

University of New Haven
Department of
Economics and Business Analytics

Senior Thesis
May 2021

**The Good, The Bad, and The Ugly of the Paycheck
Protection Program: An Empirical Analysis of Loan
Distribution**

Hannah Providence

Advisor: Brian A. Marks, PhD.



Abstract

COVID-19 not only caused a widespread pandemic in the United States, but it also pushed the economy into a recession. Small business firms suffered immensely from state mandated business closures and stay-at-home orders, creating a dire need for federal funding. The Paycheck Protection Program (PPP), rolled out by the Small Business Administration (SBA), was created to provide economic relief for small businesses – a critical part of the economy. This study determined whether or not the PPP effectively reached businesses who were hit the hardest by these state executive orders. Using a simple linear regression analysis, the study identified that the severity of executive orders does not play a statistically significant role in PPP loan distribution, meaning that the rollout was not effective in targeting relief. Additional summary statistics and analysis revealed that more PPP loan dollars were given to states with higher unemployment rates – a good sign for the effectiveness of the program.

Keywords: Paycheck Protection Program, PPP, CARES Act, Small Business Administration, SBA, Linear Regression, Federal Funding

Table of Contents

Introduction.....	3
Literature Review.....	5
Background	4
The Structure of the PPP	6
Eligibility	6
Loan Structure	6
Role of the Lender	7
The Good, the Bad, and the Ugly of SBA’s PPP Rollout	7
The Good	7
The Bad.....	9
The Ugly	10
Public Health Orders’ Negative Economic Effect on the Small Business Industry.....	11
Methodology	14
Data Model	14
Model:.....	14
Results.....	16
The Regression Analysis Supports the Hypothesis.....	16
Correlation.....	18
Summary Statistics Reveal Disproportionate PPP Loan Distribution	19
Did the PPP effectively target the hardest hit states in the U.S.?	23
Discussion.....	23
The First Problem – Legislation.....	24
The Second Problem – Rollout	24
Further Analysis of the PPP	25
Works Cited	26

Introduction

In light of the novel coronavirus (SARS-COV2) pandemic, several states issued mandated closures of non-essential businesses and other public health orders. These public health orders caused an economic crisis, which devastated the United States' economy. The unemployment rates in 43 states were at its highest levels in state unemployment data reporting ([BLS, 2020](#)). The economic devastation served as the basis of the historic \$2 trillion emergency spending bill called the CARES Act, which President Trump signed into law on March 27, 2020 ([Werner, Kane, DeBonis, 2020](#)). The CARES Act included targeted relief for small businesses – an industry that suffered greatly from the public health orders – through the Paycheck Protection Program (PPP), for example. When the Small Business Administration (SBA) first administered and launched the PPP, the allocated funding was designated to recipients within 13 days ([Desjardins, 2020](#)). Upon examination of the PPP, several studies and reports highlighted certain shortcomings of the SBA's rollout, including identifying numerous instances of fraud ([Moore, 2020](#)) to publicly traded companies getting millions of dollars from the small-business program ([Vardi, 2020](#)). As a result of these examinations, it was alleged that the PPP funds were not distributed effectively and did not prioritize those enterprises that needed it the most. Researchers identified several factors for effectively rolling out the PPP loans, like prioritizing businesses with fewer than 250 employees and prioritizing minority-owned companies. Unfortunately, little research has been done to systematically and empirically determine how money from the PPP was allocated on a state-by-state basis.

This study examines whether the first tranche of the PPP of the CARES Act effectively targeted jurisdictions that imposed highly restrictive public health orders in light of the COVID-19 pandemic by giving those states more money for its necessary relief efforts. It analyzes the

quantitative data of SBA's approved PPP loans up to and including April 16, 2020 and examines the relationship of such data with qualitative data from the 50 states' emergency executive orders using a linear regression analysis.¹

The organization of this paper is as follows. First, an introduction that provides certain background information and the importance of this study. Second, a literature review on the studies and research already done on the PPP, and the effect stay-at-home orders have on the economy. Third, this paper details the methodology, identifies the data to be used, and sets-out the hypothesis to be tested. It is expected a simple regression model will be used with an analysis of several factors, including the amount of PPP money by state normalized by the number of small business, state-wide public health orders, political representation, and state-wide mask mandates. Four, summary statistics will be evaluated, and regression results will be summarized and evaluated vis-à-vis the hypothesis under consideration. Last, the paper will provide any relevant conclusions, assess any potential policy implications, and make any recommendations, and consider any future research applications associated with programs of this nature.

¹ The present study will not use data from the most recent tranche of the PPP administered on January 11, 2021 because eligibility requirements and administration of the PPP has changed between rounds, this analysis will keep these factors constant.

Literature Review

This section provides a deep dive into the language of legislation for the PPP, reviews the SBA's rollout of the program, and addresses the parallel between highly restrictive public health orders and an economic downturn. Due to the recency of this program and of public health orders, studies on this topic are limited and many lagging macroeconomic indicators are not yet available for review.

COVID-19 and the CARES Act

The need for federal funding to provide economic relief for small businesses became clear in early 2020. A study conducted by economists in late March, 2020 found that 41.4% of small businesses reported that they were temporarily closed because of COVID-19 while 1.8% reported that they were permanently closed ([Bartik, et. al, 2020](#)). To scale, the researchers projected that more than 100,000 small businesses will close forever in light of the pandemic ([Long, 2020](#)). The PPP was designed as a result of the COVID-19 pandemic to combat some of the severe financial devastation small businesses experienced by providing tailored relief through forgivable financial loans. Businesses were eligible to apply for a loan if they could certify that they needed the loans because of the pandemic-induced recession ([CARES Act, 2020](#)). However, the legislation emphasizes that the PPP loans are to be properly administered to ensure that it “prioritizes small business concerns and entities in underserved and rural markets” ([CARES Act, 2020](#)). Small business concerns are defined as “supply chain disruptions, staffing challenges, decrease in gross receipts/customers, or a closure” ([CARES Act, 2020](#)). Key performance indicators like a state's unemployment rate and household income indicate that public health orders, i.e. stay-at-home, mask mandates, and closures to non-essential businesses have a direct, negative relationship with many of the small business concerns listed above. This implies that

businesses within jurisdictions that enforced those state-wide public health orders should be targeted for relief. However, the administrator of the PPP, the SBA, has not indicated that they prioritize those businesses in their legislation.

