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Advanced Economic Analysis

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United States Government COVID-19 Aid

An International Study

Introduction

The topic of the economic aid surrounding the COVID-19 pandemic is an area of study that is just cresting. Due to the recency of the event, we have a novel opportunity. The flurry of economic data that was produced allows us to further our understand of the government’s ability to affect our economy and our lives. This, of course, is only looking at the purely intellectual opportunities when studying this area of economics. It is not lost on me the amount difficulty people went through during the Pandemic itself and our ability to examine what worked and what didn’t, so that for future shocks to our way of life we better understand how we can help people get through those periods of strife. I will be looking at this question through the lens of consumption and how the extend child tax credit might have affected household consumption.

Being able to understand the tactics that have worked in the past will allow us to better prepare for the future because we will have the data to back up their effectiveness. Studying this moment in time and this specific policy change to an individual tax credit could provide the answers to future instants of shocks and how the government might be able to help improve the amount of consumption in the economy. Additionally, looking at this provides a better understanding of consumption and the factors that are currently guiding consumers and consumer trends.

Literature Review

The research I was able to find on this topic was relatively sparse. However, I was able to find multiple studies on American aid that was provided and one study looking at how Europe handled the pandemic. For both areas of study there seemed to be a general consensus on the fact that aid during the pandemic was useful. There was a pretty clear split between what area of the economy these studies examined. “The Social Safet Net” (Bitler et al, 2020) and the “Poverty in the United States” (Creamer et al, 2022) both examine personal economy. How aid directly affected the individual. Whereas “COVID-19 Financial Aid and Productivity” (Altomonte et al, 2023) and “Has the Paycheck Protection Program Succeeded?” (Hubbard and Strain, 2020) focus on the firms and how they were impacted by the aid given.

Where these papers disagreed was the follow up. For example, Altomonte et al claim that the best next moves for Europe, and the specific countries they studied, would be to remove the aid given to the businesses. Their argument was that businesses need to prove themselves in the marketplace and that governments ought not step in and support what they call “zombie” firms. Bitler, Hoynes, and Schanzenbach disagree. They claim that the aid that was provided was helpful and useful but there needs to be more. That we shouldn’t stop with the aid that we provided. This difference in conclusion could be explained by the fact that they were looking at two different aspects of the economy, with the first concerned about businesses and the second concerned about individuals.

I was not able to find any research that looked across national borders unfortunately. The strongest non-American research I could find was done by Altomonte et. al. And while their research were enlightening their scope is different from how I am approaching the topic. Luckily, I was able to find a study that looked at this problem through the difference-in-difference model. Glenn and Strain examined how PPP loans affected the businesses that applied for them and they decided to do so by comparing the treated group (business that received PPP loans) to the untreated over time. This research will be very beneficial because it will help me construct my own difference-in-difference model.

Theory

Before discussing the model, I used, it will be helpful to establish a theoretical baseline to judge the model and the results from. My hypothesis is that after individuals were able to make use of the extended child tax credit consumption would also increase. The theoretical foundation for this conclusion is the standard understanding of how the income effect affects the consumption of an individual. The theoretical result of income increasing would be consumption increasing in turn. The tax credit would have a similar effect because a tax credit acts as some additional money you get to subtract from your tax liability. And so if your tax liability is long enough, the tax credit could not only mean you pay less taxes, but instead you actually receive more money.

However, there are other factors that would need to be included in the model in the attempt to isolate the effect of the tax credit and not another factor. The consumer price index acts a measure of inflation for a standard basket of goods that a household of consumers would buy. CPI in my model stands for the consumer price index. This could easily affect consumption because even if you gain a bump to your income, if a corresponding, or greater, increase in prices comes along with it, there would be little relative change in consumption. I expect that an increase in CPI will correspond with a decrease in consumption. Unemployment is also another factor that ought to be controlled for. This is because individuals who are unemployed would have a different mindset and utility function than those who are employed. When you are unemployed, your mind turns towards conserving. Stocking up. Ensuring that you can continue to pay for the required expenses. This means that if a person like this were to reserve more money, they wouldn’t turn to consumption but rather saving. I predict that unemployment will have a dampening effect on consumption. Additionally, because I am looking at this through a difference-in-difference model I will also have the treatment, after and interaction variables. The Treatment variable is going to be a binary value, either 0 or 1 depending on if the data is from the United States of another country. The United States will be 1, because I am looking at the effect on a US policy change on US household consumption. The after variable is going to be another binary value based on if the data is coming from before or after the second quarter in 2021, because I wanted to see what the effect of the extended child tax credit was, and that version of the credit only existed after that point in time. Finaly the interaction variable is another binary value if you have both 1’s in the treatment variable and after variable. This symbolizes if the data comes from the United States after the second quarter in 2021 in attempt to isolate the effect that the extension on the child tax credit might have.

