

How Inflation Has Impacted US Citizens Today

Tristan Tsai¹

¹Eastlake High School

ABSTRACT

The COVID-19 pandemic shut the world down and threw the global economy into a recession. Through stimulus checks and the gradual re-opening of the world, the economy recovered from the recession but flew into a period of increased inflation. Using data on inflation, unemployment, and certain factors such as household income and labor statistics, it is revealed that inflation weakens the labor force while having no clear impact on wealth classes. In addition, it is observed that the presence of COVID has not impacted the labor force or certain wealth classes by any sizable margin, and that the Phillips Curve, a graph depicting the relationship between inflation and unemployment, has been flattening throughout the last several decades.

1. Introduction

Since January 2022, the inflation rate has risen as much as 9.1% year-on-year in the United States, something we have not seen in well over 40 years. This has led scholars and policymakers to wonder when the inflation rate could eventually return to normal. Economists and financial experts believe that the higher prices will not go down until well into 2023, or possibly even longer than that. However, many are optimistic with the changes the Federal Reserve is making, such as raising interest rates and reducing the liquidity in the market. The higher rates of inflation have been affecting everyone across the globe, and if one country raises interest rates, that creates pressure on other countries to do the same. If other countries do not raise their interest rates in a similar fashion to what the Federal Reserve has been doing over the past few months, this has the potential to throw the foreign exchange market out of balance, resulting in the dollar appreciating too much compared to other currencies. However, the difficult socio-economic situations across other developed countries, from the Eurozone to the United Kingdom, will make this transition to a higher interest rate less likely. As a result, analyzing the path of the inflation rate in the United States is becoming increasingly more important.

How long will it take for the inflation rate to return to the optimal 2% rate? In a quest to find an answer to the above question, scholars have started to analyze the dynamics of the latest inflationary episode. Around 40 years ago, the world experienced another episode of high inflation, far greater than the one today, with prices peaking at over 14% compared to the 9% that we are experiencing today. A big driver for that inflation pattern was the oil crisis, caused by the war in the Middle East, which interrupted oil exports. Many believe that we can draw parallels between the 1980s and today, as another factor in the inflationary episode that we experience now is the oil crisis caused by the war between Russia and Ukraine. Both episodes have caused a similar upward trend in inflation rates, and there is reason to believe that we can draw similarities between the two episodes to get a better idea on how to properly handle the inflationary episode that we are experiencing today.

In this paper, I investigate the parallels between the inflationary events of the 1980s and the current one, using data from the U.S. Bureau of Labor Statistics and the Current Population Survey to analyze inflation and unemployment rates, as well as analyzing the relationship (via a regression analysis) between inflation and important variables such as household income, the availability to work, and the impact of COVID-19 on the current state of inflation. I find that the Phillips Curve has flattened since the previous inflationary episode, and thus the relationship between

¹ I'd like to acknowledge Dr. Andrea Bernini of the University of Oxford as he guided and mentored me through this project.

inflation rates and unemployment rates has become weaker. In addition, COVID has not had a massive impact on the labor force or those of different social classes.

The remainder of this paper is as follows. Section 2 provides a historical background of the 1980s and 2020 episodes. Section 3 presents the literature review. Section 4 describes the data. Section 5 provides the main analyses and discussion. Section 6 concludes.

2. Historical Background

Both the 2020s and the 1980s periods of inflation had energy crises as one of the leading factors. While the energy crisis of 1980 was arguably more detrimental to the inflation rate than the 2020s, both played a huge part in the reason why inflation reached such high levels.