The Structure of the PPP

The SBA released an '[interim final rule](#)' to the Federal Register on April 15, 2020 specifying the eligibility criteria for a PPP loan, the specifications of the loan forgiveness plan, and detailed instructions for the lender's role in administering the PPP. Below is a summary of what the rule specifies.

Eligibility

The PPP loan was created for businesses located in the US with 500 or fewer employees which is a common criterion for a small business. These businesses had to be in operation on or before February 15, 2020 and 'certify in good faith' that the loan was needed due to current economic uncertainty. The SBA did not require borrowers to demonstrate hardship to qualify for the forgivable loan. This way, loans can be processed quickly, and businesses can begin using the funds as soon as possible.

Loan Structure

Businesses could borrow up to 2.5 times their average monthly payroll costs, less the cost for independent contractors. Businesses could not, however, borrow more than \$ten million nor could they apply for the loan more than once.

The full amount of the PPP loan is forgiven (turned into a grant) only if the borrower uses at least 75% of the loan for payroll costs in an eight-week period after their loan was approved. The

other 25% can be used for employee benefits (i.e. health insurance, paid sick leave, etc.), debt interest payments (no prepayments or principal payments), rent payments, and utility payments.

Role of the Lender

To incentivize more banks to act as lenders and issue loans on behalf of the government, the SBA outlined several features of the PPP that makes the role of the lender ‘harmless’. The lender is only responsible for submitting a borrowers’ documentation on their behalf, the SBA will not hold a lender accountable for borrower misrepresentation. However, the SBA did uphold the Bank Secrecy Act requirement for lenders to take borrowers through the anti-money-laundering compliance program.

The SBA also paid lenders fees for processing PPP loans in the following amounts: five percent of principal on loans up to \$350,000, three percent on loans between \$350,000 and \$2 million, and one percent on loans above \$2 million up to \$ten million.

The Good, the Bad, and the Ugly of SBA’s PPP Rollout

The PPP was designed with the best intentions – to support a critical industry of the economy and keep their employees paid. However, the novel program had several structural failures that are illustrated in the section below.

The Good

The PPP is described as “the most ambitious and creative fiscal policy response to the Pandemic Recession in the United States” ([Hubbard, Strain, 2020](#)). SBA swiftly opened applications for the PPP on April 3, 2020 – just seven days after the CARES Act was signed into law. The initial approved budget of over \$346 billion dollars was administered to over 1.6 million small

businesses across the nation providing vast and critical relief to the small business industry ([SBA, 2020](#)).

The PPP has proven to be effective in many ways, at least in the short-term. The program is the first of its kind and more information on its effects are only just developing. Even so, there are some working papers by academic researchers that assess the effects of the program, particularly showing positive relationship between PPP and employment levels.

A discussion paper by Hubbard and Strain ([2020](#)) used a difference-in-differences event study framework to determine the effect of a small business applying for larger PPP loans and of a small business being eligible for PPP based on size. They compared these factors to employment levels from November 2019 to August 2020. Hubbard and Strain 2020 found that that PPP played a significant role in the health and viability of small businesses. Applying for a PPP loan of \$150,000 or more and PPP eligibility as determined by firm size both increase employment, financial health, and business continuity as several studies have noted below:

A working paper by Autor et al. ([2020](#)) analyzed payroll data from ADP – one of the world’s largest payroll processing firms. They estimate that the PPP boosted employment at eligible firms by 2 to 4.5 percent, or an increase in aggregate U.S. employment by 1.4 million to 3.2 million jobs through the first week of June 2020.

A study by Faulkender, Jackman, and Miran ([2020](#)) examines how well the PPP preserved jobs by looking at the rates of unemployment insurance (UI) claims. They estimate that because of small firms’ eligibility for a PPP loan, weekly claims for UI were reduced by one to two percent.

The PPP shows clear, early signs of success in achieving one of their primary goals, keeping the employees of small businesses on their payroll. It has supported millions of jobs nationally and

improved the financial health of the economy. However, design flaws and structural oversights did not optimize the effectiveness of the rollout.

The Bad

Although the PPP seemed to have a tremendous positive effect on employment, it may have only been in the short term. A working paper by Pardue ([2021](#)) looks at the effect of the PPP from the firm level. Using payroll microdata and information on the deadline of each firm's loan forgiveness period, Pardue ([2021](#)) finds that as the PPP forgiveness period expired, companies reduced active employment by a statistically significant 0.41% per week and 1.6% in the four weeks post-expiration. This reduction in employment shows how firms were still affected by the pandemic-induced recession well beyond the timeline of financial support. The PPP was not designed to support economic relief that highly restrictive public health orders demanded.

This is also evident in the initial funding for \$349 billion allocated to the PPP on April 3rd, 2020. Greatly underfunded, the PPP planned to close on June 30, 2020 or until monies ran out, giving businesses around three months to apply for and receive a loan. However, the program was so popular, it ran out in just 13 days and with the PPP being disbursed on a "first come, first served" basis, it left a lot of smaller firms who did not have easy access to a lender in a tough spot.

