The Effect of the Minimum Wage on Teenage Employment and Unemployment: A Meta-Analysis

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# **Topic Definition:**

In this meta-analysis we explore the effect of the minimum wage on youth employment. Our study examines the effects of both federal and state increases to minimum wage, as we predict they will both have negative effects on teenage employment. Our meta-analysis focuses on the effect of minimum wage on teenage employment, because teenagers are a low-skill labor group that is likely to be most affected by changes in minimum wage. Another benefit of studying this group is the wealth of empirical data available on the subject.

In conducting our analysis, we distinguished between the effect of the minimum wage on employment rates -- the percentage of teenagers who are working -- and unemployment rates -- the percentage of teenagers *in the workforce* who can't find a job. Employment rates and unemployment rates are not perfectly correlated because teenagers have three options available to them, not two:

- they can seek work and find a job, in which case they are classified as employed;
- they can seek work and fail to find a job, in which case they are classified as unemployed; or
- they can decide not to seek work, in which case they are classified as out of the work force.

In addition to separating employment and unemployment effects, we separated the effects of minimum wage increases on whites and non-whites. This distinction is important

because minimum wage increases affect these two social groups differently, and varying results may have policy implications.

We established boundaries in our study to avoid dealing with similar topics we did not wish to explore. We set aside studies that look at the effects of minimum wage increases on enrollment in school. Several studies looked at transition effects that minimum wage increases have on students' decision to enroll or drop out of school, based on their employment eligibility and ability to find work. This is very different from what we are trying to evaluate in our meta-analysis. We also limited the scope of our analysis to studies conducted on workforce in the United States. There were no boundaries established for time period or geographic location in the United States.

#### **Political Environment:**

The Democrats found success in 2006 by making raising the minimum wage an integral part of their Congressional campaign. Following the popularity of this issue, Democratic leadership included it as part of their 100 hours promise. A wage raise from \$5.15 to \$7.25 over two years was quickly approved by both the House and the Senate, but Congress struggled to work out the details of the accompanying tax cuts. Senate Democrats included \$8.3 billion in tax cuts for small businesses in their proposal. Alternatively, the House tax cuts were much smaller, amounting to \$1.3 billion over 10 years.<sup>1</sup>

On April 21<sup>st</sup>, 2007, the two Houses reached an agreement. Congressional Democrats accepted a plan which would raise the minimum wage to \$7.25 from \$5.15 an

<sup>1</sup> 

Zernike, Kate. "Senate Passes Wage Bill, but Obstacles Await." New York Times 156.5384 (2007): A15-A15.

hour over the course of two years. The agreement also allowed \$5 billion of the Senate's proposed tax cuts for small businesses. President Bush voiced support for this bill. However, it was tied to an emergency funding bill for Iraq which he vetoed on May 1<sup>st</sup>. After extensive negotiations, Democrats removed withdrawal deadlines from the Iraq funding bill. President Bush signed the resulting bill, which funded the Iraq war and raised the minimum wage, on May 25, 2007

#### **Policy Environment:**

The US's first minimum wage law was passed by President Franklin D. Roosevelt on 1938 as part of the Fair Labor Standards Act. Among other measures, it set the minimum wage at 25 cents an hour. Since then, the minimum wage has been raised 19 times till it reached its current level of \$5.15 in 1997. The FLSA also allows for a subminimum wage level for certain groups. Many students and teenagers fall into this category and are not entitled to the full minimum wage.<sup>2</sup>

During his presidency, President Clinton updated minimum wage laws so that states could establish their own minimum wage levels as long as they were higher than the national level. Twenty-nine states and the District of Columbia have established their own, higher minimum wages.<sup>3</sup> Of these twenty-nine jurisdictions, six states passed ballot measures in the 2006 elections raising the minimum wage by \$1.00-\$1.70 above the federal level. The measures passed with an average of 65% of the vote.<sup>4</sup>

 <sup>&</sup>lt;sup>2</sup> "The Minimum Wage Debate Balancing the Needs of Workers and Business." <u>Congressional Digest</u> 86(2007): 65-65.
<sup>3</sup> Ibid

<sup>&</sup>lt;sup>4</sup> Frank, Thomas. "Liberals Mark Some Victories with Ballot Initiatives." <u>Christian Science Monitor</u> 0734-7456 (2006) 13a

## **Theory:**

Proponents of a higher minimum wage argue that increasing the current minimum wage will benefit working families and low-skill workers, decrease poverty, and increase real-wages. These advocates also contend the increasing the minimum wage will not have a negative effect on employment rates. Those against increasing minimum wage argue that wage hikes are likely to reduce the number of jobs, drive low-skilled workers and teenagers out of the labor force, and create economic hardship for businesses.

