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Introduction

What is the effect of unemployment benefits on the unemployment rate? This is a question that many people have pondered for decades now. While Unemployment Insurance was created to combat economic hardship and protect American workers, some believe that there is a point where the benefits actually act as an incentive against rejoining the workforce. This is exactly the kind of conversation that took place following the expansion of unemployment benefits during the COVID-19 pandemic. Initially there was a clear need for the expansion of Unemployment Insurance (UI) as massive numbers of individuals were laid off and the economy stalled. Shortly after this, many politicians, media analysts, and academics began to speculate that these benefits were acting as a barrier to restarting economic growth and raising the employment rate. In response to this, other politicians, labor organizations, and others in favor of continued UI benefits argued that the pandemic was still the biggest factor keeping people out of the labor force, and that benefits were still needed to help people get by. So the question posited above is one that has always loomed over American economic policy and has been a particularly important one on the minds of most Americans over the past two years.

Before we begin to approach the first question, it is important to understand why the unemployment rate is so important. Firstly, the unemployment rate is the measure of working age individuals that are a part of the labor market that are actively seeking work but unable to find gainful employment. The definition of unemployment is inherently critical because families and individuals rely on income to live and survive, regardless if it's income from unemployment or a paycheck from a job. Additionally, the unemployment rate is an economic measure that is consistently used to indicate that an economy is booming, but is also followed closely in times of economic hardships, and for good reason. The unemployment rate is a way to measure the strength of the labor market, but additionally the unemployment rate has been found to have a negative long-run relationship with GDP. This means as unemployment goes down GDP typically trends up, until the economy reaches something called "optimal employment". Lastly unemployment can be used as a potential indicator of inflation as they have had an inverse short term relationship in the past, but this has begun to weaken in recent data. Because of this, should a relationship be discovered between unemployment benefits and the unemployment rate it would give us better insight into how UI can be used inorder to generate greater welfare as well as influence the unemployment rate.

Speaking more specifically, the high unemployment rate following the COVID-19 pandemic has been a heavily debated topic of late. This topic is particularly relevant based on the economic shifts we have seen from the beginning of the pandemic. Unemployment was extremely high mid-2020, in conjunction with the uncertainty that the pandemic brought, this led to significant unemployment benefits being extended to US citizens. These benefits came via the CARES Act in the forms of the Pandemic Emergency Unemployment Compensation (PEUC) program and the Pandemic Unemployment Assistance (PUA) programs. These programs extended the length of the unemployment period beyond 20 weeks, increased the amount of money provided weekly on unemployment, and in the case of PUA, expanded the types of individuals that qualify for UI. These new types of individuals included self-employed workers, independent contractors, gig workers, low wage workers who can no longer work because of the pandemic, Those without sufficient work history, and Individuals who have exhausted their regular unemployment benefits and extended federal benefits. This means that traditional employees may apply for PUA after all of their other unemployment benefit options have expired. These programs represented a major departure from how unemployment had been operating for the previous decades, reflecting the uncertainty and volatility that the COVID-19 pandemic had brought about.

Eventually, as the pandemic began to wane, prior to the rise of the Delta and Omicron variants, unemployment benefits became a trending topic. Many argued that the continuation of benefits kept unemployment high because people could earn as much or more than what they would have at their jobs prior to 2020. Others felt continuation was still necessary for most Americans due to the looming threat of covid and the possibility that some individuals were still unable to find work. Getting the answer to this argument correct is highly important. Should it be the case that the null hypothesis is disproven but UI benefits were kept at a higher rate then unemployment could continue to be high and the economic output gap would continue to widen possibly causing inflation. However, if the null hypothesis were to hold but UI benefits were cut, then the government would have greatly diminished its support of unemployed workers while leaving them in a labor market with low levels of employment.

