Slide 1: Title Slide

- Good Afternoon Everyone. For those of you who do not know me, my name is Brandon Williams.
- Today, I will be presenting my honors thesis titled "An empirical analysis of economic inequality on Economic Growth.
- My honors thesis advisor is Dr. Greenlaw. I would like to thank him for his comments and support along the way.

Slide 2: Introduction + Visualization of Gini Coefficient

- For the United States, one of the most important trends of concern is the growing level of inequality.
- It is widely accepted that the United States is currently experiencing historically high levels of economic inequality.
- To measure inequality, economists use the Gini coefficient.
- In the *Figure* below, the Gini coefficient is depicted from 1947 – 2019 and is measured as the income Gini ratio of families by race of households, all races. As can be seen in the *Figure*, the United States is currently experiencing a high level of income inequality.

Slide 3: Introduction to Supply Side Theory

- There are three different theories for the relationship between economic inequality and economic growth: supply-side, demand-side, and what is referred to as the political economy.
- My research explores the supply side theory.
- It has been well established that inequality has a negative impact on
    - Undermining educational opportunities for children from poor socio-economic backgrounds, lowering social mobility, hampering skills development, and less-productive labor inputs
- It is important to note that the supply side theory is not a zero-sum game. In other words, just because an individual in a lower socio-economic class cannot go to college, does not mean that someone in a higher socio-economic class will go to college.
- Most research has studied the extent to which higher inequality is associated with less opportunity and mobility.
    - However, I aim to study if there is a causal linkage between higher inequality and slower macroeconomic growth.

Slide 4: Research Question + Contribution

- My main research question is to what extent does or does not human capital accumulation explain the relationship between income inequality and economic growth?
    - My hypothesis is that inequality limits human capital accumulation primarily through the channel of educational attainment, which then dampens labor quality. Reductions in labor quality led to slower economic growth.
- My contribution is that I examine the impact of income inequality on labor quality.

Slide 5: Literature Review

- One of the most important demographics of labor quality is educational attainment as education allows for individuals to grow their skills and increase their opportunities. Equally as important, experience (as proxied by age) can also increase one's human capital.
- Chou, Meng-Hsi, and Gee San investigate the growth of labor quality on Taiwan's economic growth and conclude that the growth of labor quality impacts economic growth more than capital investment. In addition, the researchers also find that the main demographic trends are the growth in educational attainment and experience.
- Vandenberghe finds evidence that better-educated and older or more experienced workers are more productive than their less-educated, younger or less experienced counterparts.
- Another important aspect of labor quality is the role of gender and ethnicity.
- During the second half of the twentieth century, the composition of the labor force saw an increase in the number of female workers.
- More importantly, during this same time period, educational attainment for women also increased; however, Seguino and Braunstein find that this educational equality did not translate to equality in employment.
- The authors find a negative relationship between gender job segregation and labor share of income.
    - Despite an increase in employment participation by women, women are relatively rare in high-skilled jobs compared to their male counterparts.
    - Because there is a discrepancy between high and low- skilled jobs between males and females, gender can dampen labor quality.
- Weinberger (1998) finds that there is strong evidence to suggest that within the market for recent college graduates, there is discrimination among different ethnic groups and females when compared to white males.
- Lastly, the fluctuations in the business cycles can bring about more transient changes.
    - For example, the workforce tends to become more experienced in recessions because older and more experienced workers are less likely to lose their jobs than younger and less experienced workers.
- Devereux supports this notation that employers hire more experienced workers than less experienced workers during recessions.
- Both Aaronson and Sullivan and Fernald aim to examine the economy's potential rate of growth.

    - Aaronson and Sullivan provides insights on the improvements in labor quality due to changes in the distribution of education and worker experience, whereas Fernald provides historical and recent observations of the dynamics of productivity and potential output
- In his report, Bernstein (2013) states there is solid theoretical backing; however, little empirical evidence. This is what I hope to provide.

Slide 6: Economic Theory

- My economic theory is that as inequality increases, human capital accumulation decreases through decreases in educational attainment.

    - This decrease in human capital accumulation presents itself as a weaker form of labor quality
    - Finally, reductions in labor quality dampen economic growth.

- Labor quality is defined as ratio of labor input to hours.
    - The growth rate captures the productive benefits of changes in composition of hours worked
        - Generally, the growth rate is defined as the sum of growth in hours and growth in labor quality

- As can be seen in the prior literature, it is important to capture the changes the composition of the workforce
    - Demographics such as Educational attainment, Gender, and Experience of the workforce must be included in the regression equation.
    - Lastly, business cycles must also be captured as older and more experienced workers are less likely to lose their jobs during recessions than younger and less experienced workers.

Slide 7: Estimating Equation

- The first equation is useful in order to determine if economic inequality decreases the educational attainment in the United States
    - It is expected that Education will have a negative sign.

