

The impact of rising Minimum Wage on the Unemployment rate

Johnathan Martinez

ECON: 495W Capstone in Economics

Professor Stone

12 December 2023

Abstract

This paper investigates the relationship between minimum wage and unemployment rates specifically. The interplay between minimum wage policies and unemployment rates has long been a subject of analysis for economists. This study examines if a significant relationship exists between minimum wage and unemployment rates using state-level data, controlling for variables like percent with bachelor's degree or higher age 25+, percent of urban population, and rate of union representation.

Introduction

Minimum wage refers to the legally mandated minimum hourly wage employers must pay their employees for their work. The government established the minimum wage to provide low-wage workers with a basic standard of living, protect workers from exploitation, and reduce income inequality within the labor market. The government's rationale behind setting a minimum wage is to ensure that workers receive a fair and reasonable wage for their labor, ultimately promoting economic stability and social welfare. By providing a minimum wage, the government aims to prevent employers from exploiting workers by paying them less than they deserve, which could result in poor working conditions and reduced productivity. Moreover, the minimum wage is intended to provide a basic standard of living for low-wage workers who may struggle to make ends meet and support themselves and their families.

According to the fundamental concepts of microeconomics, the minimum wage is determined by the interaction of supply and demand for labor. In other words, workers act as suppliers and employers as consumers. A surplus of labor may be created when the minimum wage is set higher than the natural wage that results from market forces. This surplus of labor can result in a higher rate of unemployment. The reason behind this is that some employers may be unable to pay the higher wage and may opt to reduce their workforce, while some workers may be willing to work at the lower wage but cannot find employment opportunities. Consequently, the excess labor supply leads to a decrease in the demand for labor, which ultimately results in higher unemployment rates. Therefore, understanding the link between minimum wage levels and unemployment rates is crucial when evaluating the economic repercussions of adjusting the minimum wage, whether through increases, decreases, or maintaining its current level.

The relationship between minimum wage policies and unemployment rates remains among the most debated topics in economic policy and labor studies. This paper will focus specifically on examining the potential correlation between the minimum wage and unemployment rates. Specifically, will an

increase in minimum wage increase the unemployment rate? This methodology will be conducted through multiple linear regression that analyzes cross-sectional data from 2019, comparing state-specific minimum wages with their respective unemployment rates. This methodology allows for a comprehensive understanding of how minimum wage changes affect employment levels.

Literature Review

A pivotal study that greatly influenced this paper is the seminal work by Card and Krueger (1994) on the impacts of minimum wage, which was instrumental in reevaluating the relationship between minimum wage policies and employment levels. "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania"(1994) by David Card and Alan B. Krueger is one of the most famous case studies within minimum wage research, which focused on the fast-food industry in New Jersey and Pennsylvania. New Jersey and Pennsylvania were compared in this study due to their similar geographic and economic characteristics. In New Jersey, fast-food restaurants were divided into three groups based on their initial wages: \$4.25 (the old minimum wage), \$4.26 to \$4.99, and \$5.00 and above. The study compared employment growth rates between New Jersey and Pennsylvania restaurants before and after the minimum wage increase. They found that New Jersey restaurants had an average employment growth rate 13% higher than their Pennsylvania counterparts, with a minor difference in growth rates of 2.76% after the wage increase. The study also examined the employment rate changes in low-wage versus high-wage restaurants within New Jersey. Following the increase in minimum wage, low-wage restaurants experienced an upswing in employment rates, while high-wage restaurants saw a decline. The study's approach of using adjacent regions with different wage policies provided a more detailed understanding of the labor market's response to wage interventions. David Card and Alan B. Krueger's comprehensive view of the fast-food industry challenged conventional economic assumptions by comparing employment trends across different wage levels and states. This study marked a significant shift in how economists and policymakers perceive the relationship between minimum wage policies and employment levels (Card & Krueger, 1994).

