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Basic Facts on the Coverage of the Paycheck Protection Program

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Basic Facts on the Coverage of the Paycheck Protection Program

Mark Schweitzer and Angela Guo

October 25, 2023

Abstract

This paper applies loan-level information from Paycheck Protection Program loans to analyze the coverage of this extraordinary lending program. We show that loans went to a large share of small businesses across most industries in the US, especially to industries that were most negatively impacted by COVID-19 stay-at-home orders. We geocode the loans and then identify that 2021 loans were more concentrated in low- and moderate-income communities, along with census tracts where minority residents are a majority of the population. The growth of nonemployer loans and fintech lending in the program were key components of the broadened reach of the program.

Keywords: small business lending, credit access, fintech, discrimination

JEL Codes: G21, L5, R3, J71

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Introduction

The Paycheck Protection Program (PPP) was an extraordinarily large effort to support small businesses during the pandemic, which sharply reduced revenues for most small businesses. In 2020 and 2021, Congress committed \$814 billion to provide forgivable loans to small businesses and nonprofit organizations. Under the law, qualifying businesses could obtain an initial loan of up to two and half months of payroll, with a maximum of \$10 million. Businesses with fewer than 300 employees and reductions in gross receipts above 25 percent were also allowed a second-draw loan, again based on self-employment earnings and payroll, up to a maximum of \$2 million (US Government Accountability Office, 2021).¹ These loans were intended to be forgiven if the employee compensation levels were maintained and at least 60 percent of the loan proceeds were spent on payroll costs (US Small Business Administration, 2023).² As of October 23, 2022, 96 percent of total PPP loan value has been forgiven (US Small Business Administration, 2022).³

The initial PPP funding expired after 14 days, focusing attention on which businesses had not been able to access the program and the role of banks in the distribution of funds. A Government Accountability Office (GAO) report noted that in this first phase of the program, 42 percent of loans went to larger small businesses (those with 10-499 employees), even though these businesses represent just 4 percent of the population of small businesses. The Coronavirus Aid, Relief, and Economic Security (CARES) Act of 2020 included a Sense of the Senate statement that the Small Business Administration (SBA) should issue guidance to lenders that “prioritizes small business concerns and entities in underserved and rural markets, including veterans and members of the military community, small business concerns owned and controlled by socially and economically disadvantaged individuals . . . , women, and businesses in operation for less than 2 years.”⁴ Over time, the SBA made specific changes to the program to improve its reach, including a \$10 billion set-aside for businesses that applied through community development financial institutions (CDFIs) and a 14-day application period exclusively for businesses or nonprofits with fewer than 20 employees.

This analysis focuses on assessing the reach of the program rather than its overall efficacy. Specifically, we examine the number of loans made to different businesses by industry, by income level and race and ethnicity of residents in the communities where the funds were received, and by whether the businesses had employees. While considering the number of loans, we also consider whether the loans were made in 2020 or 2021 and what type of lender (banks, fintechs, et cetera) made the loan. These are the primary factors that we believe influenced the breadth of coverage of the program.

¹ For a summary of the legislative history and implementation of the lending program, see the September 2021 GAO report at <https://www.gao.gov/products/gao-21-601>.

² <https://www.sba.gov/funding-programs/loans/covid-19-relief-options/paycheck-protection-program/ppp-loan-forgiveness#section-header-2>

³ See https://www.sba.gov/sites/sbagov/files/2022-10/2022.10.24_Weekly%20Forgiveness%20Report_Public.pdf for more information.

⁴ <https://www.congress.gov/116/plaws/publ136/PLAW-116publ136.pdf>.

While the PPP was unprecedented and designed to address the special circumstances of the pandemic, a PPP-like remedy may be considered in future crises and economic downturns that significantly impact small businesses. It is important for policymakers and the public to have a clear understanding of the reach and equity of the program. As Congress was clearly aware, it is critical that such a wide-reaching program be viewed as fair and widely accessible to covered businesses. The efficacy of the program starts there, but it also depends on outcomes for businesses and communities that will require ongoing data collection and analysis. And while the efficacy of the program should be evaluated, the extensive coverage of the PPP and its overlapping coverage with other programs will complicate simple tests of the program's efficacy. The extensive aid provided during the pandemic makes finding affected but untreated firms nearly impossible.

Data

We analyze SBA data in our effort to document key facts around the reach of the program into small businesses by industry and the communities in which the businesses operate. Since it is important to be able to estimate the number of businesses potentially relevant to the program, we compare SBA lending data to relevant Census Bureau data on the number of businesses by employment size. We compare SBA data with the Census Bureau's information on the number of companies in the US. For employer firms, this measure comes from the Statistics of US Businesses (SUSB) data from 2019.⁵ For the nonemployer firms, we use the Census Bureau's Nonemployer Statistics (NES) data from 2018.⁶ Given significant changes in the program over time, we use data from the full PPP loan program from 2020 through 2021.

Throughout this analysis, we rely on the administrative data provided by the SBA on PPP loans as of September 30, 2022. These data include 11,484,457 loan records, with approved loans totaling over \$522 billion in 2020 and \$270 billion in 2021. These figures are smaller than those reported in the May 31, 2021, releases (the date of program completion), which were 11,823,594 loans and a total of \$799 billion of approved loans (US Small Business Administration, 2021a).⁷ The reduction in loans likely reflects that the fact that some PPP loans were cancelled, while other records were corrected. Like other administrative data sets, these data certainly still have errors, but the SBA worked to improve data quality as the program evolved. For example, early data included records without industry codes or without the number of employees. We use all

⁵The SUSB data are derived from the Census Bureau Business Register, which uses tax and other administrative records to track business entities with employees for the Census Bureau's economic surveys. SUSB data exclude nonemployer firms, along with information on private households, railroads, agricultural production, and most government entities. The 2019 SUSB data files (<https://www.census.gov/programs-surveys/susb/data/datasets.html>) were released on April 1, 2022.

⁶ Nonemployer data provide statistics obtained from business income tax records. The NES data (<https://www.census.gov/programs-surveys/nonemployer-statistics/data/tables.html>) we use were collected from 2018 and released on June 30, 2022.

⁷ https://www.sba.gov/sites/sbagov/files/2021-06/PPP_Report_Public_210531-508.pdf.

observations that are feasible despite the existence of clear errors to provide the most complete report of PPP loan recipients.

Table 1: Basic Data Description

	2020		2021	
	Number of loans	Average loan amount (\$)	Number of loans	Average loan amount (\$)
Full Data Set	5,155,987	101,419	6,328,470	42,822
Identified employers	4,394,608	113,923	2,408,215	89,020
Identified nonemployers	376,920	6,579	3,370,379	13,590
Missing NAICS code	219,132	43,943		
Agriculture (Employers)	120,337	65,547	151,582	33,783
Agriculture (Nonemployers)	28,382	6,833	377,205	12,750
Other excluded Employers	15,567	133,041	8,204	86,096
Other excluded Nonemployers	1,041	7,522	12,885	13,788

Sources: Authors' calculations, Small Business Administration.

Note: Employers excluded from SUSB include those in rail transportation or public administration. Nonemployers excluded from the NES include those in management of companies and public administration. Agriculture businesses are those with a 2-digit NAICS code of 11. We drop duplicate loans to businesses within each year and within each draw since the data are updated. We keep the observation for the highest loan amount for identified company duplicates, and we keep the most recent loan if the loan amounts are identical. We identify 862 duplicate loans in 2020 and 3,644 duplicate loans in 2021.

When the data are compared to census sources, we need to exclude three categories of loans. The first two categories include firms with no information on their industry, which occurs only in the 2020 data, and business categories excluded from the two Census Bureau sources. In addition, we exclude agriculture employers and nonemployers because the coverage of this sector is incomplete in both sources. We also exclude loans where the SUSB or the NES do not cover the specific industries: primarily, public administration.

We split the SBA records into employer and nonemployer records. This split is more difficult to identify in the PPP loan data than it would appear based on the SBA reports. Businesses list the number of “jobs reported,” but these data are often missing or equal to zero or one for businesses that are likely to have larger employment levels. The number of jobs reported by the business did not generally influence the loan amount they received; so the guidance on answering this specific question was limited. The organizational structure of a business is indicative of its being an employer or nonemployer, but exceptions appear to occur in most business structures and evolve over the program. For example, “self-employed individual” is a reported business type, but many loans of this type can list “jobs reported” above 1. In this example, other information suggests that businesses that are listed as “self-employed individuals” sometimes have employees.⁸ We used the legally binding borrowing threshold for nonemployers to assess which

⁸ For example, the SBA (2021b) provided guidance for loan amounts for “self-employed individuals” who have employees (<https://www.govinfo.gov/app/details/FR-2021-03-08/2021-04795>).

