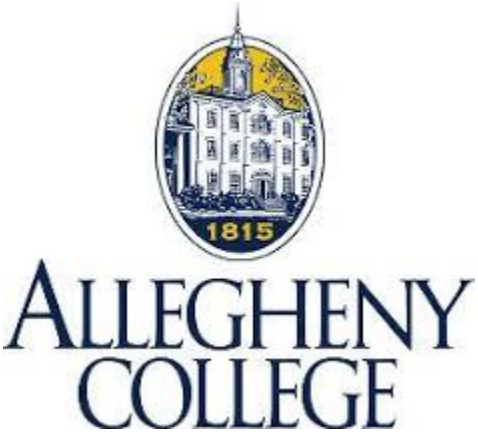
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Is Minimum Wage an Effective Anti-Poverty Tool?



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By

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Submitted to the Department of Economics

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In accordance with the Allegheny College Honor Code this work is my own unless otherwise cited.

Samantha Bretz

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Abstract

Minimum wage policy has been a topic of contention in the American political sphere. I specify my population of interest to individuals considered to be part of the Millennial generation. In this study I employ an OLS fixed effects model to test the relationship between minimum wage and poverty as expressed by a dummy variable for probability of falling below the poverty threshold. I find different results across two years of data, concluding that younger individuals of minority groups (women, Hispanic-identifying, and black-identifying) benefit the most from minimum wage increases.

1. Introduction

In his 2013 State of the Union speech former President Barack Obama said, “Tonight let's declare that in the wealthiest nation on earth, no one who works full-time should have to live in poverty.” His statement addresses a topic of a century’s worth of political contention: minimum wage in America. There are differing opinions in the political sphere on the effectiveness of minimum wage as an economic tool. Those on one side of the spectrum believe that minimum wage increases can help families escape poverty by providing a “living wage” to people who are willing to work full-time, even if the work is low-skill. The other side argues that increases in the minimum wage increase unemployment, especially among skilled workers. Further, there is debate as to what dollar amount should be assigned to the term living/livable wage. Massachusetts was the first state to pass minimum wage legislation, which protected women and children in the workforce. On June 4th, 1912 the Massachusetts Commonwealth issued the statement, “Whenever wages are less than the cost of living and the reasonable provision for maintaining the worker in health, the industry employing her is in receipt of the working energy of a human being at less than its cost, and to that extent is parasitic.” In 1938 congress passed the Fair Labor Standards Act, setting the federal minimum wage to $0.25 per hour, $4.19 in today’s dollars adjusted for inflation. The raise in 1968 from $1.40 to $1.60 hourly provided the minimum wage’s highest real purchasing power in history, as it would be worth approximately $10.40 today. Federal minimum wages have increased 22 times since their introduction in 1938. Intuitively, to keep purchasing power in line with the Consumer Price Index, minimum wage would have to follow the rate of inflation. Congress had proposed a 2015 bill which would increase minimum wage by indexing $1.00 each year for 5 years, but it was not

ratified. Many politicians and economists fear that wage increases that are too robust would negatively affect employment and increase the rate of inflation. Nearly a decade of stagnant nominal federal minimum wages has passed, however 15 states have indexing plans in place for the near future to keep pace with inflation as well as nominal wage increases of other salaried and hourly workers to maintain income distribution. Understanding the effects of minimum wage increases on the financial wellbeing of citizens will continue to be an important area of research as states undergo policy changes.

This paper examines the effectiveness of minimum wage legislation as an anti-poverty tool. I seek to empirically discern the relationship between minimum wage at the state level and the probability of an individual Millennial staying above the poverty threshold. I hypothesize that results will show that minimum wage is not a significant factor in helping the group of interest get out of poverty.

Understanding the effects of minimum wage on Americans is important for shaping policy that affects millions people. Card and Krueger (1995) estimate that 60% of all American workers have worked for minimum wage pay at some point in their lives. Today, about 5% of all Americans work at the federal minimum wage of $7.25 per hour. The Bureau of Labor Statistics' 2015 minimum wage report expresses the intersection of labor and minimum wage. It states that 78.2 million workers age 16 and older worked at an hourly rate, about 58.5% of all American workers. It notes that workers under 25 make up one fifth of all hourly wage employees, but this group makes up half of all people earning the federal minimum wage or less.

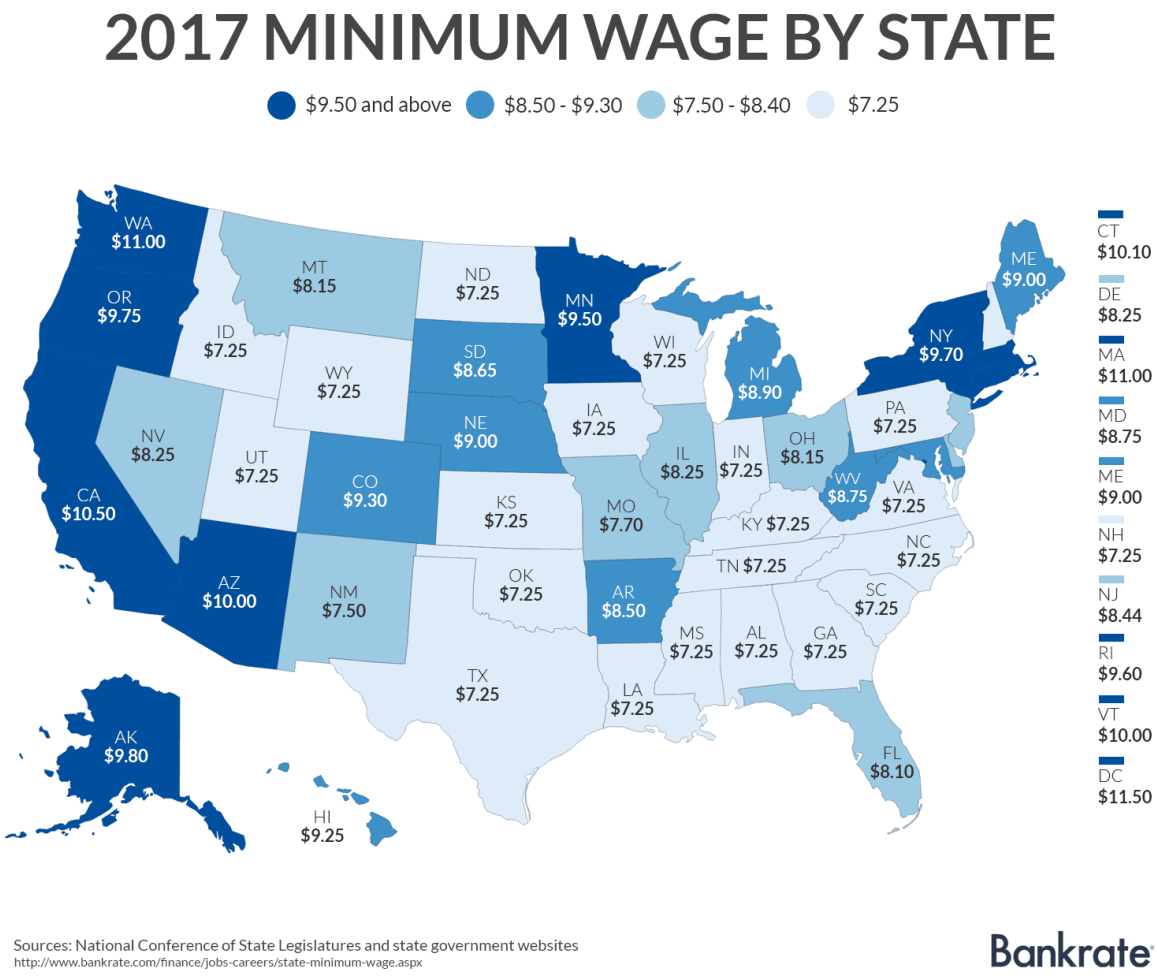
The demographic of interest to my research is the generation known as the "Millennials." The Millennial generation follows the cohort Generation X, but there is no definitive cutoff for the transition between generations. Pew Research Center calls Millennials "those born after 1980 and the first generation to come of age in the new millennium." I choose the birth year range 1980-1995 to restrict my sample population to those who are of age to work in the United States for the time period 2011-2015. Millennials have become vital to the economy. By 2020, one in three adult Americans will be Millennials. As of 2016, this generation accounted for over $1 trillion in spending. At the time of this paper's submission all Millennials by the above definition will be above the traditional age for graduating from a four-year college or university and have entered the work force. This generation will continue to significantly affect the labor market as suppliers and the consumer market as demanders.

