Senior Project

Department of Economics

Minimum Wage, Consumer Price Index, and the Unemployment Rate of Workers Without a College Degree

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Abstract

Increasing the minimum wage to $15 has been a very controversial debate over the last few years. While it is easy to believe that raising the minimum wage would result in more money for everyone, it is important to determine the economic effects this large increase would have. My research aims to determine how raising the minimum wage effects unemployment- more specifically for teenagers, young adults, and those without a college degree, as well as the effect on consumer price index. Through my research, I found statistically significant evidence that proves that increasing minimum wages result in an increase in consumer price index, in general and for tradable and non-tradable goods. There was also statistically significant evidence that proves that increasing minimum wages result in a decrease in unemployment. I believe that the higher minimum wage attracts those who are not in the work force, helping to increase employment.

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I. Introduction

In recent years, the support for a $15 minimum wage has been on the rise in the U.S. A nationally representative survey conducted in April 2021 showed that 62% of U.S. adults supported raising the minimum wage to $15 an hour, while 38% opposed the idea (Dunn, 2021). As of January 2022, only two states have a $15 minimum wage (Janisch, 2022).[1] However, twenty-two states have plans in place to achieve a $15 minimum wage (Janisch, 2022). [2] There are seven states with a minimum wage set above the federal minimum wage with no plans to reach a $15 minimum wage.[3] There are twenty states that still go by the federal minimum wage (Janisch, 2022).[4] Given this interest in increasing the minimum wage, it is important to evaluate its effect on unemployment of vulnerable workers as well as the cost of living.

It is important to study this topic in order to understand if a higher minimum wage will be beneficial to all workforce participants and the economy. This paper will compare the consumer price index (CPI) and labor participation rate in states that have higher minimum wages to those states where minimum wages are set at or near the mandated minimum wage to determine if a higher minimum wage is helping or hurting teenagers, young adults, and those without a college degree. This paper will also look at employment by industry to determine which industries are most affected by a higher minimum wage.

Using data obtained from the Integrated Public Use Microdata Series (IPUMS) and the Bureau of Labor Statistics for the years 2000 to 2017, I will use linear regression analysis to

[1] California and Washington D.C.
[2] Alaska, Arizona, Colorado, Connecticut, Delaware, Florida, Illinois, Maine, Maryland, Massachusetts, Minnesota, Missouri, Montana, New Jersey, New York, Ohio, Oregon, Rhode Island, South Dakota, Vermont, Virginia, and Washington
[3] Arkansas, Hawaii, Michigan, Nebraska, New Mexico, Nevada, and West Virginia
[4] Alabama, Georgia, Iowa, Idaho, Indiana, Kansas, Kentucky, Louisiana, Mississippi, North Carolina, North Dakota, New Hampshire, Oklahoma, Pennsylvania, South Carolina, Tennessee, Texas, Utah, Wisconsin, Wyoming

determine the effect of an increase in minimum wage on unemployment and consumer price index. The results of my study will determine if a higher minimum wage puts more money in the pockets of those that need it or if it results in higher inflation and unemployment hurting the workers.

The rest of this paper is organized as follows: section II provides a brief review of the literature, section III provides the economic theory behind my research, section IV provides a preview of the data used for the analysis, section V provides the methodology for the regressions used, section VI provides the results from the regressions ran, and section VII provides conclusions that can be drawn from the research, as well as what policy can be implemented.

II. Literature Review

The effect of higher minimum wages on unemployment has been an ongoing debate among economists and politicians for quite some time. Many researchers have found that increasing the minimum wage causes unemployment to increase, however, there are some researchers who believe that increasing the minimum wage does not increase unemployment and is beneficial for the economy.

A higher minimum wage is intended to help lower income families, but the empirical evidence does not support this hypothesis. For example, Neumark (2018) reviews the existing literature on the minimum wage laws and concludes that the evidence for the positive effect of increasing minimum wage on workers is limited at best. Specifically, only a subset of workers, those who are lucky to keep their jobs, appear to be benefiting from it. An exception to this

conclusion is the instances of change in minimum wage that are accompanied by other policies such as a targeted tax credit (Neumark, 2018).

In contrast to this, a fact sheet published by the Economic Policy Institute (2021) states that "multiple studies conclude that total annual incomes of families at the bottom of the income distribution rise significantly after a minimum wage increase. Workers in low-wage jobs and their families benefit the most from these income increases, reducing poverty and income inequality."