Another significant literary source used for reference During the research process is an article titled "An Evaluation of the Relationship between Minimum Wage and Unemployment: Does the Local Cost-of-Living Matter?" by Christopher S. Brunt and Anthony G. Barilla. In this article, the authors analyze the connection between minimum wage policies and unemployment rates while emphasizing the importance of regional variations in the cost of living. The study found a positive and statistically significant link between higher minimum wages and increased unemployment rates, particularly in areas with lower cost of living. Using a geographically adjusted real minimum wage (GARMW), the research demonstrated that a one dollar increase in the minimum wage could lead to an increase of approximately

0.17 to 0.25 percentage points in the unemployment rate. This finding is crucial because it suggests that raising the minimum wage, especially in low-cost areas, could have a harmful impact on employment rates. The research also examined the differential effects of minimum wage increases across different regions in the United States. The study revealed that counties in southern and midwestern regions would likely be more negatively affected by federal minimum wage increases. This is particularly evident in the simulated impact analysis conducted in the study, which predicted unemployment rate increases of 1.0 to 1.2 percentage points for a majority of counties in the southern region in response to a simulated increase to a \$15 per hour minimum wage. The research emphasizes the importance of considering local economic conditions when implementing minimum wage policies, as a uniform approach may lead to significant disparities in employment outcomes across different regions.

"The Impact of Minimum Wages on Unemployment Duration: Estimating the Effects Using the Displaced Worker Survey" by Roberto Pedace and Stephanie Rohn is an article that analyzes the impact of minimum wages on unemployment. The study utilized various statistical models to examine how changes in minimum wages affect unemployment duration based on different demographic characteristics such as age, gender, skill level, and educational attainment. The results indicate that for male participants, there is a negative relationship between minimum wages and the duration of unemployment. In other words, higher minimum wages are associated with a lower likelihood of remaining unemployed. This effect is particularly pronounced for males over the age of 25, where a \$1 increase in the minimum wage was correlated with a 17 percent decrease in the duration of unemployment. The study's results for female workers were more varied across different subgroups. Although there is some indication of a similar relationship for higher-skill male workers, the study's results are most evident and statistically significant for the older male group. These findings suggest that the impact of minimum wages on unemployment duration varies by age and skill level, highlighting the complex interplay between minimum wage policies and labor market dynamics.

The article titled "Minimum Wage Effects Across State Borders: Estimates Using Contiguous Counties" by Arindrajit Dube, T. William Lester, and Michael Reich is an academic paper that analyzes the impact of minimum wages on earnings and employment in various sectors, with a particular focus on the restaurant industry. The study uses a unique approach by examining policy discontinuities at state borders, comparing contiguous counties with differing minimum wage policies between 1990 and 2006. One of the study's key findings is the range of earnings elasticities, which came to be between 0.149 and 0.232 across all specifications. This range is particularly noteworthy as all coefficients are statistically significant at the 1% level, indicating a consistent and significant impact of minimum wage increases on earnings. The study also examines the effects on employment, addressing one of the most critical

concerns regarding minimum wage policies. Contrary to some traditional views that suggest negative employment impacts, this study finds no significant adverse effects on employment in the restaurant industry, a major employer of minimum-wage workers. The authors found that for cross-state contiguous counties, there are substantial earnings effects and no significant employment effects of minimum wage increases. The study demonstrates that the differences in estimated elasticities between local case studies and national-level studies using traditional fixed-effects specifications are mainly due to insufficient controls for unobserved heterogeneity in employment growth rather than other factors. They noted that traditional national-level estimates suggest a labor demand elasticity close to -1, implying that minimum wage increases have little impact on the total income earned by affected workers due to the disemployment effect. However, their study found that the labor demand elasticity identified from changes in the minimum wage is significantly lower, suggesting that minimum wage increases raise overall earnings. The article concluded by highlighting the importance of accounting for heterogeneity in employment growth in future minimum wage studies, as their findings found no detectable employment losses from the kind of minimum wage increases observed in the United States over the past several decades.