The concept of "poverty" is qualitative in nature but does have quantitative measures set by the American government. Poverty reduction has been an important discussion among social activists throughout history. The 2016 poverty rate was 12.7%, down by .8% from the prior year. About 17 million households fall below the poverty threshold; 5.3 million of those households are headed by Millennials. The Merriam-Webster definition of poverty is, "the state of one who lacks a usual or socially acceptable amount of money or material possessions." The official measure of poverty is the poverty threshold measured by the U.S. Census Bureau and is adjusted each year. At its root, the poverty threshold is defined as three times the cost of a minimum food diet and is updated based on annual changes in the CPI. In the current labor market, many students and those considered dependents hold minimum wage jobs, so changes to minimum wage will not likely affect their position about the poverty threshold. However,

some employees seek to support their families by working full-time at minimum wage. If a person is willing to work full-time at a low-skill minimum wage job, they expect to be able to support themselves enough for basic food and shelter. If the minimum wage is not high enough to meet the poverty threshold, we can expect a higher rate of poverty. Welfare policy to address poverty is a topic debated by legislators. According to the Senate Budget Committee, 2011 spending on the 83 American welfare programs amounted to $1.03 trillion. Comparatively, the 2011 expenditure for Social Security was $725 billion, Medicare was $480 billion, and non-war defense was $540 billion. Understanding the external factors associated with poverty have policy implications as elected officials determine the best policies for addressing poverty.

This paper analyzes data from 2011 and 2015. These years were chosen to examine the most recent effects of minimum wage laws in America, as well as for the consistency in the economy and federal minimum wage laws. This is one of the first analyses of post-recession poverty levels to my knowledge. This period saw no federal minimum wage changes, thus I am able to focus on the variation of minimum wage by state. The federal minimum wage rate for this period is $7.25 per hour; many states set their minimum wage as the federal rate, some set higher rates, and a few have set it lower than the federal rate.

Figure 1: Variation in minimum wage by state



Sources: National Conference of State Legislatures and state government websites
http://www.bankrate.com/finance/jobs-careers/state-minimum-wage.aspx

Bankrate

2. Literature Review

The volume of research into minimum wage and poverty is vast, however, it is not wholly conclusive. Studies over the past century have estimated varying effects of minimum wage on poverty. Many studies have not produced significant results, concluding that minimum wage is not an effective tool to combat poverty. Interestingly, the articles on the relationship between minimum wage and poverty in countries outside of the United States tend to demonstrate moderate-to-significant results.

a. Criticism for minimum wage as an anti-poverty tool

Neumark, Schweitzer, and Wascher (2004) argue that the distributional effects on income of raising the minimum wage are near zero. This paper analyzes the real effects of minimum wage changes by looking at differently "treated" groups of states that increased their minimum wage by small amounts (less than 45 cents) and large amounts (greater than or equal to 45 cents) against control groups. They find that in populations treated by larger increases in minimum wage increase their proportion of families in poverty more than the families in the control groups. They employ a method of using a ratio of income-to-need to inspect the effect of disemployment; the conclusion is that of those who fall below the poverty line after a minimum wage increase, they are generally from the 1.5:1 income-to-need ratio group as opposed to those with a higher income-to-need ratio.

Neumark and Wascher (1997) also consider the relationship between minimum wage increases and transitions into and out of poverty of poor and non-poor households. The parameters of this study are like those of Kapelyuk (2015)—discussed below—but the findings

are different. They find that an increase in minimum wage is associated with a decrease of households in poverty. Simultaneously, they find that an increase in minimum wage is associated with an increase of non-poverty households falling into poverty. The conclusion is that the wealth is redistributed among poor households, but not among the whole income distribution. The authors claim that minimum wage is not an effective tool against poverty because some gain while others lose.

Considering the effect of welfare on poverty, Golan, Perloff, and Wu (2001) define the dependent variable by the Atkinson Index as a measure of welfare. In this study they use cross-section time-series data with 850 observations: one for each state in each years 1981-1997. When typifying minimum wage, they use a time-weighted average for states that change their minimum wage during the year. They found that an increase in minimum wage significantly increases welfare loss due to income inequality.

b. Support for minimum wage as an anti-poverty tool

Card and Krueger's 1995 book "Myth and Measurement: the New Economics of the Minimum Wage" recapitulates five years of their published articles on minimum wage, and has been a controversial work in the study of economics. The authors maintain that raising the minimum wage does not increase unemployment among low-skilled workers. In fact, their analysis of the fast food industry in New Jersey before and after the 1992 increase estimates that an increase in minimum wage increases employment. Pennsylvania was used as a control group. Their complementary studies found significantly increased wages, but no significant job loss in states that increased minimum wage. With regard to poverty, they estimate that the

minimum wage hikes in 1990 and 1991 increased income to those at the lowest 10% of income dispersion, however "the actual effects of the minimum wage on the standard of living of families with low earnings are modest." The authors call for more research into complementary policies to minimum wage laws, such as subsidies like the Earned Income Tax Credit (EITC) program, which is a federal tax refund for low-income families in poverty. It is hypothesized that the EITC program incentivizes those in the workforce to seek jobs, increasing the supply of employment and driving wages down. The authors also hypothesize that moderate increases to the minimum wage would shift income to low-income households "with a relatively high marginal propensity to consume," thereby increasing aggregate demand and spending, and spurring economic activity.

Adams and Neumark (2000) examine effects of local living wage ordinances on several factors, including wage dispersion, employment, and poverty. They use cities where living wage campaigns have not been passed as the control group. Their findings are timing-sensitive: there are no significant immediate effects on wages after the passing of an ordinance, but there are positive and significant lagged effects on low-skill wages. The effects are small economically, which they say may be because such ordinances have limited geographic coverage, compliance, and enforcement. Regarding employment, the study considers hours worked as an independent variable, and finds that there is no significant immediate effect from passing the ordinance. As expected, the lagged effect is marginally significant and negative. The lagged employment effect is significant and negative, but the effect was not as severe as the increase in income for low-wage workers. They conclude that local minimum wage ordinances may be associated with small poverty reductions in urban settings.