As we have discussed there is a lot of debate around this issue and subsequently a good amount of research done attempting to answer the question. One paper we found from Harvard Business School (HBS) looked at the effect of UI deposits on the unemployment rate as well as other economic markers such as consumer spending. The team looked at the period from the onset of the pandemic onward. “Using bank information for over 18,000 people receiving benefits, the team compared states which ended benefits early versus those that kept them intact. They found that there were limited increases in unemployment in states where the benefits ended versus those that kept them” (Iacurci, 2021). So in initial research it may already indicate in favor of our null hypothesis, but it is too early to tell for sure. While this paper seems to answer our questions, there are differences in the sources of data sources used that may lead to a different conclusion.

In the HBS paper, by Coombs et al, the team used data from a financial intermediary, Earnin, to gather their data on individuals monitoring the levels of UI recipients. This is different from our current data sources, which utilizes data from the Department of Labor on the number of UI claims made for a given period. The researchers used Earnin to have faster access to data on unemployment as well as insights into things beyond UI like consumption and earnings. We believe that the team may have sacrificed having an accurate estimate of the unemployment/employment rate for the sake of speed and more data points. Because of this the likelihood that our results will differ is high.

Aside from these differences in data sources, we found that the approach in measuring the impact of “additional” UI benefits is similar. We will be looking at the difference in UI claims in states that withdrew from the Federal Pandemic Unemployment Compensation early to those that remained in the program until the federal end date in September.

From their research with data from Earnin the researchers found that "…ending pandemic UI increased employment by 4.4 percentage points while reducing UI recipiency by 35 percentage points among workers who were unemployed and receiving UI at the end of April 2021." (Coombs, 2021) and they noted additionally that "…our evidence suggests that most of the employment gains were due to the mechanical exhaustion of UI benefits, as opposed to through greater incentives for job finding from the loss of $300/week supplement." (Coombs, 2021)

So far, we have seen that the current literature on the matter seems to fail to disprove our null hypothesis. Overall, we believe that the level of impact of unemployment benefits on the unemployment rate is a pertinent topic in today's climate and will have ample data available for our research.

Model

In order to test the effects of extra UI payments on the overall UI rate we are using a fixed effect panel regression model. For our panel variable we used the Federal Information Processing Standards (FIPS) state codes in order to segment our data by state. Our time variable was the date of the day ending each week that we had obtained data for from March of 2020 to February 2022. In this model we have set the continued UI claims as our dependent variable as this represents the level of individuals currently on unemployment.

As for our independent variables we ran two separate regressions with two different independent variables. The first regression we combined the PUA claims and PEUC claims into one variable called Combined Pandemic Claims. This variable represents the total "additional" UI payments and so that we can measure its impact.

The second of these two regressions used a binary dummy variable that represents the presences of pandemic unemployment programs. Prior to the rolling out of the PUA and PEUC programs, this variable would be a 0, when the programs went into effect it would be a 1 and revert to a 0 when the programs ran out. This is different from our first independent variable because it seeks to measure the presence of the pandemic UI programs, while the first measures the effect of the total number of claims made under that program.

The final component of our model is the explanatory variables of new covid cases, new covid deaths, and the total number of completed vaccinations administered. These were chosen in order to address omitted variable bias by lessening any “noise” the COVID-19 pandemic caused to unemployment.

Data

During our research we used one database to compile data for statistical analysis. This source was Opportunity Insights’s (OI) project tracking the COVID-19 economic recovery called tracktherecovery.org. This project gathered data from the United States Department of Labor as well as other private financial intermediaries to obtain their economic data.

Opportunity Insights provided data on the number of UI claims, continuing UI claims, and pandemic relief claims, both the PUA and PEUC programs. This data was offered on a national, state and county level, but we decided to use the state level data. The reason for this is because not all states provided their county level data on unemployment, and those that did used their own state agencies. So, to avoid differences in the reporting of data and get an estimate of all states, we elected to go with the state level statistics.

In the data provided by OI identified the states using the state FIPS codes, so to allow for clearer identification and sorting of states in the dataset, we included a column that matched the state FIPS code with its abbreviation (i.e. Alabama, AL, 01). OI also provided the date for each data point in the form of three columns reflecting the year, month, and day ending each week from which their data was recorded. These were combined into a singular column in the form of MM/DD/YY, for better visual analysis and sorting by date.