Results from previous studies support both of these theories. Studies on minimum wage showing a negative effect on employment have been used in the argument against raising wage levels. For example, Currie and Fallick (1996) undertook a national study on the effect of minimum wage on youth employment using data from the National Longitudinal Survey of Youth. The dataset for this study is extremely large - upwards of 62,000 observations. Additionally, this study accounted for confounding factors such as race and schooling. Currie and Fallick concluded that raising minimum wage did have a negative effect on youth employment..

However, some studies of the minimum wage have found insignificant or even positive effects on youth employment, meaning that wage hikes actually increase youth employment. David Card has published extensively on this topic. In Card (1992), he accounts for a series of confounding factors in his regression including race, school enrollment, and industry distribution. Card also examines the effects of national policy on specific geographic regions. Card concludes that increasing the federal minimum wage will not have a significant effect on teenage employment.

Of course, single studies may be misleading, because they utilize an unusual sample or contain errors in the analysis. These problems can be minimized by combining numerous studies into a rigorous meta-analysis. By conducting this meta-analysis, we hope to sort out the confusion on this topic and make appropriate policy recommendations.

## Methodology:

In our attempt to compile a large enough universe of relevant articles, we searched both political science and economics databases. The primary search terms that we used in each search were "minimum wage" (MW) and "America" (Am). In addition to these terms, we added "employment" (Em), "Youth" (Y) and "Teenager" (Teen) individually to the searches. Thus, there were three different combinations of terms that were used in the searches: MW + Am + Em (search 1), MW + Am + Y (search 2), and MW + Y + Teen (search 3). We searched EconLit, Business Source Premier, and International Political Science Abstracts with each of these were relevant to our topic. Search 2 found 45 articles, most of which were relevant. Search 3 in EconLit came up with 16 articles, half of which were relevant. Searches in Business Source Premier were less fruitful; Search 1 had 13 results, search 2 found 2 articles, and Search 3 yielded 1 result. No search in this database proved to be especially helpful. Finally, we were unable to find any articles using our search terms in International Political Science Abstracts.

In addition, we performed a search to find any dissertations on the subject. We searched OCLC First Search's Dissertation Abstracts Online using the same methodology as stated earlier to find any relevant papers. We eliminated any papers that were either

not related to our variables, or did not include an original study. The searches brought up 6 relevant articles which we included in our list. We also looked for further studies in the reference sections of articles that we found, and added the appropriate articles to our master list. We are confident that the seventeen articles we reviewed form a complete universe on this topic.

In order to refine the results of our initial searches, we devised inclusion criteria for our universe of studies:

1) The data used in the study originates in the United States.

2) The outcome measure is some form of employment, whether it is rate of employment or the unemployment rate.

3) The outcome measure must also include only the teenage labor force, between the ages of 16 and 21.

4) The independent variable is a minimum wage, either at the state or federal level.

5) The data is independent from other data sets included in the universe of studies.

6) Studies must be either articles published in an academic journal or dissertations written at accredited universities.

For our meta-analysis, we chose to include only studies which used data from the

United States. Foreign countries have separate workforces and different cultures surrounding the labor market, which may change the way minimum wage affects employment levels. The minimum wage rate is very different for a country such as France compared to that of the United States. Therefore, it would be impossible for U.S. policy makers to draw any substantial conclusions from a meta-analysis which included data from such different countries.

We also limited our studies to those which used teenage employment as the dependent variable. The universe of literature on minimum wage is huge, so we chose to focus our research on the youth labor market. Teenagers fill a large percentage of lowskilled jobs, and therefore are highly affected by changes in the minimum wage. The studies must have as their dependent variable some measure of teenage employment, whether it is measurements of employment or unemployment.