In Russia, minimum wage increases had moderate poverty-reducing effects. Kapelyuk (2015) examines the effect of a large increase in minimum wage on families' transitions out of poverty. Poverty is defined differently in Russia than in the United States according to demographic. This study uses income as the defining characteristic of poverty. Three panels of data featuring four separate specifications tested independent variables' effects on the probability of being poor, transitioning into poverty, and transitioning out of poverty. The two statistically significant independent variables were log of minimum wage and employment. The signs were negative as expected on the panels for being poor and transitioning into poverty. Conversely, the signs were positive as expected on the panel for transitioning out of poverty, supporting the hypothesis that an increase in minimum wage reduces poverty. The author concedes that the economic effect is only moderate. One of the drawbacks of this study is that the explanatory variables only account for a small amount of variation in the dependent variable; the R-squared remains below .161 for all specifications.

Addison and Blackburn (1999) provide insight into the effect of minimum wage changes on poverty levels of different demographics. Their paper is a response to many of the simulation-based empirical studies, using a "reduced-form" approach and existing data from 1983-1996. The classification "low-wage worker" includes all demographics, from teenagers to adults of all genders and races. The authors restrict their population to those most likely to be affected by minimum wage: teenagers, young adults, and high school dropouts above the age of 24. They conclude that an increase in minimum wage is associated with a decrease in poverty among high school dropouts. Their findings for minimum wage's effects on poverty levels of teenagers and young adults suggest a negative relationship, but the statistical significance

varies by specification. The authors note that separating the observations into time periods—1980's and 1990's—yields differing results. They posit that the labor market in America improved over time, causing the analysis of the 1990's to show higher coefficients on independent variables, suggesting greater economic significance. They call for further research into future years to understand why the two decades yielded different results, and to identify trends in employment and poverty not captured in their study. I note that Addison and Blackburn, and Card and Krueger express similar findings, and that their data come from the same time period. I question if these findings would hold true with data sets from different time periods.

c. Contribution

Though the body of literature is vast, this study seeks to add to it by examining post-recession poverty levels. I will use more recent data available to me. This study asks the question, "Is minimum wage an effective anti-poverty tool?" This study also seeks to identify demographic characteristics—gender, race—that are most affected by minimum wage changes. This study is also extensive in its use of a large amount of data; most previous studies used hundreds or thousands of observations because that was all that was available at the time. This study uses individual-level data for the time period and demographic of interest, using about one million observations to run empirical tests.

3. Theory

There are economic theories I can apply which may help explain the relationship between minimum wage and poverty. The most pertinent theory that considers supply and demand of labor is the **disemployment effect**. In economic terms, a minimum wage is a government-imposed price floor on the price of labor. The disemployment effect occurs when the supply of labor at the predetermined price exceeds the demand for labor on the firm side; a surplus of labor is created. According to this theory, firms who hire low-skill workers will respond to an increased minimum wage by hiring fewer workers to reduce costs. The disemployment effect may cause companies to lay off workers or cease hiring activities. Theoretically, increased labor costs increase average variable costs, but not fixed costs. Increased cost of labor shifts the production iso-cost curve to the right when the axes are labor (L) on the x-axis and capital (K) on the y-axis. If the marginal cost of capital becomes less than the marginal cost of labor, the firm will switch to using more capital and less labor, reducing employment. Supply of jobs may decrease, increasing unemployment and individuals without employment income, thereby increasing poverty. During firms' transition to using more capital we may observe an increase in sales for firms who produce capital goods; for example, fast food restaurants may purchase automated kiosks for customers to order food in lieu of a cashier. The employment cycle is cyclical, however, as firms turn toward capital replacements, it is unlikely that these replaced jobs will return.

The **underemployment equilibrium theory** describes a labor market whereby consumption and production outputs are not optimized, but the market has reached an

equilibrium point. Put differently, the market is producing below its potential, and less efficiently. This circumstance comes about when there is a surplus of or insufficient demand for skilled labor. Underemployment is driven by overqualification when there is a lack of demand for the skills possessed. College graduates and young adults moving into more competitive, highly saturated job markets may be forced to take low-wage jobs until they are able to find employment in their field.

In recent history, conditions have become favorable for underemployment to occur. In the early 21st century we note rapid technological change leading to jobs being performed mechanically which had historically been performed by people. As noted above, the demand for labor decreases; this decrease likely occurs across low-skill work and some technical work. Additionally, the financial crisis of 2008 caused a negative shock in the job market where firms laid off many employees. College students at the time remained optimistic about future job prospects and graduated into a job market competing with not only their similarly educated colleagues, but also competing with those who lost their jobs initially. In response, many recent graduates took jobs for which they were overqualified in food service and retail. The underemployment effect may cause overqualified Millennials to be forced into a low-skill, low-wage job market even with high levels of education when the labor market is oversaturated. Underemployment may help explain why young adults fall below the poverty threshold.

4. Data

In order to empirically test for correlation between poverty and minimum wage I extracted and constructed variables pertinent to the analysis based on publicly available information. The data from this study comes from three primary sources: Integrated Public Use Microdata Series (IPUMS), the U.S. Census Bureau, and the U.S. Department of Labor. Data are extracted for the years 2011 and 2015 to examine the population of Millennials of age to join the workforce, and to study any differences in significance between a year of recession recovery and a year for which we have the most recent data.

There are limitations on the data used because of the large number of observations obtained from IPUMS. The computing power of the hardware and software available to me. After trial-and-error I limited my data collection to about 600,000 individual-level observations per year analyzed. I obtained the following information for each individual through the IPUMS database: family size, state of residence, number of children, age, gender, marital status, educational attainment, usual hours worked in a week, social security income, welfare income, total family income, and race demographics. From the Wage and Hour Division of the U.S. Department of Labor I obtained historical minimum wage information. From the U.S. Census Bureau I obtained poverty thresholds based on age and household size. From the Bureau of Labor Statistics, a subsection of the U.S. Department of Labor, I obtained state-level unemployment statistics.

Because the data from IPUMS is obtained by a survey of individuals and households, I must address the possibility of individuals lying about factors such as income and welfare

assistance due to potentially strong emotions tied to low levels of real income and the stigma of welfare receipt. IPUMS obtains its data from U.S. federal censuses and the American Community Surveys, so we expect there to be some level of error. We assume that individual-level data from IPUMS has been obtained by random sampling from the population of the United States.

Explanation of dependent variable:

1. Family poverty dummy – I deviate from prior research by analyzing the probability of a person falling below their poverty threshold. I assign a "0" to all individuals whose family total income is greater than or equal to the poverty threshold for their family dynamic characteristics. The empirical test result will be interpreted as the percent probability of the individual falling below their poverty threshold.

Explanation of independent variables:

1. State-level minimum wage – this is the key variable and represents the hourly wage in dollars for the state where the individual lives. Minimum wage is related to poverty in that wages are the main source of income and determinant of a person's ability to earn above their poverty threshold. I expect to find statistically insignificant results based on the mixed results of prior research.
2. Prior year change – this dummy identifies states which passed legislation to increase their state minimum wage the year before, whether effective immediately or at the start of the year that we analyze. This variable will likely share multicollinearity with the state dummy variables, but is still included to capture the effects of abrupt minimum

wage change. If this variable produces an insignificant result, it may be a signal to analyze the lagged effect of minimum wage change. The sign on its result will signal a disemployment effect if the coefficient is positive.

