

Sabasteanski, Nika; Brooks, Jeremy; Chandler, Thomas

## Article

# Saving lives and livelihoods: The paycheck protection program and its efficacy

EconomiA

## Provided in Cooperation with:

The Brazilian Association of Postgraduate Programs in Economics (ANPEC), Rio de Janeiro

*Suggested Citation:* Sabasteanski, Nika; Brooks, Jeremy; Chandler, Thomas (2021) : Saving lives and livelihoods: The paycheck protection program and its efficacy, EconomiA, ISSN 1517-7580, Elsevier, Amsterdam, Vol. 22, Iss. 3, pp. 278-290,  
<https://doi.org/10.1016/j.econ.2021.11.004>

This Version is available at:

<https://hdl.handle.net/10419/266986>

## Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

## Terms of use:

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



<https://creativecommons.org/licenses/by-nc-nd/4.0/>

HOSTED BY



ELSEVIER

Contents lists available at ScienceDirect

EconomiA

journal homepage: [www.elsevier.com/locate/econ](http://www.elsevier.com/locate/econ)

# Saving lives and livelihoods: The Paycheck Protection Program and its efficacy<sup>☆</sup>



Nika Sabasteanski<sup>a</sup>, Jeremy Brooks<sup>b</sup>, Thomas Chandler<sup>b,\*</sup>

<sup>a</sup> New York University School of Law, New York University, New York, USA

<sup>b</sup> National Center for Disaster Preparedness, The Earth Institute, Columbia University, New York, USA

## ARTICLE INFO

### Article history:

Received 15 July 2021

Received in revised form 4 October 2021

Accepted 15 November 2021

Available online 24 January 2022

### Keywords:

Economic inequality

Disaster Aid

Pandemic

COVID-19

Economic Recovery

## ABSTRACT

In March 2020, the COVID-19 pandemic, caused by the SARS-CoV-2 virus, swept through the United States. The necessary but costly non-pharmaceutical interventions (NPIs) including social distancing, stay-at-home orders, and the closing or restriction of most businesses greatly increased the unemployment rate, and put millions of Americans at risk for eviction and bankruptcy. As a part of the relief efforts to mitigate the economic consequences of the shutdown orders, the United States Congress passed The Coronavirus Aid, Relief, and Economic Security Act, also known as the CARES Act, which created the Paycheck Protection Program (PPP). The PPP, administered by the Small Business Administration (SBA), was intended to help small business keep employees on their payroll through loans guaranteed by the SBA that are forgivable if certain conditions are met. This paper, using publicly available data released by the SBA of loans worth \$150,000 or greater, analyzes the effectiveness of the program through multiple avenues. On the overall effectiveness of the program, we explore the types of business that received PPP funding, the ranges of loan amounts provided, the types of banks that processed the loans, the cost-effectiveness of jobs saved based on the loan range, and the racial distribution of loan recipients. We also analyze the geographical distribution of loans based on congressional district to look at the influence race and political party had on how much PPP funding each congressional district received. Finally, we look at the how the PPP fit into the context of the COVID-19 pandemic by looking at the number of COVID-19 cases in each state at the time the program was initially closed, the amount of PPP funding for each state and analyzing the relationship between the loan amount per COVID-19 case and the date of reopening in each state, the relationship between the number of PPP loans received, and how long it took until a state reopened. We note that states that received more loans tended to delay their reopening, as a result, one of the main goals of the PPP, limiting the spread of COVID-19 by keeping people at home, was successful in that regard. We determine that the program, while a critical lifeline in a desperate, unprecedented time, had flaws in its deployment related to a lack of preparedness, a lack of equity in which recipients had initial access and how much funding recipients received, and noticeable gaps in the data. Finally, we recommend policy solutions and fixes going forward to bolster our

<sup>☆</sup> Production and hosting by National Association of Postgraduate Centers in Economics, ANPEC.

\* Corresponding author.

preparedness response at the state and federal level and ensure that going forward, we can do better to meet the missed marks during the acute phase of the coronavirus pandemic.  
 © 2022 National Association of Postgraduate Centers in Economics, ANPEC. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## 1. Introduction

In March 2020, the COVID-19 pandemic, caused by the SARS-CoV-2 virus, swept through the United States. The virus itself, but mostly the non-pharmaceutical interventions (NPIs) including social distancing, stay at home orders, and the closing or restriction of most businesses including restaurants, airlines, and hotels upended industries, spiking the unemployment rate, and put millions of Americans at risk for eviction and bankruptcy. On March 27th, Congress passed the Coronavirus, Relief, and Economic Security (CARES) Act ([US Department of the Treasury](#)), which included the creation of the Paycheck Protection Program (PPP) intended to provide loans to small businesses guaranteed through the Small Business Administration (SBA). The SBA considers an organization a small business based on several variables including industry, number of employees, and average annual receipts. The upper limit of the employee range typically falls between 250 and 1500 employees depending on the industry ([Size Standards Table](#)). The Paycheck Protection Program and Health Care Enhancement Act, passed on April 23rd, provided additional funding to the PPP ([Yin](#)). The overall goal of the PPP was to help small businesses continue to pay their employees by providing loans that would be forgiven and made into a grant if the requirements for using the funds were met. Forgiveness was based in part on the employer maintaining or quickly rehiring employees at their typical headcount and the amount of forgiveness was proportional to the employee headcount as well as their salaries and wages. At a minimum, 60% of the PPP loan had to be used to fund payroll and employee benefits costs. The remaining 40% or less could be used for mortgage interest payments, rent and lease payments, and utilities. Payroll costs are defined as salary, wages, commissions, tips, bonuses, hazard pay, benefits (vacation, family, medical leave), state and local taxes and are capped at \$100,000 annually per employee not including benefits ([Yin](#)).

Small businesses were considered eligible if they met the SBA's size standards or were sole proprietors, independent contractors, or self-employed. Businesses with a NAICS Code beginning with 72 for Accommodations and Services could qualify if they had more than one physical location with less than 500 employees per location. Finally, any business, 501(c)(3) non-profit organization, 501(c)(19) veterans organization, or Tribal business concern (sec. 31(b)(2)(C) of the Small Business Act) with less than 500 employees or one that met the SBA's industry size standard would also qualify ([Paycheck Protection Program](#)). The loan had a maturity rate of two years and an interest rate of 1% and did not require collateral. Private banks and other lenders provided the loans as opposed to the SBA acting as the direct loan servicer. Applicants were asked to self-verify how they would use the funds and to provide documentation confirming the number of employees and their associated wages. Additionally, they could apply through multiple lenders ([Yin](#)). The PPP was closed to new applicants on August 8th and the SBA reported a leftover balance of \$133,987,798,876 although there has been subsequent related legislation since then.

The data from the PPP was made publicly available in July 2020 and periodically updated until the program closed on August 8th, although there was another release on December 1st for loans under \$150,000 ("SBA releases details on PPP loans" December 2, 2020). The data showed that the PPP had guaranteed 5.2 million conditionally forgivable loans totaling \$525 billion from 5460 lenders, supporting over 50 million jobs, although the job figure was self-certified by the recipients ([Dealbook, 2020](#)). The majority of loans (68.6%) were below \$50,000 and the average loan size was \$10,729 ([SBA Paycheck Protection Program Loan Report Round 2](#)).