The role of lenders in rollout brought up more problems than just accessibility. The incentives issued by the SBA to encourage banks to participate may have backfired. Several news sources reported that some small businesses were suing some of America's biggest banks for allegedly failing to process the forgivable loans on a 'first-come, first-served basis' ([Egan, 2020](#)). They claim that these banks prioritized PPP applications that were asking for a larger amount of loans so that they could earn more money from the fees. Many banks struggled to even submit loan

applications on their borrowers' behalf. The electronic system used to submit applications to the SBA was not accessible on the first day for several smaller banks ([Jarvis, Winn, 2020](#)).

These failures in logistics left the rollout vulnerable to fraud and misrepresentation. A Forbes article reports that 71 publicly traded companies were approved for loans from the SBA. They “received \$300 million of emergency loans, representing 0.09% of the financing that was distributed by the SBA.” ([Vardi, 2020](#)). It also didn't help that borrowers were self-reporting their need for the loan in the first place. Only after the fury surrounding public and well-funded private companies obtaining loans did the SBA issue further guidance of PPP eligibility. On April 23, 2020, the SBA reinforced the importance of borrowers certifying in good faith that the loan was necessary due to ‘economic uncertainty’. SBA elaborates to say that a public company with access to capital markets will unlikely be able to make the required certification ([Match Law, 2020](#)). The present study pushes this envelope further, arguing that the SBA can determine ‘economic uncertainty’ from a state-by-state basis and further target relief to businesses suffering from severe public health orders.

The Ugly

Some of the pitfalls in the PPP rollout caused particularly harsh repercussions to sectors with the least protection. For example, The Office of the Inspector General reviewed the SBA's implementation of the PPP on April 24th, 2020. After assessing the SBA's Interim Final Rules and FAQs, as well as the borrower application itself, the review found that the SBA did not effectively execute Section 1102 (a)(P)(4) legislation in the CARES Act and was not “prioritizing underserved and rural markets” ([SBA Inspector General, 2020](#)). The review states that the SBA did not issue any guidance to lenders about prioritizing markets indicated in the CARES Act such as; rural markets, socially/economically disadvantaged individuals, woman and

veteran owned businesses, as well as businesses in operation for under 2 years ([SBA Inspector General, 2020](#)). They indicate that because guidance wasn't issued, businesses that fit the above criteria may not have received the loans as intended.

Many minority-owned businesses found themselves at a disadvantage when trying to secure funding from the PPP because traditional, larger banks favored existing customers to file their PPP application. Because minority-owned businesses typically lack relationships with traditional banks, they were essentially blocked from receiving funding seeing as traditional banks make up the majority of eligible PPP lenders ([Federal Reserve Bank of Cleveland, 2020](#)).

Not only was PPP funding not hitting the most vulnerable demographics, evidence suggests that funds disproportionately flowed to areas that were more economically stable relative to their counterparts. A working paper by Granja, et al. ([2020](#)) examined if geographic areas that were exposed to banks who underperformed in submitting bank loan applications received less PPP lending overall. They found that the PPP may have been targeted towards areas less affected by the pandemic. They also analyzed other factors like areas with higher populations and population density, as well as areas with higher COVID-19 cases, deaths, and social distancing and determined that these areas received less PPP funding.

The present study examines another factor that may have suffered from less PPP funding, states with strict public health orders.

[Public Health Orders' Negative Economic Effect on the Small Business Industry](#)

The COVID-19 pandemic negatively impacted the economy two-fold. First, at face value, the rapid spread of the virus caused unsafe conditions outdoors which in turn made it unsafe for

employees to go to work. This causes a severe reduction in the production of goods and services because of the sharp decline in the labor force market.

Secondly, many public health orders were instated across the country in light of the pandemic. In particular, shelter-in-place orders and business closures slowed down the recovery speed of the economy ([Karabarounis, Trachter, 2020](#)) and caused a reduction in aggregate demand ([Hubbard, Strain, 2020](#)). In turn, businesses were temporarily closed forcing owners to layoff their workers or cut their hours and/or wages if they did not have the proper funding. Whilst many large firms in the economy could turn to capital markets for a bail out, small firms did not have that save luxury ([Hubbard, Strain, 2020](#)). Enter the PPP, an opportunity for small businesses to stay afloat despite their disadvantages in the recession, continue to finance their overhead expenses, and keep their employees on their payroll.

Targeted relief for small businesses is important for economic recovery because small firms do in fact create more jobs than larger ones ([Neumar et. al, 2011](#)). This influential role in the labor force impacts the unemployment rate tremendously, one of the most significant indicators of an economic downturn or economic growth.

The pandemic did not affect all industries in the small-firm sector the same way. For instance, the restaurant industry was one market that suffered more than others in April 2020. An analysis of a survey conducted by the National Restaurant Association estimated that the restaurant and foodservice industry would lose more than \$50 billion in sales in April ([2020](#)). Out of the estimated 6,500 restaurant operators surveyed, eighty-eight percent say “they laid off or furloughed employees since the beginning of the coronavirus outbreak in March. On average, these operators cut 83 percent of their restaurant’s total staff. Forty-one percent of these operators laid off or furloughed 100 percent of their staff.” ([National Restaurant Association,](#)

[2020](#)). These staggering layoff and furlough rates were cause for concern and mirror the rates of other, hard-hit industries including travel and transportation, entertainment (e.g., casinos and amusement parks), personal services (e.g., dentists, daycare providers, barbers), other sensitive retail (e.g., department stores and car dealers), and sensitive manufacturing (e.g., aircraft and car manufacturing) – all in which are dominated by small businesses ([Dey, Loewenstein, 2020](#)).

Many of these small firms advocated for the PPP in light of the drastic shift in the economy; in a survey of over 5,800 small businesses in late March 2020, 72% said they would apply for a CARES Act PPP loan ([Bartik, et. al, 2020](#)).