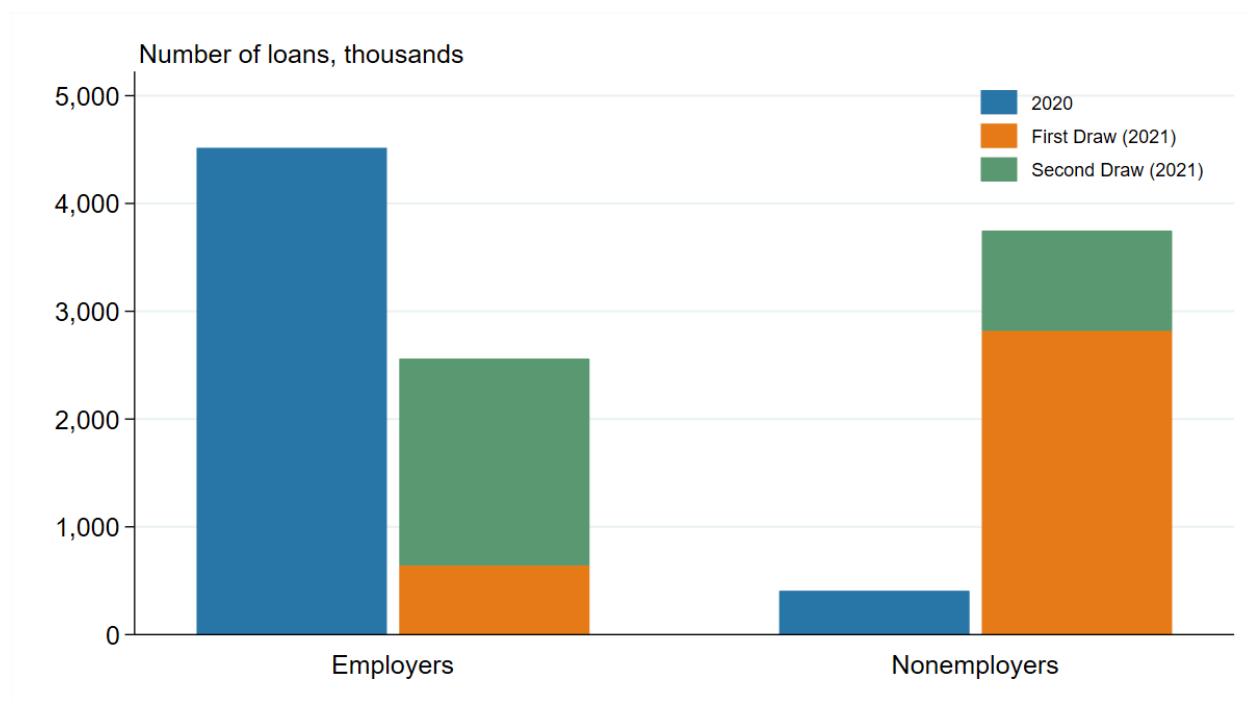
firms were likely to be nonemployers. See the appendix for the rules we identified to separate the data into employer and nonemployer sets.

Fact 1: The Paycheck Protection Program reached over 8 million small businesses in 2020 and 2021.

In 2021, businesses that had already received a PPP loan were allowed a “second draw” if they met revenue loss conditions. The availability of a second draw of PPP loans means that fewer businesses were served than the total count of loans: 11,484,457. Overall, we identified 2,854,995 second-draw loans.⁹ Of the second-draw loans, 1,916,808 went to businesses that we identify as employer firms, while 927,857 went to firms we identify as nonemployers. This implies that there were 5,157,934 unique employer firms and 3,225,029 unique nonemployer firms served by the 2020 and 2021 PPP loan program.

There was a large difference in the amount of funds received from the program by employer status. The average employer firm that borrowed from the PPP received \$103,371 in combined first- and second-draw loans, while nonemployer firms that borrowed received \$12,758 on average.

Figure 1: PPP Loans Split between Employers and Nonemployers



Sources: Authors’ calculations, Census Bureau, Small Business Administration.

Note: This figure includes agricultural workers and is based on our employer/nonemployer definition.

⁹ The SBA data use a variable named “processing method,” which refers to first- and second-draw loans in 2021.

Fact 2: The Paycheck Protection Program reached the vast majority of smaller employer businesses in most sectors of the economy.

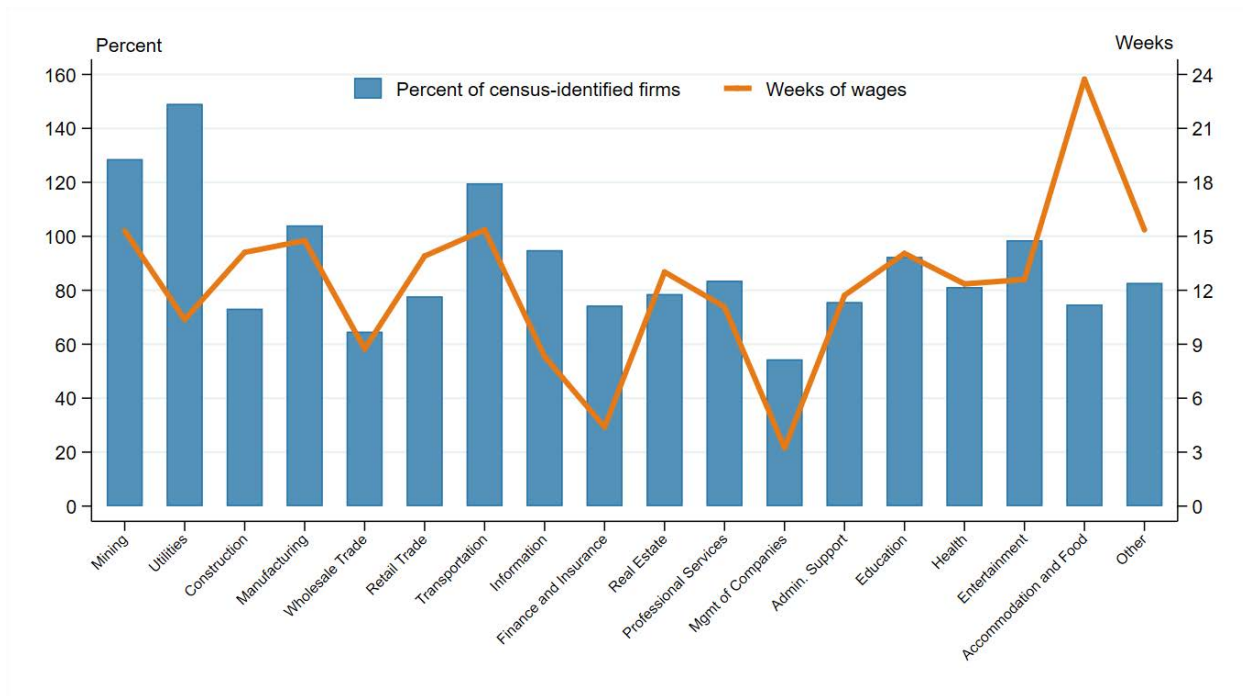
To clarify the fraction of businesses that received PPP loans, we need an accurate count of the number of smaller businesses by industry. We matched the industry reported to the SBA to the count of businesses with fewer than 500 employees from the Census Bureau's most recent (2019) count of employer businesses: the Statistics of US Businesses (SUSB).¹⁰ The SUSB is derived from tax and other official records; so it is the most accurate data on businesses available, but these data can only be treated as indicative of the number of qualifying firms by industry. For example, firms were asked to certify that they were impacted by the pandemic, and there are alternative size standards that allow businesses with more than 500 employees to be included. In addition, some firms may have closed or opened between the collection of census data and the date by which businesses needed to be in operation (February 15, 2020) for inclusion in the PPP. Finally, there may be an imperfect overlap between the firms that we identify as employers based on the SBA data and the census counts of employers.

Census Bureau data show that there were 6,101,473 nonagricultural firms with fewer than 500 employees in 2019 versus 4,950,562 PPP loans to businesses that we identified as (nonagricultural) employers, indicating that about 81 percent of small employer businesses in the United States received a PPP loan. The blue bars in Figure 2 show the number of businesses receiving a PPP loan as the percentage of the SUSB count for firms with fewer than 500 employees by broad industry categories (sectors). The results for most sectors indicate that about 80 percent as many firms received PPP funding relative to the number of SUSB-identified firms; however, some industries stand out. More employer businesses in the Mining, Utilities, Manufacturing, and Transportation sectors report receiving a loan than in the SUSB data counted in 2019. This could be due to several forms of inaccuracies in the SBA data, and some businesses in these sectors may have qualified through alternative size rules. These sectors typically have a relatively small number of small firms in the SUSB; so errors in the industry reported that were assigned to these sectors could disproportionately boost the ratio. Similarly, if some of these businesses were actually nonemployers, then these ratios would be elevated, but Mining, Utilities, and Manufacturing are sectors that have relatively high shares of employer firms, according to Census Bureau information. Finally, it is also likely that the program did allow some fraudulent loans to get through, and such loans could have made more frequently in these sectors.¹¹ Griffin, Kruger, and Mahajan (2023), using measures that may point to fraud, find that about 1.4 million out of the 11.5 million loans in their PPP data (12 percent) had at least one of these characteristics. That said, we have not tried to identify fraud in our analyses.

¹⁰ This follows the approach used in Schweitzer and Borawski (2021). The SUSB covers only part of the agricultural sector; so this section excludes SBA loans that were listed as going to agricultural firms.

¹¹ The specific amount in the PPP is unknowable, but the Department of Justice is pursuing cases (Office of Public Affairs, 2021). (<https://www.justice.gov/opa/pr/justice-department-takes-action-against-covid-19-fraud>)

Figure 2: PPP Coverage of Small (<500 employees) Employer Firms



Sources: Authors’ calculations, Census Bureau, Small Business Administration.

Note: The left-hand-side axis of the figure is loans in a sector as a percentage of SUBS firms with <500 employees. The right-hand-side axis is the estimated average weeks of industry payroll coverage for borrowing firms with <500 employees by sector. The overall estimated coverage (excluding agriculture) of census-identified firms is 81.3 percent of census-identified firms and covers 12.7 weeks of payroll wages.

To assess how large the loans were relative to the typical small business’s wage bills, we compare the aggregated loan amounts to the total amount of payroll reported in the SUBS. Overall, the combined 2020 and 2021 loans are equal to 12.7 weeks of payroll reported by nonagricultural SUBS businesses with fewer than 500 workers in 2019. That compares to the intended coverage of the 2019 PPP of two months of payroll plus 25 percent for certain other expenses, including mortgages, rent, and utilities, or roughly 10 weeks of payroll, with caps (\$10 million/firm) and other exclusions. The second-draw loans were in addition to the prior amount and were scaled to two and half months of average payroll costs with a cap at \$2 million. Our payroll coverage ratio also includes firms that did not receive a PPP loan.