The Treasury Department compiled data related to the equitable distribution of its resources and as of the end of June 2020, 27% of the PPP funds went to low- or moderate-income groups which was proportional to the share of the population at 28%. 72% of the PPP funds went to groups that are not considered low-income. The SBA also designates historically underutilized business zones (HUBZones) in rural and urban areas and considers rural areas those regions where the U.S. Census Bureau designates 30% of the county or more as rural. According to the Treasury Department, 17.6% of all loans and 22.5% of loan volume went to HUBZones while 20.1% of loans and 15.3% of volume went to rural communities ([SBA Paycheck Protection Program Loan Report Round 2](#)). While the PPP loan application did ask about race/ethnicity and gender of loan recipients, these data were reported infrequently. Similarly, information on the type of lender beyond their size and type of institution was not reported. While the PPP was rolled out at a rapid speed due to the unprecedented scale of the COVID-19 pandemic, which necessitates the introduction of some oversights and gaps, concerns arose regarding the equitable distribution of the loans. Black-owned lending institutions and Black-owned small businesses were disproportionately underrepresented in the program. Black Americans were and remain heavily impacted by the pandemic and according to the CDC, have 2.8 times the rate ratio of death and 3.7 times the rate ratio of hospitalization as compared to white Americans despite having only 1.4 times the number of cases ([CDC, 2020](#)). Similarly, Black unemployment has remained at about double that of white unemployment during 2020 with 15% of Black Americans unemployed as of June 2020, as compared to 9% of white Americans ([Groeger, 2020](#)). Furthermore, Black Americans who have retained employment during the pandemic are more likely than white Americans to be essential workers. While only 11.9% of the total workforce, Black Americans represent 16.6% of essential workers, 26% of transit workers, 14.2% of drug store workers, 18.2% of trucking, warehouse and postal workers, 17.5% of healthcare workers, and 19.3% of childcare and social services workers are Black ([Gould and Wilson, 2020](#)). Finally, Black Americans also have higher rates of pre-existing conditions including diabetes, hypertension, asthma, and other air pollution related conditions including heart disease. Many of these diagnoses are correlated with COVID-19 mortality ([Gould and Wilson,](#)

2020). The combination of pre-existing conditions and economic vulnerability combined with disproportionate representation in the essential work sector and structural racism in obtaining loan relief, created a perfect storm.

A study conducted by the National Community Reinvestment Coalition found that there were significant differences in the amount of encouragement Black and white loan applicants received and similar differences were found across genders. 32.1% of white males in the matched-test study were told in some manner that they were qualified for a loan while only 8% of Black males were. Many of the differences in treatment went so far as to constitute a fair lending violation and overall Black applicants were provided with less information and were discouraged from pursuing the loan in comparison to their white counterparts (NCRC, 2020). The New York Times found that 75% of loans were allocated to majority white census tracts despite only 68% of the population living in those tracts (Flitter, 2020a). Furthermore, banks and other lenders appeared to favor account holders and, in some cases, deny loans to applicants who had opened credit cards with competitors. As a consequence of redlining and other discriminatory practices, Black communities and small businesses have less established relationships with major lenders (Flitter, 2020b). The SBA rolled out the PPP rapidly and without consideration to how the mechanisms of allocation and distribution could and did perpetuate systemic economic inequalities at a time when minority communities were in critical need of assistance.

While the COVID-19 pandemic was in some ways a force majeure, in many ways the pandemic and its antecedents including a stark wealth gap, institutionalized racism, and inconsistent, unequal access to quality healthcare, were not unforeseeable. This paper seeks to address the gaps in the Paycheck Protection Program but also to recommend and address preparedness goals as the country endures the remaining months of the pandemic and any other protracted crises on the horizon.

## 2. Methods

### 2.1. Data collection

#### 2.1.1. GIS

The GIS shapefile of the United States was downloaded from the US Census's data library; data regarding the Paycheck Protection Program was downloaded from the Small Business Administration; data on racial statistics was downloaded from the US Census American Community Survey.

The PPP loan amount was available by state, ZIP code, and congressional district but did not include county or census block level data. Although a limited proxy for the dependent variables to be discussed, we relied on congressional districts as the level of analysis rather to join the shapefile with the PPP and racial data. The loan amount per state and per congressional district were then aggregated in Microsoft Excel, and raw racial numbers were converted into percentages at the district level.

Finally, each congressional district was coded 0 for Republican, 1 for Democrat, and 2 for either libertarian, independent, or vacant for the 116th Congress. The political party of each sitting congressional representative was downloaded from the House of Representatives directory. Information regarding COVID-19 case counts per state were gathered from the COVID Tracking Project from The Atlantic and re-opening dates per state was gathered from the New York Times' Coronavirus Restrictions and Mask Mandates for All 50 States tool.

### 2.2. Data analysis

#### 2.2.1. Bivariate choropleth maps

The shapefiles were then joined to the CSV files using GEOID (state + congressional district) as the target field and the join field. The first set of maps layered the PPP loan amount by congressional district with the % Black and white respectively per district. The mode was changed to quantile with three classes with a precision value of 0. In order to visualize the bivariate choropleth map, the blending mode 'multiply' was selected for both layer and feature and a bivariate legend was also generated. Using the same technique, an additional map was created layering PPP loan amounts and the political party of the congressional representative for each district as of 2020.

#### 2.2.2. Spatial analysis

In order to assess the statistical assumptions that there was spatial independence, exploratory spatial data analysis (ESDA) was deployed to identify any inherent spatial autocorrelation in the data. Using GeoDa, a queen first order contiguity weight was generated.

Using the weight, the univariate local Moran's I was calculated to analyze the spatial autocorrelation for the loan amount. There was weak positive spatial autocorrelation (0.0820) but it was statistically significant (p-value = 0.011), indicating that congressional districts with larger PPP loans were generally surrounded by districts with larger PPP loans and districts with lower loans were surrounded by districts with lower PPP loans.

The local indicator of spatial autocorrelation (LISA) was calculated in GeoDa and then saved to the attribute table. In QGIS, the high positive and low positive clusters were selected and saved as a new shapefile and then the borders were dissolved. The statistically significant clusters were then layered over each of the independent variables.

#### 2.2.3. Regression

A linear regression was run using GeoDa with the PPP loan amount in the congressional district as the dependent variable and political party, % white, and % Black as covariates.

### 2.2.4. Other tables

Using MS Excel, the PPP loan data for loans equal to and greater than \$150,000 was provided by the SBA in ranges rather than specific amounts. The SBA subsequently released data for loans less than or equal to \$150,000 but those are not dealt with here. We used the midpoints of those ranges as the basis of many of the following calculations. Those midpoints were \$250,000 (\$150,000–\$350,000), \$675,000 (\$350,000–\$1,000,000), \$1,500,000 (\$1,000,000–\$2,000,000), \$3,500,000 (\$2,000,000–\$5,000,000), and \$7,500,000 (\$5,000,000–\$10,000,000).

The most frequent PPP loan recipients were also categorized in by their North American Industry Classification System industry (NAICS). Additionally, the cost per job was calculated, defined as the median loan amount from each category of loan amount from Fig. 1, divided by the number of jobs that applicants in each category reported to have been saved. By multiplying the number of loans by the midpoint of each loan range it calculates a rough idea of the amount of money loaned out through PPP. Using those midpoints of loan ranges and dividing the reported number of jobs saved gives a rough estimate of the cost per job saved.

We compared the PPP lender list to a list of a portion of Black-owned banks and credit unions and then tabulated the number of loans per lender and the percent of loans per lender given the total number of loans.

Finally, we also analyzed the number of loans per state compared to the reopening dates to assess if there was a relationship between a high number of loans per state and a reopening date. A linear regression was run with the number of loans each state received as the independent variable and the reopening date as the dependent variable. The reopening date was re-coded as the number of days from March 1, 2020 which was the date the national emergency was declared.

### 2.3. Limitations

There were several limitations to the data sets and data analysis. First, the US Treasury Department's PPP data initially only provided loan ranges rather than specific loan amounts. Thus, only median loan amounts were used for analysis. Second, since most of the auxiliary fields in the dataset were self-reported and not mandatory, there was a dearth of information on race and gender and furthermore, the number of jobs reportedly saved per loan is also likely not a reliable or accurate indicator.

A second major limitation was the modifiable areal unit used, which in this case was congressional district. This can serve as a source of statistical bias that can significantly impact the results of statistical hypothesis tests, and given the lack of granularity and the artificiality of congressional districting, it's possible that this choice could have affected the accuracy of the results. However, the PPP data did not contain a suitable alternative unit.