When researching the effects of an increased minimum wage on unemployment, it is important to compare the effects on different groups of workers and industries. Increased minimum wages has had the strongest negative effect on the unemployment rate of teens, young adults, the less-educated, and low-wage workers (Neumark and Shirley, 2021). Kim and Jang (2020) found that a "1% increase in the minimum wage causes a 0.6% reduction in restaurant employment." This finding shows that the restaurant industry, which is predominantly employed with teens and young adults, is heavily impacted by changes in minimum wage. A group that is shown to be both benefited and hurt by an increased minimum wage are those who have reached retirement. Results have shown that a higher minimum wage results in increased earnings for those aged 62-70 and may have small positive effects on the supply of labor (Borgschulte and Cho, 2019). Higher minimum wages for the elderly have also helped to "decrease the number of Social Security beneficiaries and amount of benefits disbursed" (Borgschulte and Cho, 2019). While this is beneficial for the economy, it could be potentially hurting the elderly, as they could be better off collecting Social Security.

Research shows that when there is an increase in minimum wage, there is also an increase in prices of goods for consumers. This is most evident in restaurants and retail stores.

MacDonald and Aaronson (2000) found that food prices respond very quickly to minimum wage increases, with most of the observed response occurring within two months of the increase in minimum wage.

This paper aims to discover the difference in the cost of living (i.e., CPI) for states that have a $15 minimum wage compared to states that have the minimum wage set at the federal minimum wage. My research also aims to further elaborate on if a higher minimum wage results in unemployment and what industries or groups of people are affected most by this.

III. Theoretical Discussion

While the effects of minimum wage on employment, is more complex than what a basic supply and demand model can explain, we could use the model to get a basic idea of the effects of minimum wage on employment. When the minimum wage is set higher than the equilibrium wage, the quantity of labor demanded decreases while the quantity of labor supplied increases. This results in a surplus of labor or a shortage of jobs (unemployment) and the difference between quantity demanded, and quantity supplied is the unemployment.

When comparing states with a higher minimum wage to those with the federal minimum wage, we expect to see a higher consumer price index in states with higher minimum wages. A higher minimum wage results in an increase in the cost of labor and therefore the price of goods and services. The increase in price varies by the type of good. Specifically, the price of tradable goods, which can be produced in states with lower minimum wages, are not expected to change significantly while the price of non-tradable goods should increase as a result of a higher minimum wage. Tradable goods are easily manufacturable goods, and their prices are typically set internationally (Dube, 2019). Without control over the price of the good, the manufacturers

are not able to offset an increase in labor by increasing the price of the good (Dube, 2019). In contrast to this, non-tradable goods are domestically produced goods. When there is an increase in the price of labor, firms that produce non-tradable goods can offset the higher cost of labor by increasing the price of their good. By increasing the cost of the non-tradable goods, I expect this to lead to an increase in the consumer price index. Lastly, it is worth noting that the change in prices may not be instantaneously and may take a few months or longer to take effect.

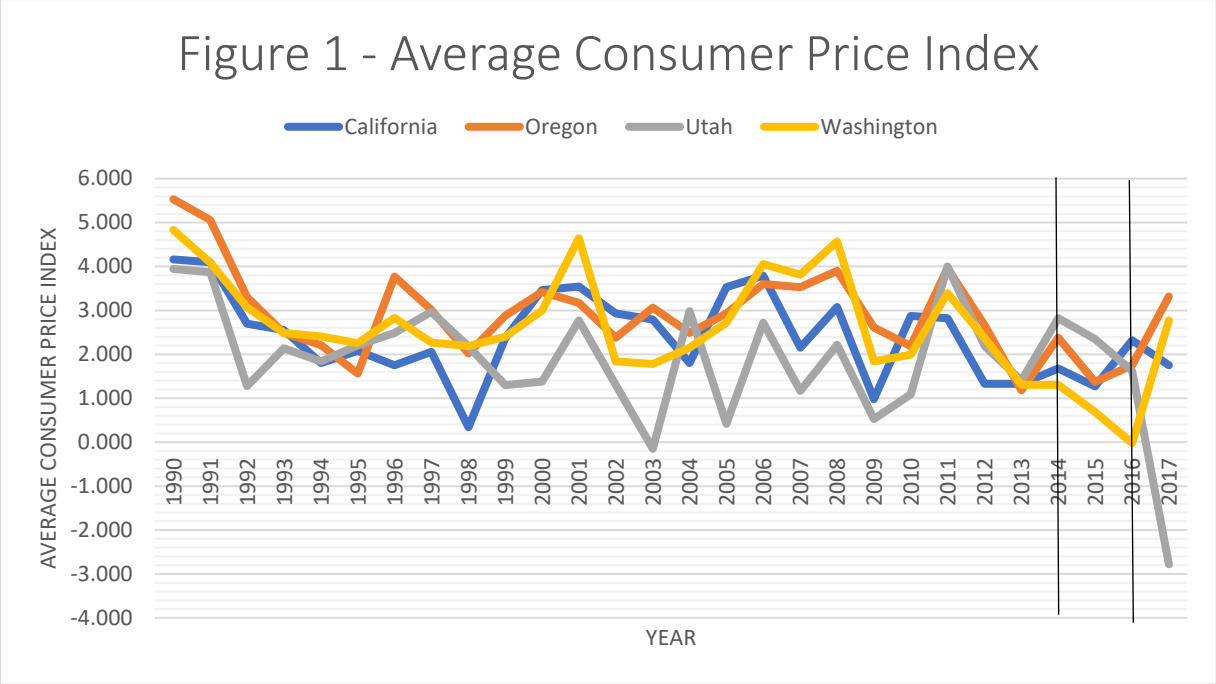
When trying to determine the effects of minimum wage on unemployment, it is important to look at the effects on certain groups of people, such as teenagers, young adults, and those without a college degree. These groups of people are most vulnerable to the effects due to working jobs that pay minimum wage, such as in restaurants.