Data source and Results

This study analyzed data sets from different states in 2019 to examine the relationship between the minimum wage and unemployment rates. The data was collected from 2019 to avoid any effects of the COVID-19 pandemic on unemployment rates and other variables used in the multiple regression analysis. However, the urbanization variable data was collected from the Nation's Urban and Rural Populations Shift Following the 2020 Census. The state-by-state unemployment rate data was obtained from the Bureau of Labor Statistics, and the minimum wage data used in the analysis was data from the U.S. Department of Labor, which provided minimum wage data for all states in 2019. It is essential to mention that several states have legal minimum wages lower than the national minimum wage. However, because of the Fair Labor Standards Act, any state with a minimum wage lower than the national minimum will automatically have a minimum wage equal to the national minimum wage of \$7.25.

The following variables were included in the regression in order to account for other impacts on the unemployment rate. The bachelor variable was included to control for the level of education in the area, as areas with higher education levels might have different unemployment dynamics. The bachelor variable was collected as a percentage of individuals aged 25 plus with a bachelor's degree or higher. The data was collected from the United States Census Bureau. Real GDP (in 2012 dollar) serves as a proxy for an area's economic health, which was converted into a logarithmic form to help linearize the relationship and interpret the coefficient as a percentage change. The real GDP data was collected from the U.S.

Bureau of Economic Analysis. The unionization variable is the percentage of workers within a state represented by a union. This variable was included to account for the proportion of the workforce that is unionized, which can influence labor market dynamics and unemployment rates. The urbanization variable controls for the urban-rural composition of an area, as urban and rural areas may have different employment opportunities and challenges. This urbanization dataset was collected from the Nation's Urban and Rural Populations Shift Following the 2020 Census as the percentage of a state's urban population.

$$\text{Unemployment} = \beta_0 + \beta_1(\text{Minwage}) + \beta_2(\text{Bachelor25}) + \beta_3(\log_GDP) + \beta_4(\text{unionization}) + \beta_5(\text{UrbanRate}) + \epsilon$$

This model is the multiple linear regression model that seeks to quantify the relationship between the unemployment rate and minimum wage, controlling for education, log of Real GDP, unionization, and urbanization. The choice of control variables is based on theoretical and empirical considerations, suggesting that these factors are also crucial in determining unemployment rates. The model assumes a linear relationship between the dependent and independent variables. The coefficients (β_1 , β_2 , β_3 , β_4 , β_5) represent the marginal effect of each independent variable on the unemployment rate. For example, β_1 measures how a unit change in the minimum wage is expected to affect the unemployment rate, holding other variables constant.

Presented in Table 1 are the summary statistics for the data collected, providing an initial understanding of the socio-economic landscape of the region. These statistics include the mean, standard deviations, and observations for the tested variables. The data set comprises 50 states in the United States, with an average unemployment rate of 3.54%. Notably, Mississippi has the highest unemployment rate of 5.5%, while Vermont has the lowest rate at 2.3%. The standard deviation of approximately 0.777 suggests moderate variability in unemployment rates across different regions.

Additionally, the average minimum wage across the U.S. is \$8.97, with Washington having the highest at \$13.5, and the federal minimum wage of \$7.25 being the minimum for 21 states with a minimum wage lower than the federal minimum. Furthermore, the percentage of the population aged 25+ with a bachelor's degree or higher, represented by Bachelor25, had an average of 31.234% with a standard deviation of 5.223792. Massachusetts has the highest percentage of degree holders at 43.7%, while West Virginia has the lowest at 20.6%, with a standard deviation of 5.224.