## 3. Results

### 3.1. Other

Fig. 1 shows that 57% of businesses received a loan valued between \$150,000–\$350,000, 30% of businesses received a loan between \$350,000–\$1,000,000, 8% of businesses received a loan between \$1,000,000–\$2,000,000, 4% of businesses received between \$2,000,000–\$5,000,000, and 1% of businesses received a loan between \$5,000,000–\$10,000,000. The most frequent PPP loan recipients were also analyzed in Fig. 2 by NAICS industry (North American Industry Classification System). Full Service Restaurants received the highest number of loans above \$150,000, with Offices of Physicians (except Mental Health Specialists), Offices of Lawyers, Plumbing, Heating, and Air-Conditioning Contractors, and New Car Dealers following closely behind.

The cost per job, as seen in Fig. 3, included the following categorical breakdowns: 4734 loans in the \$5–\$10 million range, 53,218 loans in the \$1–\$2 million range, 199,679 in the \$350,000–\$1 million range, 380,636 in the \$150,000–\$350,000 range. It appears that smaller loan categories were more cost effective as saving jobs. For comparison, the \$150,000–\$350,000 range cost about \$11,111 per job saved in contrast to the \$5 million–\$10 million cost per job saved being \$21,371, nearly double the cost per job saved. It is also important to note that it is unclear how the number of jobs saved was determined especially since it was self-reported.

There is a concern that the PPP, like other federal assistance programs (Mach et al., 2019), suffered from an inequitable distribution along race and class lines. The PPP application did attempt to collect information on the race/ethnicity and gender

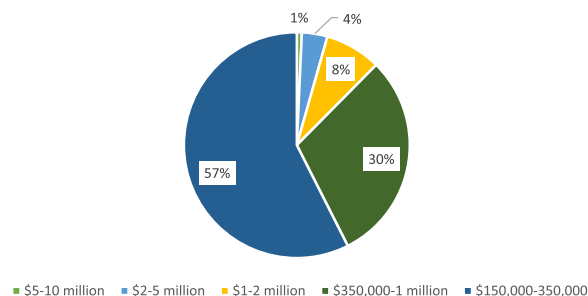
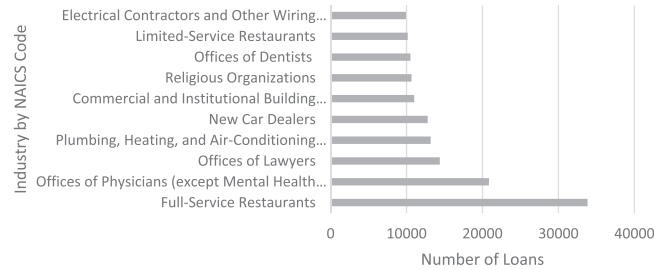
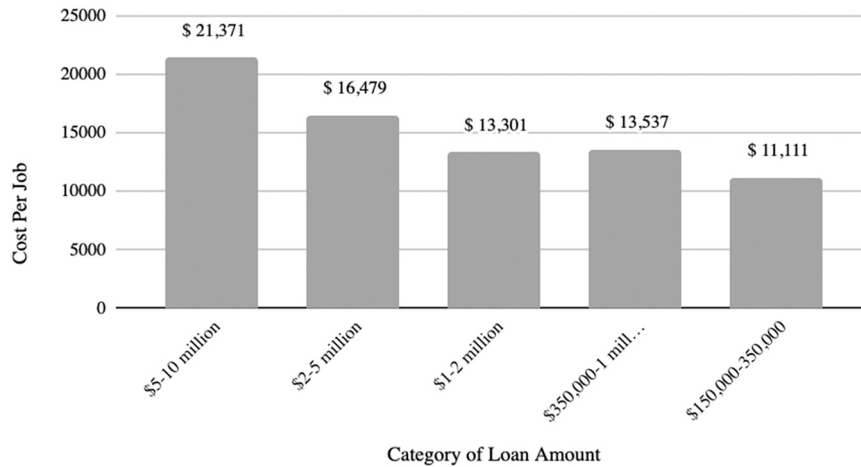


Fig. 1. Breakdown of PPP Loan Range for \$150,000 and Greater.

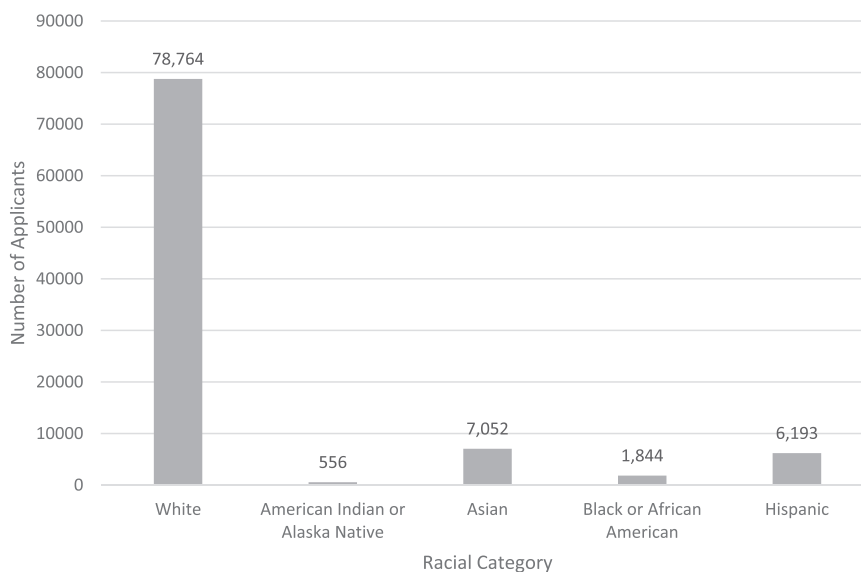


**Fig. 2.** Most Frequent PPP Loan Recipients by Industry.



**Fig. 3.** Rough Cost Per Job (Loan Amount/Number of Jobs Saved) PPP.

of loan recipients, but this field was optional and as a result, only 14.3% of applicants provided race/ethnicity information ( $N = 94,412$ ). The distribution of self-reported races is shown in Fig. 4, with 83.4% of those applicants reporting race identifying as white, 2% identifying as Black or African American, 7.5% identifying as Asian, 6.56% identifying as Hispanic, and 0.59% identifying as Native American or Alaska Native. However, it is important to note that according to the SBA as of 2012, 85.4% of



**Fig. 4.** Self-Reported Racial Distribution of PPP Loan.

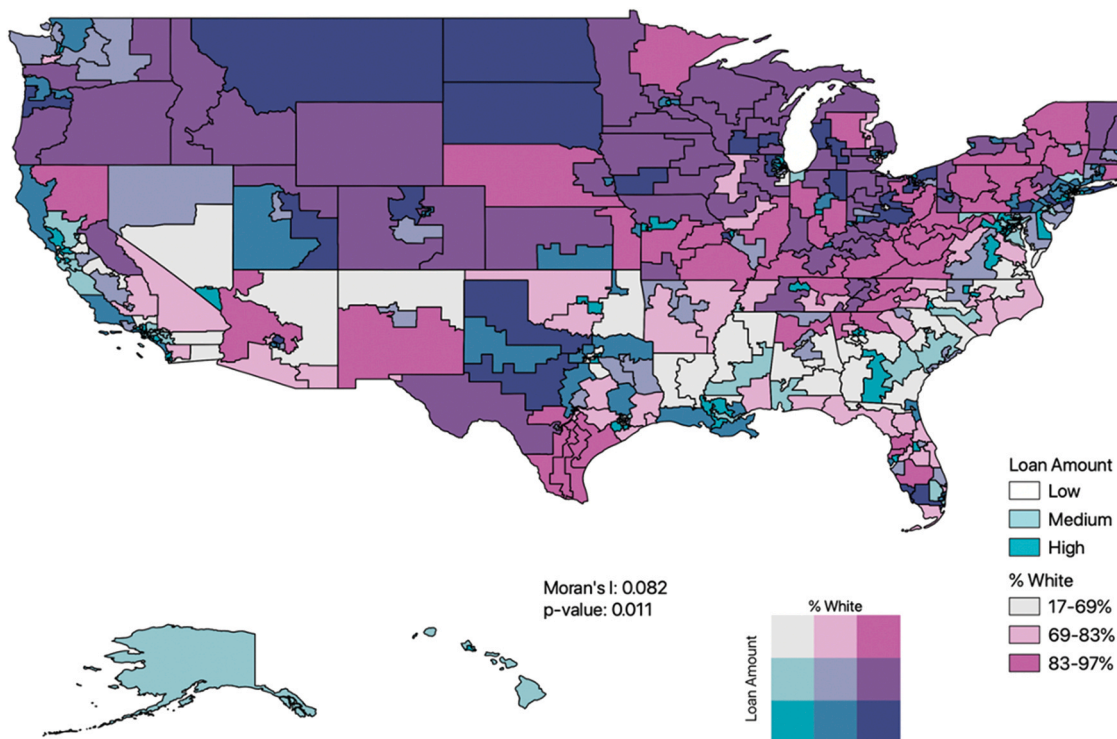


Fig. 5. Paycheck Protection Program Loan vs % White by Congressional District, 2020.