After some visual improvements to the dataset we needed to create the necessary variables of “combined pandemic claims” and our binary dummy. The pandemic claims variable was made by taking the sum of the PUA claims and the PEUC claims into a new column. The binary dummy variable was created as all 0s and then were converted to 1s using the if statement matching each state by FIPS codes to its respective start date through to its end date of the programs.

The most extensive data cleaning came in the form of the COVID-19 data. The reason for this was that the COVID data we received from OI was in a daily frequency, while our unemployment data was weekly. First we began by having the time frame of the two datasets equal the same by starting on February 23rd 2021 and ending February 5th 2022. After that the covid data was grouped into weeks, segmented by state fips and matched with its corresponding unemployment data.

Results

The first regression using combined pandemic claims as our independent variable is pictured in Figure 1 in the appendix. The results indicated a mild, yet still statistically significantly positive effect of the pandemic claims on the level of unemployment. We can also see that absent of the pandemic claims the model found that there would still be roughly 160,000 individuals continuing to claim unemployment, which is far lower than the 2 million continued claims that were present prior to the pandemic.

In addition to the impact of the independent variable we also learned of the interaction from our explanatory variables. Firstly, we found that of all the variables tested, including the pandemic claims, COVID-19 deaths had the largest impact on the level of unemployment claims, while COVID-19 vaccinations had the lowest effect. Lastly, the relationship between COVID cases and the was found to be negative, counter to intuition.

Moving to our second regression analysis, pictures in Figure 2 in the appendix using our binary dummy variable, results reflected a similar relationship for the explanatory variables, but the effect of the dummy variable was found to be not statistically significant.

Conclusion

The Harvard Business School paper mentioned in our introduction found that there was a minimal level of impact from the addition of pandemic UI benefits on the total level of unemployment. They reasoned that the main driver of unemployment was beyond just the presence of benefits. After running our two regression models we have come to a similar conclusion.

Looking at the coefficient found in our first panel regression we found that the effect of additional benefits was small, below a 0.2 increase in UI claims for every additional pandemic claim. Taking this in combination with the result of our second analysis that found the presence of these pandemic UI benefits programs had no statistically significant impact on the level of unemployment, we see that the effect on unemployment from these programs falls somewhere in the range of minor to insignificant. We believe that, through omitted variable bias and reverse causality bias, the true effect of these programs could be even lower than what was estimated in our first regression.

One major source of omitted variable bias in our model is the number of job postings over the observed period. The effect of this omitted variable is obvious, had there been extremely low levels of job postings over a certain time, then it would be unlikely that we would see a decrease in unemployment and vice versa. In fact, layoffs and the “closing” of the economy in response to the pandemic was one of the main drivers in the massive spike in unemployment claims. In a similar vein, the number GDP per capita per state could also have been a source of omitted variable bias. Like the level of job postings, this metric would represent the amount to which economic activity could have returned to the state, indicating the potential opportunity for employment.

Our second potential source of bias comes in the form of reverse causality. As we stated in our introduction, the PUA and PEUC programs were started in response to already high-levels of unemployment and therefore were not the cause of the unemployment itself. Using this logic it then follows that the level of pandemic claims would be dictated by the total level of unemployment. This reverse causality is doubtless present in our model so we find again that the true effect the pandemic programs have on UI recipiency evades us.

To summarize, our findings from our regression model, the potential impact of bias, and the contemporary research all point to the same conclusion, the presence of additional UI benefits, were not a statistically significant driver of unemployment levels. Like we saw in our explanatory variables, the main drivers of unemployment are most likely external stresses on the economy and or cycles within the economy, such as a slowdown. This is an important conclusion to keep in mind whenever discussion around UI policy sees renewed debate, or the next time an economy sees persistent high level of unemployment.