The Accommodation and Food sector stands out in terms of dollars of support at 24 weeks of industry payroll. In this sector, firms with more than 500 employees but with smaller location-specific establishment sizes could apply for assistance. It was also one of the sectors most heavily impacted by the pandemic. This combination looks to have boosted the relative funds flowing to this sector.

On the low end of support, the Finance and Insurance, Real Estate, and Management of Companies sectors stand out. These sectors have higher levels of pay, where more pay levels are

above the \$100,000 individual payroll cap. Only the first \$100,000 of pay for any individual may be included in the firm's payroll. Even for these less supported sectors, the PPP still provided over three weeks of payroll for the entire sector (of firms with less than 500 employees), which at about 6 percent of the wage bill is still meaningful support.

Fact 3: The Paycheck Protection Program allowed businesses with more than 500 employees to borrow, but most loans went to businesses with fewer than 500 employees.

All firms with fewer than 500 employees qualified for the PPP, with some limited restrictions on firms with large affiliates and certain excluded entities. Second-draw loans were generally limited to firms with fewer than 300 employees, with an exception for the Accommodation and Food sector that put the limit on each physical location rather than the whole firm. However, businesses were also allowed to qualify under the SBA size standards based on their detailed industries. The size standards are available in the *Federal Register* by detailed industry (6-digit NAICS codes).¹² As examples, Underground Coal Mines and Direct Property and Casualty Insurance Carriers are considered small businesses in the SBA standards with employment levels up to 1,500 employees. Other industries can qualify as a small business based on a revenue cutoff. Television Broadcasting Stations and General Medical and Surgical Hospitals can qualify as small businesses if they have annual receipts of less than \$47 million. A business is allowed to apply under whichever is the more lenient standard. Unfortunately, the SBA data do not identify the standard under which the business qualified.

To get a sense of the relevance of the different size standards, we merged the loan data with the alternative size rules by industry. Most firms in any of these industries are likely to be smaller than the cutoff, but it is one way to examine the extent to which alternative size categories based on detailed industries were active in the program.

¹² We use the small business size regulation standards from January 14, 2021, which can be accessed at <https://www.ecfr.gov/on/2021-01-14/title-13/chapter-I/part-121>.

Table 2: Lending Patterns by Alternative Size Standard Categories

	Standards	Percent of Total Loans	Percent of Total Loan Amount	Average Loan Amount (\$)	95th Percentile of Loan Amount (\$)	Percent of Loans Greater Than \$2 Million
Number of employees	≤500 Employees	6.9	12.4	185,167	810,467	1.2
	750 Employees	1.0	2.3	238,899	1,028,147	1.9
	1000 Employees	1.2	2.6	226,178	981,170	2
	1250 Employees	0.6	1.6	260,926	1,132,515	2.3
	1500 Employees	0.5	0.8	178,753	694,875	1.5
Revenues (millions of dollars)	1-8 million	34.5	19.0	56,999	189,520	0.1
	12-19.5 million	25.4	28.7	116,611	450,000	0.7
	22-34.5 million	12.7	13.3	107,659	423,400	0.7
	35-40.5 million	6.4	7.2	116,759	457,213	0.7
	41.5 million	2.8	3.8	142,135	559,459	1.2
	Accommodation and Food	8.0	8.3	107,083	334,400	0.5

Sources: Authors' calculations, Small Business Administration.

Note: The “standards” column uses the SBA alternative size standard provided by 3-digit industry codes. The table aggregates employer borrowers (including agriculture) based on their identified industry. For example, the column “percent of loans greater than \$2 million” is the percentage of loans made to firms in industries included in that specific standard that are greater than \$2 million.

Key outcomes that could be different for industry categories with alternative size rules are the average loan amounts, the 95th percentiles' loan amount, and the frequency of loans above \$2 million. For the businesses in industries with exceptions that allow for specific numbers of employees above 500, the average loan amounts and the 95th percentile loan amounts tend to be higher. The one exception is for industries allowing 1,500 employees (largely certain manufacturing industries and telecommunications carriers), which typically have lower loan amounts.

We also consider the frequency of large loans, which we define as loans of \$2 million or higher. A relatively low-wage employer (average pay per employee of \$20,800 per year) with 500 employees could qualify for a loan of just a little over \$200,000. For comparison, the average pay per year in Accommodation and Food businesses (with employment of between 500 and 749) is \$20,978 according to the SUSB data. Most other large sectors pay more, but this threshold provides a cautious estimate of the potential number of loans made to employers with more than 500 employees. The industries with employment size standards above 500 employees do have higher rates of loans above \$2 million. That said, these employment size exceptions represent 3.3 percent of all loans, and the vast majority of loans in industries covered by these exceptions are similar in size to what we see for businesses that should have been constrained to 500 employees.

A larger category, covering over 80 percent of loans, are businesses with an alternative size standard based on revenue. Depending on the average wage rates and costs of other inputs, some

of these caps were large enough to potentially allow more than 500 employees, but average and large loan levels are all lower in these categories than seen in the group constrained to 500 or fewer employees.

Returning to loans above \$2 million, the SBA data show a few key detailed industries with the highest rates of receiving large loans. The frequency of large loans in certain industries reflects the possibility of both larger and higher-wage firms. The top five industries for large loans are Offices of Physicians, New Car Dealers, Limited-Service Restaurants, Full-Service Restaurants, and Offices of Lawyers.

There is no definitive way to show that businesses with more than 500 employees received loans, but they could have qualified and there are PPP loans large enough to covered firms with more than 500 employees. Nonetheless, overall, the majority of PPP loans are quite similar in size to loans made to industries where 500 employees should have been the relevant cutoff.

Fact 4: The Paycheck Protection Program was initially focused on employers, but ultimately reached many nonemployer businesses of all types.

Despite the focus on maintaining payrolls, the PPP loan program also supported many nonemployer businesses. By our estimate, 3,747,299 of 11,484,457 loans went to nonemployers.¹³ Loans to nonemployers tend to be smaller on average: \$12,884 per nonemployer loan versus \$105,107 for each employer loan. While attention is typically focused on small businesses that employ others, nonemployers considerably outnumber small employers: 26,848,652 versus 6,101,473 according to census statistics.

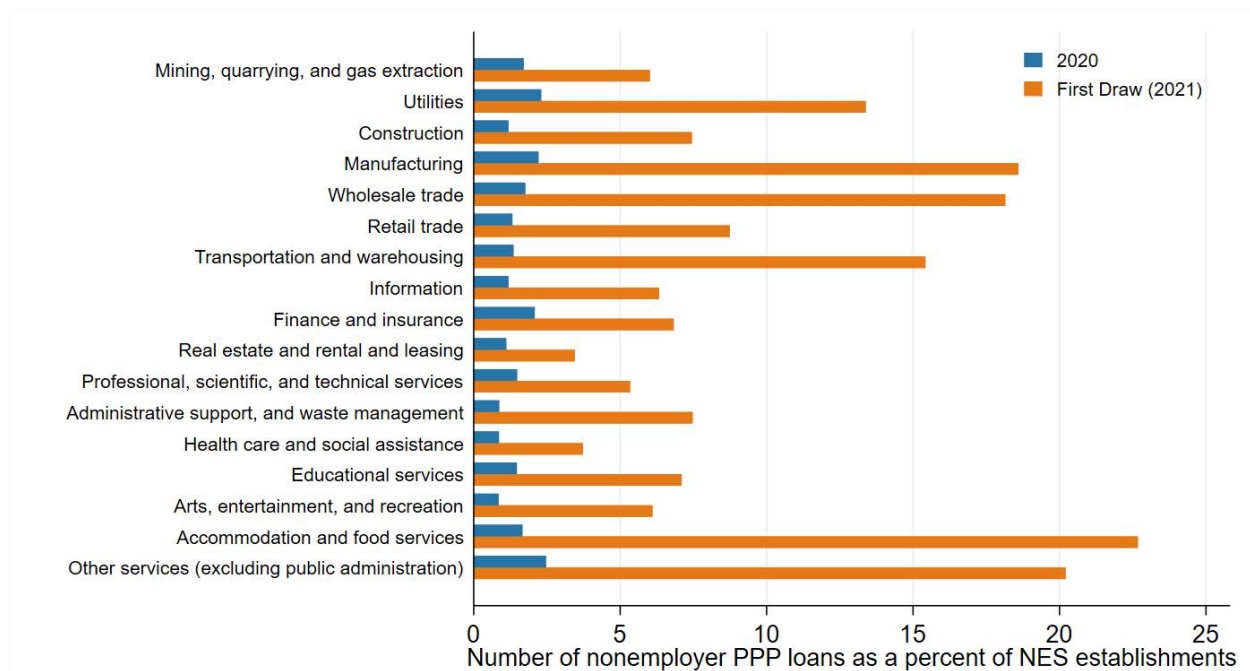
PPP loans to nonemployers increased sharply in the 2021 program after rule changes and clarifications made it more attractive and available to nonemployers. In particular, an SBA rule change on March 3, 2021, allowed independent contractors and proprietors to use “gross income” in place of “net profits,” a change that likely boosted the loan qualifications and amounts for nonemployers.¹⁴ This rule change also removed eligibility restrictions for felonies that did not involve financial fraud and late student loan payments.

To examine what fraction of nonemployer businesses received PPP loans, we compare the Census Bureau’s Nonemployer Statistics (NES) by industry from 2019. These data are the most comprehensive nonemployer data available and are sourced primarily from the tax filings of individuals who claim business income. Overall, about 1 percent of nonemployers received a PPP in 2020, with another 9 percent receiving a first-draw loan in 2021. To avoid double-counting entities, we exclude second-draw loans. Figure 3 highlights the widespread use of PPP loans among nonemployers and the sharp rise in that coverage from 2020 to 2021, across all sectors.