This paper aims to test whether an increase in the minimum wage results in an increase in unemployment and CPI.

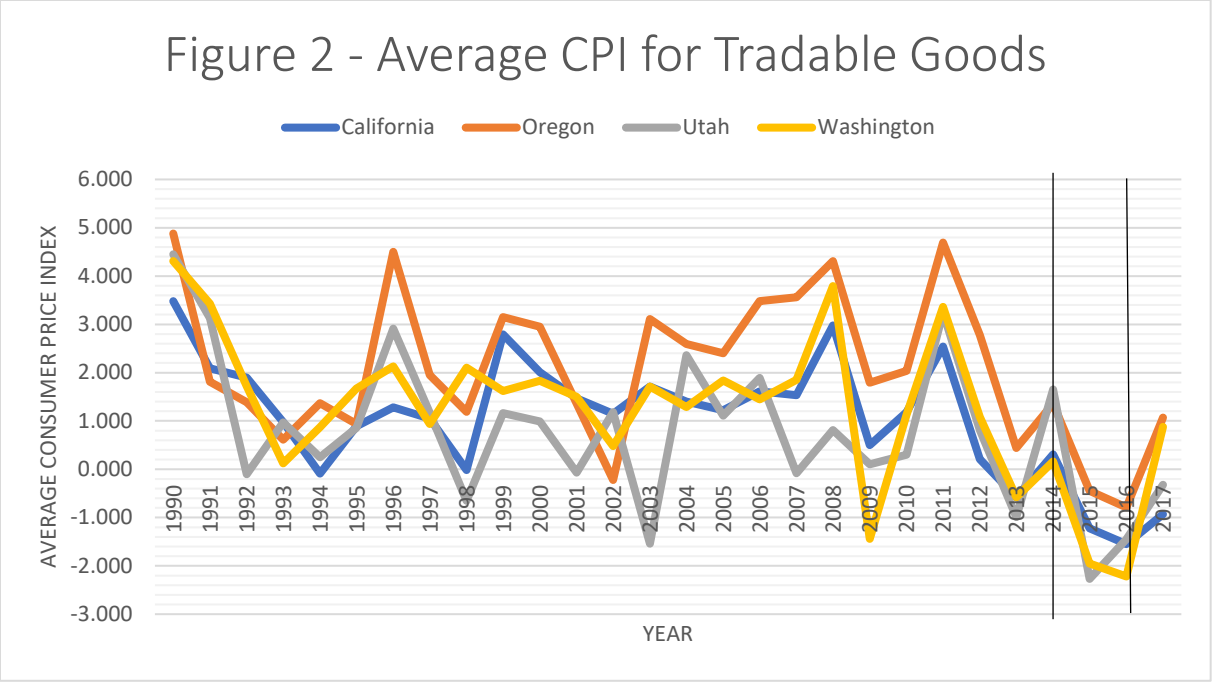
IV. Preview of the Data

The data for this paper was obtained from IPUMS as well as a data set made using microdata from the Bureau of Labor Statistics. The variables obtained from IPUMS that are included in the analysis are sex, age, race, educational attainment, employment status, occupation, industry, marital status, number of children and total personal income. The data used for CPI was a dataset built by Herreño, Steinsson, and Hazell in 2020 using microdata from the Bureau of Labor Statistics. The CPI data was taken each quarter for the years 1990-2017, so I took the average of the four quarters to use for my analysis. For this analysis, California, who has increased their minimum wage multiple times during this period, will be compared to Utah, who