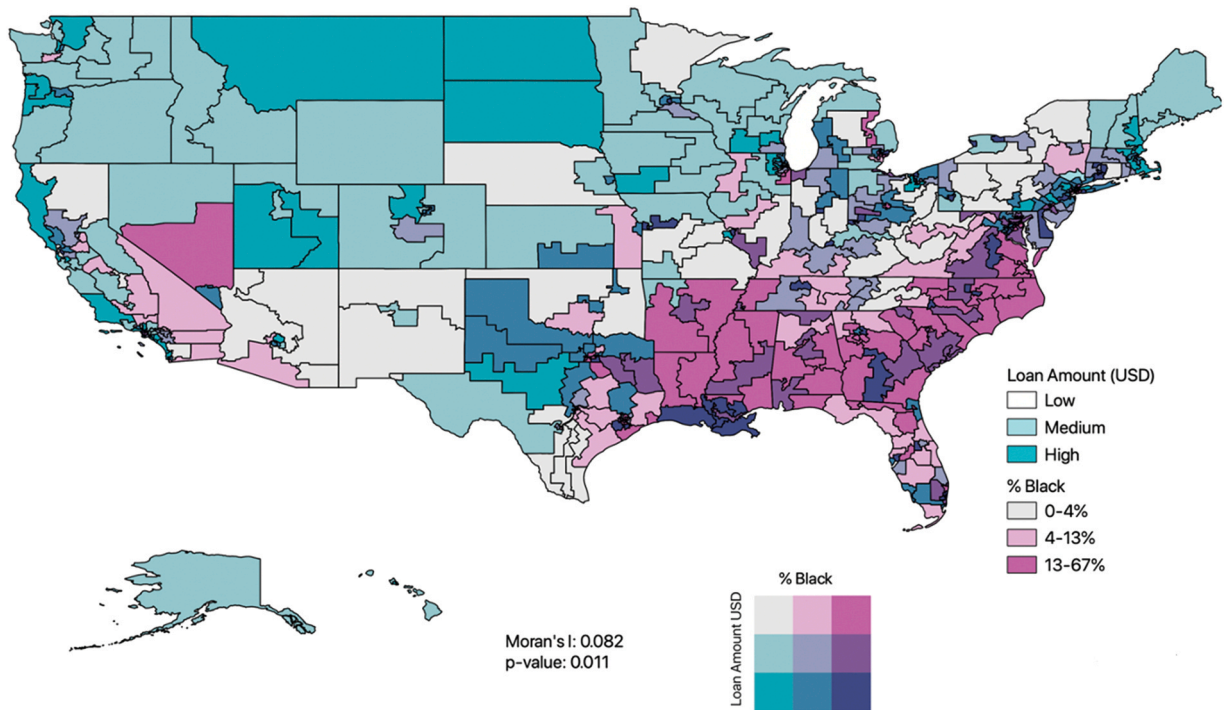
small businesses in the US were white-owned, although independent contractors and self-employed people were also eligible for PPP loans (Lichtenstein, 2014).

### 3.2. GIS

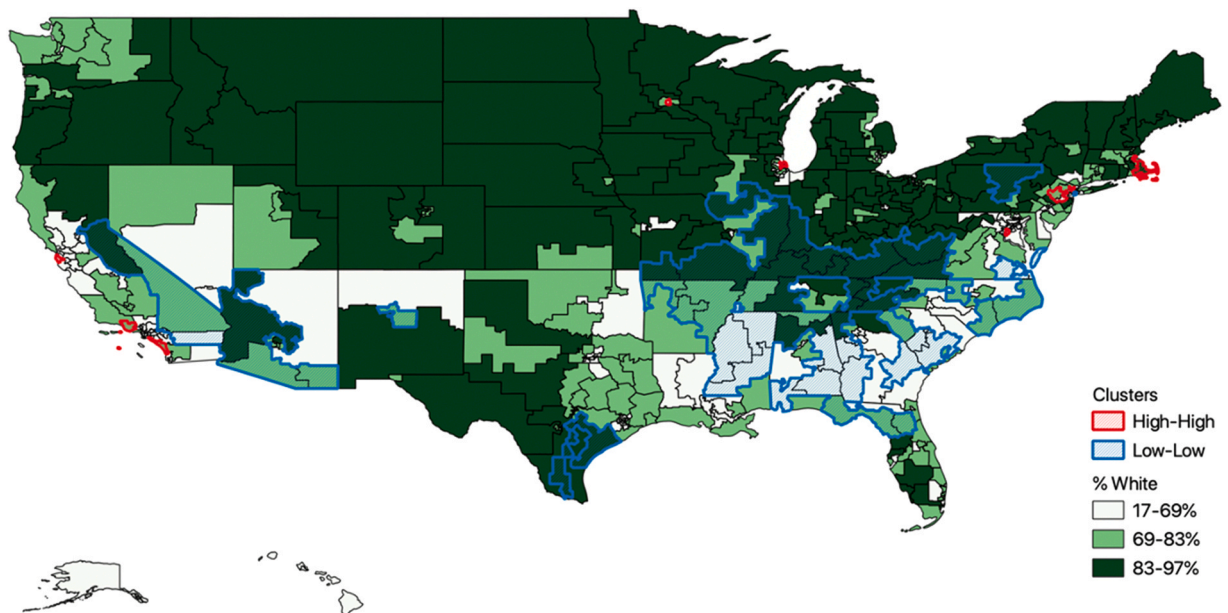
In order to assess if there had been equitable distribution of PPP loans along racial lines, the racial demographics of each congressional district was used as a proxy. The data were analyzed using QGIS and GeoDa. The first two thematic maps (Figs. 5 and 6) show the overlay of % white or Black overlaid with the total amount of loans per congressional district. On visual inspection, congressional districts that are majority white tended to receive larger total loan amounts than predominantly Black districts without controlling for covariates such as the number of COVID-19 cases per district, median income, or population density. The Moran's I is 0.082 indicating that there is a slight positive spatial dependence for the loan amount (there is a slight and positive relationship between any one congressional district's loan amount and their identified neighboring CD's average loan amount, potential positive spatial clustering). The p-value is 0.011, meaning the spatial dependence is statistically significant. A linear regression was run using loan amount as the dependent variable and % Black, % white, and political party of the congressional district as covariates. The regression showed that certain racial demographics were significantly correlated with loan amounts. The model's R-squared is 7.5%, indicating that 7.5% in the variation in a congressional district's PPP loans can be accounted for by the racial makeup of the district and its political party. For the 438 congressional districts, each 1% increase in the Black population was associated with a \$826 million decrease in the total PPP loan amount (p-value: 0.00103). The decrease associated with the % white population was not statistically significant.

In order to assess the degree of spatial autocorrelation a spatial analysis was also conducted using GeoDa, which found significant low-low clusters in predominantly Black districts (low loan amounts surrounded by districts with low loan amounts), and smaller but still significant high-high clusters (high loan amounts surrounded by districts with high loan amounts) in predominantly white districts shown in Figs. 7 and 8. Race is clearly not the main mediating factor, but it does contribute to the spatial clustering of loan distribution. Congressional districts are an imperfect proxy for the race of loan recipients, which was mostly not included in the SBA data, so it is possible that the correlation between race and loan amount is even stronger.