¹³ These figures exclude the Management of Companies and Public Administration sectors, along with loans with no industry code. We also exclude agricultural nonemployers in this part of the analysis. Loans listed as going to this industry are hard to reconcile with the underlying census data.

¹⁴ See more at <https://www.govinfo.gov/app/details/FR-2020-04-20/2020-08257> (SBA, 2020).

Figure 3: Loans to Unique Nonemployer Businesses



Sources: Authors’ calculations, Census Bureau, Small Business Administration.

Note: The bars are calculated by dividing the number of PPP loans for companies that we identify as nonemployers by the count of NES nonemployer establishments by sector from 2019.

Lending rates are particularly high for Accommodation and Food Services, which is a sector with relatively few nonemployer firms (just 4.2 percent of all unique nonemployer businesses are in this sector). Manufacturing and Wholesale Trade also stand out for having high rates of coverage (5.3 percent of all nonemployer businesses). But again, there are relatively few nonemployer businesses in this industry category.

The majority of PPP loans to nonemployers were in the “Other Services” sector (22.4 percent of unique nonemployer loans), which is also the category with the largest number of nonemployer businesses in the NES. Within the “Other Services” sector, many of the loans were to businesses that provided personal care services, in particular, beauty salons (42 percent of nonemployer loans in “Other Services”), barber shops (13 percent), and nail salons (7 percent). These services require close contact with customers, increasing the need for financial assistance during the onset of the COVID-19 pandemic. Other detailed industries within the “Other Services” sector include automotive services such as automotive repair and car washes, which were also impacted by the pandemic through the reduced use of vehicles.

Loans to nonemployers in the Wholesale Trade sector were primarily made to wholesale trade agents and brokers (22 percent of nonemployers in Wholesale Trade). The majority of loans to nonemployers within the Transportation sector went to taxi drivers (35 percent), which may be

the category where many gig economy workers locate themselves when asked to provide an industry. The pandemic certainly boosted stay-at-home orders for goods and services, but also led to a decrease in demand for ride-sharing services. Among nonemployers that received PPP loans in the Accommodation and Food Services sector, the majority of nonemployers were specifically in caterers (39 percent), mobile food services (17 percent), and food service contractors (14 percent). This also points to how the travel industry was impacted by COVID-19, as nonemployers in the traveler accommodations, hotels, and motels industry received PPP loans; nonemployers could be local individuals who rent out their homes to travelers.

The amount of loans provided to nonemployers in the Manufacturing sector stands out, given that manufacturers are not typically nonemployers. There were an unusually large number of nonemployer businesses in the “Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing” industry. Given the small number of manufacturers in this category nationwide, this is probably a sign of frequent misclassification on the part of small lawn-care service providers. The other prominent categories of manufacturing (retail bakeries and apparel and jewelry manufacturing) are more consistent with small artisanal producers.

While there are certainly some idiosyncrasies in the nonemployer companies that received PPP loans, most of the nonemployer PPP loan shares are consistent with the program’s 2021 intent to include many self-employed entrepreneurs.

Fact 5: The Paycheck Protection Program focused loans on low- and moderate-income neighborhoods, particularly in 2021.

Assessing how well PPP loans reached low- and moderate-income (LMI) communities has been a focus since the start of the program. The SBA has provided a simple summary of loans to LMI communities and an LMI indicator variable that equals “Yes” if the loan falls within a low- and moderate-income tract in recent PPP loan data. For 2021, the SBA indicates that 31.2 percent of PPP loans were made to low- and moderate-income tracts. Unfortunately, the SBA does not split out low-income from moderate-income communities; so we completed our own geocoding of PPP loans, which shows that 32.7 percent of the PPP loans went to low- and moderate-income communities in 2021.¹⁵

With our geocoding, we were able to identify the census tracts for 5,103,231 (99 percent of all 2020 loans) PPP loans in 2020 and 6,116,257 (96.7 percent of all 2021 loans) PPP loans in 2021. In this section, we include both nonemployers and employers in our analysis and do not omit observations with missing NAICS codes.

To examine the distribution of PPP to low- and moderate-income communities in comparison to pre-pandemic trends, we use both population data from the ACS and small business data from the Federal Financial Institutions Examination Council (FFIEC) in 2019.¹⁶ The share of PPP loans that went to low- and moderate-income communities is similar to the population share, as

¹⁵ See the appendix for more information on the SBA’s and our geocoding results.

¹⁶ We obtained the FFIEC data from <https://www.ffiec.gov/hmcpr/cra20tables1-5.pdf> (Table 4.1).

the share of PPP loans that went to low-income (moderate-income) tracts is 0.9 (0.2) percentage points greater than (less than) the population share.¹⁷ On the other hand, the share of businesses is smaller than the share of the population in low- and moderate-income communities; so the share of PPP loans going to these communities is even higher than the share of businesses themselves. Finally, low- and moderate-income locations typically receive a smaller share of businesses loans, as measured by the location of small loans to businesses. In comparison to this measure of traditional small business lending activities, the PPP program was substantially more focused on low- and moderate-income communities.

Table 4: Comparing Shares across Census Tract Income Levels

Census tract income level	Share of PPP loans (percent)	Share of population (percent)	Share of businesses (percent)	Pre-pandemic share of small loans to businesses (percent)
Low	7.4	6.5	5.2	4.6
Moderate	21.2	21.4	17.9	17.2
Middle	40.3	43	37.7	37.7
Upper	31.1	29	39.2	40.5

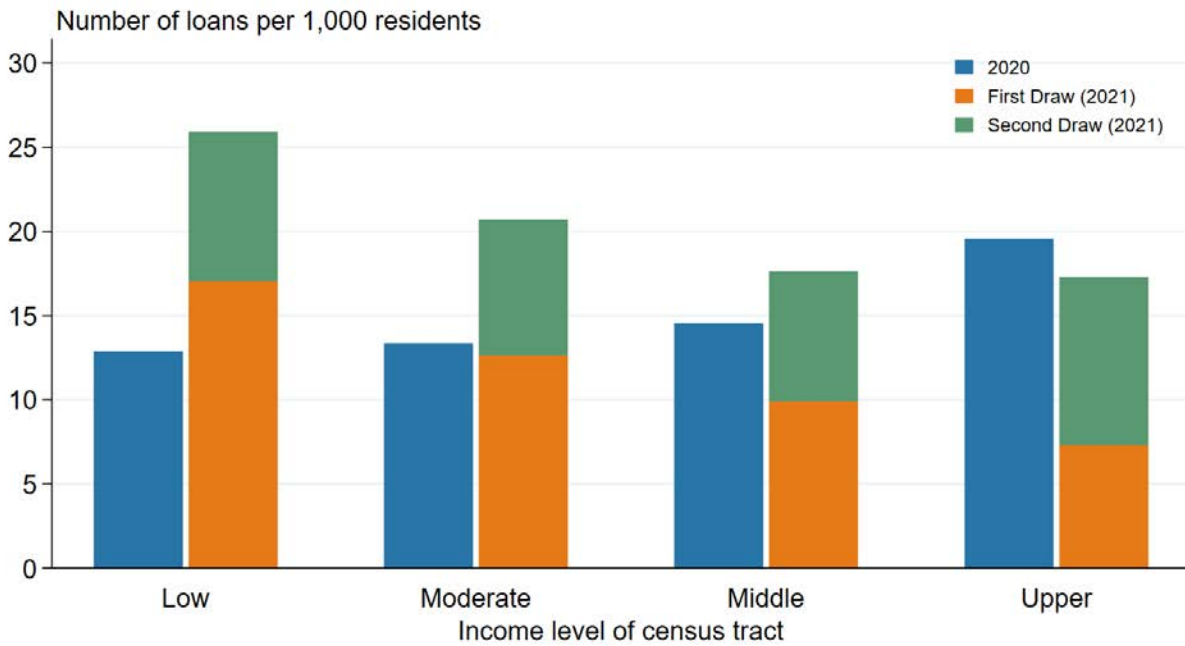
Sources: Authors' calculations, Census Bureau, Federal Financial Institutions Examinations Council, Small Business Administration.

Note: We calculate the share of businesses by tract income level using the FFIEC 2019 report, excluding the total for businesses for which the tract is not known or if the income for the tract is not reported. The share of PPP loans is the combined share of 2020 and 2021 loans. The pre-pandemic share of small loans to businesses refers to the share of businesses with revenues less than \$1 million that received loans in 2019.

Since some income tracts are not uniform by population size, we also calculate the number of PPP loans per 1,000 residents, as shown in Figure 4. Loans in 2020 favored upper-income communities relative to their population. Combining first- and second-draw loans, the 2021 program year substantially favored low-income communities for loans. As shown in Figure 4, low-income tracts received more than twice the number of loans per 1,000 in 2021 compared to 2020. This occurred despite the fact that upper-income communities still received a high share of second-draw loans in 2021. Offsetting this was strong growth in first-draw loans in low-income tracts in 2021: There were about 17 PPP loans per 1,000 residents in low-income tracts, compared to 12.9 PPP loans per 1,000 residents in low-income tracts in 2020.

¹⁷ These results are from Borawski and Schweitzer (2021).

Figure 4: Loans by Income Level of the Census Tract



Sources: Authors' calculations, Census Bureau, Small Business Administration.

Note: The number of loans per 1,000 residents is calculated by dividing the number of geocoded loans by the ACS tract-level population for each of the four income categories.

Fact 6: The 2021 Paycheck Protection Program reached minority communities better than the 2020 version.