It is important to note that industries like the restaurant and foodservice market were not negatively affected in the same capacity from state to state. This is due to both the size of the industry in a particular state's GDP as well as the severity of their public health orders. A Bradley University professor Colin Corbett, Ph.D illustrates the struggle between lifting a stay-at-home order and keeping it in place. "...The longer the stay-at-home order lasts, not only is that a continuation of loss of revenue, but it's also going to increase the amount of businesses that have to end," Corbett said ([Sheehan, 2020](#)). Dr. Corbett indicates the negative relationship between public health orders and the economy through revenue loss from consumers not being able to reach these businesses the way they used to.

Small businesses are in need of federal funding, and the PPP is an important tool to help keep them afloat. Current working papers show that the program is effective in reducing the decline in employment levels for small businesses, but it is unclear whether the PPP funded the firms who need it most. This study investigates how well the PPP prioritized the hardest-hit businesses.

Methodology

To analyze whether the PPP prioritized funds for businesses suffering state-wide closures and restrictions, a simple regression analysis was conducted. The analysis measures the severity of public health orders, mask mandates, political representation, and overall population to determine the weight each variable has on loans administered by the SBA.

Public loan data provided by the SBA up to and including April 16, 2020 – the last day of funding for the first tranche of PPP – was used as the basis of the dependent variable in the regression analysis. To normalize the data, the loan amount for each state was divided by the number of small businesses in each state respectively.²

Data Model

Using the R Programming language, a simple regression analysis was conducted with the above data.

This paper investigates the relationship between the variables defined below and the normalized amount of PPP (average loan amount per business) in each of the 50 US states. The following model was used:

Model:

$$\begin{aligned} PPP = Normal\ PPP \sim & \beta_0 + \beta_1(Mask_Mandates)_{x1} + \beta_2(Restriction_Severity)_{x2} \\ & + \beta_3(Political_Representation)_{x3} + \beta_4(Unemployment_Rate)_{x4} \\ & + \beta_5(Small_Business_Population)_{x5} + \beta_6(Population)_{x6} + e_t \end{aligned}$$

² SBA data is split up in nine Excel files and consolidated into 3 workbooks for analysis purposes. All loans that were approved from April 3, 2020 to April 16, 2020 have been included in the analysis, totaling over \$322 billion.

Where β_1 represents mask mandates across the 50 states. To quantify a state's facial covering executive order, or lack thereof, emergency health orders that were in effect on March 27th, 2020 – the date the CARES Act was signed – were assessed for each state. A “1” was assigned to each state with an official state-wide requirement and a “0” was assigned to each state with a partial requirement, a recommendation, or no legislation at all. This distinction was used to separate the most severe public health order from the others.

β_2 represents restriction severity of each state based on two types of executive orders: stay-at-home and non-essential business closures. Using legislation written for each state between March and April 2020, these executive orders were quantified on a scale from 1 to 4 with 4 indicating orders with the highest severity. A “1” was assigned to states with no executive order detailing a stay at-home order or non-essential business closures; a “2” assigned to states with either a stay-at-home order or non-essential business closures, not both; a “3” assigned to states with both orders, but with one or both issued in the month of April 2020; and a “4” assigned to states with both orders issued in the month of March. For the regression analysis, these numbers were displayed as percentages; 25%, 50%, 75%, and 100% respectively.

β_3 explains political representation, quantified based on the party affiliation of the state governor with a “1” for Democratic and “0” for Republican.

β_4 represents unemployment rate. These numbers pull from the Bureau of Labor Statistics and use the unemployment rate from April 2020 to account for the fact that unemployment rate is a lagging indicator.

β_5 represents the small business population of each state using data from the [SBA](#). The most recent numbers available are from 2017. **Figure 1** illustrates the high correlation between small

business population and total population, a test for multicollinearity indicates that this variable should be removed from the data model. The results reflect the revised model.

β_6 uses total population numbers to determine if this factor influences the regression.

This data model investigates the following hypothesis: restrictive public health orders have no effect on normalized PPP in each US state.

A linear regression analysis was used to test this hypothesis because it identifies the factors that influence the variance of normalized PPP. The above data model is comprised of six possible determinants for the PPP loan distribution.

Results

This section assesses the results of the regression analysis as well as summary statistics for the factors within the data model.

The Regression Analysis Supports the Hypothesis

Table 1 illustrates the effects of each factor on normalized PPP (the dependent variable) in which population and unemployment rate are the only statistically significant variables.

Population has a slightly negative effect on normalized PPP where each additional person in the state decreases the dependent variable (DV) by \$.0002. Unemployment rate (UR) on the other hand, has a slightly positive effect in which each additional percentage increase in UR increases the DV by \$225.

These results suggest that the PPP may have effectively targeted states with higher unemployment rates and provided them with more funding relative to their counterparts.

Table 1: Residuals, Coefficients, Residual Error, R-squared, and F-statistics

Residuals:

Min	1Q	Median	3Q	Max
-4708	-1427	-294	1011	6388

Coefficients:

	Estimate	Std. Error	t value
(Intercept)	8881.546317	4776.858496	1.86
Restriction_Severity	-2144.387245	1457.940293	-1.47
`Mask Mandate`Yes	-4.759151	1011.938614	0.00
Population	0.000594	0.000492	1.21
DemocraticYes	149.615880	869.355737	0.17
`Unemployment Rate`	210.961426	94.139482	2.24
`Small Business Pop`	-0.007367	0.004746	-1.55
`Small Business Ratio`	20982.149037	40854.340488	0.51

Pr(>|t|)

(Intercept)	0.07	.
Restriction_Severity	0.15	
`Mask Mandate`Yes	1.00	
Population	0.23	
DemocraticYes	0.86	
`Unemployment Rate`	0.03	*
`Small Business Pop`	0.13	
`Small Business Ratio`	0.61	

Signif. codes:

0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2480 on 42 degrees of freedom
Multiple R-squared: 0.356, Adjusted R-squared: 0.249
F-statistic: 3.32 on 7 and 42 DF, p-value: 0.00661

Also, in **table 1**, the summary statistics in the last row help to assess the effectiveness of the overall model. The R-squared is at .35, indicating that approximately 35% of the variation in the DV can be explained by this model. This means that the model does not explain nearly 70% of the reason why normalized PPP varies amongst states.