The episode of inflation we are experiencing now in 2022 has two primary causes. The larger driving factor can be traced back to 2020 to something that has changed lives in every corner of the world: COVID-19. When the pandemic started, many workplaces had been forced to shut down and, as a result, many people lost their jobs. This led to a reduction in income levels and a widening income inequality. To combat this, the US government introduced stimulus checks to families over the course of the last two years, which has combined to over \$931 billion according to the US Government Accountability Office. This led to an unprecedented increase in the money supply and lower interest rates, which ultimately led to a higher aggregate demand without a proper adjustment in aggregate supply. In addition, nearing the end of the stimulus checks, COVID-19 began to fade away as a deadly threat, and restrictions began to loosen up. Stores opened again, people were free to travel and move across states and countries, and this contributed to a further increase in the desire to spend money according to the Economist. Both of these factors created a large spike in aggregate demand, and since aggregate supply failed to compensate this movement, prices in the economy rose dramatically, leading to the inflation that we see today. However, this was not the only reason why inflation has gone up as much as it has today. The other driving factor of inflation, although not as impactful as the previous one, has been the energy crisis that occurred as a result of the Russia's invasion of Ukraine. As a leader in global exports, Russia's invasion caused major stops to the global supply chain of energy products – from oil to natural gas – creating supply shortages that could not meet the increasing demand. The most notable of these shortages has come in the form of oil. There is a current oil crisis that has caused the price of gasoline and oil to skyrocket, and large groups of the population – especially those in the lower part of the income distribution – are suffering as a result of this rise in prices. Videos have gone viral of people outraged at gas prices, where they have tripled in some regions according to the US Energy Information Administration. These two main factors – COVID-19 and the energy shock – were the driving cause in creating the inflationary pressure that we witness today.

In the 1980s, the inflationary episode can also be traced back to war, and another oil crisis. In fact, one of the main contributors to the oil crisis of the 1980s was the Iranian Revolution. This event created interruptions in the Middle East, and as a result, the oil supply became very limited, with shortages and supply shocks driving up the price significantly during the inflationary period in the 1980s. In the Iranian Revolution, the Shah of Iran at the time left the country after the protests began, allowing a new regime to take over, one that destroyed the Iranian oil sector. When this new regime restarted the oil sector, production came at a lower quality and quantity, throwing the oil production of Iran out of balance, disrupting global oil imports and exports. In 1980, when Iraq invaded Iran, oil production in both countries experienced significant drops, which took the disruption of oil trade to an unprecedented level, further driving up global energy prices and economy-wide inflation rates. However, following this initial energy shock, other countries soon began to pick up the pieces and the missing oil production was eventually filled in. Supply recovered to meet the stable demand. Importantly, another factor that led to the large spike in inflation rates was public perception and people's expectations. Somewhat related to the current energy crisis, many people believed that this shortage of oil and energy resources was an issue that was much larger than it actually was, creating hysteria and panic that further increased and accentuated the rise in prices. In addition, due to the widespread shortages, people eventually responded to the higher prices by decreasing their demand for energy and their consumption of oil. The shock had a long-lasting

effect on people's behavior. When supply recovered, this change in behavior led to a large surplus and a mis-match in demand and supply in the oil market for many years. This contributed to a huge crash and a protracted economic recession.

3. Literature Review

This paper received inspiration from a paper by Marijn Bolhuis, Judd Cramer, and Lawrence Summers titled "Comparing Past and Present Inflation". In that paper, the researchers discuss how the way that inflation is calculated has changed over the course of the last 40 years, and how to properly adjust the data to one scale and provide a more accurate comparison between time periods, namely the 1970s and 80s to today. Their paper focuses more on the correction of the numbers and the methodology to get those numbers, and they find that although the previous inflationary episode in the 70s and 80s does have a higher peak than the one that we experience today, the gap isn't as wide as the official CPI data may suggest. In this paper, we will be discussing more of the similarities and differences between the two time periods as well as the effect that inflation has had on society.

4. Data

The data used was taken from two different places. The first is the US Bureau of Labor Statistics, where data regarding inflation and unemployment rates for various cities and states dating back to the 70s was collected. The second was data taken from the Current Population Survey, where information regarding household income, how many people looked for work within the last year, and how many people were available for work in the last week was collected in the same states as the ones from the Bureau of Labor Statistics. Each of these variables was divided by the population to produce a percentage.

To construct the graphs, the inflation and unemployment rate for each state was collected and put into a scatterplot with a line of best fit. For the data tables, a regressions analysis was done initially with the inflation rate as well as the individual variables of household income, availability to work last week, and whether or not someone looked for work in the last year. A second regressions analysis was then done including the COVID-19 death rate in that particular state to finish the table.

However, there are some limitations to these numbers. The data from CPS was a small sample that was estimated to apply to the entire population of a particular region. It is a possibility that that sample may not accurately represent the population of a given region, thus skewing the data tables. In addition, some of the data in certain regions was constructed with a low degree of statistical confidence, so some of the conclusions at the end of this paper may be taken with a grain of salt.