Research on the distribution of PPP loans focused on the specific race or ethnicity of the employer/business owner is hampered by the fact that most (79 percent) PPP loans include no information on the race or ethnicity of the owner. Prior research has used location and business characteristics to predict the race/ethnicity of the owner.¹⁸ Rather than trying to infer the race/ethnicity of the owner, we focus on the known census tract information based on the business's provided location to identify communities by the racial and ethnic majority of residents. On average, 4,475 residents are within each census tract.

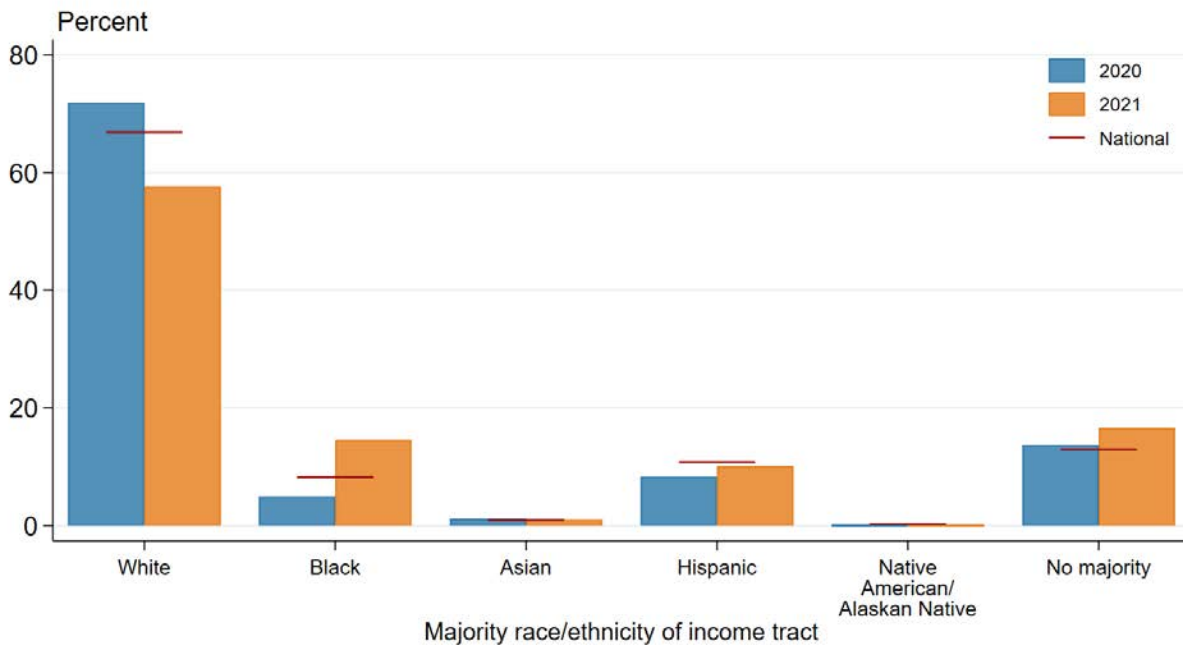
In our analysis, we code tracts with a Hispanic population of more than 50 percent as Hispanic-majority tracts regardless of the racial majority of the census tract. As for census tracts that do not have a Hispanic majority, we define the racial majority of a tract if at least 50 percent of the

¹⁸ Chernenko and Scharfstein (2022) use restaurant data from Yelp to identify minority-owned businesses that received PPP loans in Florida. Lester and Wilson (2023) use geocoded PPP loan data to assess whether minority census tracts and places that received fewer mortgages were less likely to receive PPP loans. Similar to our results they find lower PPP loan counts and lending amounts for Black and Latinx communities in 2020 data, although conditions improve for Black-majority communities in 2021.

population is a given race (white, Black, Asian, or Native American) and non-Hispanic. See Appendix Section A3 for additional details on defining racial and ethnic majorities.

In 2020, 72,853 census tracts received at least one PPP loan, which represents over 99 percent of all census tracts. Most of these tracts are predominantly one race or ethnic group, while 12.9 percent of census tracts have no racial majority.

Figure 5: Share of PPP Loans by Racial or Ethnic Majority of Census Tract

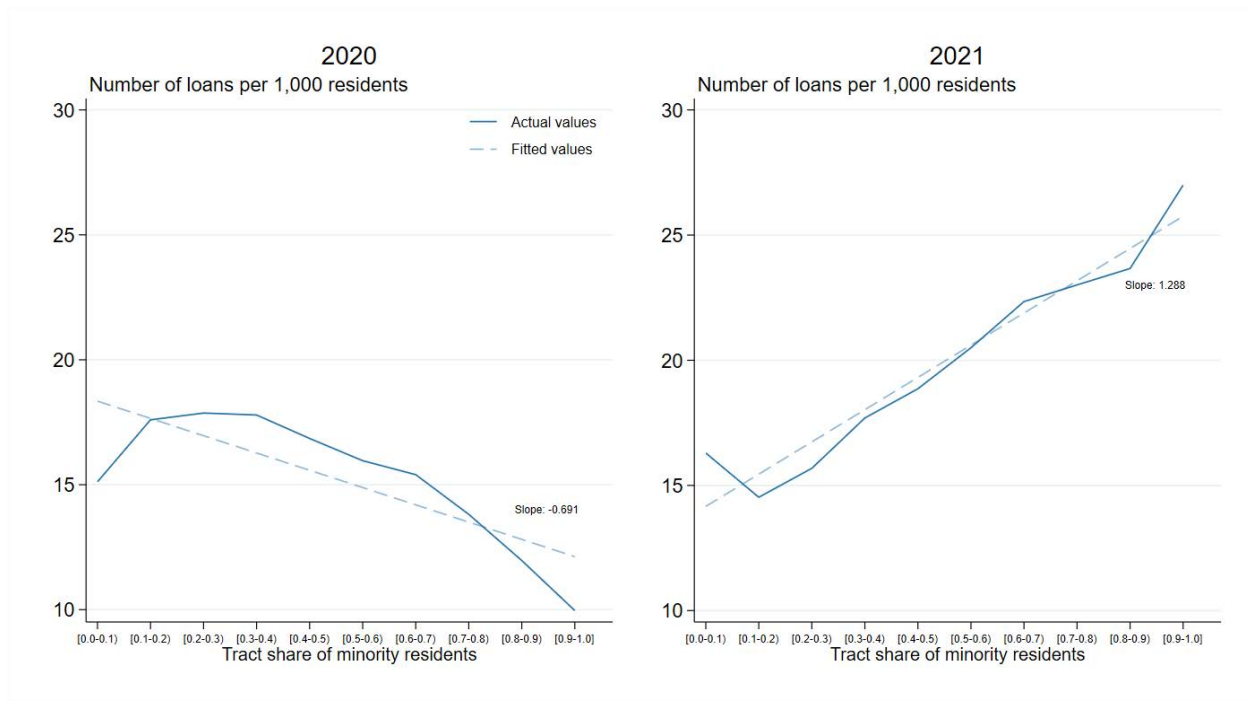


Sources: Authors' calculations, Census Bureau, Small Business Administration.

Note: The red lines are the proportion of tracts by majority race out of all census tracts in the ACS sample. The bars are composed of the percentage of loans distributed to census tracts by majority race/ethnicity for the 2020 and 2021 programs.

The distribution of loans across census tracts is largely in line across racial and ethnic majorities, but there are some substantial differences in 2020 and 2021. As shown in Figure 5, the majority (66.9 percent) of census tracts in the United States have a racial majority of white, non-Hispanic residents. A high percentage of the initial share of the 2020 PPP loans went to businesses located in census tracts that have a majority of white residents (72 percent), while Black- and Hispanic-majority tracts received a relatively smaller share of loans of 5 and 8 percent, respectively, notably below the share of Black- and Hispanic-majority tracts. That said, the distribution of PPP loans dramatically shifted toward non-white-majority census tracts in 2021. Black-majority census tracts received a higher percent share of loans of 14.6 percent in 2021, well above the share of Black-majority census tracts in the United States of 8.2 percent. Similarly, census tracts with no racial majority received 16.6 percent of loans in 2021, compared to the share of tracts with no racial majority of 12.9 percent.

Figure 6: Reach of PPP Loans into Communities by Minority Share



Sources: Authors' calculations, Census Bureau, Small Business Administration.

Note: The number of loans received is based on geocoding into census tracts. The tract share of minority residents is binned into deciles.

While Figure 5 focuses on communities with clear majority populations, businesses likely reflect the overall composition of a community, which might be more mixed. To further highlight the shift in loans to reach minority businesses, Figure 6 shows the number of loans per 1,000 residents by the diversity of the census tract, as measured by the share of the population that is other than white/non-Hispanic. The 2020 figure (on the left) shows that places that are less white/non-Hispanic tended to have lower average lending rates per 1,000 residents: The average slope over the minority share of the tract is -0.69 . The one exception is that nearly all white tracts (minority share between 0 and 10 percent) had a lower amount of loans per 1,000 than tracts with less than a 70 percent minority share. The 2021 program loans (shown in the right panel) shifted dramatically to have higher lending rates per 1,000 residents in tracts with higher minority shares. The slope across minority share in the right panel is positive and more than twice as steep. Combining all loans from both years still results in a pattern that gradually rises as the share of minorities in a community increases, which is consistent with the lending program's intent to better reach historically disadvantaged communities on average.

Fact 7: Fintech lenders were far more prevalent in the 2021 Paycheck Protection Program loans.

One key difference in the 2021 implementation of the PPP was the entry of several financial technology (fintech) lenders. Fintech lenders are nonbank lenders that rely on a technology platform to originate loans. Many loans were used as collateral in the Federal Reserve’s Paycheck Protection Program Liquidity Facility (PPPLF), which allowed both banks and nonbanks to borrow at attractive terms. We use this process to identify whether the lender was a bank, a fintech, a community development financial institution (CDFI), or a small business lending fund (SBLF). We matched lender types from the PPPLF entity lists with the PPP data.¹⁹ Fintechs differ from traditional lending institutions such as banks, since they are primarily characterized by unique customer-lender interactions and the use of technology to screen and monitor lenders (Berg, Fuster, and Puri, 2021). CDFIs are entities designated by the Treasury Department as serving underserved communities. SBLFs were previously recognized nonbank SBA lenders.