Finally, Real GDP, the average value of log_RGDP in the dataset is 12.27 with a standard deviation of 1.060. California has the highest Real GDP, while Vermont has the lowest. The unionization rate had an average of 11.12%, with Hawaii having the highest union rate at 23.5%, and South Carolina

having the lowest union representation rate of 2.2%. The Urban Rate, which represents the 2020 Census percent urban population within the state, had an average of 72.434% with a standard deviation of 14.81673. California has the highest percent urban population within the state of 94.2%, while Vermont has the lowest percent at 35.1%. Overall, these summary statistics provide a foundational understanding of the socio-economic landscape across the regions in the study, which is critical for conducting a robust regression analysis as it allows for a comprehensive examination of how these different factors interact to influence unemployment rates.

Table 2 displays all regression models and their corresponding tests. The simplest model, Model 1, contains only two variables in the regression, namely the unemployment rate and minimum wage. This model depicts a direct relationship between minimum wage (Minwage) and unemployment, with the coefficient β_1 measuring the change in unemployment for each unit change in minimum wage.

Specifically, Model 1 is structured as follows: $\text{Unemployment} = \beta_0 + \beta_1 * \text{Minwage} + \epsilon$, where β_0 is the intercept, β_1 is the coefficient for the minimum wage, and ϵ represents the error term. The intercept (β_0) is statistically significant ($p < 0.05$), estimated at 3.211636 with a standard error of 0.5440653, which implies that if the minimum wage were zero (a theoretical scenario), the unemployment rate would be approximately 3.21%. However, the coefficient of the minimum wage is not statistically significant, and the R-squared of only 0.0079 suggests that the conclusions drawn from this model do not entirely depict the factors contributing to the unemployment rate. Therefore, while Model 1 provides an initial insight into the relationship between minimum wage and unemployment, exploring other factors that may influence the unemployment rate is necessary to receive the whole picture.

In this analysis, Model 2 delves deeper into the relationship between minimum wage and unemployment by taking into account the percentage of the population ages 25 and up with a bachelor's degree or higher, known as Bachelor25. By doing so, the model provides a more nuanced understanding of how minimum wage impacts unemployment while considering the population's educational attainment. The coefficient for Minwage is 0.1899081, indicating that for every unit increase in the minimum wage, the unemployment rate is expected to increase by approximately 0.19 units. This coefficient is statistically significant ($p\text{-value} = 0.002$), indicating a strong relationship between minimum wage and unemployment. Meanwhile, the coefficient for Bachelor25 is -0.0972, signifying that an increase in the percentage of the population with a bachelor's degree is associated with a decrease in the unemployment rate of about 0.0971907. This coefficient is also statistically significant ($p\text{-value} < 0.05$). The intercept of the model is 4.882222, which represents the expected unemployment rate when both the minimum wage and the percentage of bachelor's degree holders are zero. The R-squared value of 0.2992 indicates that

approximately 29.92% of the variation in the unemployment rate is explained by this model, which is a substantial improvement from simpler models and reflects the added explanatory power of including the Bachelor variable. The R-squared value of 0.2992 indicates that approximately 36.49% of the variation in the unemployment rate is explained by this model, which is a substantial improvement from simpler models and reflects the added explanatory power of including the Bachelor25 variable.

In Model 3, the regression analysis includes two additional variables - the percentage of the population with a bachelor's degree (Bachelor25) and the log of real GDP (log_RGDP). The coefficient for the Minwage variable is 0.1899081, which suggests a positive relationship with the unemployment rate. Essentially, an increase in the minimum wage is linked to a corresponding rise in unemployment. This finding is statistically significant ($p\text{-value} = 0.002$), between minimum wage increases and unemployment. The coefficient for the Bachelor variable is -0.1073145, implying that higher educational attainment in a population correlates with lower unemployment rates. Additionally, the coefficient for log_RGDP is 0.193958, indicating a positive relationship with unemployment. This finding was also statistically significant with a $p\text{-value}$ of 0.034. The R-squared value of 0.3649 in Model 3 indicates that the model explains approximately 36.49% of the variability in unemployment rates, which is an improvement from Model 2 (0.2992).