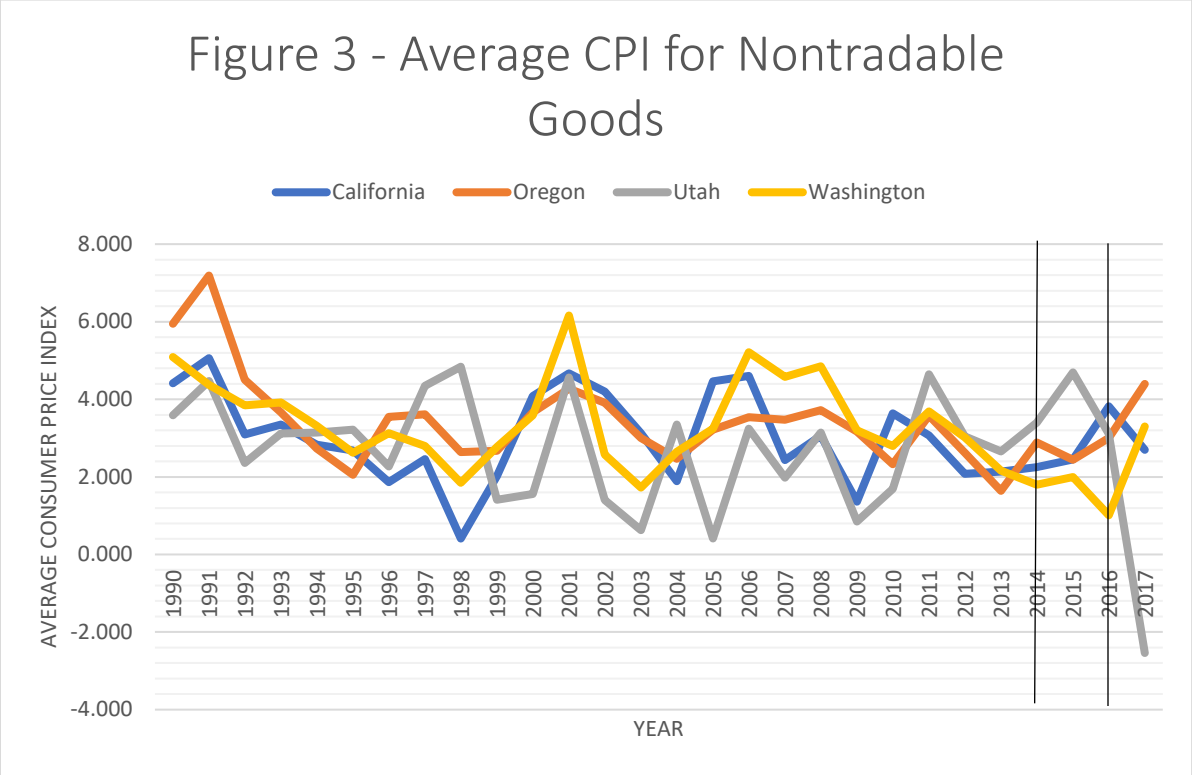
has always had the federal mandated minimum wage, as well as Washington and Oregon to see if other factors during this time could have affected the consumer price index (CPI).



Source: Bureau of Labor Statistics. The vertical lines indicate an increase in minimum wage in California.



Source: Bureau of Labor Statistics. The vertical lines indicate an increase in minimum wage in California.



Source: Bureau of Labor Statistics. The vertical lines indicate an increase in minimum wage in California.

The graphs above were made using data from the Bureau of Labor Statistics. In the graphs above, the average CPI for the years 1990-2017 is being compared among California, Oregon, Utah, and Washington. California had increased their minimum wage from $8 to $9 on July 1, 2014 and again from $9 to $10 on January 1,2016. They increased the minimum wage again on January 1, 2017 from $10 to $10.50. The increases in minimum wage have been shown as vertical lines on the graphs.

In Figure 1, the trend for average consumer price index was very similar in California, Oregon, Utah and Washington before and after the increases in minimum wage. The trend for average CPI was similar in all four states when looking at average CPI for tradable goods before and after the

increases in minimum wage. However, for non-tradable goods, Utah and Washington both have a decrease in average CPI for the year 2016, whereas California and Oregon see an increase in average CPI. This decrease in not drastic for Utah and Washington, therefore making it difficult to conclude from these graphs if increases in minimum wages cause an increase in average consumer price index. To further research the effects the increase in minimum wage has on average CPI, I will be running multiple regressions.

Table 1 is a summary statistics table that includes what percentage of the observations is included for each variable. The summary statistics table is based on 3462318 observations.

Table 1: Summary Statistics Table– Source: IPUMS and own calculations

Variable	Percent
Female	53.45%
Male	46.55%
White	70.64%
Other Races	29.36%
Employed	92.10%
Unemployed	7.90%
No Children	56.20%
Has Children	43.80%
Married	55.47%
Divorced	10.46%
Single	30.43%
Other	3.64%
Less than High School	9.31%
High School	30.12%
1 year College	17.70%
2 years College	8.55%
3 years College	21.61%
4 years College	12.71%
Average Age	41.77
Average Total Income	50998.16

V. Empirical Methodology

In order to measure the impact of change in minimum wage on unemployment and CPI, the first step is to use a simple regression model.