We compared the PPP lender list to a list of Black-owned banks and credit unions (U.S. Map of Black Banks & Credit Unions). Table 1 shows that the majority of Black-owned banks and credit unions provided few loans especially proportional to their size, which is defined as total assets (Schildbach, 2017). The percentages per lender were also included, with none exceeding 0.13%. Many Black-owned lenders provided 0 loans. Most of the banks listed in Table 1 had assets in the hundreds of millions with



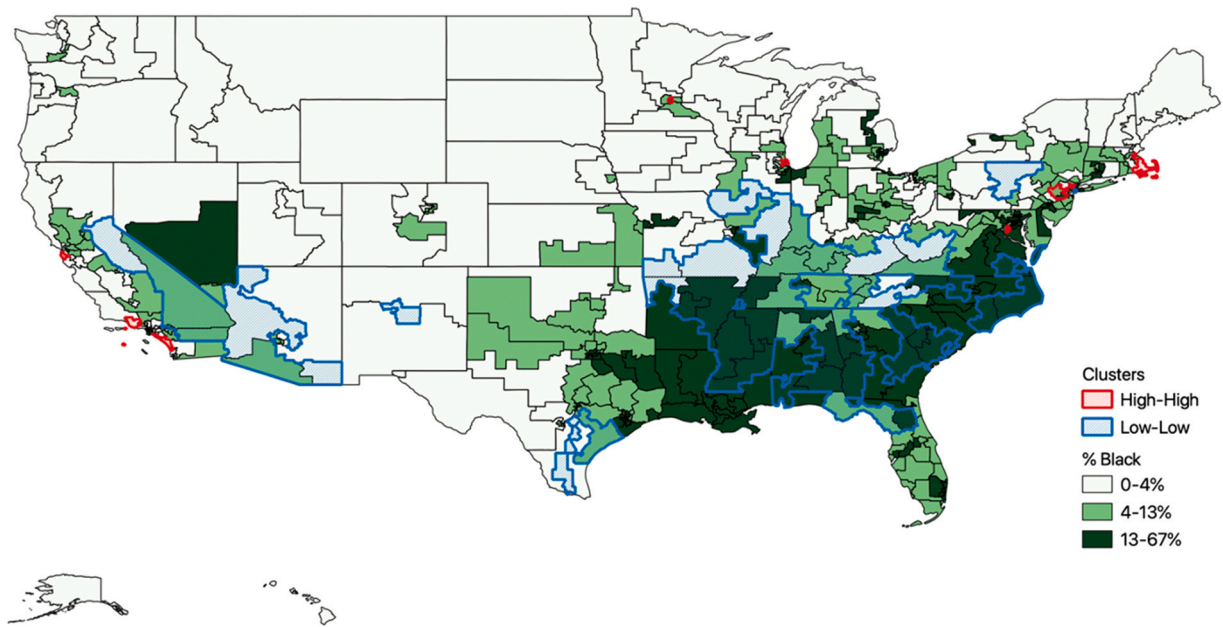
**Fig. 6.** Paycheck Protection Program Loan vs % Black by Congressional District, 2020.



**Fig. 7.** %White by Congressional District with Statistically Significant Spatial Clusters for PPP Loan Amount.

OneUnited Bank reporting \$661 million in assets. The majority of top non-Black owned banks like JP Morgan Chase, Citi Bank, and Bank of America have assets in the trillions, making it difficult to adjust for the discrepancy in loan frequency by lender size.

In addition to racial equity, there was also a question of how PPP loans were distributed along political party lines and with regards to COVID-19 case counts. A geographic analysis of PPP loans by congressional district as compared with political party (simplified to Republican or Democrat), is shown in Fig. 9 below. The darkest purple color in the bivariate choropleth map shows where Democratic districts received the highest loan amounts primarily concentrated on the west and east coasts with



**Fig. 8.** %Black by Congressional District with Statistically Significant Spatial Clusters for PPP Loan Amount.

**Table 1**  
Black-Owned PPP Lenders (Number and Percent).

Bank	Number of Loans	% of Total Loans (N = 662,515)
Carver Federal Savings	35	0.01
Carver State Bank	9	0.00
Citizens Trust Bank	42	0.01
Citizens Savings Bank	4	0.00
First Independence Bank	17	0.00
First Security Bank and Trust	7	0.00
First Tuskegee Bank	0	0.00
Harbor Bank of Maryland	65	0.00
Industrial Bank	39	0.01
Liberty Bank	57	
Mechanics & Farmers Bank	21	0.00
Metro Bank	23	0.00
Movement Bank (Formerly First State Bank)	3	0.00
OneUnited Bank	1	0.00
Optus Bank	60	0.00
Tri-state Bank of Memphis	8	0.00
United Bank of Philadelphia	4	0.00
Unity National Bank	38	0.01

pockets in Texas and the mid-west. The turquoise-colored districts show where Republican districts received the highest PPP loans, primarily in the Pacific Northwest and Midwest. Overall, there was no way to visually discern any clustering. As such, we turned to GeoDa to evaluate significant high-high and low-low clusters in Fig. 10. There were several low-low clusters primarily centered in Republican congressional districts in the south, which is where many Black-owned businesses are centered. The few high-high clusters were in primarily Democratic districts in the northeast and mid-west. The linear regression showed that Democratic congressional districts were associated with a \$219 million increase in PPP loan distribution.

However, this analysis did not assess if the loan amount was proportional to the number of COVID-19 cases per state. As seen in Table 2, using a ratio of number of loans to number of cases per state, the hardest hit states like New York, were not heavily favored in terms of the number of PPP loans. Areas with the highest ratios included Hawaii, Vermont, New Hampshire, and Alaska, whereas states that were most impacted like New York and California had significantly lower adjusted ratios. We compared this to the number of COVID-19 cases per state in Fig. 11 and the total loan amount per state in Fig. 12 as well as the number of loans distributed per state in Fig. 13.

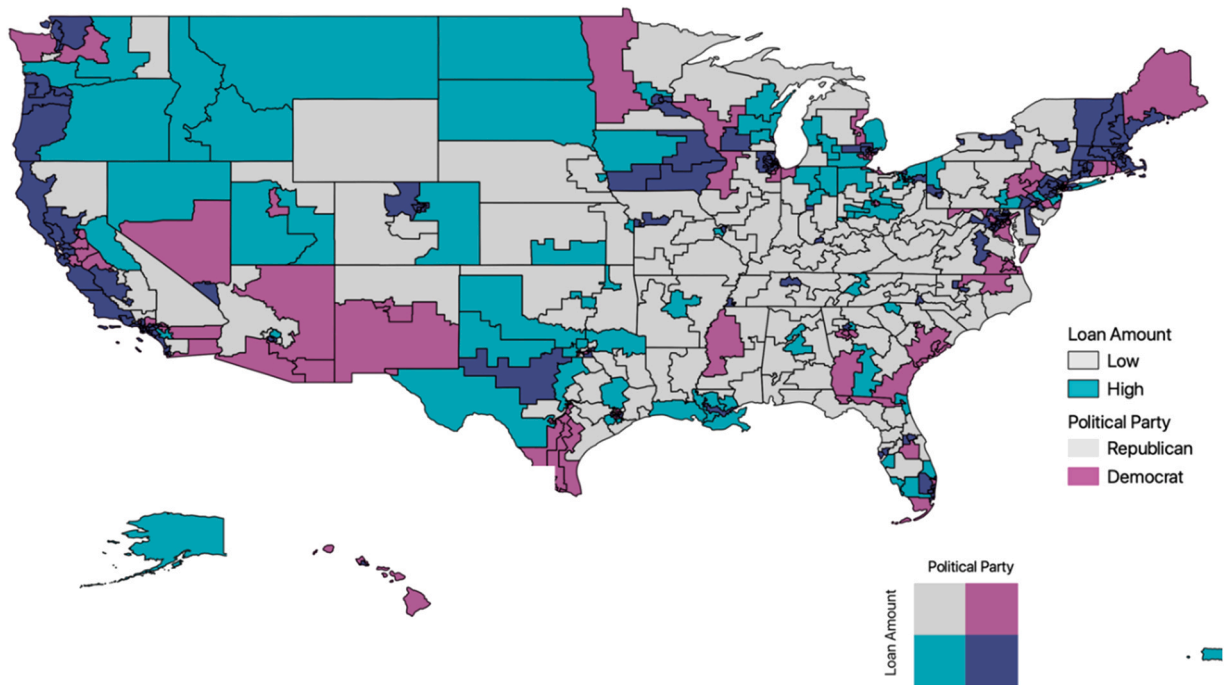


Fig. 9. Paycheck Protection Program Loan Amount vs Congressional District Political Party, 2020.