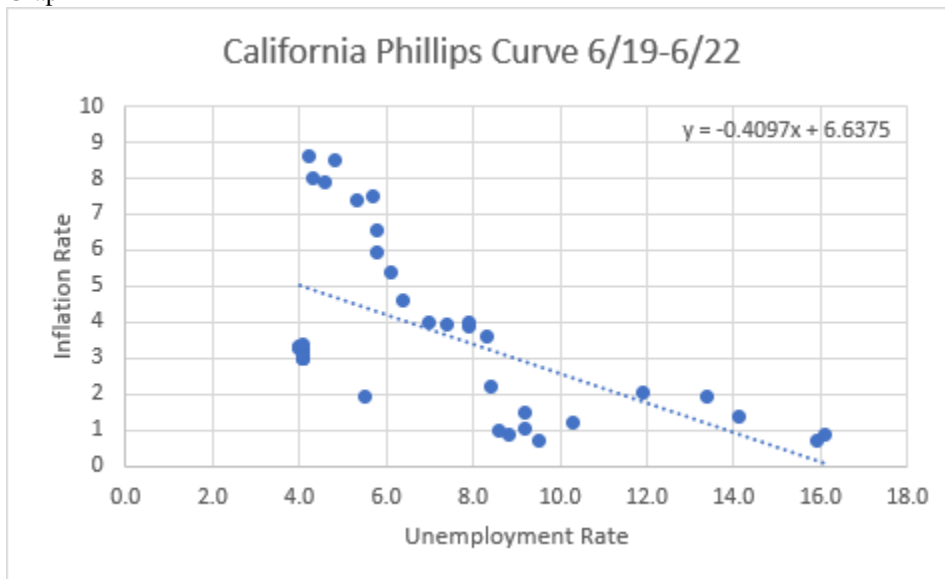
5. Results and Discussion

This section of the paper will take a deeper dive into the numbers, analyzing first the Phillips Curve in certain states, specifically California, New Jersey, New York, and Illinois, taken within the last three years vs the period from 1976-1984, when the inflationary episode back in the 80s reached its peak. The second subsection of this section will take a look at regressions analysis, seeing how COVID-19 has affected people in society today, using different variables from the CPS. The last subsection will combine the two previous subsections and elaborate further on how inflation today compares with inflation of the past and how it affects people today, finishing with potential solutions to fix or improve the current issue with inflation today.

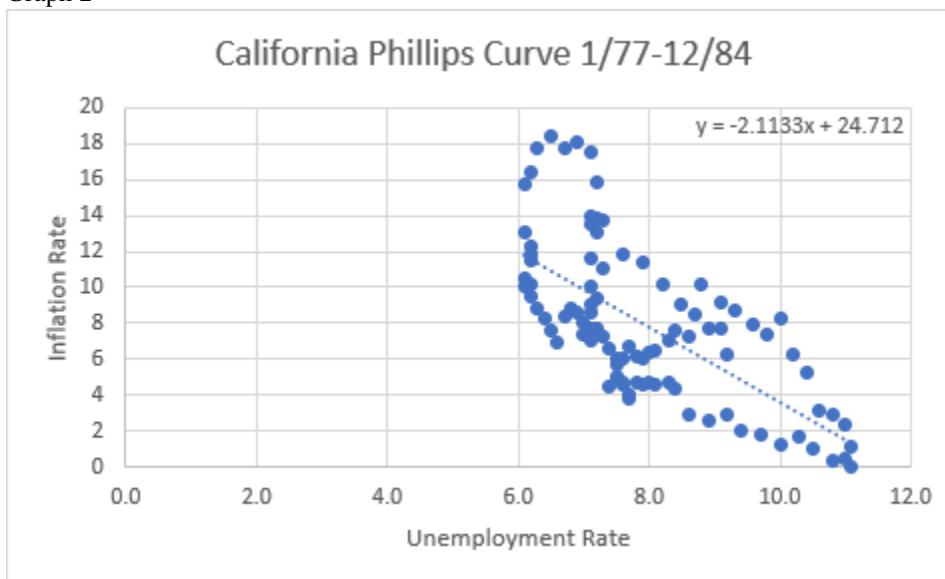
5.1 The Phillips Curve

The Phillips Curve is a graph that shows the relationship between inflation rates and unemployment rates. It was created by William Phillips who successfully showed that there appeared to be an inverse relationship between inflation and unemployment. The Phillips Curve plays an integral role in the way that central banks react to changes in the economy, as it provides important data on how the economy is functioning.

