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<div align="center">The Effect That the Poverty Cutoff Line Can Have on Welfare Distribution</div>

<div align="center">**I: Introduction**</div>

Does changing the cutoff for a household's official poverty status have an effect on the amount of welfare that is distributed? Knowing the answer to this question would certainly be relevant to many policies regarding poverty which is certainly an important issue in America.

My hypothesis here is that changing the poverty line cutoff will have an effect on the amount of money people receive from welfare. While it is true that there are other factors that affect the amount of welfare people receive, increasing the poverty line cutoff should help more people that might lie right outside of the poverty line get the government assistance that they need. For the question that I have posed, my null hypothesis would be that changing the poverty line cutoff will not have an effect on the amount of money people receive from welfare. If the coefficient for my independent variable (poverty line cutoff) is significantly different from 0 when I perform my regression, then I would reject my null hypothesis. The variable I am testing here (the dependent variable) will be the amount of income people receive from welfare. Knowing how a change in the poverty line could affect the amount of welfare that gets distributed would be mostly useful to policymakers as it could influence the decisions they make that are related to addressing poverty and low income households.

There have been several written publications that have addressed the issue regarding what should be done with the poverty line in America. In the publication "United States Poverty Studies and Poverty Measurement: The Past Twenty-Five Years" by Howard Glennerster, Glennerster details how poverty has been measured in the United States and also how the poverty threshold was originally determined. It becomes pretty clear in the article that party politics played an important role in determining the poverty line in 1965 as Glennerster explains that the poverty threshold in the U.S was set to be rather low so that it "could not be challenged for its generosity" (Glennerster 87). Glennerster details that even after the measure was installed in 1965, party politics made the relatively low threshold difficult to alter in the coming years. However despite the poverty threshold itself not being able to keep up with the rising cost of living as the years went on, the amount of public spending that was put into public assistance programs like food stamps, Medicare, and Medicaid actually increased. Interestingly enough, it is to be noted that this public assistance does not get counted when determining one's poverty level. The reason that this relates to my research is because these facts imply that there would be other factors outside of the poverty line that affect how much public assistance people receive. Trying to understand these other potential factors is critical to understanding the true effect that a change in poverty line cutoff can have on welfare distribution in America.

In the publication "Presidential Address: How to Improve Poverty Measurement in the United States." by Rebecca M. Blank, Blank argues that the method used to measure poverty in the U.S is outdated and should be updated to fit the needs of Americans in more modern times. Blank explained that the poverty rate statistic that was introduced in 1965 "was remarkably impervious to most of the policies designed to improve life among low-income families that were implemented in the following decades" (Blank 238). This was due to rapid growth in both

food stamp and housing benefits that occurred during the 1970s. The important fact to take note of here is that these programs were not taken into account for the poverty rate calculation. In fact just like the last publication noted, "The public dollars that we put into antipoverty programs have grown enormously since the mid-1960s. But we have had an official poverty statistic that did not measure the impact of these changes on the economic resources of the poor" (Blank 238). In fact, poverty rates appeared to stay stagnant. The key message to take away from this is that poverty statistics alone are not capable of measuring the effect that public spending has on helping low-income households.

Both of the articles that I mentioned talked about how the current poverty line calculation is not accurate enough for the current needs of the American people. Both articles also mentioned how poverty rate statistics alone can't fully explain the effect that public spending has on public assistance programs. What I am trying to determine with my research is what kind of effect would an actual change to the poverty line cutoff bring to the amount of public assistance income that people receive as well as trying to determine other variables that could play an important role in the amount of welfare a household could ultimately receive.

II: Regression Model

The data I am currently using comes from the Current Population Survey which was released for March of 2018. The Current Population Survey is a survey of around 60,000 U.S households that is taken every month and is conducted by the United States Census Bureau for the Bureau of Labor Statistics. On top of being used as the primary source of labor force statistics, the Current Population survey also is used to collect data for other studies that help keep the U.S informed of the "economic and social well-being of its people" ("About the Current

Population Survey"). All things considered, the data in this survey should prove to be both trustworthy and reliable.

There are six main variables that I have used which come from this data source. The poverty line cutoff (in dollars) will be my main independent variable that I am using. The amount of welfare income (in dollars) that one receives will be my dependent variable. I will also be including total family income (in dollars), family size, employment status, and disability status as control variables to deal with omitted variable bias when calculating my regression since each of these variables have a unique effect on the amount of welfare that people receive. When it comes to the "observations" in this CPS dataset, it is important to keep in mind that each "observation" represents one U.S household.