Model

The reason a difference in difference model is being used as opposed to another type of model is that the difference in difference model lets us simulate a experiment to study the effect of higher tax credits, especially for those who are more needy, on consumption. Because it is impossible to actually construct a good experiment like testing a drug, finding a situation like this in real world is extremely helpful. The difference in difference model also offers a very elegant solution to a problem that would arise in an analysis of consumption. That is, consumption trends upwards. This makes it very difficult to find a good way to measure the effect a certain thing has on consumption itself. Additionally, the model allows us to look at different countries which provides good context that we would normally miss out on if we were to only look at the United States. The equation I plan to use for the difference in difference model is as follows.

*Consumption =*

*β0 + β­1United States1 + β2After Child Tax Credit2* + β3*United States X After Child Tax Credit3 + β4CPI4  + β5Unemployment Rate5 + β6Economic Activity6 + ε*

Data

To best accomplish an analysis of the model I proposed above I have gathered the corresponding data from several different countries to achieve a wider range of data. The countries I am utilizing are the United States, Canda, Brazil, France, Germany, Italy, and Japan. I chose those countries because they were a handful of the largest economies, and they offer a wide range of environments. Pulling from North and South America, Europe and Asia allows me to remove any singularities that might present themselves present in the location of the country. For each country I am looking at the consumption of the household in 1,000, the CPI (or consumer price index), the unemployment rate, and the economic activity. The IMF, international monetary fund, supplied the data for the CPI and economic activity for each country. And the Federal Reserve Bank of St. Louis database provided the data for household consumption and the unemployment data.

All of the previous data was recorded on a quarterly basis starting from the first quarter in 2020 to the last quarter of 2021. This was done because the effect I am attempting to capture is a relatively short-term change. The After, Treatment, and Interaction variable were all encoded to represent the change that occurred in the United States and the period of time after the second quarter of 2021. This is because the effect I am studying, the extension of the Child Tax credit for the year 2021. Table 1 shows the summary statistics of the data used in the regression. Household consumption has a larger variance because the United States household consumption is an order of magnitude larger all other countries, however the relative low variance of the other summary statistics signals that the data as a whole is not something to be concerned about and the method of analysis will allow that variance to not affect the regression by much.

**Table 1:**

A close-up of numbers

Description automatically generated

Analysis

The regression run on the data can be seen in Table 2. There were three regressions run, each with a robust standard error to attempt to best capture the reality of the regression. The first regression was run with the treatment, after, interaction and all explanatory variables. The second regression that was run was run with the same variable except for the exclusion of the CPI, or consumer price index. This was because the CPI run in the first regression was not statistically significant and would have then just been adding noise. The final regression was only run with the treatment variable, after variable and the interaction variable. This regression was run to examine if there was used to including the explanatory variable.

With all three regressions the level of significance for each variable was not affected. The treatment variable, symbolizing the United States, was constantly significant. This can be explained because the United States had a much higher consumption compared to the other countries included in the regression. The coeffienct of the treatment term was positively correlated with the effect that if a country is the United States the household consumption in the thousands will increase by 294. Additionally, both unemployment rate and economic activity are both statistically significant, one at the 1% level and the other at the 5% level. This demonstrates that both are worthy of consideration in this question.

**Table 2:**

A table of numbers with a black background

Description automatically generated with medium confidence

The interaction term was also always significant at the 1% level meaning that the effect presented by the interaction term (The United States after the second quarter of 2021) has a statistically significant chance if a country is the United States and it is after the second quarter of 2021 household consumption will increase by 25.42 thousand dollars. This seems to indicate that there was a real affect by the extension of the child tax credit, and that the effect was an extremely positive one.

Conclusion

The results of the regression point to the fact that there is high likelihood that the aid the United State Government provided during the pandemic was highly helpful for individuals. The incredible significance and large coefficient suggest that people were able to consume much more after the child tax credit. And while consumption isn’t a one-to-one measure for complete wellbeing, it still indicates a level of spending is increasing. And when households and spend more, that means they have the ability to engage more with the economy. It allows for markets to grow and firms benefit greatly. The fact that the change of the how the child tax credit functioned allows for such a significant benefit to consumption shows two things.

The first is that it shows the extent of need for such a change in the United States economy. The tax credit was augmented to address the economic stress that many households were experiencing. In a year that saw many people lose their jobs, granting aid that effectively increased their income was hugely beneficial. Additionally, because of how the tax credit is structured, scaled as progressive, meant that the households that needed the money the most were able to gain the most from the tax credit.

The second thing these results tell us is that directed and careful aid to individuals or households is extremely effective. This result is backed by previous research that was cited earlier in the paper. When government aid is directed at individual households and consumers and when it is careful, provided to those who need it most, the benefit to the economy and individual is enormous. Looking at the aid now it clear that its use cannot be overstated, and while there is rationale for why the extended tax credit was only temporary to soft the difficulties of the pandemic, it would not be a terrible idea for a similar extension to be developed for a long-term form of government aid.

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