Appendix

```
Fixed-effects (within) regression               Number of obs     =      5,406
Group variable: statefips                       Number of groups  =         51

R-sq:                                           Obs per group:
     within  = 0.3389                                         min =        106
     between = 0.4003                                         avg =      106.0
     overall = 0.0795                                         max =        106

                                                F(4,5351)         =     685.85
corr(u_i, Xb)  = -0.2033                        Prob > F          =     0.0000
```

contclaims_coun~r	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
pand_claims	.120943	.0083622	14.46	0.000	.1045498	.1373363
covid_cases	-.2717389	.0817873	-3.32	0.001	-.4320755	-.1114024
covid_death_count	22.81001	9.112335	2.50	0.012	4.946124	40.6739
full_vaccine	-.0054818	.0001464	-37.43	0.000	-.0057689	-.0051947
_cons	163247.8	3485.65	46.83	0.000	156414.5	170081.1
sigma_u	219014.13					
sigma_e	165862.32					
rho	.63551641	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(50, 5351) = 55.45                   Prob > F = 0.0000
```

Figure 1: First Panel Regression using combined pandemic claims

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Fixed-effects (within) regression               Number of obs     =      5,406
Group variable: statefips                       Number of groups  =         51

R-sq:                                           Obs per group:
     within  = 0.3134                                         min =        106
     between = 0.8976                                         avg =      106.0
     overall = 0.0001                                         max =        106

                                                F(4,5351)         =     610.54
corr(u_i, Xb)  = -0.5006                        Prob > F          =     0.0000
```

contclaims_coun~r	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
binary_dumb	8548.973	5689.922	1.50	0.133	-2605.593	19703.54
covid_cases	-.3263327	.083443	-3.91	0.000	-.4899151	-.1627504
covid_death_count	27.17304	9.286712	2.93	0.003	8.967305	45.37878
full_vaccine	-.0060853	.0001544	-39.41	0.000	-.006388	-.0057826
_cons	182672.9	5597.836	32.63	0.000	171698.8	193646.9
sigma_u	261561					
sigma_e	169037.55					
rho	.70538895	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(50, 5351) = 135.84                  Prob > F = 0.0000
```

Figure 2: Second Panel Regression using the binary dummy variable

Bibliography:

“Charts Related to the Latest ‘The Employment Situation’ News Release | More Chart Packages.” *U.S. Bureau of Labor Statistics*, U.S. Bureau of Labor Statistics, 7 Jan. 2022, https://www.bls.gov/charts/employment-situation/civilian-unemployment-rate.htm.

Coombs, Kyle, et al. “Early Withdrawal of Pandemic Unemployment Insurance: Effects on Earnings, Employment and Consumption.” *Early Withdrawal of Pandemic Unemployment Insurance: Effects on Earnings, Employment and Consumption - Working Paper - Faculty & Research - Harvard Business School*, Harvard Business Review , Aug. 2021, https://www.hbs.edu/faculty/Pages/item.aspx?num=61668

Foundation, — The Century. “Unemployment Insurance Data Dashboard.” *The Century Foundation*, The Century Foundation, 2 Dec. 2021, https://tcf.org/content/data/unemployment-insurance-data-dashboard/?agreed=1.

Iacurci, Greg. “Ending Unemployment Benefits Had Little Impact on Jobs and Fueled $2 Billion Spending Cut, Study Finds.” *CNBC*, CNBC, 23 Aug. 2021, https://www.cnbc.com/2021/08/23/ending-unemployment-benefits-had-little-impact-on-jobs-study-says.html.

Narendranathan, W., et al. “Unemployment Benefits Revisited.” *OUP Academic*, Oxford University Press, 1 June 1985, https://academic.oup.com/ej/article-abstract/95/378/307/5190745.

United States, Congress, Labonte, Marc. *Introduction to U.S. Economy: Unemployment*. https://crsreports.congress.gov/product/pdf/IF/IF10443.

“The Economic Tracker.” *Economic Tracker*, https://www.tracktherecovery.org/.

Jones, Charisse. “What States Are Ending Federal Unemployment Benefits Early? See Who Has Cut the Extra $300 a Week.” *USA Today*, Gannett Satellite Information Network, 1 July 2021, https://www.usatoday.com/story/money/2021/07/01/unemployment-benefits-covid-federal-aid-ending-early-many-states/7815341002/.