3. State unemployment rate – expresses the percentage of unemployed individuals in the state where the individual lives. This variable will likely share multicollinearity with the state dummy variables but is still included to control for the effect of unemployment on a person's ability to get out of poverty. I expect that there will be a positive correlation between state unemployment rate and poverty.
4. Family size – the number of family members in the household. Family poverty threshold is determined in part by the number of family members in a household; this variable controls for the effects of having to sustain more dependents, and for multiple sources of income in a household. I expect a positive coefficient due to increased poverty thresholds with more family members.
5. Number of children – the number of children in the household. A higher number of children raises the family poverty threshold, so a family must earn more to get out of poverty. I expect the coefficient on this variable to be positive and significant, explained by the higher family poverty threshold based on more children.
6. Gender – this is a dummy representing the gender of the individual. A "1" is assigned to individuals reported as female, and a "0" is assigned to individuals reported as male. I expect the coefficient on this variable to be positive, meaning that identifying as a woman would be associated with a higher probability of being in poverty, because of gender discrimination against women.

7. Age – this variable captures the effect of living longer to potentially find employment or better-paying work. I expect a negative coefficient because individuals are more likely to find higher-paying work with more time to acquire skills and experience, and to search for work suited to their skills.
8. Marital status – this dummy assigns a "1" if the individual is married, and a "0" if the individual is not. Marriage is an indicator of social capital; a person likely has more potential job connections through their spouse. Because of this increased social capital I expect a negative coefficient.
9. Education – this variable represents educational attainment, indexed from 8^{th} grade to any education further than four years of college. Higher education is said to be associated with higher wages. I expect this coefficient to be significant and negative.
10. Usual hours worked (weekly) – this variable seeks to capture the effects of full-time versus part-time employment. Generally, income is directly correlated to how many hours are worked. As hours worked increases, income increases along with the likelihood of getting out of poverty. I expect a negative relationship between usual hours worked and the dependent variable.
11. Income from social security – this variable controls for income received from the federal Supplementary Security Income program for disabled individuals. This program is designed to supplement income to help people get out of poverty. If it is effective, I expect a negative coefficient.

12. Income from welfare – this variable controls for income received from welfare. This does not include other non-cash benefits. This is another supplemental income program variable for which I expect a negative coefficient.

Variable inconsistencies:

IPUMS assigns the code "9999999" to family incomes that are considered sensitive because the information could reveal the identity of the anonymous individual when deduced from the other information available, so these values are dropped from the data set. Because I cannot assign a family poverty dummy value to an observation without the family total income, I must also delete these individuals from the data set; otherwise the family poverty dummy would be biased downward if I left the values at "9999999" or upward left them blank (they would be read as zero and automatically assigned a "1" on the family poverty dummy because zero is less than any poverty threshold.) About 70,000 observations are dropped for each year because of this data cleansing.

An issue I have found in my data compilation is the discernment between state of residence and state of employment. In many cases, the individual works in the same state as where they live, but a small number live and work in different states. I choose to use state of residence to create state dummy variables because in cases of an unemployed individual, their state of employment is coded blank and would be rendered unusable. Additionally, because I consider the family total income in defining each individual's poverty threshold, I must address the possibility of other family members working in-state or out-of-state. Using state of

residence is more likely to capture the most family members affected by wages in that same state.

The data I extracted does not indicate the family dynamic of the individuals analyzed. I have specified in my data generation that I am only interested in individuals born between 1980 and 1995; IPUMS does not indicate whether or not this person is the head of the household, nor if they are considered as dependents. This study seeks to examine minimum wage as an anti-poverty tool for Millennials, but the effect could be downward biased if the individual is dependent on other breadwinners for various reasons. I consider different subsets of the data set in my analysis to account for this bias.

Minimum wage laws vary in regulatory scope. I note that some states are listed as holding a range of minimum wages, stipulated by employer size and annual receipts/sales. I use the maximum of the range given because any lower value is used for the small number of exceptions to the policy.

Family poverty threshold is based on the US Census Bureau's determination of the minimum amount of money needed to afford basic necessities. Though the Census Bureau thoroughly examines the needs of households up to nine family members and up to eight children dependents, it does not consider the costs of living in different states. This does not present a problem for data analysis, as the assigning of poverty thresholds is consistent.

There are qualitative variables that are not available to me such as number and quality of connections to jobs, vacancies of minimum wage positions, medical information, discrimination, employee skills, constraints to finding work, under-the-table employment,

political forces, social forces, other anti-poverty policies, and non-work obligations. Different methods of collecting data may produce proxies for some of these variables, but they were not available to me on the individual level.

I have listed the summary statistics for each dataset in Appendix A. What I would like to highlight as particularly important is the percentage of individuals in each population that fall beneath their poverty threshold. Poverty among all individuals is 21% and 17% for 2011 and 2015 respectively. The percentage of individuals below their poverty threshold climbs to 27% and 30% when reduced to single-person households; in other words, when an individual is solely responsible for their own income. Among single-person households of women, Hispanic-identifying individuals, and black-identifying individuals the percentage of people in poverty ranges from 29% to 36%, with the black-identifying subset consistently having the highest percentage in poverty.

5. Empirical Methods

As previously stated, the aim of this study is to examine the relationship between minimum wage and poverty within the Millennial generation. I will employ methods similar to that of the previous literature of empirical analysis using updated and comprehensive data. This approach is based on historical observations.

In my analysis of the efficacy of minimum wage as an anti-poverty tool I construct an empirical framework to test the correlation between the probability of an individual falling below their poverty threshold and explanatory variables including minimum wage at the state level. I employ an OLS regression on cross-sectional data in single-year analyses. To control for unobserved state-by-state variation, I employ a fixed effects method. The first version of the model merely included control variables, but I decided to include 51 state dummy variables to strengthen the model and reduce the possibility of the variables of interest being biased upward. The index "i" represents individual *i*, and the index "j" represents state *j*.

The function is as follows:

$$fampovertydummy_{ij} = B_0 + B_1 minwage_{ij} + B_2 prioryearchange_{ij} + B_3 stateunemploymentrate_{ij} + B_4 famsize_{ij} + B_5 nchild_{ij} + B6 sex_{ij} + B_7 age_{ij} + B_8 maritalstatus_{ij} + B_9 educ_{ij} + B_{10} uhrswork_{ij} + B_{11} incss_{ij} + B_{12} incwelfr_{ij} + B_{13} statedummies_i + a_i + u_{ij}$$

The dependent variable measures the probability of an individual falling below their individual poverty threshold. I was presented with the choice to use the income of the individual or the income of the individual's family to compare against the family's poverty

threshold. While the individual's income may not be an exact comparison to the assigned threshold, there is no influence from family members' income. I chose to use family poverty threshold because it illustrates a more precise snapshot of an individual's poverty status based on household conditions.