$$CPI(\text{price index})_{st} = B_0 + B_1 MinWage_{st} + X_{st} + Year_t + State_s + Error_{st} \quad (1)$$

$$CPI(\text{tradable goods})_{st} = B_0 + B_1 MinWage_{st} + X_{st} + Year_t + State_s + Error_{st} \quad (2)$$

$$CPI(\text{non-tradable goods})_{st} = B_0 + B_1 MinWage_{st} + X_{st} + Year_t + State_s + Error_{st} \quad (3)$$

$$Unemployment_{ist} = B_0 + B_1 MinWage_{st} + X_{ist} + Year_t + State_s + Error_{ist} \quad (4)$$

In the above regression equations, *MinWage* is the minimum wage, which is used as an indicator variable, being a 1 for the years the minimum wage was increased and a 0 if it was not increased. *X* represents the control variables. The control variables are %female, %white, %black, %Indian, %Chinese, %Japanese, %other race, average age, %high school, %college, %married, %divorced, %single, occupation, industry, and number of children. *Year* and *State* are included for fixed effects, as well as an error term to help determine the certainty of the model. The subscript *s* represents the state (California, Oregon, Utah and Washington) and *t* represents the year (2000-2017). The subscript *i* indicates that the analysis for unemployment was ran using individual-level data.

I will be running regression equations 1-3 to determine the effects of increasing minimum wages on the average consumer price index and more specifically the effects on tradable and non-tradable goods. I will be running regression equation 4 to determine the effects of increasing minimum wages on unemployment. After getting the results for the regression, I will further

research by running the regression equation again, using 25% highest earning industries. I will run the regression equation a third time using the 25% lowest earning industries. By accounting for the industries in the regression equation, I will be able to determine the effects of increases in minimum wages on lower earning workers to determine if the increase in wages is truly helping them.

VI. Results

After running the regressions for consumer price index, I can conclude that an increase in minimum wages causes an increase in CPI, in general, and for tradable and non-tradable goods. While most of the variables are not statistically significant, the F-value for the general CPI regression equation and for the regression equation for tradable goods is statistically significant at the $P<.001$ level and the F-value for the non-tradable goods regression equation is statistically significant at the $P<.01$ level. Since the F-values are statistically significant, I can conclude that the increase in minimum wage directly affects CPI and based on the coefficient of *MinWage*, I can conclude that increasing minimum wages result in an increase in CPI in general and for tradable and non-tradable goods. These results are similar to those seen in Figure 3 in the Preview of the Data section. In Figure 3, there was an increase in the CPI for non-tradable goods in 2016 when California increased their minimum wage.

For the unemployment regressions, the variable *MinWage* is very statistically significant (significant at the $P<.001$ level) for all industries, the top 25% earning industries and the bottom 25% earning industries. The F-Value is also very statistically significant for all three regression equations. These regression equations being statistically significant at the $P<.001$ level allows me

to draw the conclusion that increasing the minimum wage directly affects unemployment and based on the coefficient of *MinWage,* increasing minimum wages causes a decrease in unemployment. These results are the opposite of what I would have expected to see, as I predicted that the unemployment rate would increase because of companies not being able to afford to pay these higher wages to as many workers. I believe that a reason why the unemployment rate decreasing when the minimum wages increase could be that the higher wage is more attractive to those who were previously not working, and they are more willing to get back into the labor force at this higher wage.

Table 2: Consumer Price Index Regression Results– Source: IPUMS and own calculations

VARIABLE	CONSUMER PRICE INDEX	CONSUMER PRICE INDEX - TRADABLE GOODS	CONSUMER PRICE INDEX - NONTRADABLE GOODS
INTERCEPT	-39.9094	12.81917	-58.79129
	(67.82048)	(81.47022)	(77.87177)
MINWAGE	0.30596	0.85773	0.08621
	(0.39692)	(0.47680)	(0.45574)
FEMALE	-70.98174*	1.08477	-92.17612**
	(32.39601)	(38.91612)	(37.19724)
WHITE	-8.06208	34.01630	-26.188624
	(18.66968)	(22.42720)	(21.43661)
BLACK	87.30006	115.84828	71.67847
	(64.0951)	(76.99506)	(73.59427)
INDIAN	-16.33612	21.72250	-23.10722
	(71.15849)	(85.48004)	(81.70448)
CHINESE	-51.67278	149.39756	-163.83396
	(105.11928)	(126.27587)	(120.69841)
JAPANESE	-454.34371*	-347.95412	-455.88972*
	(193.03420)	(231.88478)	(221.64270)
OTHER RACE	-889.10464**	-464.36236	-1019.13456**
	(265.09523)	(318.44902)	(304.38349)
AGE	0.76282*	0.51296	0.88680
	(0.39385)	(0.47312)	(0.45222)
HIGH SCHOOL	13.68058	-49.42599	31.41535
	(36.36885)	(43.68854)	(41.75887)
COLLEGE	9.13894	-29.41390	18.66126
	(29.00367)	(34.84102)	(33.30213)
MARRIED	42.51852	-39.96612	75.86160
	(61.27817)	(73.61118)	(70.35986)
DIVORCED	55.21722	-6.94104	74.30654
	(73.71054)	(88.54573)	(84.63476)
SINGLE	61.46893	-41.58149	104.89994

