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Written Transcript

Slide 1: Introduction

- Good Afternoon… My name is Brandon Williams and I am an Economics and Mathematics major. Today, I will be presenting my research paper, "What has happened to U.S. Inflation? The Effect of Globalization on the Phillips Curve."

Slide 2: Phillips Curve Graph

- Traditionally, the Phillips curve shows the relationship between the inflation rate and the unemployment rate.
- Since the end of the Great Recession, the curve has not yielded the same results, thus the performance of the curve has been called into question.
- This graph depicts the historical performance of the Phillips Curve in the United States from 1986 to 2006 and 2007 to 2018.
- Notably, the relationship appears to have disappeared completely since 2006.
- The unemployment gap is approximated by the difference between the non-accelerating rate of unemployment (NAIRU) and the actual unemployment.
    - The information for the NAIRU is provided by the U.S. Congressional Budget Office, while the actual rate of unemployment is provided by the U.S. Bureau of Labor Statistics.

Slide 3: Motivation

- Currently, in the United States, inflation rates have remained low and stable, while unemployment has decreased and GDP growth has increased. These latest trends have caused speculation into the Phillips Curve.
- Therefore, I try to explain these trends through globalization.
    - I define Globalization as the process of international integration through the exchange of products, technology, information, and jobs.
        - During this time, world trade has risen from 27.32% in 1970 to 59.4% in 2018.
- There have been few papers that study the impact of Globalization on inflation dynamics.
- However, Forbes argues that as the world has become globalized, the increase in world trade has led to the relationship between unemployment and inflation to weaken, partially because domestic are required to keep their prices low to compete with foreign companies. Forbes also suggests that domestic prices have been influenced by, "increased trade flows, emerging markets, and ease of using global supply chains."
- The next research paper explains how global value chains provide evidence that the world output gap influences domestic inflation. In particular, their results support the hypothesis that as global value chains become more related through indirect and direct competition, domestic inflation becomes more sensitive to the global output gap.
- To answer questions surrounding the validity of Okun's law, this research cites Ball et al, who analyzes how well Okun's law has performed in short-run

unemployment movements in the United States since 1948 and twenty advanced economies since 1980. They find that the law is both "strong and stable" in most countries; however, they note that the coefficient varies.

Slide 4: Research Question / Contribution

- My research attempts to answer the question to what extent does Globalization effect the inflation dynamics in the United States?
- More specifically, I want to examine the impact of Multinational Corporations and Foreign Direct Investment flows on U.S. inflation.

Slide 5: Multinational Corporations and FDI

- During this period of globalization, the rise of multinational corporations has increased the magnitude of foreign direct investment flows.
- Multinational corporations are defined as corporations that engage in foreign direct investment.
- In addition, foreign direct investment is when a Multinational Corporation establishes or purchases an "effective voice in the management" of productive assets in another country other than its residence.
- Furthermore, an effective voice in management is defined as 10% or higher ownership in the productive asset.

Slide 6: Economic Theory

- In the United States, the growth of multinational corporations force domestic firms to compete with multinational corporations for lower input prices during the production process.
    - As the prices of final goods become cheaper, domestic firms lose their ability to raise wages for workers and to set their prices for final goods. The presence of multinational corporations deters domestic firms from increasing their wages to attract workers because the domestic firms have to compete with the multinational corporations.
- However, one of the main reasons for multinational corporations to conduct foreign direct investment is vertical specialization.
    - Vertical specialization is when multinational corporations establish a productive asset in a foreign country rather than remain in their domestic country because the corporations want to exploit a comparative advantage, such as making a specific product more efficiently or at a lower cost.
    - This allows multinational corporations to reduce the cost of their final good as the firms can fragmentize the production process.
- As multinational corporations and domestic firms decrease their price of inputs, supply and demand models suggest that this decrease in the cost of production shifts the supply curve to the right. Moreover, this shift in the supply curve causes the price of the final good to decrease as well.
- Therefore, as the United States economy becomes internationally integrated, the total output increases because the good becomes cheaper thus, becoming more available to consumers in the domestic economy and the world economy.

- In addition, Okun's law suggests an increase in the change of output leads to a decrease in the change in unemployment.
- Finally, because the change in the price level is decreasing, then the inflation rate must be decreasing as well.

Slide 7: Estimating Equation

- Therefore, to answer my research question, first I run a regression on the traditional Phillips Curve. After, I augment the Phillips Curve to include global variables, such as the world output gap, the exchange rate, import commodity index, inward and outward FDI, an openness to trade variable, and a time dummy variable.
    - Import commodity measures input prices, whereas the
    - Exchange rate serves as a proxy for competition
    - Openness to trade measures how the United States has trade as a percentage of GDP.
    - The dummy variable captures the changes in the inflation rate since the end of the Great Recession.
- Notably, every regression is tested and corrected for multicollinearity and serial correlation. The detection for multicollinearity uses the simple correlation tables and the high variance inflation factors. When multicollinearity is detected, I either dropped a redundant variable or did nothing because there is natural collinearity between the variables.
- The detection method for serial correlation is Lagrange's Multiplier test. With time-series data, each regression is tested for 1 or 2 lags due to the loss of degrees of freedom with more lags. If serial correlation is detected, the remedy for this issue is the Newey-West Standard Errors.

Slide 8: Data

- To collect the variables needed to run a regression, I collected data from the World Bank Open Data, OECD Statistics, BLS, BEA, and University of Michigan.
- The main independent variable is FDI inward and outward, whereas the main dependent variable is the inflation rate.
- The inflation rate is measured in five different measurements with each measurement providing different information on certain aspects of the economy.
- Lastly, the sample period is from 1986 to 2018.

Slide 9: Regression Results – Traditional Phillips Curve

- Based on the regression results, there is evidence to support the claim that the traditional model of the Phillips Curve can no longer explain the inflation dynamics.
- The model is explained poorly as the R^2 is very weak.
- In addition, there are very few statistically significant variables, therefore, I believe the traditional model is not fully specified.

Slide 10: Regression Results – Augmented Phillips Curve

- *Table 2* describes the regression results for the augmented Phillips Curve equation.
- The results from the regression suggest that the augmented Phillips Curve does appear to be a better model than the traditional model.
- In general, the R^2 for each measure of inflation has increased.
- However, with each regression, there is a lack of evidence to support the model.
- For CPI and Wage Inflation, Outward FDI seems to be more negatively correlated with inflation, whereas Inward FDI does not play a role.
- It should be mentioned that the World Output gap is not statistically significant for any of the regressions.
- Nonetheless, Openness to trade and the time dummy variable appear to be irrelevant as well; however, the research could provide more conclusive results if the sample size were increased.

Slide 11: Conclusion / Future Research

- Ultimately, this paper finds little support for the theory that globalization has influenced domestic prices.
    - The regression results are not convincing enough to determine if globalization has impacted the inflation dynamics.
- Forbes (2019) suggest that world output is more relevant than the domestic output gap, however, I find that the world output gap is not relevant in explaining the U.S. inflation dynamics due to lack of statistical significance.
- Further research should focus on data in the sector or industry level. I used aggregate data, whereas using disaggregate data might have more explanatory power.
    - FDI flows by sector could provide more evidence for the recent behavior of inflation. Thus, one recommendation of this paper is to observe data at the sector level.
- In addition, another recommendation is to explore other possibilities that have changed the inflation dynamics, such as worker' bargaining power or the 'sharing' economy.