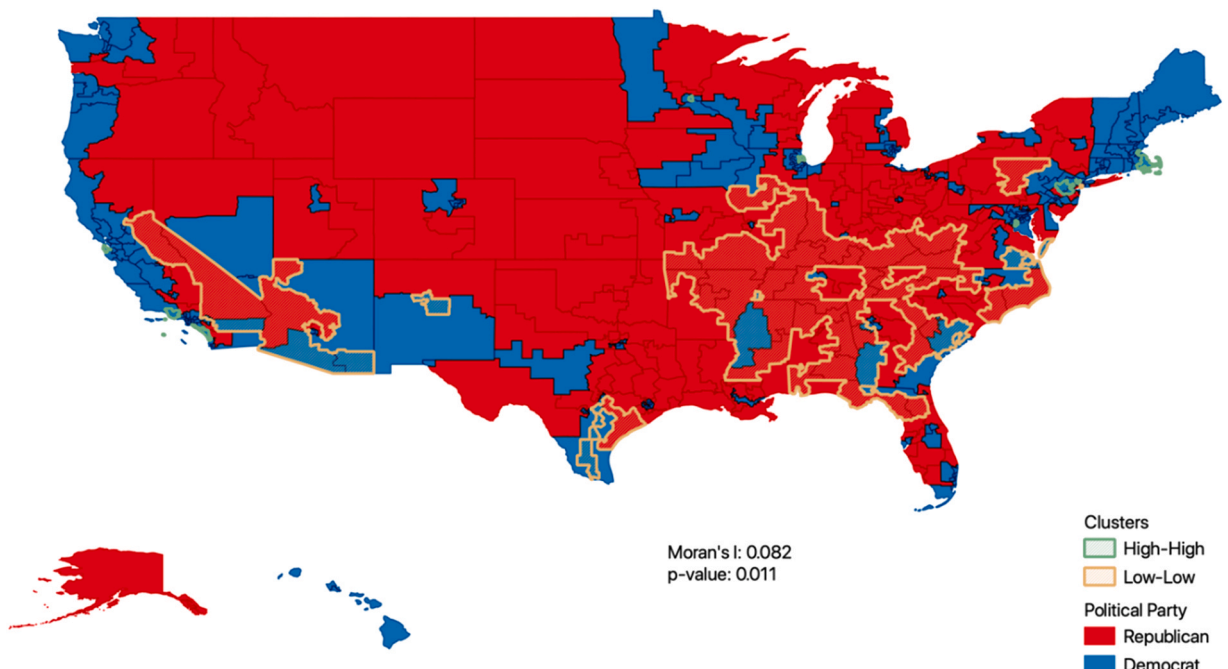


Fig. 10. Political Party by Congressional District with Statistically Significant Spatial Clusters for PPP Loan Amount.

Finally, we also analyzed the number of loans per state vs the reopening dates to understand if there was a relationship between a high number of loans per state and a reopening date. A linear regression analysis with the number of loans as the independent variable and the reopening date as the dependent variable was conducted. Loan amounts were significantly correlated with reopening dates for states ( $r = 0.2865$ ,  $p < 0.0001$ ) with an R-squared of 8.2%. For the 50 states and Washington DC, each additional loan a state received was associated with a 0.00022 increase in the number of days between the declaration

**Table 2**  
Loan Amount/COVID-19 Cases by State and Reopening Dates.

State	Loan Amount per COVID-19 Case	Date of Reopening
SC	\$44,328	20-Apr
AK	\$245,266	24-Apr
GA	\$53,498	24-Apr
OK	\$100,478	24-Apr
MT	\$261,587	26-Apr
CO	\$167,469	27-Apr
MS	\$34,888	27-Apr
TN	\$58,908	27-Apr
SD	\$131,524	28-Apr
AL	\$50,075	30-Apr
IA	\$86,112	1-May
ID	\$82,622	1-May
ME	\$438,630	1-May
ND	\$192,275	1-May
TX	\$69,397	1-May
UT	\$97,727	1-May
WY	\$256,887	1-May
FL	\$45,601	4-May
IN	\$110,527	4-May
KS	\$135,945	4-May
MO	\$132,417	4-May
NE	\$97,439	4-May
WV	\$193,015	4-May
HI	\$638,403	7-May
AZ	\$37,870	8-May
NC	\$72,063	8-May
NV	\$61,035	9-May
RI	\$78,479	9-May
NH	\$303,623	11-May
OH	\$159,867	12-May
WI	\$131,444	13-May
LA	\$46,909	15-May
MD	\$90,388	15-May
OR	\$276,959	15-May
PA	\$150,417	15-May
VA	\$105,726	15-May
VT	\$668,157	15-May
NM	\$82,509	16-May
MA	\$100,776	18-May
MN	\$160,768	18-May
CT	\$109,393	20-May
KY	\$124,464	20-May
CA	\$104,540	25-May
WA	\$161,051	26-May
DC	\$156,560	29-May
IL	\$98,816	29-May
NY	\$77,294	29-May
DE	\$83,794	1-Jun
MI	\$141,624	1-Jun
AR	\$52,198	6-Jun
NJ	\$78,795	9-Jun

of a national emergency and re-opening. In other words, each additional PPP loan in a state delayed reopening by about 19 s. For more real-world context, Florida received 42,047 PPP loans. By multiplying the number of PPP loans in Florida by 19 s each from the basic linear regression, it would predict a delay of 9.25 days in reopening. The greater the number of loans given to a state, the later a state re-opened as shown in Fig. 14, indicating that the financial incentive may have given businesses a cushion to remain closed, while those states that received fewer loans had more incentive to re-open prematurely to regain lost revenue despite the virus risks. Table 2 shows states in chronological order of re-opening compared to their loan amount/COVID-19 case ratio.

#### 4. Discussion

Overall, the self-reported data collected by the SBA, was lacking. To accommodate gaps, we used proxies including the racial and political composition of congressional districts as well as the median loan range amount. This may have contributed to

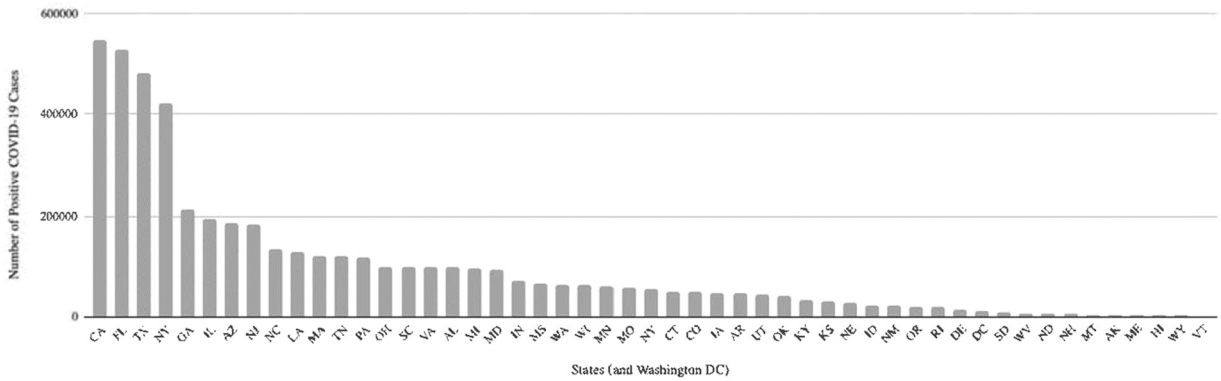


Fig. 11. Positive COVID-19 Cases as of 8/8/2020.