I expect that analyzing single-person households will provide a more precise expression of the effects of minimum wage on individuals seeking to support themselves. I iterate in the introduction about the impact the Millennial generation will have on consumer markets and the national economy; this emphasis assumes that the Millennials are the breadwinners of their respective households. I also examine subsets of data for marginalized minorities: women, Hispanic-identifying individuals, and black-identifying individuals. The aim is to understand which groups of people are affected most by minimum wage changes.

a. Data diagnostics:

i. Breusch-Pagan test for heteroskedasticity

In determining if the model is BLUE (Best Linear Unbiased Estimator), I employed the Breusch-Pagan test in STATA. The Chi-squared values for the complete data sets were high enough for me to conclude that my model suffers from heteroskedasticity. This does not mean that my variables are biased, but that my standard errors would be biased upward. To correct for this issue I use robust standard errors to return more precise t-statistics.

ii. Variance Inflation Factor (VIF) for multicollinearity

In testing for multicollinearity I find that the minimum wage, prior year change, and state unemployment rate variables, as well as several of the state dummy variables result in a

degree of multicollinearity greater than 10 in the VIF test for both years. Too many collinear variables can lead to inflated standard error, which may make otherwise significant variables appear insignificant. Despite the presence of multicollinearity, I must continue to include minimum wage because it is the variable of interest. After running the regressions for both years with and without prior year change and state unemployment rate I decided to keep the two variables in the model because I am interested in interpreting their effects on the poverty dummy even with the influence of state fixed effects; I recognize that they may be biased downward because of this issue.

iii. Ramsey RESET test for omission of relevant variables

The omitted-variable bias: there are many unobserved characteristics that are not available to me, or that are not easily quantifiable. As expected, the results of the Ramsey RESET test demonstrated a high F-value, meaning that my model is misspecified due to omitted variables. There are likely variables in the unobserved term that explain the variation in income relative to the poverty thresholds better than the variables I use in the model. The consequence of not including unobserved variables like discrimination, social capital, and labor market climate information is that the variables that are included will be biased upward.

Model specifications:

Model 1a is the overarching model on 2011 data; model 1b is the overarching model on 2015 data. Models 2a and 2b narrow the pool to a subset of single-person households. Models 3a and 3b specify the pool to women single-person households. Models 4a and 4b specify the pool to Hispanic-identifying single-person households. Models 5a and 5b specify the pool to black-identifying single-person households.

Results:

Table 1				
	1a	1b	2a	2b
Variables	2011 - All	2015 - All	2011 - Single	2015 - Single
minwage	0.007918***	0.0037916	-.0118974***	0.0012401
	0.0030436	0.0038535	0.0033458	0.0105906
prioryearchange	-0.0607096 ***	0.0230867	-.024248*	-0.060086
	0.0104721	6.572764	0.0133742	0.0437616
stateunemploymentrate	-0.0117019***	-0.006022**	-.0187287***	0.0049743
	0.0017201	0.0027541	0.0026243	0.0071288
famsize	-.1081852***	-0.0560195***		
	0.0004168	0.0004096		
nchild	.1720023***	0.117254***		
	0.0008549	0.0006945		
sex	-.01988932***	-.003006***	-.0240214***	0.0204046***
	0.0010534	0.0009602	0.0017685	0.0023061
age	-.0064684***	-.0068968***	-.0346959***	-.0186816***
	0.000161	0.0001296	0.0002399	0.00029
marst	-0.2414226***	0.0284667***		
	0.0013613	0.0002224		
educ	-0.0255956***	-.0265728***	-.0471575***	-.0213169***
	0.0002993	0.0002407	0.0005739	0.0005961
uhrswork	-.0049028***	-.0050074***	-0.0090672***	-.015083***
	0.0000324	0.000032	0.0000566	0.0000786
incss	-0.0000159***	-7.56e-06***	-.0000135***	-.0000207***
	5.28E-07	4.35E-07	1.30E-06	1.24E-06
incwelfr	0.000014***	0.0000218***	-6.01e-06***	-4.48E-06
	1.05E-06	1.25E-06	2.24E-06	3.80E-06
constant	1.324254	0.8461248	2.604945	1.636787
	0.0243542	0.0280212	0.0335424	0.0686209
R-squared	0.2473	0.1893	0.4631	0.4319

Table 2						
	3a	3b	4a	4b	5a	5b
Variables	2011 - Women	2015 - Women	2011 - Hispanic	2015 - Hispanic	2011 - Black	2015 - Black
minwage	-.0297896**	0.0086061	-0.0526618*	0.0554241	-.1093271***	0.0010555
	0.0144862	0.0179912	0.0293204	0.0543705	0.0358745	0.0480614
prioryearchange	0.0259843	-0.0286352	0.1961677**	-0.326391	0.4082082***	-0.2563353
	0.043451	0.0758768	0.0941714	0.221058	0.1163141	0.2024755
stateunemploymentrate	-.0161181***	-0.0070304	-.0377047***	-0.0024315	-.0553581***	-.0819164**
	0.0038768	0.0120695	0.007407	0.0355581	0.0092895	0.0391239
sex			-0.0325595***	.0410922***	-.0455816***	0.0077598
			0.0055945	0.0070611	0.0042984	0.0071002
age	-.0386143***	-.0191595***	-.02691***	-0.0154287***	-.0209264***	-.0147697 ***
	0.0004283	0.0004403	0.0006226	0.0008093	0.0004478	0.0008537
educ	-.0442373***	-0.0257173***	-0.0277917***	-.0143975***	-.0468853***	-.0256197***
	0.0009834	0.0009905	0.0014052	0.0016264	0.0013501	0.001877
uhrswork	-.009756***	-.0160403***	-.0099909***	-.0160285***	-.0076397***	-.0163184***
	0.000099	0.0001232	0.000151	0.0002206	0.0001315	0.0002292
incss	-.0000123***	-.0000219***	-0.0000151***	-.0000193***	-0.0000149***	-.0000249***
	2.04E-06	2.18E-06	4.79E-06	3.86E-06	2.70E-06	3.33E-06
incwelfr	5.46E-06	-4.72E-06	-9.82e-06*	3.30E-06	2.16E-06	-3.56E-06
	3.53E-06	5.21E-06	5.26E-06	9.30E-06	5.19E-06	0.00001
constant	2.705835	1.767864	2.571715	1.23122	3.133607	2.074117
	0.1036697	0.1129505	0.1991048	2.31E-01	0.2457828	0.3415358
R-squared	0.5259	0.4613	0.3705	0.4053	0.3979	0.4338

* Denotes significance at the 10% level
** Denotes significance at the 5% level
*** Denotes significance at the 1% level

6. Results and Discussion

a. Discussion of coefficients:

The variable of interest is minimum wage. In synopsis, we can observe no statistical significance in any of the 2015 specifications, but all 2011 specifications hold statistical significance and varying levels of economic significance. Of the 2011 population subsets in model 1a we observe the only result with a positive sign on minimum wage. The coefficient is .008, which is interpreted as a .8% increase in an individual's probability of falling beneath their family poverty threshold with a dollar increase in minimum wage. Model 2a, when the population is reduced to single-person households, we observe a coefficient of -.012 that is significant at the 1% level. What may be most important in these results are the coefficients on

each of the minority population subsets. A one-dollar increase in minimum wage is associated with a 3% decrease in poverty for women, a 5.3% decrease for Hispanic-identifying individuals, and a 10.9% decrease for black-identifying individuals. I argue that minimum wage is economically significant in all minority specifications for 2011. Looking at the most economically significant specification, the 10.9% decrease for the black subset, I extrapolate the effect to the real potential change: of the 10,827 observations, a 10.9% decrease realistically means that 1,180 people in this group get out of poverty with a one-dollar increase. 5.3% of 12,158 is 644 of the Hispanic subset getting out of poverty. For the women, 3% of 89,080 is 2,672. It makes sense that the black-identifying individuals see the greatest impact because the summary statistics note that the baseline for poverty in single Millennials was highest for the black subset, and as a result, a greater fraction of the subset would be affected by an upward shift of the lowest wage. A dollar increase in a state's minimum wage is not unfeasible; in fact, between 2014 and 2016, Alaska raised its minimum wage from $7.25 to $8.75 to $9.75, increasing by a dollar or more each year. Historically, states have opted for increases as low as $.06 at a time (in the case of New Jersey in 2017), and as high as $1.53 (in the case of Washington in 2017). Of course, an increase by just a few cents is not expected to have an enormous impact on large groups of people in poverty, but there is a case for more substantial wage increases based on the large number of people shown to be positively affected according to this model.