In addition, the P-value of the [F-statistic](#) is statistically significant in this model, proving that there is an impressionable relationship between at least one of the independent variables (i.e. unemployment rate and population) and normalized PPP.

Restriction severity is one of the factors in the data model that is not significantly significant, supporting the hypothesis that the loan distribution did not take into account a state’s public health order when approving loans.

Correlation

Figure 2 summarizes the correlation between all variables within the model as well as how they correlate with the DV. As they relate to normalized PPP, all variables are negatively correlated with the exception of the unemployment rate. This mirrors that of the summary results from the regression model.

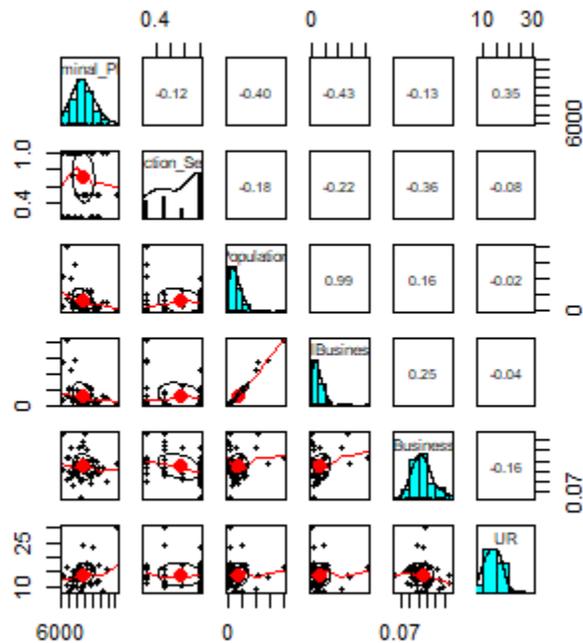


Figure 2: Correlation of R Model Variables

Something that is important to note is the negative correlation between the DV and restriction severity. At -0.1164 , the two variables are slightly negatively correlated. These results indicate that as restriction severity increases, normalized PPP decreases.

Summary Statistics Reveal Disproportionate PPP Loan Distribution

In addition to a regression analysis, this study also examined the variables through charts, heat maps, and pivot tables. The summary statistics focus mostly on normalized PPP and restriction severity to further test the hypothesis.

Figure 3 shows the distribution of states by restriction severity where 58% had both of the highly restrictive executive orders in place, 24% had only one, and 18% of U.S. states had neither. So, while the majority of states suffered from non-essential business closures and stay-at-home orders, several states did not and many of those states who did not suffer, still received more funding.

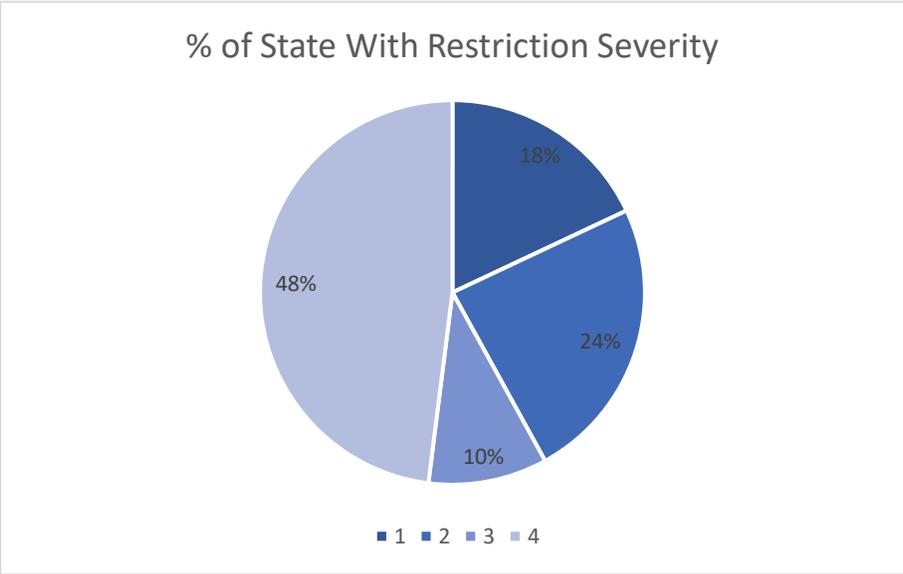


Figure 3: *Distribution of Restriction Severity by State*

Table 2 lists the top ten states that were approved for the largest amount of PPP loan dollars per business and the bottom ten states which were approved for the least amount. Of the bottom ten states, seven of them had both highly restrictive health orders in place (stay-at-home and non-essential business closures) while only four of the top ten states had both highly restrictive health orders in place. This suggests that states that needed PPP funding the most, received less than their counterparts and the distribution difference is significant. The gap between the average of the bottom 3 states and top 3 states was \$11,314.18, implying that some businesses could have received critical extra funding for their business for better economic relief.

