that raising the minimum wage in the USA had little effect on employment¹⁹.

Figure 2: Trimmed Funnel Graph of Estimated Minimum-Wage Effects (n=1492)



Source: Doucouliagos and Stanley (2009).

Research Design

The purpose of this paper is to estimate whether the change in real minimum wage, had any effect on change in school enrollment and/or youth employment controlling for the state of the economy (i.e. change in the headline unemployment rate, U3²⁰) during the time period 1985-2007.

For the purpose of this paper I divided the youth population into four mutually exclusive categories of youth activity distinguished by employment status and enrollment status. Particularly, the proportion of individuals enrolled in school and employed, the proportion of individuals enrolled in school and not employed, the proportion of individuals not enrolled and employed, and the

¹⁹ Doucouliagos and Stanley (2008), page 60-61

²⁰ [Definition of "U3 Unemployment Rate"](#)

proportion of individuals not enrolled in school and not employed. Further, I created two categories that sum up individuals by their enrollment status: total enrollment, the proportion of individuals enrolled in school regardless of their employment status, and total not enrolled is the proportion of individuals not enrolled in school regardless of their employment status.

The real minimum wage changes every year, because even when the legal minimum wage specified as, say, \$5.25 does not change, the price level changes. My null hypothesis (H0) is that Real Minimum Wage Variable (RMW) has no effect on four distinct groups of youth described above, youth unemployment, and youth labor force participation rate. The alternative hypothesis is that Real Minimum Wage Variable (RMW) has an effect on four distinct groups of youth described above, youth unemployment, and youth labor force participation rate.

To complete the analysis, the data for youth activity by employment status and enrollment status was collected as 9-month averages for the months that youths are normally in school: September through December and January through May. The source of data for youth enrollment, youth employment, and national unemployment rate for the years 1985 to 2007 was the U.S. Bureau of Labor Statistics. The data was collected and calculated for youth enrollment rates and youth employment, divided into four categories by youth activity, using the Current Population Survey (CPS) Table 7: Employment status of the civilian non-institutional population 16 to 24 years of age by school enrollment status, age, sex, race, and Hispanic or Latino ethnicity, Annual Average 1985-2007. Moreover, to augment the analysis, I retrieved the World Bank data on youth unemployment rates and youth labor participation rate. These are a second plausible source of data. The model then tests if there is any relationship between change in minimum wage over the time and change in youth unemployment and change in youth labor force participation rate.

The model is a time series, and in general, the real minimum wage has fallen and employment has risen. . The linear regression equation is specified to include a constant, time (controlling for long-term growth and change), the unemployment rate (controlling for the macroeconomy), and the real minimum wage. The variables are then specified as changes to avoid spurious regression, i.e. the attribution of an effect of the minimum wage on employment or some other outcome just because both have been rising or falling over the time period considered. If the minimum wage matters, a change in the minimum wage should predict changes in youth enrollment or employment regardless of the time trends, which are eliminated.

A technical detail is that the disturbances in the equation that represent other factors in the economy like hurricanes or mortgage problems or increases in trade, might affect two years, so disturbances might be correlated. This is tested using the Durbin-Watson statistic, which asks whether consecutive prediction residuals for, say, 1991 and 1992, 1992 and 1993, etc., are correlated. When they are, the model is adjusted to correct for that using “Prais Winsten” estimation²¹. The adjustment pairs consecutive years and eliminates shared prediction error.

²¹ Wooldridge

Analysis and Results

Figure 3: Summary Statistics and Regression Results

Variable	Obs	Mean	Std. Dev.	Min	Max
Year	31	1996	9.092121	1981	2011
Enrolled and Employed	19	27.26316	2.10402	24	31
Enrolled and Not Employed	19	51.89474	3.998538	47	59
Total Enrolled	19	79.15789	2.713406	73	83
Not Enrolled and Employed	19	12.26316	1.726979	10	16
Not Enrolled and Not Employed	19	9	1.054093	8	11
Total Not Enrolled	19	21.26316	2.490919	18	27
Unemployment Rate	22	5.895455	1.494268	4	9.6
WB Youth Unemployment Rate	26	12.25385	2.09136	9.3	18.4
WB youth LBFR	22	59.37273	4.181271	50.9	64.5
<i>Note: All variables, besides “year”, in percentage points; WB = World Bank, LBFR = labor force participation rate</i>					

Figure 4: Regression Results

Variables	Enrolled and Employed		
	Coefficient	T-statistics	p-value
Real Minimum Wage	-.841	-0.56	0.583
Unemployment Rate***	-1.475	-4.73	<0.001
_cons	-.326	-1.83	0.089