It is unsurprising that we see a difference in statistical and economic significance among the two years analyzed, but I do find it odd that the shift is so severe even though the R-squared remains high in regressions with mostly statistically significant variables just the same

as with few statistically significant variables. One possible explanation could be the unobserved macroeconomic effects. 2011 represents a period of recovery from the global financial crisis and the United States Great Recession. Average unemployment was 8.9% for the year. The lack of confidence in global markets may have made hiring markets more careful in selecting employees. For reference, the 2015 unemployment rate was 5.3%, one of the signals of a strengthening, more confident economy. It is likely that work, low-skill or otherwise, was easier to find in 2015 than in 2011, rendering minimum wage less significant a factor in pulling Millennials out of poverty.

Another possible explanation is the difference in ages of the individuals across the 4-year gap. Age is statistically significant, negative, and at least as practically significant as most of the other explanatory variables across all specifications, providing strong evidence that older individuals are less likely to fall below the poverty line. This is the hypothesized result because each additional year older can mean an additional year of experience in the workforce, increasing the likelihood of a pay increase or getting hired at a (better) job. As I have noted from the Bureau of Labor Statistics, most minimum wage jobs are held by younger people. The ages of individuals in the 2011 dataset are 16-31, whereas in 2015 the ages increase to 20-35. We see that the average age in the full sets of data increase from 23.1 to 27.5. I expect that by 2015, the generation in this sample has escaped the effects of underemployment. I define underemployment as the state of an overqualified individual involuntarily working at a low-wage, low-skill job. Richard Vedder's research finds that over 20 million college graduates were underemployed in 2010 – this number is expected to increase to 30 million by 2020. It is likely that a 27-year-old will have gained enough experience and professional connections to land a

job that pays above the poverty threshold if we assume they are not hindered by structural issues of poverty.

One possible extension of this study to address the ambiguity over the years could be testing time series or panel data indexed for time by fixed effects to observe the correlation between years. If a researcher can identify shocks in sharp poverty increases, we may be able to discover the most effective macroeconomic characteristics of each year. Another perspective may be gained by following the same age groups over several years to control for changes captured by differences in age over time.

We can see that increased education level of the individual is negatively correlated with the family poverty dummy across all specifications; this is the expected sign meaning that one more year of education is associated with a decrease in probability of being in poverty. The Center on Budget and Policy Priorities identifies that a good education is related to escaping poverty in the future. It follows that a good education leads to development of skills and knowledge that help students succeed in the job market. However, the education/poverty relationship is more nuanced than that. It is important to distinguish that the variable in the model represents years of education, and not quality of education. Edward Royce in his book "Poverty and Power" discusses the structural inequities in "poor" and "rich" educational systems. When poor families are faced with the choice of where to send their children to school, those in inner-city districts may only be presented with poor options of underfunded schools with below-average educators. It is not an option to gain a higher quality education for the geographically locked. Claiming that increased education or training is the best tool to help people get out of poverty also ignores the market for jobs; considering the current level of

underemployment, it is likely that many people in poverty do have the skills for higher-paying work but cannot find a job that fits their qualifications due to lack of social capital, geographic constraints, and other barriers to work.

The results for state unemployment rate are surprising to me. According to some of the prior literature and the theory of disemployment, we expect that an increase in unemployment would result in increased probability of falling below the poverty threshold. The coefficients on the state unemployment rate variable are generally significant and negative, meaning that a higher unemployment rate by state is associated with lower poverty probability. An explanation may simply be that unemployment is more prevalent among higher-wage earners and those who can depend on another household member to bring in income. Because this variable is correlated with the state dummy variables, I am led to believe that each state dummy captures unemployment and other labor market effects better than this variable.

Usual hours worked in a week was included in the model to account for the relationship between the type of employment and poverty. As expected, the coefficients on this variable are consistently significant and negative. However, the coefficients are very small in 2011, and somewhat economically significant in 2015. The greatest effect is observed in each of the minority specifications, where the coefficient hovers around -.016, meaning that an additional hour of work per week is associated with a 1.6% decrease in poverty. I interpret this as minority subsets may be employed part-time with varying hours, so any time they work above their average hours results in an increase in income, pushing them further toward breaking above the poverty threshold. In creating jobs, it would potentially be more helpful to combatting poverty if these jobs gave employees more hours.

Analyzing income from welfare I see that it is only significant in one population. Related, I see that the income from social security is significant with the expected negative sign in almost all specifications. However, in all significant cases, the coefficient is in the hundred thousandths or smaller, rendering it the least economically significant of all control variables. What this indicates to me is that these federal programs are not over-effective. The statistical and economic significance would be greater if all beneficiaries received enough income to meet their personal poverty thresholds. In the future of poverty research it would be interesting to explore the effectiveness of subsidy and reimbursement anti-poverty programs.

b. Future work:

A strength of this study is that it is repeatable with different data sets. For further research I would be interested to run empirical tests on a state-by-state basis. Because this study reviews the variation across the entire country, the results may suffer from casting too broad a blanket over the country when state policy effects may be hidden behind the state dummy variables.

I choose not to use pooled cross-sectional data because of the computing limitations associated with large pooled data sets, and because I do not seek to observe changes with time with this study, but rather with enumerated changes in minimum wage. Future studies may expand upon my work by constructing a time-series or panel data model to observe the effect of time on poverty. Poverty rate for the U.S. in 2011 was 15%, whereas in 2015 it was 13.5%. I infer that adding a 2015 year dummy variable to pooled data would result in a negative relationship.

In future Millennial generation research, I would suggest obtaining household relationship information to identify the dependence dynamic. The reduced population subsets only consider individuals supporting themselves, rendering the marital status and number of children variables obsolete. Many anti-poverty programs like WIC (Women, Infants, and Children) target families with children, so understanding the effects of minimum wage on larger families will be important for the future of policy-making.

Based on the literature on the subject of poverty, there is evidence of lagged effects with regard to policy changes (Adams and Neumark, 2000). An extension of this study may be to analyze the effects of a state minimum wage change in the year it takes effect and on years following.