	(63.89621)	(76.75613)	(73.36590)
NUMBER OF CHILDREN	-2.92132	5.50642	-5.49757
	(5.91866)	(7.10987)	(6.79584)
OCCUPATION AND INDUSTRY CONTROLS?	Yes	Yes	Yes
NUMBER OF OBSERVATIONS	72	72	72
ADJUSTED R SQUARED	0.3619	0.4414	0.2629
F VALUE	3.37***	4.30***	2.49**

Table 3: Unemployment Regression Results – Source: IPUMS and own calculations

VARIABLE	UNEMPLOYMENT - ALL INDUSTRIES	UNEMPLOYMENT WITH TOP 25% INDUSTRIES	UNEMPLOYMENT WITH BOTTOM 25% INDUSTRIES
INTERCEPT	0.12378***	0.12282***	0.01928***
	(0.00120)	(0.00200)	(0.00270)
MINWAGE	-0.01521***	-0.01434***	-0.01040***
	(0.00028507)	(0.00038486)	(0.00069595)
FEMALE	0.00228***	0.00028776	0.01205***
	(0.00029500)	(0.00039552)	(0.00070699)
WHITE	-0.00075246	-0.00196***	0.00000542
	(0.00036360)	(0.00050601)	(0.00081934)
BLACK	0.04665***	0.02410***	0.09168***
	(0.00078191)	(0.00108)	(0.09168)
INDIAN	0.04739***	0.03246***	0.05741***
	(0.00147)	(0.00217)	(0.00321)
CHINESE	0.00008217	-0.00345	0.00694**
	(0.00086323)	(0.00101)	(0.00228)
JAPANESE	0.00990***	-0.01068***	-0.00391
	(0.00166)	(0.00198)	(0.00452)
OTHER RACE	0.02355***	0.01549***	0.03114***
	(0.00261)	(0.00361)	(0.03114)
AGE	-0.00093204***	-0.00004739	-0.00177***
	0.00001224	(0.00001709)	(0.00002957)
HIGH SCHOOL	-0.03457***	-0.02600***	-0.02353***
	(0.00053845)	(0.00129)	(0.00098212)
COLLEGE	-0.05546***	-0.04373***	-0.03518***
	(0.00053026)	(0.00126)	(0.00099975)
MARRIED	-0.03277***	-0.02386***	-0.03565***
	(0.00077733)	(0.00112)	(0.00177)
DIVORCED	-0.00279	-0.00150	-0.00262
	(0.00086521)	(0.00123)	(0.00203)
SINGLE	0.00985***	0.00568***	0.00101

	(0.00083644)	(0.00121)	(0.00190)
NUMBER OF CHILDREN	-0.00507***	-0.00303***	-0.00439***
	.00013799)	(0.00019236)	(0.00033805)
OCCUPATION AND INDUSTRY CONTROLS?	Yes	Yes	Yes
NUMBER OF OBSERVATIONS	3462318	1223166	869453
ADJUSTED R SQUARED	0.0447	0.0117	0.1202
F VALUE	9530.66***	849.93***	6986.45***

VII. Conclusion

From the results for my research, I can conclude that there is significant evidence to prove that increases in minimum wages result in increases in the consumer price index. From graphing the average CPIs for 2000-2017, you could see a small increase in CPI for non-tradable goods in California in 2016, but not enough of an increase to confirm that increases in minimum wages are causing a significant increase. After running the regression equations, I found that the F-value for the general CPI regression equation and for the regression equation for tradable goods is statistically significant at the P<.001 level and the F-value for the non-tradable goods regression equation is statistically significant at the P<.01 level. Since the F-values are statistically significant, I can conclude that the increase in minimum wage directly affects CPI and based on the coefficient of *MinWage*, I can conclude that increasing minimum wages result in an increase in CPI in general and for tradable and non-tradable goods.

However, increases in minimum wages result in a decrease in unemployment. This was proven by *MinWage* and the F-value being very statistically significant (significant at the P<.001

level) for all three regressions ran for unemployment. These regression equations being statistically significant at the P<.001 level allows me to draw the conclusion that increasing the minimum wage directly affects unemployment and based on the coefficient of *MinWage*, increasing minimum wages causes a decrease in unemployment.