Moving on to Model 4, the coefficient for Minwage is 0.1418224, which indicates a positive association with unemployment. In other words, a unit increase in the minimum wage is correlated with a 0.14% rise in unemployment rates. This result is also statistically significant, with a $p\text{-value}$ of 0.044. Conversely, the coefficient for Bachelor25 is -0.1091418, implying an inverse relationship with unemployment. This suggests that higher educational attainment in a population is associated with lower unemployment rates. This negative coefficient is statistically significant ($p\text{-value} = 0.000$). Lastly, the coefficient for log_RGDP is 0.1992885, indicating a positive relationship with unemployment. This finding may seem counterintuitive, but it could be due to structural changes in the economy, such as automation or changes in job markets. The coefficient of 0.1992885 is significant ($p\text{-value} < 0.05$). The R-squared value of 0.3893 in Model 4 indicates that the model explains approximately 38.93% of the variability in unemployment rates.

When examining the factors that contribute to unemployment rates, Model 5 was found to be the best regression model. This model takes into account several variables, including Minimum Wage (Minwage), Bachelor's degree attainment (Bachelor25), log of Real GDP (log_RGDP), Unionization Rate, and Urbanization Rate (UrbanRate). Upon analyzing the statistical significance of these variables at the 5% level, it was discovered that Bachelor25 and Miniwage were statistically significant, while log_RGDP, unionization, and UrbanRate were not. The R-squared value of 0.3949 and an adjusted R-

squared of 0.3262 indicate that the model fits well overall. The Variance Inflation Factor (VIF) results, with a mean VIF of 1.79, suggest that multicollinearity is not a significant concern in this model.

One interesting finding is the positive association between the minimum wage (Minwage) and unemployment rates. With a coefficient of 0.1435 and a standard error of 0.0689, this result is statistically significant at the 5% level (p-value: 0.043). In economic terms, this means that for every unit increase in the minimum wage, there is a corresponding increase in the unemployment rate of approximately 0.143%, holding other factors constant. Another noteworthy result is the negative relationship between education, represented by Bachelor25, and unemployment. The coefficient of -0.1131 is statistically significant (p-value < 0.001), indicating that every additional 1% increase in the population with a bachelor's degree is associated with a 0.1131% decrease in the unemployment rate. The coefficient for log_RGDP, representing the economic output of a region, was found to be positive (0.1589) but not statistically significant (p-value: 0.152). This lack of significance (p-value 0.152) could be due to various reasons, including the possibility that other unaccounted factors might influence the relationship or that the effect of GDP on unemployment might be delayed. While unionization and urbanization rates also showed positive coefficients (0.0271 and 0.0055, respectively), they were not statistically significant in this model. These results suggest that while unionization and urbanization rates might have some influence on unemployment rates, their impact is not as pronounced or direct as that of minimum wage or education levels in this analysis.

Conclusion

This paper delved into state-level data to investigate the correlation between minimum wage policies and unemployment rates. The findings revealed compelling evidence that a rise in minimum wage can increase unemployment rates. Interestingly, the analysis also discovered that the percentage of the population aged 25 and over with a bachelor's degree or higher was statistically significant. However, other factors, such as the Log of Real GDP, the rate of union representation, and the percentage of a state's urban population, were not found to be statistically significant in my primary regression model. It seems that despite minimum wage and education playing a significant role in unemployment rates, there are other variables that my model could not capture.

In interpreting these results, it is essential to consider the limitations inherent in any econometric analysis. Factors such as potential omitted variable bias, measurement errors, or regression model assumptions can impact the results. Furthermore, the relationships observed in this model are correlational and do not necessarily imply causation. The findings should be considered part of a broader

investigation into the complex dynamics of the labor market and supplemented with other qualitative and quantitative analyses.