Graph 1

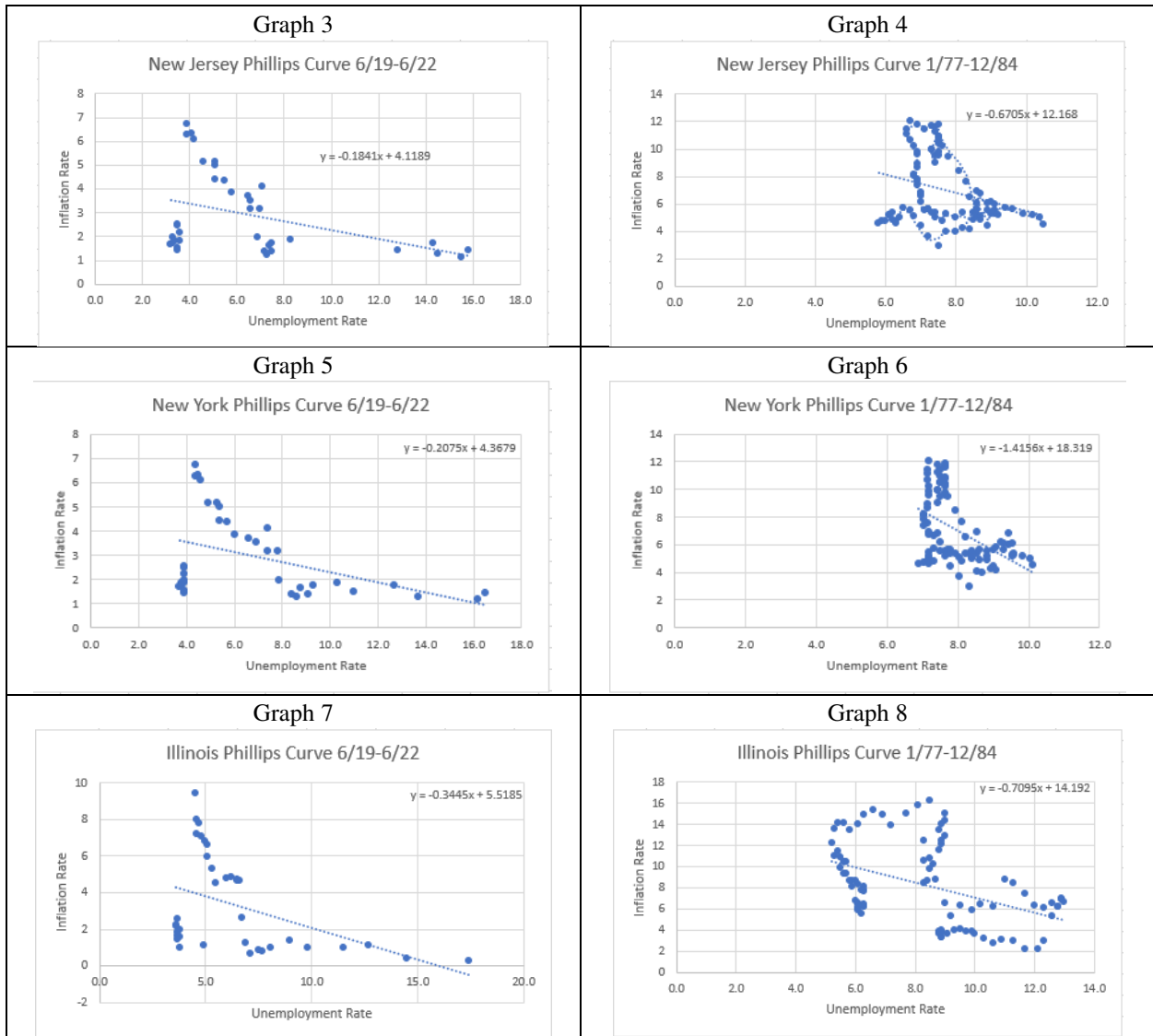


Graph 2



Comparing Graphs 1 and 2, there is a visible difference in the way that unemployment and inflation have evolved between the inflationary periods from 2019 to 2022 (Graph 1) and from 1977 to 1984 (Graph 2). In the more recent inflationary episode in the 2020s, the inflation rate reached a peak just shy of 9% in California compared to the