Table 2: *States, Restriction Severity, and Normal PPP During March and April of 2020*

State	Restrictions	Normal PPP
Florida	1	\$ 6,212.29
Nevada	4	\$ 6,567.18
California	1	\$ 7,458.00
Arizona	4	\$ 7,587.50
North Carolina	4	\$ 7,988.38
Georgia	1	\$ 8,025.27
South Carolina	3	\$ 8,319.55
New York	4	\$ 8,583.29
New Mexico	4	\$ 8,782.52
Mississippi	3	\$ 9,128.19
Indiana	4	\$ 13,825.67
Hawaii	4	\$ 13,975.20
New Hampshire	1	\$ 14,062.91
South Dakota	1	\$ 15,126.96
Iowa	2	\$ 15,138.68
Kansas	2	\$ 15,765.43
Nebraska	1	\$ 15,877.99
Minnesota	4	\$ 16,534.39
Wisconsin	4	\$ 17,536.48
North Dakota	2	\$ 20,109.14

Figure 4 reveals the possible influence of political representation on the execution of certain executive orders. Although the regression analysis finds that this factor is not statistically significant on the variation of Normalized PPP, there may be a relationship amongst other factors. **Figure 5** categorizes states by restriction severity. Of the 50 states, 23 have Democratic governors, and 16 of those 23 (or ~70%) democratic states issued both a non-essential business order and a stay-at-home order in March of 2020. In contrast, only eight of the 27 (or ~30%) states with republican governors did the same and seven republican states issued none at all.

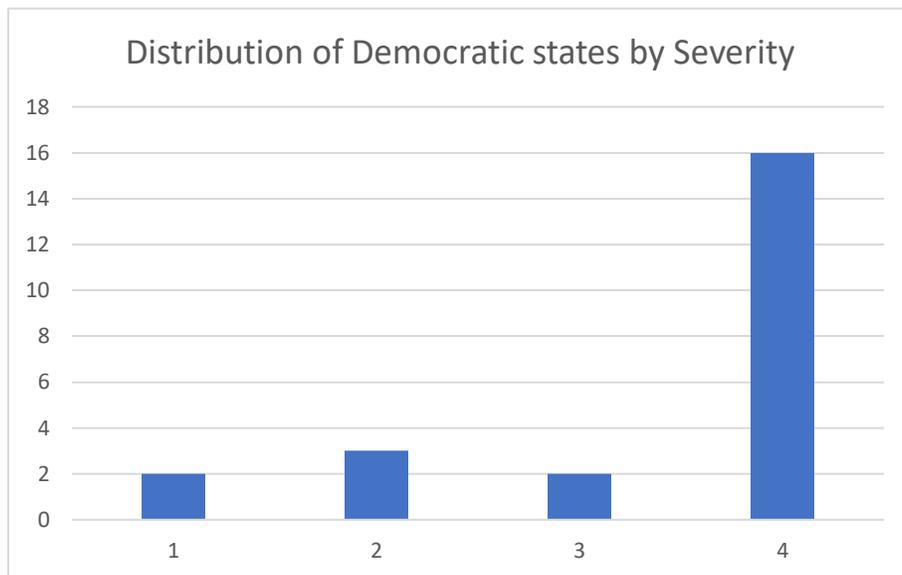


Figure 5: *Distribution of Democratic states' Restriction Severity*

To visually assess the distribution of PPP loans across the U.S., **Figure 6** illustrates the total amount of PPP loan amounts approved in each state with California and Texas receiving the most dollars. This is likely because they are the highest populated states in the U.S. with 39,557,045 and 28,701,845 people respectively. **Figure 7** looks at the same distribution but for normalized PPP loans in which North Dakota received the most at \$20,109.14 while only issuing one of the two highly restrictive executive orders and not mandating facial coverings in March or

April of 2020. So, when analyzing the distribution of PPP loans while not accounting for population, the state with the most amount of loans does not have the maximum amount of restrictions.