Observations = 17
R-squared = 0.631
*** p<0.01, ** p<0.05, * p<0.1

Variables	Enrolled and Not Employed		
	Coefficient	T-statistics	p-value
Real Minimum Wage*	3.080	1.89	0.080
Unemployment Rate***	2.147	5.20	<0.001
_cons	.819	2.45	0.028

Observations = 17
R-squared = 0.749
*** p<0.01, ** p<0.05, * p<0.1

Variables	Total Enrolled		
	Coefficient	T-statistics	p-value
Real Minimum Wage	1.144	0.62	0.546
Unemployment Rate*	.830	1.92	0.075
_cons	.517	1.81	0.091

Observations = 17
R-squared = 0.266
*** p<0.01, ** p<0.05, * p<0.1

Variables	Not Enrolled and Employed		
	Coefficient	T-statistics	p-value
Real Minimum Wage	-0.014	-0.01	0.990
Unemployment Rate***	-1.067	-4.89	<0.001
_cons	-.357	-3.00	0.009

Observations = 17
R-squared = 0.625
*** p<0.01, ** p<0.05, * p<0.1

Variables	Not Enrolled and Not Employed		
	Coefficient	T-statistics	p-value
Real Minimum Wage	.642	0.62	0.544
Unemployment Rate	.271	1.32	0.208
_cons	-.105	-0.93	0.368

Observations = 17
R-squared = 0.157
*** p<0.01, ** p<0.05, * p<0.1

Variables	Total Not Enrolled		
	Coefficient	T-statistics	p-value
Real Minimum Wage	.800	0.46	0.653
Unemployment Rate**	-.814	-2.23	0.043
_cons	-.458	-2.18	0.047

Observations = 17
R-squared = 0.260
*** p<0.01, ** p<0.05, * p<0.1

Variables	Youth Unemployment Rate		
	Coefficient	T-statistics	p-value
Real Minimum Wage	.537	1.35	0.196
Unemployment Rate***	1.402	23.01	<0.001
_cons	.050	1.11	0.284

Observations = 19

R-squared = 0.981

*** p<0.01, ** p<0.05, * p<0.1

Variables	Youth Labor Force Participation Rate		
	Coefficient	T-statistics	p-value
Real Minimum Wage*	-2.142	-1.99	0.064
Unemployment Rate**	-.440	-2.60	0.019
_cons	-.464	-2.08	0.054

Observations = 19

R-squared = 0.589

*** p<0.01, ** p<0.05, * p<0.1

In the 1985, 1990-2007 period, based on results presented in Table 4, only one youth category, enrolled and not employed, seem to have been impacted by the increase in minimum wage at the 0.1 significance level. The sample size is very small here, $p=6.5\%$. The *coefficient* for the minimum wage variable for the group Employed and not Enrolled is 3.08, which means that for every dollar increase in the real minimum wage, the average proportion of individuals enrolled in school and not employed will go up by 3.08%. A *t-statistic* equals to -1.89 and a *p-value* is 6.5%. Furthermore, there is one more variable that seem to be affected by the real minimum wage variable - youth labor force participation rate, at the 0.1 significance level. The *coefficient* for this variable is -2.142, which indicated that for every dollar increase in the real minimum wage, the average youth labor force

participation rate goes down by about two percent. The result is statistically significant, for *t*-*statistic* equals to -1.99 and a *p*-*value* is less than 0.1.

Conversely, in most of the cases, besides the group not enrolled and not employed, the national unemployment rate (as the measure to control for the state of the economy) had a statistically significant effect at 0.01 level, which is an expected outcome. The effect is usually to increase unemployment or increase enrollment. In other words, youth are affected by the overall economy, and education is a substitute for market work.

Tests for Autocorrelation

There is a problem if the prediction errors or omitted factors at one point in the time series are determined or strongly influenced by values at previous time. This is called autocorrelation and it violates a basic but unnecessary assumption of regression, the independence of observations. To test for autocorrelation I have used the Durbin-Watson statistics. The theory depends on the number of observations (17 or 19) and the number of explanatory variables (two; the difference between time in two consecutive years is a constant). While the Durbin-Watson theory is complex, the idea is not: check the correlation of the prediction residuals. The test requires a computed table, as it is not a standard *t* or *z* distribution.

Only one of the dependent variables resulted in a statistically significant result at the usual 5% level of statistical significance, Enrolled and not Employed (*enr_and_not_emp*). The estimated correlation of the prediction residuals was 0.42. Note that given the small sample size and small number of explanatory variables here, caution might suggest correcting for a lack of independence of the omitted factors anyway. Still, time trend, overall unemployment rate, and the minimum wage are potentially important factors affecting youth enrollment and employment.