peak that rose above 18% in the 1980s.² The corresponding rates of unemployment in these two peak periods are 4.2% and 6.9%. Unemployment reached as high as 16% in the 2020s, while only reaching around 11% in the 1980s. These numbers indicate that in the inflationary period from 40 years ago, there was a stronger relationship between inflation rates and unemployment rates than there is today. A large reason for this weakened relationship, or the flattening of the Phillips Curve, is that in recent decades the Federal Reserve has put more weight on inflation targeting according to the Federal Reserve Bank in Cleveland. In other words, deviations of inflation from the ideal point have been more meaningful in the decision-making process of the US central bank. In fact, the Fed has been aiming to keep inflation at a more consistent level through an active monetary policy. This has led to the unemployment rate becoming less volatile, which ultimately led to a weaker relationship between the inflation rate and unemployment rate, with more stable dynamics across both variables. This has created the appearance of the flatter Phillips Curve that we see today, and that can also be observed across Graphs 1 and 2, Graphs 3 and 4, Graphs 5 and 6, and Graphs 7 and 8.



² The actual rates of inflation are 8.6% and 18.1%, respectively.

5.2 Regressions Analysis

When looking at Figure 1, we can see that for every 1 percentage point increase in inflation rates, then the number of people in California with a household income of below \$10,000 increases by roughly 0.2 percentage points. In the regression analysis, this relationship is estimated with a high degree of statistical confidence (p-value < 0.01). However, in this period, COVID-19 also represented a significant shock to the economy, and might have impacted the share of people in this earning group. Therefore, I include the share of COVID-19 deaths in California to account for this potential additional channel on the dependent variable of interest (i.e., the share of below earning below \$10,000). Reassuringly, the estimate of the relationship between inflation and the dependent variable is unaffected by the inclusion of the COVID-19 variable. In fact, with a p-value above 0.10, it appears that COVID-19 has not had that much of an effect on the amount of people earning less than \$10,000.³

DEP. VAR.	CA Income U10K	
	(1)	(2)
<i>Inflation</i>	0.2 *** (0.042)	0.186 *** (0.042)
<i>COVID Effect</i>		-0.021 (12.821)
R Square	0.39	0.433
Obs.	37	37

Figure 1

Now let's take a look at Figure 2. We can see that for every 1 percentage point increase in inflation rates, there is roughly a 0.432 percentage point increase in the number of people in California with a household income greater than \$100,000. This relationship is estimated with a high degree of statistical confidence, as the p-value is less than 0.01 according to the regression analysis. Again, we must take a look at how COVID-19 affected this number. Once again taking into account the share of COVID-19 deaths in California, we find that the inclusion of this variable does little to change the data. In fact, the p-value was at 0.35, showing that COVID-19 did not have a great effect on those in California that were earning over \$100,000.

DEP. VAR.	CA Income O100K	
	(1)	(2)
<i>Inflation</i>	0.432 *** (0.098)	0.413 *** (0.1)
<i>COVID Effect</i>		-0.029 (30.384)
R Square	0.358	0.383
Obs.	37	37

Figure 2

³ The R-square value is 0.43, which indicates that the regression model with two independent variables (inflation and COVID-19) well represents the overall variation in the dependent variable. However, the R-square is not 1, which tells us that there is still something unexplained in the share of people earning below \$10,000. This is to be expected, given the limited number of variables included in the model.

Moving to Figure 3, we can see that for every 1 percentage point increase in the inflation rates, there is roughly a 0.052 percentage point decrease in the amount of people in California that have looked for work in the last year. This relationship is estimated with a high degree of statistical confidence with a p-value under 0.01 according to the regression analysis. However, unlike the previous two variables, it can be observed that COVID-19 can change this number. Including the share of COVID-19 deaths in California, the percentage point decrease changed from 0.052 to 0.042, with a p-value only slightly greater than 0.01, so while the effect by COVID-19 doesn't have a high degree of statistical confidence, there is still some relationship there that is somewhat statistically confident, and that COVID-19 did have an effect on the amount of people who looked for work in California.

<i>DEP. VAR.</i>	CA Looked For Work in Last Year	
	(1)	(2)
<i>Inflation</i>	-0.052 *** (0.018)	-0.042 ** (0.017)
<i>COVID Effect</i>		0.014 ** (5.271)
R Square	0.186	0.517
Obs.	37	37

Figure 3

Within Figure 4 we can see that for every 1 percentage point increase in the inflation rate, there is roughly a 0.077 percentage point decrease in the amount of people in California that have been available for work in the last week. In the regression analysis, this relationship is estimated with some degree of statistical confidence, with a p-value of roughly 0.028. Returning back to the trend we see with income over \$100,000 or under \$10,000, COVID-19 does not appear to have a huge effect on the amount of people in California that were available for work in the last week, as the p-value is above 0.1.