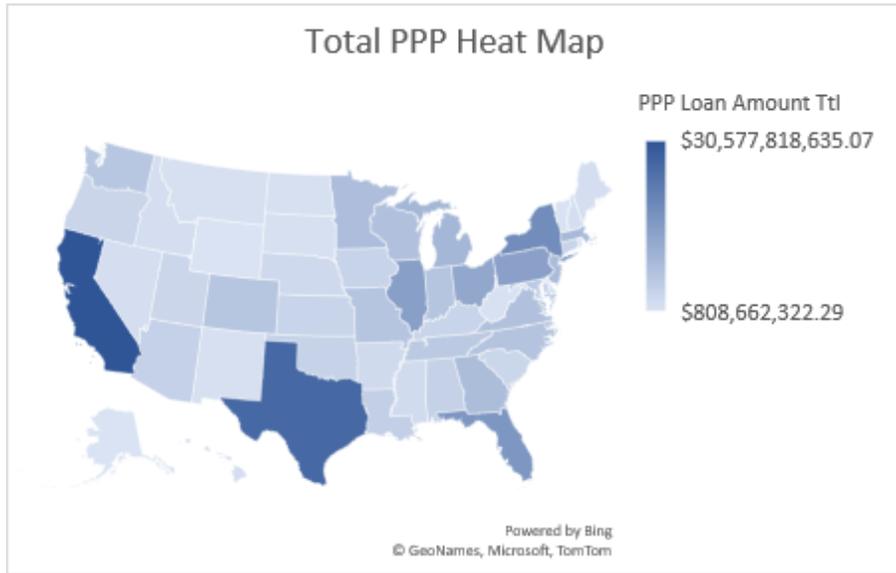


Figure 6: *Distribution of Total PPP by Each US State*

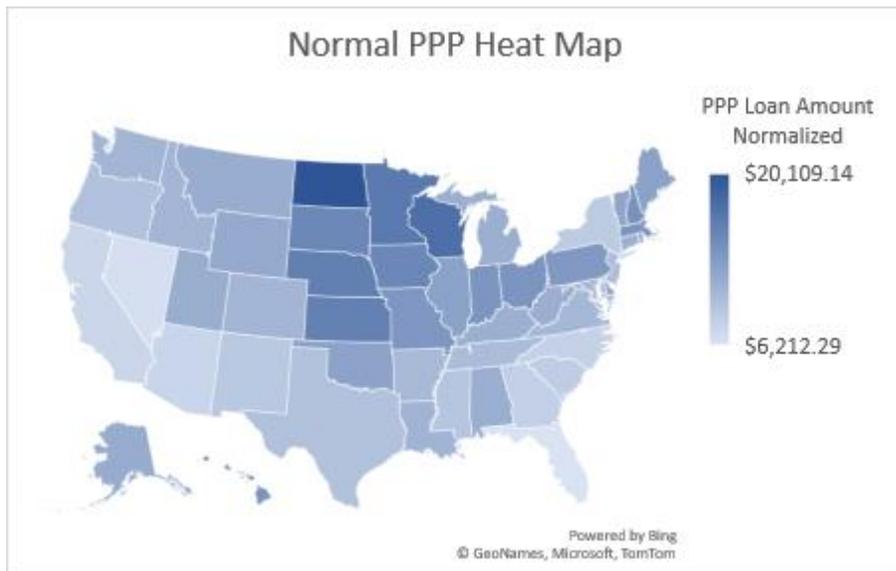


Figure 7: *Distribution of Normal PPP by Each US State*

Did the PPP effectively target the hardest hit states in the U.S.?

For purposes of this study, ‘hardest hit’ is defined as states that issued public health orders that directly affected the revenue stream and overall economic health of small businesses. More specifically, states that have issued some version of a ‘stay-at-home’ order and/or mandated closures of non-essential businesses.

Based on the regression analysis performed in this study, the severity of restrictions in each state was not a statistically significant factor in the distribution of PPP funds. In addition, a summary analysis of the relationship between normalized PPP and restriction severity reveals that there is a disproportionately higher amount of funds given to states with lesser restrictions.

This study concludes that the first tranche of the PPP did not effectively fund the hardest hit states in the U.S. which are the states that needed it the most.

It is important to note, however, that these conclusions are based on the variable of normalized PPP, which does not consider the variability of PPP loans that each business received. Because different small businesses within each state received different amounts of PPP loans, the total for each state is heavily influenced by the number of businesses that were approved for higher loans (think loans of \$150 thousand or more). This in turn would also influence the dependent variable – normalized PPP.

Discussion

This study finds the regression and data analysis to be in support of the proposed hypothesis that the PPP did not effectively distribute its loan dollars to critically affected regions during the first tranche. This section discusses reasons as to why this may be the case and reflects on how the PPP’s performance can be analyzed beyond this study.

The First Problem – Legislation

The CARES Act is a bill that is the first of its kind; sending \$290 billion directly to eligible tax payers, \$260 billion to expand unemployment insurance, and \$346 billion to fund the PPP ([Amadeo, 2020](#)), the CARES Act’s goal is to provide economic relief to industries and consumers who need it most. Stimulating the economy through federal funding of key stakeholders is an important way to ensure the U.S. does not fall into a deep economic depression. But, allocating limited resources to a large quantity of people requires a lot of detail and specification.

The legislation for the PPP left too much room for interpretation making it easily accessible to the wrong businesses while letting other firms slip through the cracks. The CARES Act directs the SBA to prioritize small businesses who’ve experienced “supply chain disruptions, staffing challenges, decrease in gross receipts/customers, or a closure” ([CARES Act, 2020](#)). However, they do not specify ways in which the businesses could be identified nor do they detail ways in which they could/should be prioritized.

As discussed in the literature review, public health orders catalyzed several of the issues above, and the specific orders in place are consistent throughout the state. This provides a clear and efficient way to distribute funding to target a dense population of businesses who suffer from those concerns.

The Second Problem – Rollout

The CARES Act leaves too much room for interpretation, and the SBA rollout of the PPP followed suit, making parameters for loan approval too loose.

The purpose of the easy approval process is made clear in the interim final rule. The SBA want to make sure that funds are issued to businesses quickly in an effort to Money ran out in just 13 days for the PPP and many businesses did not get an opportunity to take advantage. While additional funding is made available ten days later, the damage was already done for the economy as the delay in loans caused a sharp reduction in employment for small businesses ([Doniger & Key, 2021](#)).

If more of the businesses that were already closed down had access to loans at the time the first tranche of PPP was released, the reduction in employment may not have been as significant.

Further Analysis of the PPP

While this study captures important analysis of the determinants of normalized PPP variation, the study can be expanded for more detailed results and may help illustrate how the PPP rollout evolved overtime.

The current regression model only results in 32% of the explanatory variables in normalized PPP. Adding more factors to the model next time may help to paint a bigger picture on what is influencing loan dollar distribution.

In addition, normalized PPP can be a better representation of the average amount of loan dollars a business received in each state if the DV adjusted for variability of loan dollars amongst businesses.

Assessing the effectiveness of federal funding distribution is incredibly important in measuring economic relief for a target population. This analysis needs to be expanded to determine the effectiveness of the second tranche of PPP loans as well as round two and help illustrate how well the PPP helped to keep the small business industry afloat.