The studies must also use the minimum wage as their independent variable. We will look at both state and national minimum wage in our meta-analysis, but include a dummy variable to account for the difference. Through our regression, we will therefore be able to see if the type of minimum wages measured affects the change in employment.

Finally, we decided that the studies must come from an accredited university where they will have had a proper review and they have independent data sets. Many of the articles use the same data sets, but analyze it differently. We therefore had to determine which study to include in the regression based on the quality of the two studies. Also, if an author published an updated version of a previous study, but with more recent data added, we will only include the newer study. In this way, we hope to avoid biasing the meta-analysis by including the same data and analysis twice.

Our codebook includes a variable for the presence of confounding factors. We included dummy variables in the codebook to account for studies that primarily focused on minorities and urban youth, because this could lead to a different effect size in the meta-analysis. Some studies also accounted for seasonal employment, which could also be an important confounding factor. Some studies looked at state minimum wages, while others accounted for increases at the federal level. In this case we included a dummy variable to test for differences between the two.

To ensure consistency in the coding process, one in every three articles in the universe was coded by two researchers. The results of coding were then compared. If results varied between two coders, a third coder would review the article. Generally, we

found that we consistently coded the articles similarly. The measure of effect size was the elasticity of teenage employment with regard to minimum wage. This is the percent increase in employment or unemployment divided by the percent change in minimum wage.

## **Results:**

Our results are detailed in tables 1 and 2 below. The mean effect size for unemployment turned out to be .6887, and the mean effect size for employment was -.0207. This means that a 1% increase in minimum wage will increase unemployment by about two-thirds of one percent, and decrease employment by two one-hundredths of one percent. The difference between the unemployment and employment effects is striking, and may be illustrated by using the minimum wage increase just enacted. As mentioned above, the bill raises the minimum wage from \$5.15 to \$7.25 over two years, an increase of 41 percent. According to the consensus of these studies, this will lead to a substantial increase in teenage unemployment of 28%, but a minor decrease in teenage employment of just eight-tenths of one percent. These figures may seem contradictory until the definitions of unemployment and employment are recalled. The employment rate includes the percentage of all teenagers holding a job, while the unemployment rate estimates the percentage of those seeking jobs who can't find work. According to these

# Table 1: Results for Unemployment

Date of Study	Author and Sample	Effect Size –
		Unemployment Elasticity
1972	Adie – all teens	.362
1972	Adie – white teens	.27
1972	Adie – nonwhite teens	.914
1998	Partridge and Partridge	1.22 (.0113)
Mean		0.6887

Note: where available, p-value is listed in parentheses.

Table	2:	Result	s for	Empl	loyment
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Date of Study	Author and Sample	Effect Size –
5	Ĩ	Employment
		Elasticity
1968	Brozen – all teens 1950-51	026
1968	Brozen – all teens 1956-57	0
1968	Brozen – all teens 1963-64	067
1968	Brozen – all teens 1965-66	.154
1968	Brozen – all teens 1967-68	.025
1968	Brozen – nonwhite teens 1950-51	030
1968	Brozen – nonwhite teens 1956-57	.069
1968	Brozen – nonwhite teens 1963-64	.140
1968	Brozen – nonwhite teens 1965-66	.062
1968	Brozen – nonwhite teens 1967-68	.100
1977	Ragan	.474 (.042)
1981	Betsey and Dunson	077 (.017)
1983	Brown, Gilroy, and Kohen	067 (.072)
1985	Solon	099 (.003)
1989	Wellington	062 (.099)
1993	Williams	1824
1998	Park and Ratti	.050 (.417)
2001	Williams and Mills	8492 (.150)
2004	Cover and Kim	0075
Mean		-0.0207
Inverse chi-squared statistic		
for positive estimates		8.089509
Combined significance of		Not significant
positive coefficients		at 5% level
Inverse chi-squared statistic		
for negative estimates		33.44906
Combined significance of		Significant at
negative estimates		the 1% level

Note: where available, p-value is listed in parentheses.

results, the minimum wage doesn't seem to have much effect on the number of jobs teenagers hold, but does increase the number of teenagers looking for those jobs. Thus, the principal cost of higher minimum wages is in the disappointment of the greater number of teenagers who seek, but cannot find, employment.