Though I seek to address the concern of the relationship between increased wages and inflation rate. Put simply, demand-pull inflation is caused by an increase in the quantity of money supplied in an economy, which is associated with a greater aggregate quantity demanded, which corresponds to an increase in price to reach equilibrium. Cost-push inflation occurs when wages rapidly increase, which increases firms' cost of input labor; it also occurs when prices of material inputs increase. Overall price level increases for this firm's goods. However, in a dynamic economy it is impossible to isolate a single catalyst for inflation. Some fear that increased minimum wages will increase prices in the overall economy and compromise income distribution at the expense of production efficiency. Edward Gramlich (1976) argues that small increases in minimum wage may be beneficial to the overall wage distribution, but too sharp an increase may result in inefficiency. Overall, there is not overwhelming evidence that inflation is caused by minimum wage growth. As state and federal

minimum wage legislation is enacted in the near future it would be helpful to identify any trends between minimum wage and inflation in order to discern optimal increases.

c. Policy implications:

We must address the current state of poverty legislation before identifying implications of minimum wage policy. The United States legislative process benefits the rich at the cause of the strong influence of lobbying. John Craig and David Madland outline the inefficiencies caused by lobbying; they note that the practice of "rent-seeking," firms paying legislators for political favors or favorable policies in the future. "Not only do people spend more time and money trying to get a bigger piece of the economic pie for themselves rather than trying to enlarge the pie, but the policies they seek are often wasteful, inefficient, or even harmful." The profit-seeking nature of firms disregards social benefits for poor populations, making it imperative for legislators to consciously choose to focus on the poor if meaningful change is to occur. As of now, American political systems work against those in poverty by passing legislation that benefits the rich and causes the poor to become poorer; the 2018 Trump administration tax bill is an example of subsidizing corporations and the wealthy with lower tax rates and balancing by taxing the lower tiers of income more than before.

Ultimately, I argue that minimum wage increases can have an effect on poverty, but that the benefit is not strong enough on its own to be used as a primary tool to create meaningful change. Based on these results, I posit that minimum wage policy does not affect all groups equally. That isn't to say monitoring minimum wage is not important for policy-making. In fact, there is evidence in this study in support of indexing the minimum wage to keep pace with

inflation. There are no significant studies linking minimum wage increases to inflation – but wage increases in general is another story. Real wages have remained stagnant, or decreased, over the past few decades. If we simulate circumstances where minimum wage remains nominally stagnant but decreases in real value over a long period (for example, from 1998 to 2007 the federal minimum wage stayed at 5.15/hour over the 9 years), we can project that more individuals would fall below the dynamic poverty threshold over time. Theoretically, the average Millennial working full-time at a minimum wage job will earn the federal minimum wage $7.25/hour. A single-person household where the householder is younger than 65 corresponds to the poverty threshold $12,752 annually in 2017 ($12,331 and $11,702 in 2015 and 2011 respectively). I assume that this individual receives two weeks of vacation. If I multiply $7.25 by 40 hours per week and 50 weeks, pre-tax income for this individual is $14,500, 113.7% of the 2017 poverty threshold for individuals. Assuming 3% inflation, it would take only 5 years for the $7.25 hourly minimum wage to fail to meet the individual poverty threshold under these conditions. Projecting further, this wage would not meet the poverty thresholds for households of two or more between 2011 and 2017, leaving single parents struggling if there is only one breadwinner at minimum wage. This simulation is imperfect because hours for many minimum wage jobs are inconsistent, and there is no standard for time off from a full-time position at these wages. In summary, stagnant real wages may render meeting the minimum poverty threshold at full-time work impossible, providing support for the position to increase minimum wage. I call for a feeling of urgency among legislators to make plans for minimum wage legislation in the near future to abate the negative consequences in the labor market before they come about.

Based on the above oversimplified simulation I would expect minimum wage to be statistically and economically significant in its correlation to poverty reduction. Qualitatively, for a family who can only afford necessities like rent, utilities, and food with their weekly paycheck will experience a large marginal benefit from an additional $20 each week – let alone a doubled paycheck with the $15.00 hourly minimum wage proposed by some groups. There is not enough information currently to advocate for or against such a large increase to minimum wage.

State and federal policymakers must identify priorities to draft the best anti-poverty policy possible. If the priority is to help young people in the workforce escape poverty, minimum wage increases can be effective. If the priority is to help minorities escape poverty, there must be a concerted effort to design programs to support them while addressing the structural inequities like discrimination and access to quality education and healthcare. Policymakers must also ensure that their job-creation efforts fit the types of populations looking for work to avoid underemployment.

Increasing the federal minimum wage will consequently affect upward wage distribution. While the scope of this study does not cover wage implications above the minimum, I hypothesize that higher positions would increase wages concurrently. Based on the theory of disemployment and evidence from prior studies, we may observe unemployment effects for low-wage and other workers.

As foreshadowed by the diagnostic tests from the Data section, I find that my empirical analysis does not capture all of the factors that contribute to a person's relationship to the

poverty threshold. Policies that may address the structural inequities not captured by this study include subsidized pre-kindergarten education, anti-discrimination policies, and creation of jobs suitable for the skills possessed by the unemployed. These robust programs at the state and local levels in tandem with purposeful minimum wage policy should reduce poverty more effectively than minimum wage increases alone.

D. Conclusion:

In this study, I explore the factors that contribute to a person's likelihood of falling beneath the poverty threshold. I find that minimum wage can be a tool for helping Millennials get out of poverty, especially women, Hispanic, and black young individuals, but the statistical significance only holds in the 2011 specifications. Minimum wage is a piece of the Millennial poverty puzzle, but it cannot solve the problem as a whole on its own. There are factors that cannot be observed by this study's methods that are likely better explanatory factors in a person's probability of poverty. Addressing these factors will require shifting society's view of the poor. Policymakers should use small or indexed minimum wage increases along with targeted programs to have the greatest impact on poverty levels of the Millennial generation, and for generations who will soon enter the workforce.

Appendix A

Summary statistics:

1a.

Variable	Obs	Mean	Std. Dev.	Min	Max
minwage	545792	7.401668	0.60902	5.15	8.67
prioryearchange	545792	.165378	0.371522	0	1
fampovertydummy	545792	0.2095579	0.406993	0	1
stateunemploymentrate	545792	9.02108	1.669456	3.5	13
famsize	545792	3.406177	1.780096	1	20
nchild	545792	.4179028	.8866053	0	9
sex	545792	0.5050074	.4999754	0	1
age	545792	23.37155	4.715084	16	31
maritalstatus	545792	.2134733	0.409759	0	1
hispan	545792	.1846766	.3880353	0	1
black	545792	.1293386	0.335575	0	1
educ	545792	12.67576	2.121166	8	17
uhrswork	545792	23.79444	19.41875	0	99
ftoinc	545792	65272.99	68790.11	-16400	3537500
incss	545792	102.3659	1016.81	0	50000
incwelfr	545792	59.84815	633.1411	0	30000

1b.

Variable	Obs	Mean	Std. Dev.	Min	Max
minwage	552971	7.976084	0.910097	5.15	10.5
prioryearchange	552971	.3805516	0.485523	0	1
fampovertydummy	552971	.1700143	0.375646	0	1
stateunemploymentrate	552971	5.298413	0.815614	2.8	6.9
famsize	552971	3.162032	1.723419	1	20
nchild	552971	.6921394	1.106686	0	9
sex	552971	0.50943	.4999115	0	1
age	552971	27.70424	4.560276	20	35
maritalstatus	552971	.3459711	0.475684	0	1
hispan	552971	.1817329	0.385625	0	1
black	552971	.1144328	0.318336	0	1
educ	552971	13.60143	2.09944	8	17
uhrswork	552971	31.73515	18.08185	0	99
ftoinc	552971	73576.91	74891.7	-12200	1794000
incss	552971	97.65252	1086.572	0	50000
incwelfr	552971	54.62292	571.4541	0	30000

2a.