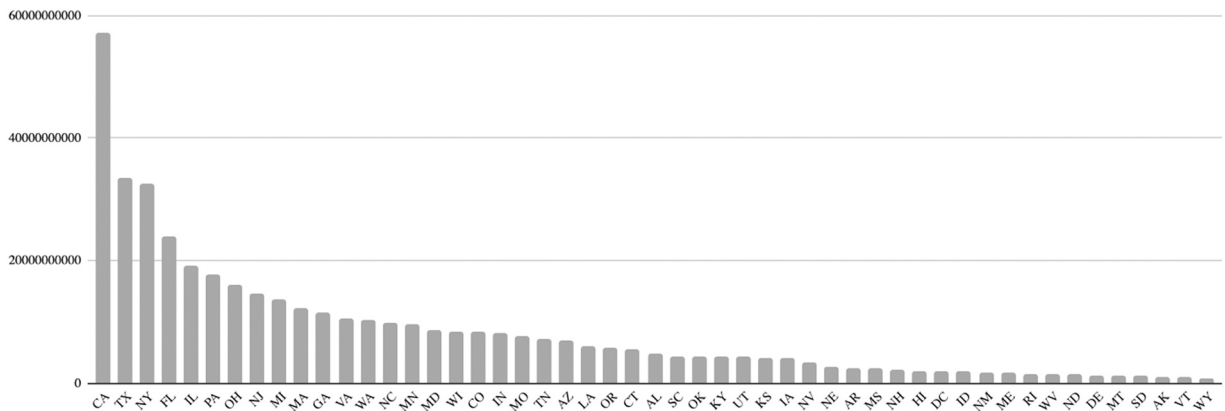


Fig. 12. PPP Amount per State.

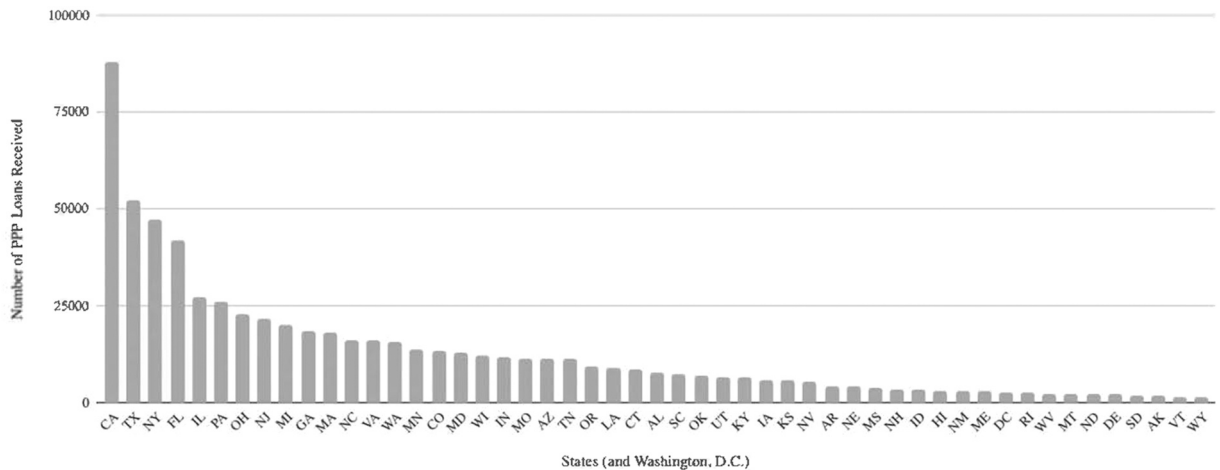


Fig. 13. Frequency of PPP Loans by State.

limitations in the data analysis. However, even with those potential limitations, the existing data are revealing. In terms of racial equity, our geographic analysis and linear regressions showed that districts with larger Black populations received lower loan amounts. Congressional districts that were Republican also tended to receive lower loan amounts than Democratic districts. One potential explanation for this is that many Republican districts are predominantly Black especially in the Southeast, where the loans tended to be lower. White Republican districts in the Midwest and Northwest had higher loan amounts on average. However, there were additional covariates that were not explored that may contribute to the model including poverty, COVID-

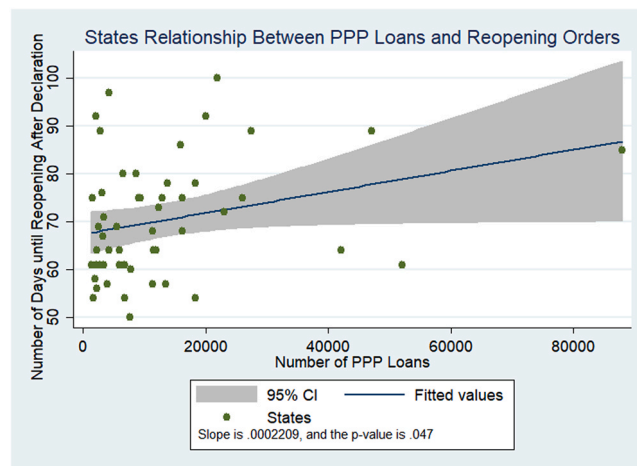


Fig. 14. States Relationship Between PPP Loans and Reopening Orders.

19 rates, county or state GDPs, as well as other factors about loan applicants. As such, the correlations observed here, while significant, do not account for the bulk of PPP loan distribution and should not be interpreted as causal. While it appears that PPP loans were not targeted to the most affected districts, there was a significant correlation between districts that received more loans, opening later, indicating that the goal of the program may have been successful for those businesses who received the loans.

Similarly, to what we found, the Center for Responsible Lending (CRL) found in their analysis that the PPP was not advantageous for minorities. The majority of approved lenders were previously SBA lenders and many of the recipients were current clients. As such, businesses that have had issues accessing credit are often blocked from obtaining loans and more likely to experience delays ([The Paycheck Protection Program](#)). Additionally, CRL found that minority-owned businesses are more likely to have fewer employees and less revenue making them less attractive as loan recipients to large lenders interested in high-fee loans. Additionally, the PPP banned business owners with a criminal history, which included those who were charged even if not convicted ([The Paycheck Protection Program](#)), which could disproportionately impact Black, and Indigenous People of Color, BIPOC, who are more likely to be incarcerated due to the institutional racism of the criminal justice system with Black Americans representing 34% of the correctional population ([NAACP](#)) and only 13.4% of the US population ([U.S. Census](#)).

Other obstacles include the onerous requirements to ensure that the loan will be forgiven, especially for smaller businesses without a legal consultant. The consequence of not having the loan forgiven presents a more significant problem for small businesses than for larger companies. Lenders were furthermore incentivized to provide larger loans to larger businesses due to an earned origination fee that was proportional to the loan amount. Our study found that few loans were provided from Black-owned firms, including some of the largest banks. Another finding was that applicants with historical relationships with lenders had a higher chance of receiving the loan to reduce the potential risk of lending ([Abramson, 2020](#)). Fewer Black-owned firms and Latino-owned firms access credit from banks, putting them at a disadvantage for PPP loans ([The Paycheck Protection Program](#)). Goldman Sachs conducted a survey of small business owners which found that Black-owned firms were less likely to apply for and be approved for first-round PPP funding. Overall, 91% of small business owners applied for a PPP loan as compared with 79% of Black-business owners. 52% of small business owners were approved and only 40% of Black business owners were. Black business owners were more likely to say their personal finances have been greatly affected and more likely to have less than one month of cash reserves ([Goldman Sachs, 2020](#)). The data we examined only included loans equal to or greater than \$150,000, which may have excluded some loans from Black-owned lenders. Finally, smaller lenders, which most Black-owned banks and credit unions would be classified as, were hesitant to participate in the program due to potential for liability claims. The SBA has said that lenders are responsible for determining if claims are fraudulent. Additionally, the interest rate is 0.5% which is much lower than typical loan rates and smaller lenders feared not having adequate liquidity to provide the loans ([Schroeder and Henry, 2020](#)).