These distinctions, while consequential in lending patterns, are often blurred in the data. Certain banks, CDFIs, and SBLFs partnered with fintechs so that almost all of their lending was produced by one of the major fintechs. A *New York Times* article²⁰ highlighted the scope of two large fintech lenders and their partners (Cowley and Koeze, 2021). To account for partnerships like this we treat banks, CDFIs and SBLFs that reported working with fintechs as fintechs. The details of our identification of PPP loans from fintechs are provided in Appendix Section A4.

Griffin, Kruger, and Mahajan (2023) used a variety of information, including nonregistered businesses, multiple businesses at residential addresses, and abnormally high implied compensation per employee, to identify potential fraud in PPP applications. They argue that fintech lenders were unusually prominent in cases of potential fraud. More recently, a report by the House Select Subcommittee on the Corona Virus (2022) has identified an alarming array of weak controls and likely fraud in fintech lenders.²¹ While we do not have any additional information on fraud to include in this analysis, we do want to identify the other implications of fintech lenders.

As shown in Table 5, a large majority of loans in 2020 were lent out by banks (84.8 percent of 2020 loans), while only 53.4 percent of loans in 2021 were from banks. While bank lenders still originated the majority of loans in 2021 overall, the growing role of fintech-supported loans is particularly evident in the increased proportion of first-draw loans in 2021. First-draw loans could not have had a 2020 loan; so these are all new customers. Second-draw loans imply either a prior 2020 or 2021 loan. Businesses returning to a prior lender for second-draw loans (which was not required) would likely make these originations more reflective of the lending patterns of 2020.

¹⁹ The PPPLF data can be accessed at <https://www.federalreserve.gov/monetarypolicy/ppplf.htm>.

²⁰ “How Two Start-Ups Reaped Billions in Fees on Small Business Relief Loans,” October 2021. <https://www.nytimes.com/2021/06/27/business/ppp-relief-loans-blueacorn-womply.html?smid=url-share>

²¹ See <https://coronavirus-democrats-oversight.house.gov/sites/democrats.coronavirus.house.gov/files/2022.12.01%20How%20Fintechs%20Facilitated%20Fraud%20in%20the%20Paycheck%20Protection%20Program.pdf> for more information.

Table 5: Loans by Lender Type

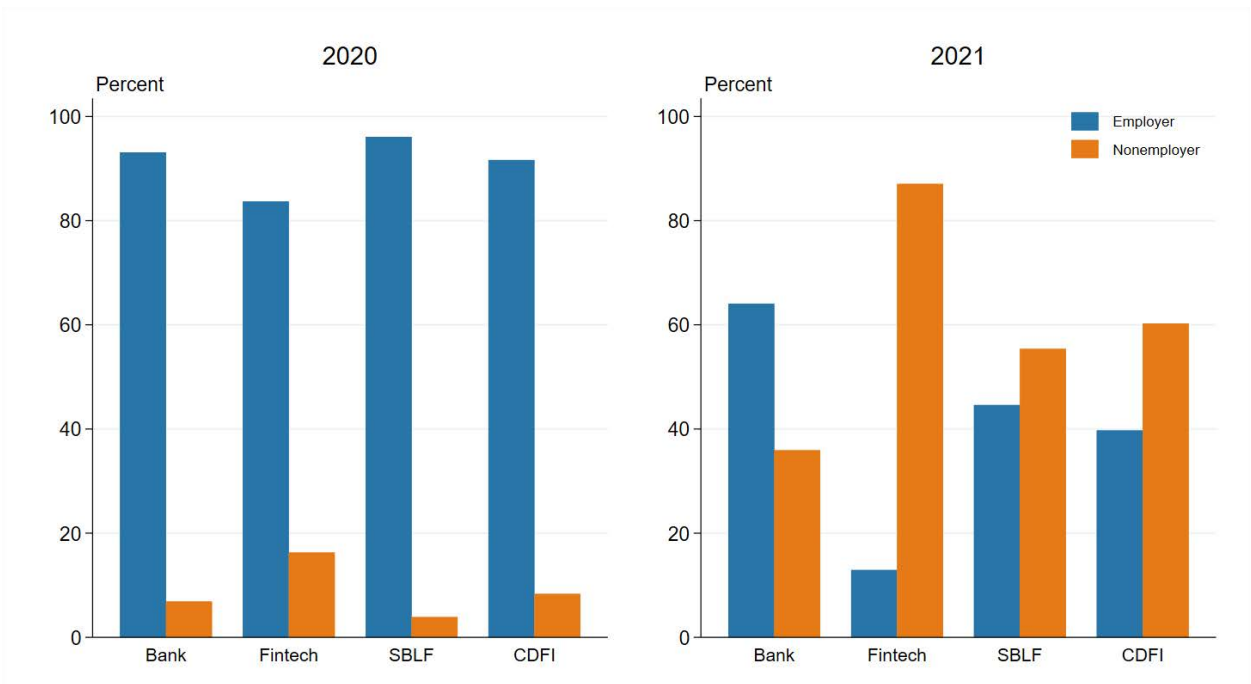
Lender Type	2020 share of PPP loans (percent)	2021 share of PPP loans (percent)	First Draw share of PPP loans (percent)	Second Draw share of PPP loans (percent)
Bank	84.8	53.4	38.2	71.9
Fintech	14.6	45.4	60.6	26.8
SBLF	0.2	0.4	0.4	0.3
CDFI	0.5	0.9	0.8	0.9

Sources: Authors' calculations, Small Business Administration.

Note: Percentages may not add up to 100 due to rounding. The first- and second-draw columns refer to the first and second draws of 2021 PPP loans.

Provided that fintech lenders assumed a large role in the PPP in 2021, fintechs reached many small businesses and especially nonemployers. An important shift underlying the expansion of fintech lenders is the extension of PPP loans to many more nonemployers, as shown in Figure 3. Figure 7 focuses on the share of loans going to employer firms versus nonemployers by lender type. In 2021, Figure 7 shows that about 87 percent of loans distributed by fintechs were to nonemployers, of which the majority were sole proprietorships. This fact is consistent with how fintechs were able to reach smaller businesses in the 2021 PPP through their unique lender-borrower relationships and easy use of technology. In contrast, only 36 percent of loans financed by traditional banks went to nonemployers in 2021. While more loans were provided to nonemployers regardless of the type of lending institution in 2021, fintech lenders had the greatest focus on financing loans for nonemployers in 2021, followed by CDFIs.

Figure 7: Employer versus Nonemployer Share of Loans by Lending Channel in 2020 and 2021



Sources: Authors’ calculations, Small Business Administration.

Note: Percent refers to the percent of total loans financed to employers and nonemployers by fintechs, banks, SBLFs, and CDFIs.

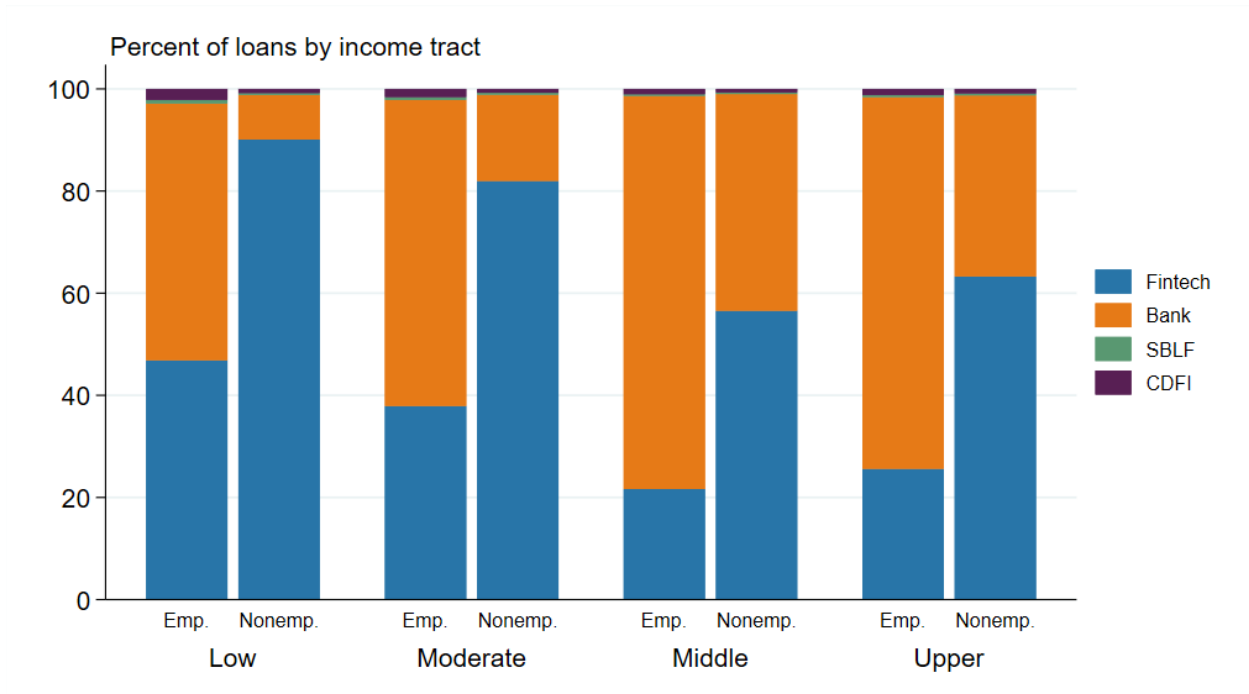
As shown by Barkley and Schweitzer (2021), the increase in fintech lenders has tended to expand credit for borrowers who are often underserved by traditional lenders. In the context of the 2021 PPP, fintech lenders had a significant role in the increased provision of smaller loans to nonemployers that may not often receive loans from banks.