Variable	Obs	Mean	Std. Dev.	Min	Max
minwage	179082	7.400708	0.621792	5.15	8.67
prioryearchange	179082	.1790967	0.383434	0	1
fampovertydummy	179082	.2700495	0.443986	0	1
stateunemploymentrate	179082	8.978569	1.653986	3.5	13
sex	179082	0.4974258	.4999948	0	1
age	179082	24.8869	3.959515	16	31
hispan	179082	.1224411	0.327796	0	1
black	179082	.1212964	0.326472	0	1
educ	179082	13.63917	2.148889	8	17
uhrswork	179082	31.13465	18.2089	0	99
ftoinc	179082	40104.84	43593.75	-11900	1023000
incss	179082	96.01962	1029.818	0	50000
incwelfr	179082	45.8064	598.1344	0	30000

2b.

Variable	Obs	Mean	Std. Dev.	Min	Max
minwage	97005	8.017109	0.938788	5.15	10.5
prioryearchange	97005	.4003402	0.48997	0	1
fampovertydummy	97005	.2981805	0.457462	0	1
stateunemploymentrate	97005	5.291328	0.826229	2.8	6.9
sex	97005	0.441668	.4965883	0	1
age	97005	26.91876	4.337907	20	35
hispan	97005	.1253337	0.331099	0	1
black	97005	.1116128	0.314891	0	1
educ	97005	14.12024	2.086214	8	17
uhrswork	97005	34.98621	17.09034	0	99
ftoinc	97005	37905.28	37905.28	-8600	914000
incss	97005	92.52307	1049.394	0	50000
incwelfr	97005	30.0167	414.9991	0	19200

3a.

Variable	Obs	Mean	Std. Dev.	Min	Max
minwage	89080	7.398472	0.622678	5.15	8.67
prioryearchange	89080	.1777054	0.382267	0	1
fampovertydummy	89080	.290211	0.453862	0	1
stateunemploymentrate	89080	8.978375	1.643342	3.5	13
age	89080	24.74852	3.923359	16	31
hispan	89080	.1129097	0.316484	0	1
black	89080	.1291199	0.335335	0	1
educ	89080	13.90526	2.12219	8	17
uhrswork	89080	29.5241	17.39587	0	99
ftoinc	89080	39940.11	44813.79	-7500	982000
incss	89080	92.70406	1022.009	0	44400
incwelfr	89080	56.122	606.924	0	30000

3b.

Variable	Obs	Mean	Std. Dev.	Min	Max
minwage	42844	8.031779	0.952293	5.15	10.5
prioryearchange	42844	0.4067547	0.491234	0	1
fampovertydummy	42844	.3387639	0.473295	0	1
stateunemploymentrate	42844	5.314497	0.81233	2.8	6.9
age	42844	26.57051	4.340135	20	35
hispan	42844	.114205	0.318064	0	1
black	42844	.1265055	.332422	0	1
educ	42844	14.41535	2.025705	8	17
uhrswork	42844	33.05303	16.76257	0	99
ftoinc	42844	29735.65	33450.15	-5400	637500
incss	42844	84.10279	952.3209	0	27900
incwelfr	42844	41.36589	465.6313	0	16500

4a.

Variable	Obs	Mean	Std. Dev.	Min	Max
minwage	21927	7.509846	0.549555	5.15	8.67
prioryearchange	21927	.1489944	0.356091	0	1
fampovertydummy	21927	.3002691	0.458385	0	1
stateunemploymentrate	21927	9.448671	1.726744	3.5	13
sex	21927	0.4587039	.4983031	0	1
age	21927	24.73845	4.052543	16	31
hispan	21927	1	0	1	1
black	21927	0.0459251	0.209328	0	1
educ	21927	12.59967	2.254934	8	17
uhrswork	21927	30.22534	18.22304	0	99
ftoinc	21927	32236.35	35793.71	-5200	796000
incss	21927	73.64893	850.9987	0	24400
incwelfr	21927	61.50955	748.7609	0	30000

4b.

Variable	Obs	Mean	Std. Dev.	Min	Max
minwage	12158	8.16782	0.878876	5.15	10.5
prioryearchange	12158	.3603389	0.480119	0	1
fampovertydummy	12158	.3016944	0.459012	0	1
stateunemploymentrate	12158	5.426715	0.806632	2.8	6.9
sex	12158	0.4024511	.4904121	0	1
age	12158	27.23614	4.422893	20	35
hispan	12158	1	0	1	1
black	12158	.0442507	0.20566	0	1
educ	12158	13.0267	2.380645	8	17
uhrswork	12158	34.88649	16.39782	0	99
ftoinc	12158	27982.68	32012.06	-2700	613000
incss	12158	56.50354	869.9827	0	50000
incwelfr	12158	41.19839	474.739	0	15000

5a.

Variable	Obs	Mean	Std. Dev.	Min	Max
minwage	21722	7.229343	0.704204	5.15	8.67
prioryearchange	21722	.1118682	0.315211	0	1
fampovertydummy	21722	.3588528	0.479675	0	1
stateunemploymentrate	21722	9.121034	1.457021	3.5	13
sex	21722	0.5295093	.4991399	0	1
age	21722	24.1795	4.325906	16	31
hispan	21722	.0463585	0.210265	0	1
black	21722	1	0	1	1
educ	21722	12.85962	1.924846	8	17
uhrswork	21722	24.79426	19.10344	0	99
ftoinc	21722	29314.33	32192.87	-5300	748000
incss	21722	163.4895	1261.172	0	30000
incwelfr	21722	84.3624	674.4291	0	20000

5b.

Variable	Obs	Mean	Std. Dev.	Min	Max
minwage	10827	7.749518	1.036343	5.15	10.5
prioryearchange	10827	0.3697238	0.482752	0	1
fampovertydummy	10827	.3395216	0.473569	0	1
stateunemploymentrate	10827	5.408109	0.727387	2.8	6.9
sex	10827	0.5006004	.5000227	0	1
age	10827	27.45322	4.407988	20	35
hispan	10827	0.0496906	0.217315	0	1
black	10827	1	0	1	1
educ	10827	13.63318	1.958079	8	17
uhrswork	10827	32.91965	17.03618	0	99
ftoinc	10827	27044.89	29659.17	-5400	637500
incss	10827	135.187	1173.557	0	27900
incwelfr	10827	53.97155	537.0592	0	16000

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About the Author:



Samantha Bretz ’18 studies economics as a major, and French and dance and movement studies as minors. She is a participant in the Law and Policy Program. During her time at Allegheny she has served as concert chair for the JaDE benefit concert, President and choreographer for Orchesis Dance Company, President of the Lambda Sigma Sophomore Honor Society, Vice President of Finance and Vice President of Membership in Tri Delta, and a voting member of the Finance and Facilities Committee. She has participated in the Allegheny College Choirs all four years, and recently represented Allegheny in New Zealand on tour with the Chamber Choir.

Samantha is a titleholder in the Miss America Organization, earning scholarships by competing in local and state pageants. She was crowned Miss Crawford County 2018 to represent the region at the Miss Pennsylvania pageant. She will continue to promote her platform “Experiential Education to Instill a Love of Learning” throughout her year of service and beyond.

She has been active in the Department of Economics, spearheading the efforts to bring back the Omicron Delta Epsilon Economics Honor Society, earning the Outstanding Junior in Economics award, and being selected as part of the inaugural class of Center for Business and Economics Fellows.

Samantha plans to move to Minneapolis, Minnesota to work for Boston Scientific in their FLDP finance rotational program after graduation.