In conclusion, this econometric analysis provides valuable insights into the factors influencing unemployment rates. The significant relationship between minimum wage and unemployment and the role of education underscores the intricate balance required in policy-making to navigate the trade-offs between wage policies and employment. The less significant roles of GDP, unionization, and urbanization in this model suggest that these factors interact with unemployment in more complex or indirect ways than captured here. This analysis contributes to the ongoing discourse on economic policy and labor market dynamics, highlighting the importance of considering a multitude of factors in understanding and addressing unemployment.

References

- Card, D., & Krueger, A. B. (1993). In *Minimum wages and employment: A case study of the fast food industry in New Jersey and Pennsylvania*. essay, National Bureau of Economic Research.
- Brunt, C. S., & Barilla, A. G. (2017). An evaluation of the relationship between minimum wage and unemployment: Does the local cost-of-living matter? *Applied Economics Letters*, 25(7), 493–498. <https://doi.org/10.1080/13504851.2017.1340562>
- PEDACE, R., & ROHN, S. (2010). The impact of minimum wages on unemployment duration: Estimating the effects using the Displaced Worker Survey. *Industrial Relations: A Journal of Economy and Society*, 50(1), 57–75. <https://doi.org/10.1111/j.1468-232x.2010.00625.x>
- Dube, A., Lester, T. W., & Reich, M. (2010). Minimum wage effects across state borders: Estimates using Contiguous Counties. *Review of Economics and Statistics*, 92(4), 945–964. https://doi.org/10.1162/rest_a_00039
- Bureau, U. C. (2023, September 26). *Urban and rural*. Census.gov. <https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural.html>
- U.S. Bureau of Labor Statistics. (n.d.). *Unemployment rates for states*. U.S. Bureau of Labor Statistics. <https://www.bls.gov/lau/lastrk19.htm>
- State minimum wage laws*. DOL. (n.d.). <https://www.dol.gov/agencies/whd/minimum-wage/state>
- Bureau, U. S. C. (n.d.). *Explore census data*. Explore Census Data. <https://data.census.gov/>
- Union members — 2019 - U.S. Bureau of Labor Statistics. (n.d.). https://www.bls.gov/news.release/archives/union2_01222020.pdf

Appendix

Table 1: Summary table

Variables	Observation	Mean	Standard Dev.	Minimum	Maximum
Unemployment	50	3.54	0.78	2.30	5.50
Minwage	50	8.97	1.88	7.25	13.50
Bachelor25	50	31.23	5.22	20.60	43.70
log_RGDP	50	12.28	1.06	10.31	14.82
unionization	50	11.12	5.02	2.70	25.50
UrbanRate	50	72.43	14.82	35.10	94.20

T Table 2: Regression model

Dependent Variable Unemployment					
Independent variable	Model 1	Model 2	Model 3	Model 4	Model 5
Minwage	0.0368 (0.059)	0.189*** (0.061)	0.190*** (0.059)	0.142** (0.068)	0.143** (0.069)
Bachelor25	--	-0.0972*** (0.022)	-0.107*** (0.022)	-0.109*** (0.022)	-0.113*** (0.023)
log_RGDP	--	--	0.194** (0.089)	0.199** (0.088)	0.159 (0.109)
unionization	--	--	--	0.0307 (0.023)	0.0271 (0.024)
UrbanRate	--	--	--	--	0.00550 (0.009)
Intercept	3.212*** (0.544)	4.882*** (0.597)	2.809** (1.111)	2.891** (1.103)	3.136** (1.175)
No. of Obs.	50	50	50	50	50
R-Squared	0.0079	0.2992	0.3649	0.3893	0.3949

*** 1%, ** 5%, *10% statistical significance

Standard errors in parentheses

Model 1

regress Unemployment Minwage

Source	SS	df	MS	Number of obs	=	50
Model	.235138389	1	.235138389	F(1, 48)	=	0.38
Residual	29.3466616	48	.611388784	Prob > F	=	0.5381
Total	29.5818	49	.603710204	R-squared	=	0.0079
				Adj R-squared	=	-0.0127
				Root MSE	=	.78191