- The next equation uses labor quality, which is derived of changes in the composition of the workforce, such as certain demographics and the behavior of the business cycle.
- From the work of Aaronson and Sullivan, Chou, Meng-Hsi and Gee San, and Vandenberghe, the regression equation must capture the level of experience and educational attainment in the economy.
- Furthermore, Aaronson and Sullivan discusses the importance of measuring gender in the composition of labor quality and Seguino and Braunstein finds evidence of gender job segregation.
- In sum, the second equation is derived from the previous literature.

- The sign of GINI is expected to be negative, whereas the sign for the EDUCATION is expected to be positive
- Next, the sign of GENDER is expected to be negative for females and positive for males.
- Lastly, the sign for AGE is expected positive for older workers and negative for younger workers.

- Finally, once this empirical relationship is established, it is hypothesized that the inequality dampens economic growth through labor quality.
- The sign for LQ is expected to be positive whereas the sign for CYCLES is expected to be negative

Slide 8: Data

- To measure labor quality, this paper uses the measurement provided by John Fernald. Fernald measures labor quality from the Bureau of Labor Statistics (BLS) and the Aaronson-Sullivan approximation.
- The variable for educational attainment and Gini coefficient is obtained from the U.S. Census Bureau, whereas the variable for experience, gender, and unemployment is collected from the Bureau of Labor Statistics.
    - The Gini coefficient is measured as the income Gini ratio of families by race of household for all races.
    - The educational attainment variable is defined as the percent of people 25 years and over, who have completed 4 Years of college or more.
    - The experience variable is a ratio between the employment level of 16-24 years old and 55 years and older against the employment level of 16 years and older.
    - The gender variable is defined as the labor force participation rate by females and males.
    - Lastly, the variable for economic growth is measured as the annual percentage change in real GDP, whereas the cycles variable is measured as the unemployment rate.
- The first and second equations use a sample period from 1964-2019, whereas the third equation uses a sample period from 1948-2019.

Slide 9: Results for Equation (1)

- The results for the first equation are depicted on the right side. It is important to note that the P-values are in the parentheses.
- The relationship between the Gini coefficient and Educational Attainment is positive and statistically significant.
- For a one percentage point increase in the income Gini ratio, educational attainment increases by about 2%.
    - This is contradictory to the literature review and economic theory. A potential explanation is that the model is too simple and that the annual time series does not provide enough variation in order to capture the true effects of the relationship.

Slide 10: Results for Equation (2)

- The results for the second equation are depicted on the right side. It is important to note that the P-values are in the parentheses.
- The most important result is that the Gini coefficient is statistically significant and negative.
    - This result provides evidence that the Gini coefficient decreases labor quality.
- For the control variables, all of the variables have their expected signs except the sign for the Age – Old, Gender-Men, and Gender-Women.
- Age-Old has a negative sign.
    - Intuitively, this result does not make sense as an older worker has more experience and knowledge, so it is expected this worker has a larger human capital accumulation.

        - A potential explanation is that experience increases with age but at a decreasing rate.
        - Furthermore, Aaronson and Sullivan (2002) expect to find a change in experience levels that turn from a positive to a negative factor for labor quality growth.
- Furthermore, Men and Women are statistically significant and have their opposite signs.
    - Intuitively, these signs do not make sense as Aaronson and Sullivan (2002) and Seguino and Braunstein have established that women tend to earn lower wages despite having the same level of education and experience as their male counterparts.
    - Although, Aaronson and Sullivan (2002) do mention that this negative effect on labor quality is diminishing overtime as the share of women workers grows; however, the size of coefficient estimates as well as the difference between the coefficient estimates seem to be rather large.
- There is neither serial correlation nor heteroskedasticity detected within the regression; however, the issue of multicollinearity does arise
    - Since the variables are statistically significant, any remedies will lower their t-scores and not change their estimated coefficients. Thus, I decided not to address the collinearity in the regression.

Slide 11: Results for Equation (3)

- The results for the third equation are depicted on the right side. It is important to note that the P-values are in the parentheses.
- Labor quality and Unemployment are statistically significant and negative.
- The results for labor quality do not have its expected sign.
    - This result is contradictory and does not provide support to the hypothesis that inequality dampens economic growth through labor quality
- Lastly, there is neither serial correlation, multicollinearity, nor heteroskedasticity detected within the regression.

Slide 12: Conclusion + Future Research

- There are numerous reasons for policymakers and citizens to be concerned about the rising level of inequality, such as its impact on the basic American social contract that says that hard work pays off; the diminishing of opportunity; the rise in societal unrest; and its impact on political functionality.
- Ultimately, the results do not support the theory that economic inequality dampens economic growth.
- The main issue that arises is that economic inequality does not have a negative relationship with educational attainment and that labor quality does not have a positive relationship with economic growth.
- One suggestion is to use disaggregate data rather than aggregate data as some of the variation between the relationships are lost when conducting analysis in the aggregate.