Limitations

There were several limitations to this study, particularly in regard to the dataset. The main issue was the availability of state by state data and including variation in the minimum wages, on the state level for the same period of time from 1985 and 1990 to 2007. As mentioned previously, my primary data source was the Current Population Survey (CPS) Table 7: Employment status of the civilian non-institutional population 16 to 24 years of age by school enrollment status, age, sex, race, and Hispanic or Latino ethnicity, Annual Average 1985, 1990-2007. The table provided aggregate data for the U.S. with no further state by state breakdown. In the attempt to resolve this issue, I have contacted the Bureau of Labor Statistics to retrieve state by state data; however, I was informed that the sample size for this particular table was too small to report on the state by state basis.

Furthermore, there was the issue of time. Given that I did not have unlimited time to conduct the study, the number of years included was limited to 1985, 1990 to 2007 period. If provided with more time, it would be an interesting next step to see what difference there might be in running the same regression model with more time periods, some larger state dataset, and more variables to control for, but when the question is youth unemployment, a lot of household variables are less relevant than they are for older adults. Experience has almost no relevance, and education has limited variation.

Conclusions

The objective in this project was to examine the relationship between the real minimum wage and school employment and youth enrollment. Previous studies provided fairly mixed results and the debate over the effects of increasing minimum wage continues.

The results of the time series regression analysis suggests that, in general, the state of the economy has a higher effect on the youth enrollment and youth employment rather than the change in the

minimum wage over the time period 1985 and 1990 to 2007. In my model, the change in the minimum wage only seemed to affect one group of youth, the proportion of individuals enrolled in school and not employed. An analysis may suggest that raising the minimum wage prompts teenagers to remain in school, to increase their likelihood of gaining employment in the covered sector in the future, which goes along with an earlier research on interaction between schooling, employment, and minimum wage.

Moreover, the findings in this study also found the statistically significant relationship between change in the minimum wage and the change in the youth labor participation rate. The conclusion is that, overall, as the minimum wage goes up, fewer teenagers decide to participate in the labor force.

The study findings, however, should be viewed as preliminary, due to the existing limitations mentioned in the previous section of this paper. Further study and analysis is necessary to understand what precise effects the change in minimum wage, will have on various groups analyzed in this paper.

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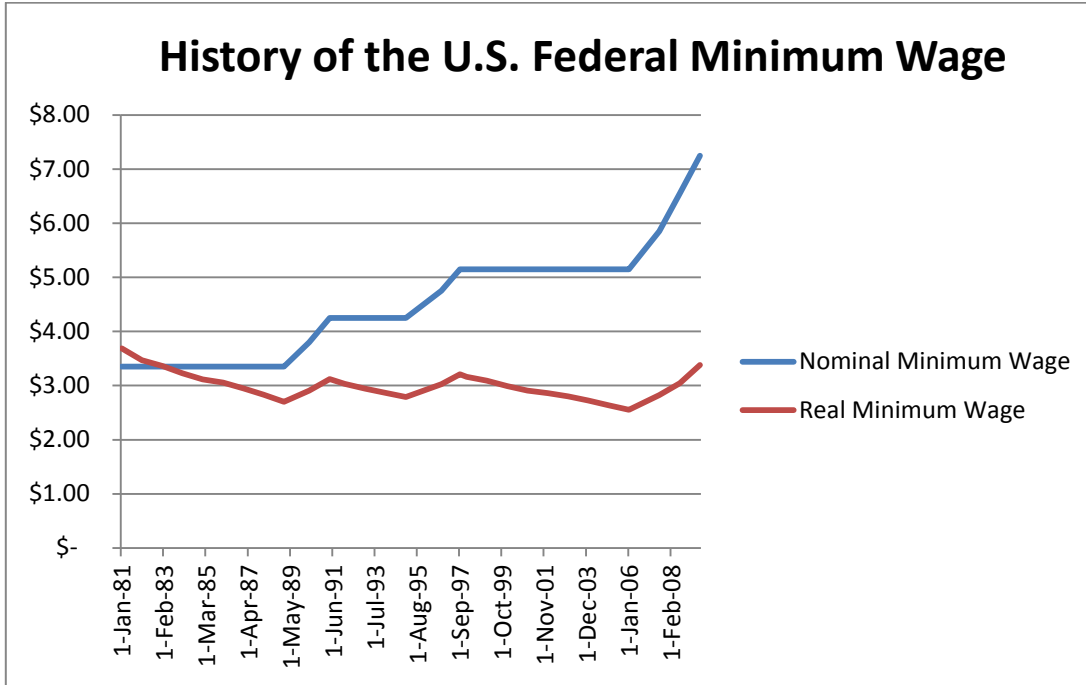
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Supplemental Material



Source: Author's calculations of data from the U.S. Department of Labor

Note: The real series is constructed by deflating the nominal minimum wage by a consumer price index for all urban consumers (CPI-U) from 1981-2009. The deflator index so that 1983 = 1.0