Summary Table					
Variable	**Observations**	**Mean**	**Std. Dev.**	**Min**	**Max**
Welfare Income	140,084	505.5297	852.9631	0	25000
Poverty Line Cutoff	140,084	22205.83	7669.044	11756	54550
Disability Status	140,084	.3638317	.4811027	0	1
Total Family Income	140,084	68967.45	94425.1	-19998	2234000
Family Size	140,084	3.490663	1.621413	1	15
Employment Status	140,084	.4585963	.4982846	0	1

Note: In order for the summary values to be accurate, I had to adjust my calculations to exclude Not in Universe or Not Available values that take on the value 999,999 in the dataset that I used. The table above shows the summary values with the proper adjustments made to them.

<u>OLS (Ordinary Least Squares) Regression Equation</u>

Welfare Income (Y) = -117.3967+ .0043675*Poverty Line Cutoff (in dollars)

+ -.0008414*Total Family Income (in dollars) + 73.32631*Family Size +

1079.179*Disability Status + -140.9136*Employment Status + u_1

For the variables *Welfare Income (Y)*, *Poverty Line Cutoff (*β*_1_hat)*, and *Total Family Income (*β*_2_hat)*, all of them are counted in dollars. For the variable *Family Size (*β*_3_hat)*, the variable is based on the number of family members that are present in a household (in the CPS dataset that number ranges from 1 to 15). For the variable *Disability Status (*β*_4_hat)*, the value of the variable is 0 if no one in the household has a disability and the value is 1 if someone in the household has a disability. An important fact to keep in mind when it comes to one's disability status is that these disabilities can range from minor physical difficulties to major ones. For the variable *Employment Status (*β*_5_hat)*, the value of the variable is 0 if someone was unemployed in the previous year and the value of the variable is 1 if someone was employed in the previous year.

There are several reasons I included *Total Family Income*, *Family Size*, *Disability Status,* and *Employment* as a part of my regression. I will start with *Total Family Income*. Compared to my initial regression, there is some slight negative bias where the effect of personal income somewhat deflated the effect of a change in the poverty cutoff line. This is because the correlation between the *Poverty Line Cutoff* values (X_1) and *Total Family Income* (X_2) was positive and the coefficient for *Total Family Income (*β*_2_hat)* in the regression equation is negative (since a wealthier household would generally receive less welfare income), leading me to come to the conclusion that there was some negative bias.

I included *Family Size* in my regression since having more family members in a household would generally increase the poverty cutoff value for a household and thus the need for welfare. My regression equations appears to back my assumption up. Since the number of family members (X_3) is positively correlated with the poverty cutoff value (X_1) and the coefficient for *Family Size (β_3_hat)* is positive, this implies that the effect of family size provided a positive bias to my original regression.

I included *Disability Status* as a variable in my regression since having a disability would likely increase the likelihood that someone would need public assistance. For the dataset that I used, one's disability status (X_4) was positively correlated with the poverty cutoff value (X_1) and the coefficient for *Disability Status (β_4_hat)* is positive, implying the effect of the *Disability Status* variable introduced a rather significant positive bias to my original regression.

Lastly, I included *Employment Status* as another control variable in my regression since being employed would generally decrease the amount of public assistance income one could receive. For the CPS 2018 dataset, one's employment status (X_5) was negatively correlated with the poverty line cutoff value (X_1) and the coefficient for *Employment Status (β_4_hat)* was also negative, this implies that the effect of the *Employment Status* variable also introduced a positive bias to my original regression.

After looking at the effect that my control variables have had on my regression, it has become quite clear that the control variables I used picked up a significant amount of positive bias that my original regression had. In the next section, I will display and discuss the results from the regressions that I calculated and offer my interpretation on the results.

III: Empirical Results

Regression 1 (Initial Regression):

Welfare Income = -329.472 + .0376028*Poverty Line Cutoff (in dollars) + u_1

Regression 2 (Final Regression):

Welfare Income = -117.3967+ .0043675*Poverty Line Cutoff (in dollars)

+ -.0008414*Total Family Income (in dollars) + 73.32631 *Family Size +

1079.179*Disability Status + -140.9136*Employment Status + u_1

Regression Results Table

Dependent Variable: *Welfare Income*	(Regression 1)	(Regression 2)
Independent Variable: *Poverty Line Cutoff* (β_1_hat)	.0376028** (.0002797)	.0043675** (.0007231)
Total Family Income (β_2_hat)		-.0008414** (.0000171)
Family Size (β_3_hat)		73.32631** (3.215033)
Disability Status (β_4_hat)		1079.179** (4.001125)

Employment Status		-140.9136**
(β_5_hat)		(3.783296)
Intercept *(β_0_hat)*	-329.472**	-117.3967**
	(6.570149)	(6.73791)
Observations	140,084	140,084
R square	0.1143	0.5909

After testing all of the coefficients in both regressions at the 95% significance level, I found all of the estimated coefficients to be statistically significant. It should also be noted that the R square between the two regressions jumped from .1143 to .5909 which is a notable change and signifies that my second regression should be more capable of explaining the true effect that the poverty line cutoff would have on welfare distribution.