Fact 8: Fintech lenders focused on nonemployers and particularly reached low- and moderate-income communities in 2021.

Not only did fintech lenders reach an increased number of nonemployer borrowers in the 2021 PPP, but they also extended more loans to individuals in low- and moderate-income tracts.

Employer loans were still provided by banks in a majority of cases. As shown in Figure 8, 50percent of loans to employers were from banks versus 47 percent were provided by fintechs in low-income tracts. Nonemployer loans were more likely to be provided by fintechs in all communities, but fintech lending was highest in lower-income tracts: More than 80 percent of loans to nonemployers in both low- and moderate-income tracts were originated by fintechs and their partners.

Figure 8: Lenders by Income Tract in First-Draw Loans of 2021

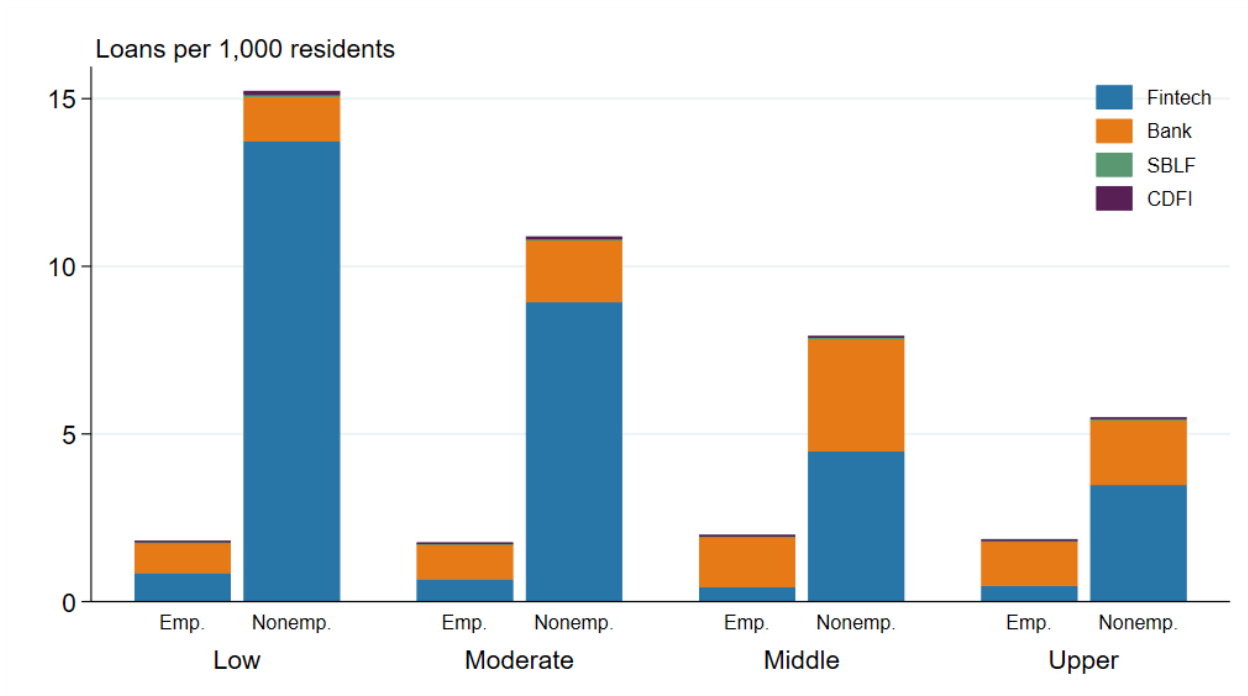


Sources: Authors' calculations, Census Bureau, Small Business Administration.

Note: This figure depicts geocoded observations of the first draw of loans in 2021.

Figure 9 shows the number of loans per 1,000 residents in each census tract in the first draw of the 2021 PPP. Overall, there were fewer than 2 loans per 1,000 residents for employers in census tracts of all income levels. In contrast, there is a clear pattern when examining the loan-to-resident ratio for nonemployers. The number of loans financed by banks per 1,000 residents to nonemployers across census tracts remains relatively consistent at 2 to 3 loans per 1,000 residents. On the other hand, fintechs reached nonemployers in low- and moderate-income tracts at 13.7 and 8.9 loans per 1,000 residents, respectively.

Figure 9: Loans per 1,000 Residents in the First Draw of 2021



Sources: Authors' calculations, Census Bureau, Small Business Administration.

Note: The number of loans per 1,000 residents is calculated by dividing the number of geocoded loans by the ACS tract-level population for each of the four income categories.

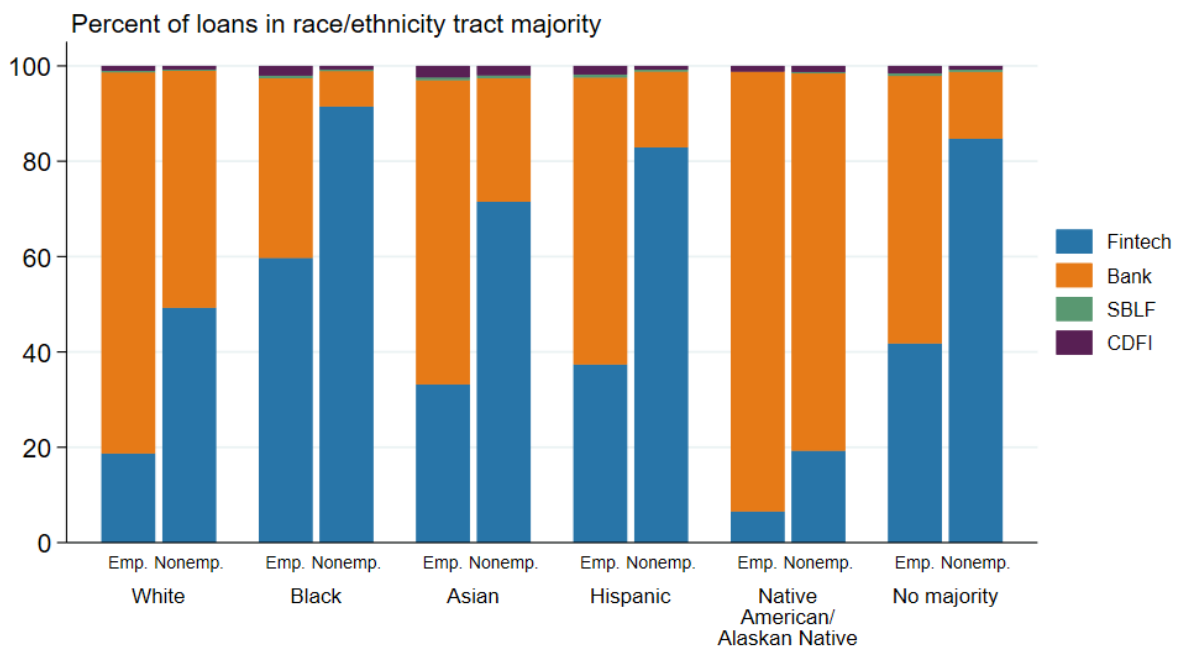
Throughout this analysis we focus on loan numbers rather than values to show whether small businesses were reached regardless of their size. Including the loan amount focuses the comparisons on larger, more established small businesses, which are likely to be more prevalent in higher-income communities. While the number of employer bank loans per 1,000 residents remains relatively steady across income levels in the first draw of the 2021 program, banks generally provided larger dollar amounts of employer loans per 1,000 residents relative to fintechs: it ranges across community income levels from \$49,000 to \$63,000 for banks versus \$12,000 to \$22,000 for fintech-originated loans. This pattern parallels the tendency for banks finance larger employer firms, while fintechs primarily focused on financing nonemployer firms.

Fact 9: Fintech lenders' focus on nonemployers made them particularly important in many minority communities in 2021.

The increase of PPP loans provided to minority census tracts may be attributed to differences in lender types. Previous research has found that Black-owned firms are more likely to borrow from fintech lenders relative to traditional banks, especially in areas with relatively higher levels of racial bias (Howell, et al., 2022; Chernenko and Scharfstein, 2022). Focusing just on 2020 loans, Battisto, Godin, Kramer Mills, Sarkar (2021) noted that fintechs financed a substantially higher share loans to-Black-owned businesses relative to White-, Asian-, and Hispanic-owned firms. Overall, in 2021, we find that more than 80 percent of loans to majority-Black census tracts were from fintechs. Fintech loans also comprised around 60 percent of total loans in both Hispanic-majority tracts and tracts with no racial majority.

In Figure 10, we focus on first-draw loans in 2021 and find that the proportion of loans from banks to nonemployers for all majority race/ethnicity tracts was relatively lower than those to employers in each respective majority group. The role of fintech lenders in expanding the reach of PPP loans in 2021 becomes more apparent when looking at the distribution of loans to nonemployers in racial majority tracts, especially in first-draw loans. Furthermore, we find that most loans to nonemployers in minority-majority tracts in the first draw of 2021 were from fintech lenders, except for Native American/Alaska Native majority tracts.