I believe that it would be beneficial for states that want to achieve a $15 minimum wage to follow in the policy implications that many states have implemented by gradually increasing the minimum wage over a certain number of years to help offset the effects on the consumer price index. It can be concluded that increasing the minimum wage increases CPI and decreases unemployment, so by gradually increasing the minimum wage, there will be smaller increases in CPI, rather than significant increases. By increasing the minimum wage, more people will join the work force to earn this higher wage, resulting in a decrease in unemployment.

VIII. References

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IX. Appendix

SAS Code:

```
LIBNAME econ "/home/u61344608/sasuser.v94";

PROC IMPORT
DATAFILE="/home/u61344608/CPI.xlsx"
OUT=econ.cpi
DBMS=xlsx
REPLACE;
SHEET="SHEET1";
GETNAMES=YES;
RUN; quit;

PROC IMPORT
DATAFILE="/home/u61344608/MinWage.xlsx"
OUT=econ.minwage
DBMS=xlsx
REPLACE;
SHEET="SHEET1";
GETNAMES=YES;
RUN; quit;

PROC IMPORT
DATAFILE="/home/u61344608/usa_00056.xlsx"
OUT=econ.ipumsdata
DBMS=xlsx
REPLACE;
SHEET="usa_00056";
```

```
GETNAMES=YES;
RUN; quit;

PROC IMPORT
DATAFILE="/home/u61344608/usa_00057.xlsx"
OUT=econ.ipumsdata2
DBMS=xlsx
REPLACE;
SHEET="usa_00057";
GETNAMES=YES;
RUN; quit;

PROC IMPORT
DATAFILE="/home/u61344608/usa_00058.xlsx"
OUT=econ.ipumsdata3
DBMS=xlsx
REPLACE;
SHEET="usa_00058";
GETNAMES=YES;
RUN; quit;

PROC IMPORT
DATAFILE="/home/u61344608/usa_00059.xlsx"
OUT=econ.ipumsdata4
DBMS=xlsx
REPLACE;
SHEET="usa_00059";
GETNAMES=YES;
RUN; quit;
```

```
PROC IMPORT
DATAFILE="/home/u61344608/usa_00060.xlsx"
OUT=econ.ipumsdata5
DBMS=xlsx
REPLACE;
SHEET="usa_00060";
GETNAMES=YES;
RUN; quit;

Data econ.mergeproject1;
	merge econ.minwage econ.cpi  ;
	by StateFip Year;
run;

PROC SORT data=econ.ipumsdata;
	by StateFip;
run;

PROC SORT data=econ.ipumsdata2;
	by StateFip;
run;

PROC SORT data=econ.ipumsdata3;
	by StateFip;
run;

PROC SORT data=econ.ipumsdata4;
	by StateFip;
run;
```

```
PROC SORT data=econ.ipumsdata5;
	by StateFip;
run;

Data econ.mergeproject;
	merge econ.ipumsdata econ.ipumsdata2 econ.ipumsdata3 econ.ipumsdata4
econ.ipumsdata5 ;
	by StateFip Year;
	run;

/*FEMALE*/
DATA econ.mergeproject;
	set econ.mergeproject;

	if sex=2 then
		female=1;
	else female=0;
run; quit;

/*WHITE*/
DATA econ.mergeproject;
	set econ.mergeproject;

	if race=1 then
		white=1;
	else white=0;
run; quit;

/*BLACK*/
DATA econ.mergeproject;
```

```
        set econ.mergeproject;

        if race=2 then
                black=1;
        else black=0;
run; quit;

/*INDIAN*/
DATA econ.mergeproject;
        set econ.mergeproject;

        if race=3 then
                indian=1;
        else indian=0;
run; quit;

/*CHINESE*/
DATA econ.mergeproject;
        set econ.mergeproject;

        if race=4 then
                chinese=1;
        else chinese=0;
run; quit;

/*JAPANESE*/
DATA econ.mergeproject;
        set econ.mergeproject;

        if race=5 then
```

```
            japanese=1;
        else japanese=0;
run; quit;

/*OTHER RACE*/
DATA econ.mergeproject;
        set econ.mergeproject;

        if race=6 then
            otherrace=1;
        if race=7 then
            otherrace=1;
        if race=8 then
            otherrace=1;
        if race=9 then
            otherrace=1;
        else otherrace=0;
run; quit;

/*EMPLOYED*/
DATA econ.mergeproject;
        set econ.mergeproject;

        if empstat=1 then
            employed=1;
        else employed=0;
run; quit;

/*HIGH SCHOOL*/
DATA econ.mergeproject;
```

```
        set econ.mergeproject;

        if educ=6 then
                highschool=1;
        else highschool=0;
run; quit;

/*ATTENDED COLLEGE*/
DATA econ.mergeproject;
        set econ.mergeproject;

        if educ=7 then
                college=1;
        else if educ=8 then
                college=1;
        else if educ=9 then
                college=1;
        else if educ=10 then
                college=1;
        else if educ=11 then
                college=1;
        else college=0;
run; quit;

/*MARRIED*/
DATA econ.mergeproject;
        set econ.mergeproject;

        if marst=1 then
                married=1;
```

```
        else if marst=2 then
                married=1;
        else married=0;