The last major aspect of the PPP from its program period that was analyzed was whether the loans went to the most affected states or not. To do this, the ratio of loan amount per state to number of COVID-19 cases was taken. If epicenter states like New York and California had been prioritized, they would have had large spikes in the bar graph. Instead, the states with the most favorable ratios were Hawaii, Vermont, and Oregon, none of which had high COVID-19 prevalence during the initial program's period. The hardest hit states did not receive the largest loan amounts (although they both received some of the highest number of total loans given). The PPP loan distribution was overall not targeted to help the states whose businesses were suffering the most from protracted lockdowns and morbidity.

As of the creation of this report in November of 2020, the landscape for COVID-19 and for the economy have greatly shifted since the PPP initially closed on August 8th. Many of the States that received loans with a comparably low number of COVID-19

cases are now hotspots (e.g. Montana, North Dakota, South Dakota) (“The COVID Tracking Project at The Atlantic” n.d.). Likewise, many businesses that received the PPP loans are still struggling (“U.S. Census Bureau Small Business Pulse Survey” n.d.). As new relief and recovery programs and policies are debated by legislators, special attention should be paid to the efficacy of the PPP and the most effective ways to help businesses and communities recover from COVID-19 as the United States continues to deal with the pandemic.

## 5. Conclusion

Overall, the Paycheck Protection Program intended to help businesses affected by COVID-19 retain their employees, and ultimately help preserve small businesses during the pandemic. While jobs were saved and some of the most affected industries were aided by the program, it suffered from several limitations. Firstly, Black business owners were disproportionately underrepresented in the self-reported data as well as in our analysis of congressional districts. Black lenders were similarly sparse. The PPP loans suffered from inequitable distribution, with several integrated mechanisms that favored larger businesses, with established credit lines at banks. Additionally, the political party of the congressional district was correlated with the total loan amount awarded. Republican districts, especially those with more Black constituents were less likely to receive higher loan amounts as compared with Democratic districts or predominantly white Republican districts. Those states that received the most loans were more likely to delay their reopening than those that had received fewer loans, indicating that the financial incentives were working and if implemented properly may have had a larger effect on incentivizing residents to shelter-at-home. The states that were most affected, notably New York, did not receive the largest sum of loans.

The Paycheck Protection Program would benefit from more rigorous data collection to increase transparency and a targeting of the loans. Gender and race data should be mandatory fields on the application. Furthermore, several of the barriers to participation in the program may need to be re-thought including the size of businesses allowed to participate in order to help smaller businesses without the capital to sustain themselves without the loan. More Black lenders should be included in the next round of PPP loans, but non-Black lenders may need to be required to increase the number of Black business owners they provide loans to, since these lenders tend to be larger. Finally, states with the most COVID-19 cases and the most economic downturn as a result of the NPIs should also be prioritized to help stem the business closures that are already rising in cities like New York.

## References

- Abramson, A., 2020. As Minority-Owned Businesses Fall Further Behind During the Pandemic, Efforts Are Underway to Help. It May Not Be Enough [Internet]. Time [cited 2020 Jul 31]. Available from: <https://time.com/5848557/black-owned-business-coronavirus-aid/>.
- CDC, 2020. COVID-19 Hospitalization and Death by Race/Ethnicity [Internet]. Centers for Disease Control and Prevention [cited 2021 Jan 4]. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/covid-data/investigations-discovery/hospitalization-death-by-race-ethnicity.html>.
- Dealbook, 2020. Follow the Money. The New York Times [Internet]. Jul 7 [cited 2020 Jul 27]; Available from: <https://www.nytimes.com/2020/07/07/business/dealbook/ppp-loan-names.html>.
- Flitter, E. 2020a. Black Business Owners Had a Harder Time Getting Federal Aid, a Study Finds. The New York Times [Internet]. Jul 15 [cited 2021 Jan 5]; Available from: <https://www.nytimes.com/2020/07/15/business/paycheck-protection-program-bias.html>.
- Flitter E. 2020b. Black-Owned Businesses Could Face Hurdles in Federal Aid Program. The New York Times [Internet]. Apr 10 [cited 2021 Jan 5]; Available from: <https://www.nytimes.com/2020/04/10/business/minority-business-coronavirus-loans.html>.
- Goldman Sachs, 2020. Survey: US Small Business Owners Need More Funding and Immediate Legislative Action [Internet]. Goldman Sachs [cited 2020 Jul 31]. Available from: <https://www.goldmansachs.com/citizenship/10000-small-businesses/US/infographic-small-business-relief/>.
- Gould, E., Wilson, V., 2020. Black workers face two of the most lethal preexisting conditions for coronavirus—racism and economic inequality. *Econ. Policy Inst.* 1–30 Jun 1.
- Groeger, IV. 2020. What Coronavirus Job Losses Reveal About Racism in America [Internet]. ProPublica [cited 2021 Jan 4]. Available from: <https://projects.propublica.org/coronavirus-unemployment>.
- Lichtenstein, J., 2014. Demographic characteristics of business owners. *Small Bus. Adm.* 2, 3 Jan 16.
- Mach, K.J., Kraan, C.M., Hino, M., Siders, A.R., Johnston, E.M., Field, C.B., 2019. Managed retreat through voluntary buyouts of flood-prone properties. *Sci. Adv.* 5 (10), eaax8995 (Oct).
- NAACP Criminal Justice Fact Sheet [Internet]. NAACP. [cited 2020 Aug 7]. Available from: <https://www.naacp.org/criminal-justice-fact-sheet/>.
- NCRC, 2020. Lending Discrimination within the Paycheck Protection Program " NCRC [Internet]. NCRC [cited 2021 Jan 4]. Available from: <https://ncrc.org/lending-discrimination-within-the-paycheck-protection-program/>.
- Paycheck Protection Program Paycheck Protection Program [cited 2020 Jul 27]. Available from: <https://www.sba.gov/funding-programs/loans/coronavirus-relief-options/paycheck-protection-program>.
- SBA Paycheck Protection Program Loan Report Round 2 [cited 2020 Jul 27]. Available from: <https://home.treasury.gov/system/files/136/SBA-Paycheck-Protection-Program-Loan-Report-Round2.pdf>.
- Schildbach, J., 2017. Large or small? How to measure bank size. *Dtsch Bank* 24 Apr 25.
- Schroeder, P., Henry, D. 2020. Thousands of U.S. banks may sit out small-business rescue plan on liability worries: sources. Reuters [Internet]. Apr 1 [cited 2020 Aug 7]; Available from: <https://www.reuters.com/article/us-health-coronavirus-stimulus-banks-exc-idUSKBN21K075>.
- Size Standards Table [cited 2020 Aug 14]. Available from: [https://www.sba.gov/sites/default/files/files/Size\\_Standards\\_Table.pdf](https://www.sba.gov/sites/default/files/files/Size_Standards_Table.pdf).
- The Paycheck Protection Program The Paycheck Protection Program continues to be Disadvantageous to Smaller Businesses, Especially Businesses Owned by People of Color and the Self-Employed [Internet]. [cited 2020 Jul 31]. Available from: [https://www.responsiblelending.org/sites/default/files/nodes/files/research-publication/crl-cares-act2-smallbusiness-apr2020.pdf?mod=article\\_inline](https://www.responsiblelending.org/sites/default/files/nodes/files/research-publication/crl-cares-act2-smallbusiness-apr2020.pdf?mod=article_inline).
- U.S. Census U.S. Census Bureau QuickFacts: United States [Internet]. [cited 2020 Aug 7]. Available from: <https://www.census.gov/quickfacts/fact/table/US/PST045219>.
- U.S. Map of Black Banks & Credit Unions BLACKOUT COALITION. [cited 2021 Jan 15]. Available from: <https://blackoutcoalition.org/black-u-s-banks/>.
- US Department of the Treasury The CARES Act Works for All Americans [Internet]. [cited 2020 Jul 27]. Available from: <https://home.treasury.gov/policy-issues/cares>.
- Yin, O. What is the Paycheck Protection Program? (A Simple Guide) [Internet]. Bench Accounting. [cited 2020 Jul 27]. Available from: <https://bench.co/blog/operations/paycheck-protection-program/>.