<i>DEP. VAR.</i>	CA Available For Work Last Week	
	(1)	(2)
<i>Inflation</i>	-0.077 ** (0.034)	-0.068 * (0.034)
<i>COVID Effect</i>		0.014 (10.355)
R Square	0.13	0.583
Obs.	37	37

Figure 4

Now let's look at figures 5-8. From there, we can see that for every percentage point increase in inflation, there was a strong degree of statistical confidence that there would be a 0.232 percentage point decrease in people in Illinois with a household income less than \$10,000 and 0.35 percentage point increase in people in Illinois with a household income greater than \$100,000. However, unlike California, COVID seemed to have played a significant role in these numbers, as the presence of COVID had p-values of less than 0.01 in both instances. Unlike income, there was a very low degree of statistical confidence when it came to the amount of people that looked for work in the last year and those that were available for work in the last week. In addition, the R-square values for both variables were less than 0.11 (when also taking into account COVID as an additional variable in the specification), which demonstrates a weak relationship between the effect of inflation on the labor force in Illinois.

DEP. VAR.	II Income U10K		DEP. VAR.	II Income O100K		DEP. VAR.	II Looked For Work in Last Year		DEP. VAR.	II Available For Work Last Week	
	(1)	(2)		(1)	(2)		(1)	(2)		(1)	(2)
Inflation	-0.232 ***	-0.261 ***	Inflation	0.35 ***	0.381 ***	Inflation	-0.015	-0.013	Inflation	-0.189	-0.15
	(0.078)	(0.068)		(0.078)	(0.067)		(0.014)	(0.014)		(0.191)	(0.187)
COVID Effect		-0.066 ***	COVID Effect		0.071 ***	COVID Effect		0.004	COVID Effect		0.091 *
		(18.667)			(18.368)			(3.789)			(51.374)
R Square	0.204	0.417	R Square	0.363	0.559	R Square	0.033	0.068	R Square	0.027	0.109
Obs.	37	37	Obs.	37	37	Obs.	37	37	Obs.	37	37

Figure 5

Figure 6

Figure 7

Figure 8

Moving to figures 9-12, we can see that within the state of New Jersey, for every percentage point increase in inflation, there was a 0.021 and 0.13 percentage point increase in the amount of people with a household income of below \$10,000 and above \$100,000, respectively, and a 0.037 and 0.071 percentage point decrease in the amount of people that looked for work in the last year and the amount of people available for work last week, respectively. However, these values should be taken with a grain of salt, as all of these values had a very low degree of statistical significance, with p-values all greater than 0.1. The R-square values for these variables were also generally low, with none of them being higher than 0.05 without considering COVID, and the highest one being 0.264 when including COVID, also demonstrating a weak relationship between the effects of inflation and the aforementioned variables in New Jersey.

DEP. VAR.	NJ Income U10K		DEP. VAR.	NJ Income O100K		DEP. VAR.	NJ Looked For Work in Last Year		DEP. VAR.	NJ Available For Work Last Week	
	(1)	(2)		(1)	(2)		(1)	(2)		(1)	(2)
Inflation	0.021	0.029	Inflation	0.13	0.239	Inflation	-0.037	-0.018	Inflation	-0.071	-0.071
	(0.049)	(0.051)		(0.189)	(0.178)		(0.029)	(0.027)		(0.06)	(0.062)
COVID Effect		0.004	COVID Effect		0.047 ***	COVID Effect		0.008 ***	COVID Effect		0.0002
		(4.861)			(16.93)			(2.53)			(5.915)
R Square	0.005	0.021	R Square	0.013	0.197	R Square	0.043	0.264	R Square	0.039	0.039
Obs.	37	37	Obs.	37	37	Obs.	37	37	Obs.	37	37