Unemployment	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
Minwage	.0368291	.0593866	0.62	0.538	-.0825756	.1562338
_cons	3.211636	.5440653	5.90	0.000	2.117719	4.305552

Model 2

regress Unemployment Minwage Bachelor

Source	SS	df	MS	Number of obs	=	50
Model	8.85091687	2	4.42545843	F(2, 47)	=	10.03
Residual	20.7308831	47	.44108262	Prob > F	=	0.0002
Total	29.5818	49	.603710204	R-squared	=	0.2992
				Adj R-squared	=	0.2694
				Root MSE	=	.66414

Unemployment	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
Minwage	.1890072	.0610732	3.09	0.003	.0661437	.3118707
Bachelor25	-.0971907	.0219906	-4.42	0.000	-.1414301	-.0529513
_cons	4.882222	.5970174	8.18	0.000	3.681178	6.083266

Model 3

regress Unemployment Minwage Bachelor log_RGDP

Source	SS	df	MS	Number of obs	=	50
Model	10.7936859	3	3.5978953	F(3, 46)	=	8.81
Residual	18.7881141	46	.408437263	Prob > F	=	0.0001
				R-squared	=	0.3649
				Adj R-squared	=	0.3235
Total	29.5818	49	.603710204	Root MSE	=	.63909

Unemployment	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
Minwage	.1899081	.0587712	3.23	0.002	.0716079	.3082083
Bachelor25	-.1073145	.0216643	-4.95	0.000	-.1509225	-.0637064
log_RGDP	.193958	.0889324	2.18	0.034	.0149465	.3729696
_cons	2.809236	1.110624	2.53	0.015	.5736671	5.044806

Model 4

regress Unemployment Minwage Bachelor log_RGDP unionization

Source	SS	df	MS	Number of obs	=	50
Model	11.5153152	4	2.87882881	F(4, 45)	=	7.17
Residual	18.0664848	45	.401477439	Prob > F	=	0.0001
				R-squared	=	0.3893
				Adj R-squared	=	0.3350
Total	29.5818	49	.603710204	Root MSE	=	.63362

Unemployment	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
Minwage	.1418224	.0684222	2.07	0.044	.004013	.2796318
Bachelor25	-.1091418	.0215222	-5.07	0.000	-.1524897	-.065794
log_RGDP	.1992885	.088261	2.26	0.029	.0215217	.3770553
unionization	.0307279	.0229196	1.34	0.187	-.0154345	.0768904
_cons	2.890517	1.102788	2.62	0.012	.6693878	5.111646

Model 5

```
regress Unemployment Minwage Bachelor log_RGDP unionization UrbanRate
```

Source	SS	df	MS	Number of obs	=	50
Model	11.6822243	5	2.33644485	F(5, 44)	=	5.74
Residual	17.8995757	44	.40680854	Prob > F	=	0.0004
				R-squared	=	0.3949
				Adj R-squared	=	0.3262
Total	29.5818	49	.603710204	Root MSE	=	.63782

Unemployment	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
Minwage	.1434858	.0689239	2.08	0.043	.0045787	.2823929
Bachelor25	-.1130718	.0225166	-5.02	0.000	-.158451	-.0676926
log_RGDP	.1588517	.1089897	1.46	0.152	-.0608027	.3785061
unionization	.0271111	.0237522	1.14	0.260	-.0207582	.0749805
UrbanRate	.0055044	.0085933	0.64	0.525	-.0118144	.0228231
_cons	3.136279	1.174521	2.67	0.011	.7691861	5.503371

```
. vif
```

Variable	VIF	1/VIF
Minwage	2.02	0.493979
UrbanRate	1.95	0.512112
unionization	1.72	0.582907
Bachelor25	1.67	0.600090
log_RGDP	1.61	0.620892
Mean VIF	1.79	