run; quit;

/*DIVORCED*/
DATA econ.mergeproject;
        set econ.mergeproject;

        if marst=4 then
                divorced=1;
        else divorced=0;
run; quit;

/*SINGLE*/
DATA econ.mergeproject;
        set econ.mergeproject;

        if marst=6 then
                single=1;
        else single=0;
        run; quit;

PROC MEANS data=econ.mergeproject;
        var female white black indian chinese japanese otherrace age highschool college married
divorced single nchild occ ind;
        by StateFip Year;
        output OUT=meanbystate_year1;
        run;
```

```
Data econ.state_clean;
        SET meanbystate_year1;
        Where _stat_="MEAN";
        Drop _stat_ _freq_ _type_;
        run;

Data econ.mergeprojectclean;
        merge econ.minwage econ.cpi econ.state_clean ;
        by StateFip Year;
run;

Proc Reg data=econ.mergeprojectclean;
        model PI_NT_Avg = MinWage female white black indian chinese japanese otherrace age
highschool college married divorced single  nchild occ ind;
        run; quit;

Proc Reg data=econ.mergeprojectclean;
        model PI_T_Avg = MinWage female white black indian chinese japanese otherrace age
highschool college married divorced single nchild occ ind;
        run; quit;

Proc Reg data=econ.mergeprojectclean;
        model PI_Avg = MinWage female white black indian chinese japanese otherrace age
highschool college married divorced single nchild occ ind;
        run; quit;

Proc Reg data=econ.mergeprojectclean;
        model Unemployed = MinWage white black indian chinese japanese otherrace
highschool college married divorced single  nchild occ ind;
```

```
        run; quit;


/*UNEMPLOYED*/
DATA econ.mergeproject;
        set econ.mergeproject;

        if empstat=2 then
                unemployed=1;
        else unemployed=0;
run; quit;

/*Summary Stats*/
proc freq data =econ.mergeproject;
table sex race empstat nchild marst educ;
run;

Proc Means data =econ.mergeproject;
vars age inctot ;
run;

Data econ.unemployment;
        merge econ.mergeproject econ.minwage;
        by StateFip Year;
        run;

Proc Reg data=econ.unemployment;
        model Unemployed = MinWage female white black indian chinese japanese otherrace
highschool college married divorced single nchild occ ind;
        run; quit;
```

```
/*Top/Bottom Industries */
Proc Sort data=econ.mergeproject;
        by ind;
        run;

Proc Means data=econ.mergeproject;
        var inctot;
        by ind;
        output OUT=meanbyind;
        run;

Data econ.ind_clean;
        SET meanbyind;
        Where _stat_="MEAN";
        Drop _stat_ _freq_ _type_;
        run;

Proc Sort data=econ.ind_clean;
        by descending inctot;
        run;

Data Top25Pct Bottom25Pct;

          Set econ.ind_clean;

          Filter=1;

          if _n_<137 then output Top25Pct; /*This line sends rows 1-35 to Top25pct database */
```

```
        if _n_>409 then output Bottom25Pct; /*This line sends rows 106-140 to Bottom25pct
database */

Run;

Proc Sort data=Top25Pct;
        by ind ;
        run;

Proc Sort data=econ.mergeproject;
        by ind;
        run;

Data econ.top25;
        merge econ.mergeproject Top25Pct;
        by ind;
        run;

data econ.top_25;
set econ.top25;
if filter="." then delete;
run; quit;

Proc Sort data=econ.top_25;
        by StateFip Year;
        run;

Data econ.top25_;
        merge econ.top_25 econ.minwage;
```

```
        by StateFip Year;
        run;

Proc Reg data=econ.top25_;
        model Unemployed =MinWage white black indian chinese japanese otherrace highschool
college married divorced single  nchild occ ind;
        run; quit;

Proc Sort data=Bottom25Pct;
        by ind ;
        run;

Proc Sort data=econ.mergeproject;
        by ind;
        run;

Data econ.Bottom25;
        merge econ.mergeproject Bottom25Pct;
        by ind;
        run;

data econ.Bottom_25;
set econ.Bottom25;
if filter="." then delete;
run; quit;

Proc Sort data=econ.Bottom_25;
        by StateFip Year;
        run;
```

```
Data econ.Bottom25_;
        merge econ.Bottom_25 econ.minwage;
        by StateFip Year;
        run;


Proc Reg data=econ.Bottom25_;
        model Unemployed =MinWage white black indian chinese japanese otherrace highschool
college married divorced single  nchild occ ind;
        run; quit;
```