When it comes to the effect of family income on the amount of welfare a household receives, it appears that a $1 increase in a family's total income decreases the welfare they would receive by only .08 cents. So if a family's total income were to say increase by $10000, then they would only lose approximately $8.41 in welfare income according to the second regression model. When I included this control variable in my regression, the coefficient for the *Poverty Line Cutoff (β_1_hat)* increased slightly. This implied that this variable was applying some negative bias to my original regression.

When it comes to the effect of *Family Size* on the amount of welfare one could receive, essentially an increase of one family member would increase the amount of welfare income one

is estimated to receive by around $73. So according to this regression, a family of 4 would be estimated to get $219 more in welfare income than a family with only a single member. When I included this variable in my regression, the coefficient for the *Poverty Line Cutoff (β_1_hat)* decreased somewhat implying some positive bias.

The coefficient associated with the *Disability Status (β_4_hat)* is quite notable since according to this regression, if one has a disability, they would be estimated to receive approximately $1079 more in welfare income than someone who did not have any physical difficulties. When I included this variable in my regression, the coefficient for the *Poverty Line Cutoff (β_1_hat)* decreased significantly implying some significant positive bias coming from this variable.

When it comes to the effect of one's employment status and the amount of public assistance income they receive, my regression model estimates that being employed would decrease the welfare one would receive by $140.91. When I included this variable in my regression, the coefficient for the *Poverty Line Cutoff (β_1_hat)* decreased somewhat implying some positive bias coming from this variable.

Interestingly enough for the main independent variable that I tested (*Poverty Line Cutoff*), the coefficient for this variable became quite a bit smaller in the second regression. From these regression results it seems rather clear that the original regression had some positive bias in it. The effect of the *Disability Status* variable in particular was quite notable considering that variable made the coefficient for the *Poverty Line Cutoff (β_1_hat)* change the most. However despite the coefficient for the *Poverty Line Cutoff (β_1_hat)* getting smaller, the beta still remained positive in both regressions. According to the second regression, a $1 increase in the poverty line cutoff is estimated to increase the welfare one would receive by about .4 cents. So if

one were to increase the poverty line cutoff by say $10000, that would mean that the welfare

gain would be estimated to be $40. This ultimately means that a change in the poverty line cutoff

might not be as significant as I originally thought it was though it certainly still seems to play a

role.

An ideal way to conduct this experiment would be if I could actually change the poverty

line cutoff and then survey households on the amount of welfare they get each time the poverty

line changes, keeping everything else constant. Of course, changing policy even once can take a

significant amount of time and so trying to use this method would not be realistic. In my

situation, I had to make use of the historical data that is publicly available in order to answer my

question instead of conducting my own survey.

While I would say that I was able to better explain what affects whether someone gets

more welfare income or not, I am sure that my regression still suffers from omitted variable bias.

Some other variables that I would look into if I were conducting my own survey would be

whether someone in a household was an ex-felon and also the education status for members of a

household. The main reason I would want to know if someone in a household was an ex-felon is

because ex-felons often cannot qualify for many financial benefits that people with a clean

record can. This would likely make an important impact in my regression if I were to include it. I

also would look into the education status of individuals in a household because those who are

better educated typically have higher incomes which should generally reduce their likelihood of

needing public assistance income.

IV: Conclusion

According to my second regression, an increase in the poverty line cutoff was estimated to increase the amount of welfare one would receive, however it certainly does seem that there are other factors at play which affect how much public assistance one receives. The control variables that I used certainly do seem to explain some of these welfare distribution patterns, but they definitely do not explain all of them.

I primarily wanted to look into the issue of welfare distribution primarily because of the impact that it can have on the lives of many people that are struggling to make ends meet on their own. Also when I was conducting my research, I did not just want to look at the effect that the poverty line cutoff had on the amount of welfare that households would receive, but also what other factors would make someone need public assistance. The one variable that I included in my regression that really stuck out to me was the *Disability Status* variable. Considering how much of an impact this variable had on my regression also goes to show the profoundly negative impact that having a disability can have on trying to lead a normal life where you don't find yourself living below the poverty line. At the end of the day, the intention behind public assistance is to help people meet their needs when their own situation prevents them from meeting their needs themselves. So I guess it should be no surprise when we find out that we have been trying our best to help those that can't walk finally get back up on their feet again.

V: References

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