Works Cited

- Autor, D., Cho, D., Crane, L. D., Goldar, M., Lutz, B., Montes, J., . . . Yildirmaz, A. (2020). *An Evaluation of the Paycheck Protection Program Using Administrative Payroll Microdata*. Working Paper, Massachusetts Institute of Technology, Economics. Retrieved from <http://economics.mit.edu/files/20094>
- Bartik, A. W., Bertrand, M., Cullen, Z. B., Glaeser, E. L., Luca, M., & Stanton, C. T. (2020). How are small businesses adjusting to COVID-19? Early evidence from a survey. *National Bureau of Economic Research*. Retrieved from https://www.nber.org/system/files/working_papers/w26989/w26989.pdf
- Congress. (2020, March 27). H.R. 748 CARES Act. *Law*. Retrieved from <https://www.congress.gov/bill/116th-congress/house-bill/748/text>
- Desjardins, L. (2020, April 16). *It took 13 days for the Paycheck Protection Program to run out of money. What comes next?* Retrieved from PBS: <https://www.pbs.org/newshour/politics/it-took-13-days-for-the-paycheck-protection-program-to-run-out-of-money-what-comes-next#:~:text=The%20%24349%20billion%20Paycheck%20Protection%20Program%20was%20completely,additional%20money%20for%20other%20recovery%2>
- Dey, M., & Loewenstein, M. A. (2020, April). *How many workers are employed in sectors directly affected by COVID-19 shutdowns, where do they work, and how much do they earn?* Retrieved from U.S. Bureau Labor of Statistics: <https://www.bls.gov/opub/mlr/2020/article/covid-19-shutdowns.htm>

Egan, M. (2020, April 21). *Big banks accused of favoring more lucrative small business loans in coronavirus program*. Retrieved from CNN:

<https://www.cnn.com/2020/04/21/business/small-business-loans-ppp-lawsuit/index.html>

Faulkender, M., Jackman, R., & Miran, S. I. (2020, December 16). The Job-Preservation Effects of Paycheck Protection Program Loans. *The Dept of Treasury, Office of Economic Policy*.

Federal Reserve Bank of Cleveland. (2020, October 08). *An Uphill Battle: COVID-19's Outsized Toll on Minority-Owned Firms*. Retrieved from Cleaveland Fed:

<https://www.clevelandfed.org/en/newsroom-and-events/publications/community-development-briefs/db-20201008-misera-report.aspx>

Granja, J., Makridis, C., Yannelis, C., & Zwick, E. (2020, November). DID THE PAYCHECK PROTECTION PROGRAM HIT THE TARGET? *NATIONAL BUREAU OF ECONOMIC RESEARCH*. Retrieved from

https://www.nber.org/system/files/working_papers/w27095/w27095.pdf

Hubbard, G., & Strain, M. R. (2020, October). Has the Paycheck Protection Program Succeeded? *IZA Institute of Labor Economics*. Retrieved from <http://ftp.iza.org/dp13808.pdf>

Jarvis, R., & Winn, L. (2020, April 25). *What went wrong with the Paycheck Protection Program*. Retrieved from ABC News: <https://abcnews.go.com/Business/inside-paycheck-protection-program-race/story?id=70330643>

Karabarbounis, M., & Trachter, N. (2020, May 26). *The Effects of Expiring Stay-at-Home Orders and the Shape of the Recovery*. Retrieved from Federal Reserve Bank of Richmond:

https://www.richmondfed.org/publications/research/coronavirus/economic_impact_covid-19_05-26-20

Long, H. (2020, May 12). *Small business used to define America's economy. The pandemic could change that forever.* Retrieved from The Washington Post:

<https://www.washingtonpost.com/business/2020/05/12/small-business-used-define-americas-economy-pandemic-could-end-that-forever/>

Match Law. (2020, May 13). *SBA Issues Guidance Regarding Certification of PPP Loan Necessity.* Retrieved from Muchlaw.com: <https://www.muchlaw.com/insights/article/sba-issues-guidance-regarding-certification-ppp-loan-necessity>

Moore, M. (2020, November 8). *COVID-19 Paycheck Protection Program fraud accusations continue to mount.*

National Restaurant Association. (2020, April 20). *Restaurant sales and job losses are wide spread across segments.* Retrieved from Restaurant.org:

<https://www.restaurant.org/articles/news/restaurant-sales-and-job-losses-are-widespread>

Neumark, D., Wall, B., & Zhang, J. (2011, February 1). Do Small Businesses Create More Jobs? New Evidence for the United States from the National Establishment Time Series. *The Review of Economics and Statistics*, pp. 16-29.

Pardue, L. (2021, February 21). Small Business Experiences as the Paycheck Protection Program Ends: Evidence from Covered Period Expiration. *University of Maryland.*

SBA Inspector General. (2020). *Flash Report Small Business Administration's Implementation of the Paycheck Protection Program Requirements.* Office of Inspector General.

- Sheehan, M. (2020, April 23). *Pros/cons to extending the 'stay-at-home' order*. Retrieved from CIProud: <https://www.centralillinoisproud.com/news/local-news/pros-cons-to-extending-the-stay-at-home-order/>
- U.S. Bureau of Labor Statistics. (2020, May 28). *43 states at historically high unemployment rates in April 2020*. Retrieved from U.S. Bureau of Labor Statistics: <https://www.bls.gov/opub/ted/2020/43-states-at-historically-high-unemployment-rates-in-april-2020.htm>
- U.S. Small Business Administration. (2020, April 15). *Federal Register Vol. 85, No. 73*. Retrieved from SBA: https://www.sba.gov/sites/default/files/2020-04/PPP%20Interim%20Final%20Rule_0.pdf
- U.S. Small Business Administration. (2020). *Paycheck Protection Program (PPP) Report Approvals through 12 PM EST 4/16/2020*. U.S. Small Business Administration. Retrieved from <https://www.sba.gov/sites/default/files/2020-04/PPP%20Deck%20copy.pdf>
- Vardi, N. (2020, April 20). *71 Publicly Traded Companies Got Paycheck Protection Funding Before Money Ran Out*. Retrieved from Forbes: <https://www.forbes.com/sites/nathanvardi/2020/04/20/seventy-one-publicly-traded-companies-got-paycheck-protection-funding-before-money-ran-out/?sh=1ae461bf5087>
- Werner, E., Kane, P., & DeBonis, M. (2020, March 27). *Trump signs \$2 trillion coronavirus bill into law as companies and households brace for more economic pain*. Retrieved from The Washington Post: <https://www.washingtonpost.com/us-policy/2020/03/27/congress-coronavirus-house-vote/>