We also examined the statistical significance of these results. Only one study on unemployment provided enough information to calculate a p-value. This study (Partridge and Partridge [1998]), found that the minimum wage has a statistically significant effect on the unemployment rate, and a p-value of just over one percent. However, since these results are limited to one study, they must be interpreted with caution. Turning to the employment effects of the minimum wage, the estimates must be separated into negative and positive groups; otherwise, a p-value for a negative estimate could mistakenly be used as evidence for a positive outcome, and vice versa. We used the inverse chi-squared statistic for calculating combined statistical significance for the all studies taken together, as detailed in Hedges and Olkin (1985), pp. 37-39. Basically, this test tells us the likelihood that the observed set of empirical outcomes could have occurred by chance if the minimum wage had no effect on employment. The positive estimates are not statistically significant at the 5% level, but the negative estimates are highly statistically significant at the 1% level. This provides solid evidence that the minimum wage has negative effects on employment, even though the size of the effect is very small.

Finally, we examined the role of moderator variables in this analysis. Are there factors which make the minimum wage more or less potent in altering the employment prospects of teenagers? For unemployment, Adie found that the minimum wage has a greater impact on nonwhites than on all teens, or on white teens. This suggests that nonwhite teems might be most affected by the recent increase in the minimum wage, but again these results are based on just one study. The situation is reversed with respect to employment. If we average Brozen's five estimates on nonwhite employment we get +.0682, while if we average all the remaining estimates (which are for all teens), we get -.05244. However, this difference is not statistically significant.

We also checked for a relationship between the effect of the minimum wage and time, and here we did find statistically significant effects. The results are listed in table 3

Regression Sta	atistics			
Multiple R	0.491891			
R Square	0.241957			
Adjusted R				
Square	0.197366			
Standard				
Error	0.218041			
Observation				
S	19			
	Coefficient	Standard		
	S	Error	t Stat	P-value
Intercept	18.23259	7.836165	2.326723	0.032597
Year	-0.00923	0.003961	-2.32941	0.032422

Table 3: Results of Regression of Year on Effect Size for Employment.

The coefficient on this regression suggests that the disemployment effects of the minimum wage may be growing over time, although the effect is quite small. For every

year that passes, the effect of a one percent increase in the minimum wage increases by one one-hundredth of one percent.

# Conclusion:

There are serious policy implications that emerge from the conclusions of our meta-analysis. The results support our underlying empirical argument that increasing the minimum wage decreases the employment rate of teenage workers. However, the actual employment effect of increasing the minimum wage is a very small negative effect on teenage employment. Very few jobs, therefore, would be lost by raising the minimum wage. Our study did find, however, a larger effect on teenage unemployment rates. This just means that more people looking for jobs could not find one. Unemployment rates were probably increased because more teens were enticed into entering the labor force by the promise of higher wages. A complete analysis of the minimum wage requires an analysis of its effects on poverty, which we have not attempted in this paper. However, our results do strengthen the argument for those advocating higher minimum wages. The effects of the minimum wage are mainly higher search costs and psychic discouragement for job seekers, with very small effects on the actual number of jobs teenagers obtain. For many policymakers, these costs will seem small relatively to the benefits of higher minimum wages.

By running a meta-analysis on the fourteen articles which passed our inclusion criteria, we are able to take a broad look at the results of several empirical. The use of meta-analysis makes our conclusions more reliable than these previous studies because it includes information from 14 studies instead of just the use of a single regression.

As a result of our findings policy makers can now look at the effect of minimum wage on teenage employment in a more confident way. This topic is hotly debated by policy makers with advocates of minimum wage increases supporting the notion that it has either a zero or positive effect on teenage employment and opponents of minimum wage increases supporting the notion that it has a negative effect on teenage employment. The findings of our meta-analysis are the most reliable and conclusive results available pertaining to the evaluation of this topic, and this accounts for the necessity for policy makers to listen to this advice. While those who believed that the minimum-wage would have a positive effect on employment were wrong, it does not follow that there is a serious negative effect either. It appears instead that a higher minimum wage draws young people into the labor force, but that they are not all able to find jobs. Therefore, our study does not find evidence that raising the minimum wage would have a serious negative effect on young workers.

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