Figure 9

Figure 10

Figure 11

Figure 12

Finally, consider figures 13-16. In the state of New York, for every percentage point increase in inflation, a 0.024 and 0.029 percentage point decreases were noticed in the amount of people earning below \$10,000 annually and those that were available for work last week, respectively. Once again, these values should be taken with a grain of salt as both numbers had a low degree of statistical confidence, with p-values exceeding 0.1. Measured with a moderate level of statistical confidence (p-value between 0.05 and 0.01), there appeared to be a 0.072 percentage point decrease in those that looked for work in the last year for every percentage point increase in inflation, and with a high degree of statistical confidence (p-value below 0.01), there was a 0.376 percentage point increase in those that earned over \$100,000 annually for every percentage point increase in inflation. In addition, when looking at the variables that had good levels of statistical confidence, it is noticed that COVID-19 did appear to have an effect, as the inclusion of COVID did have a high degree of statistical confidence, as well as a huge increase in the R-square values⁴, indicating a relationship between inflation and these variables.

DEP. VAR.	NY Income U10K		DEP. VAR.	NY Income O100K		DEP. VAR.	NY Looked For Work in Last Y		DEP. VAR.	NY Available For Work Last W	
	(1)	(2)		(1)	(2)		(1)	(2)		(1)	(2)
Inflation	-0.024	-0.055	Inflation	0.376 ***	0.473 **	Inflation	-0.072 **	-0.054 *	Inflation	-0.029	-0.037
	(0.087)	(0.086)		(0.131)	(0.103)		(0.034)	(0.032)		(0.058)	(0.059)
COVID Effect		-0.015 *	COVID Effect		0.046 **	COVID Effect		0.008 **	COVID Effect		-0.004
		(7.656)			(9.145)			(2.823)			(5.293)
R Square	0.002	0.098	R Square	0.191	0.533	R Square	0.112	0.287	R Square	0.007	0.021
Obs.	37	37	Obs.	37	37	Obs.	37	37	Obs.	37	37

Figure 13

Figure 14

Figure 15

Figure 16

⁴ R-square increased from 0.191 to 0.533 when considering those that earned above \$100,000 and 0.112 to 0.287 when considering those that looked for work in the last year.

5.3 Discussion

From the given results, we can see how inflation has changed since the last time the world experienced such a high inflationary episode compared to today. Back then, inflation appeared at a higher rate, as evidenced by the Phillips Curve. The flattening of the Phillips Curve has shown that inflation, although a huge problem for us nowadays, has gotten better, that inflation from 40 years ago was considerably higher.

However, inflation has still taken a heavy toll on the world we live in today. From the regressions analysis, it can be observed that increases in inflation will decrease how strong the labor force is, as increase in inflation percentage points led to decreases in both the availability of labor and how many people were actively seeking jobs. However, when it comes to income, inflation does have mixed effects depending on the state. In some areas, there will be an increase in people that earn a certain amount of money, and in others, a decrease.

So what needs to be done? One of the options is simply to do nothing. Let inflation rates return to normal on their own through time. This could take multiple years, but eventually, they will go down again, once people have exercised their increased demand, when people have spent their extra money from stimulus checks, when Russia ends its invasion on Ukraine. However, if the Federal Reserve wants to speed things up, they must raise interest rates. Raising interest rates causes a decrease in demand, and also prevents people from putting more money into the money supply, which would be able to lower the inflation rates. However, the Federal Reserve needs to be in contact with other banks around the world. If the Fed raises interest rates without properly coordinating with other banks, the value of the dollar will change for the worse when compared with other currencies, throwing the international trade market out of balance.

6. Conclusions

Within this paper, I discovered that the Phillips Curve has been flattening throughout the last 40 years. The Federal Reserve has been trying to contain inflation to the best of their ability, which has caused the unemployment rate to become less fragile, thus creating a weaker relationship between the two. In addition, the inflation today has appeared to have weakened the labor force, although no clear pattern is visible in the way that different wealth classes have been affected. Different areas experience different changes in the change in the number of people earning a certain income. In addition, COVID has not had a massive impact on how inflation has affected people of different wealth classes and across the labor force.

Several additional areas of research are worth exploring. For instance, in the US, how COVID-19 was handled was left to the individual state governments as opposed to the Federal government. How have policies specific to certain states affected the data collected? Do different responses to COVID-19 and inflation create a sizable impact on the variables used in this paper? Other variables concerning the labor force could be explored as well. Rather than focusing on being available or seeking work, the specific type of labor could play a factor as well. How have differing labor markets been affected by COVID-19 or inflation, and how do the results in specific states compare with one another?

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