Figure 10: Distribution of Loans by Lender, Nonemployer, and Majority Race/Ethnicity in 2021 First Draw

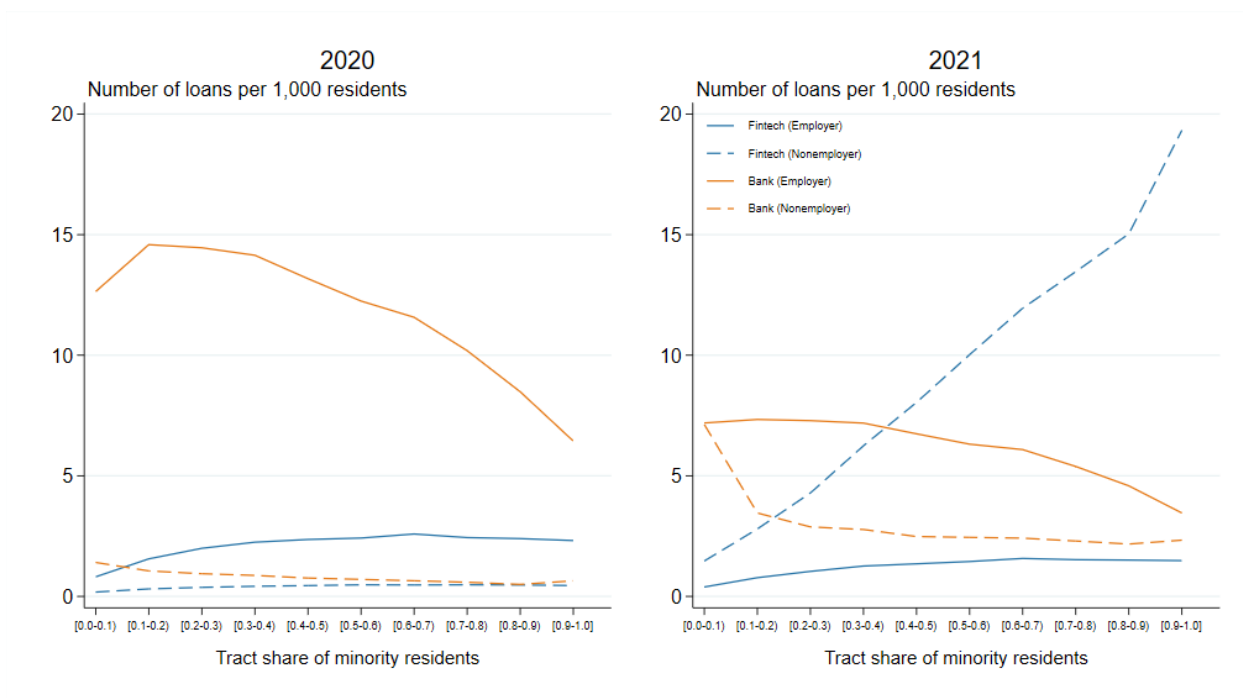


Sources: Authors' calculations, Census Bureau, Small Business Administration.

Note: We separate majority-Hispanic places from racial majority census tracts. The racial category consists of loans to census tracts with a non-Hispanic racial majority.

Notably, loans from fintechs comprised more than 70 percent of the total loans distributed to nonemployers in majority Black, Asian, Hispanic, and no majority census tracts. This fact re-emphasizes how fintechs extended the reach of lending to minority communities in the 2021 PPP. While the percentage of loans to nonemployers in majority-Black, Asian, Hispanic, and no majority census tracts was substantial, less than 20 percent of nonemployers in majority Native American/Alaska Native census tracts had loans financed by fintechs.

Figure 11: Relationship between the Tract Share of Minority Residents and Number of Loans



Sources: Authors’ calculations, Census Bureau, Small Business Administration.

Note: The x-axis is binned. The minority share is the share of non-white or Hispanic population relative to the total population.

To better examine which lenders provided PPP loans in minority communities, we examine the number of loans per 1,000 residents by the share of minority (non-white, non-Hispanic) residents at the census-tract level in Figure 11. Fairlie and Fossen (2022a) show that banks lent more to whiter areas at the zip code level, but we are able to extend their results to show that lending patterns depend on both the source of the loan and the type of small business. Overall, a community having a larger share of minority residents in census tracts is negatively correlated with PPP loans per 1,000 residents, although this mostly reflects bank borrower patterns in 2020. Bank lending to employer firms was much less correlated with the minority share in the census tract. Fintech lending rises with minority share for both employer and nonemployer loans in 2020 and 2021. That said, the pattern is particularly evident in nonemployer loans originated by fintechs in 2021. Without that strong positive correlation between fintech loans and minority share, the overall equality of the program would have been questionable, as the strong pattern from bank-originated loans in 2020 would not have had a strong offsetting effect.

Conclusion

The PPP had an unprecedented reach to small businesses throughout the US, but it evolved substantially between 2020 and 2021. Changes in lending patterns are associated with the expansion of lending by fintechs and due to policy choices that expanded program eligibility to many more nonemployers. The extensive reach and changing requirements of the PPP that we document are likely to make causal assessments of the impacts of the Paycheck Protection

Program difficult. Identifying nontreated comparison groups of businesses will be difficult, since the reasons why businesses were excluded or did not apply are also likely to make those businesses atypical. In addition, businesses that did not receive PPP loans may have received direct or indirect assistance from other programs that were co-timed with the Paycheck Protection Program.

While an assessment of the efficacy of the program will be difficult, the program provided wide-reaching, timely fiscal support to businesses in a very challenging recession. Given that many economic downturns affect small businesses negatively, this type of program may receive consideration in future recessions. Importantly, after initial data appeared to show biases in lending, the program was modified and had strong reach to both low-income and majority-minority communities. It also effectively reached most industries, with some variation that reflected intended policy outcomes: lending limits for high-earning employees and more inclusive definitions of small businesses, particularly in the Accommodation and Food Services sector. There has been evidence of fraud in the program that deserves follow-up, but we find that the program provided significant support to the majority of employer small businesses, and a large number of nonemployer small businesses, in a timely and reasonably equitable manner.

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Appendices

Section A1: Defining Nonemployers

The 2020 and 2021 SBA data sets differ in a couple of ways in regard to the cleanliness of the data. In 2020, many applicants reported more than one job when identifying as a sole proprietorship, self-employed individual, or individual contractor. Furthermore, applicants in 2020 have a lot of missing observations for jobs reported, while applicants in 2021 have very few missing observations for this variable. Papers on PPP loans apply different definitions of nonemployer based on data provided (for example, Fairlie and Fossen, 2022b), but misclassifications can occur if the “type-of-business” variable is used directly due to reporting errors from PPP applicants.

In consideration of reporting errors, we use “cutoff” loan amounts from the SBA’s Frequently Asked Questions page, and we use a linear probability model to identify nonemployers.²² In 2020, the SBA allowed loans for nonemployers to reach \$15,385 prior to June 5, 2020. After June 5, 2020, nonemployer loans were capped at \$20,833. In 2021, loan amounts for nonemployers applying for the first draw of loans were capped at \$20,833. Those applying for a second draw of loans had similar capped values with an additional caveat. Nonemployer applicants in the Accommodation and Food Services sector could have second-draw loans that were capped at a higher amount—\$29,166—while amounts for other industries were still capped at \$20,833.

For our regression, we only consider businesses that have plus/minus \$100 of the threshold value described by the SBA. We predict nonemployer status separately in four “rounds” of loans: (1) loans distributed prior to June 5, 2020, (2) loans distributed after June 5, 2020, (3) loans distributed in the first draw of the 2021 program, and (4) loans distributed in the second draw of the 2021 program. We use the following estimation equation:

$$T_i = \sum \alpha_j \text{BusinessType}_i^j + \sum \delta_k D_i^k + \sum \gamma_{j,k} \text{BusinessType}_i^j * D_i^k.$$

The outcome variable T_i is an indicator equal to one if the loan amount of business equals the threshold amount in each of the four aforementioned “rounds.” BusinessType_i^j is an indicator variable equal to one if business i identifies as business type j (j includes self-employed individual, corporation, sole proprietorship, etc.). D_i^k is an indicator that measures firm size, where the variable equals one if firm j reports k employees: k denotes values for zero employees, one employee, two employees, more than two employees, or a missing number of

²² Capped loan amounts for 2020 and 2021 PPP loans can be found on <https://home.treasury.gov/system/files/136/How-to-Calculate-Loan-Amounts.pdf> and <https://home.treasury.gov/system/files/136/PPP--How-to-Calculate-Maximum-Loan-Amounts-for-First-Draw-PPP-Loans-and-What-Documentation-to-Provide-By-Business-Type.pdf>, respectively.

employees. Finally, the interaction term $BusinessType_i^j * D_i^k$ is a linear combination of business types and jobs reported. We expect that nonemployers are substantially more likely to receive a loan amount right at or just below the threshold. We identify business types interacted with the number of jobs reported to select a probability that these businesses are nonemployers.

The results of the regressions in Table A1 were used to infer who is a nonemployer. Among businesses that had a total loan amount of less than \$15,385 before June 5, 2020, we include as nonemployers business those that reported being sole proprietorships, independent contractors, or self-employed that report one worker and sole proprietorships that report two workers. For PPP loans distributed on or after June 5, 2020, nonemployer businesses are self-employed individuals and independent contractors that reported one employee and received less than \$20,833.

For the first and second draws in 2021, we identify nonemployers using the same methodology. Nonemployers are businesses that reported one employee working and the business type is sole proprietorship, self-employed, independent contractor, or single member LLC that received less than \$20,833 in loans. Nonemployers in the second draw have the same restrictions, except the “cutoff” loan is slightly higher for businesses that are in the Accommodation and Food Services sector (\$29,166).

Table A1: Margins of Nonemployer Estimation Equation

	(1)	(2)	(3)	(4)
Business Type × Jobs Reported	Before June 5	After June 5	First Draw	Second Draw
Corporation × 0	0.017*	0.610***		
Corporation × 1	0.029***	0.281***	0.315***	0.237***
Corporation × 2	0.01	0.274***	0.238***	0.134***
Corporation × > 2	0.005	0.175***	0.195***	0.075***
Corporation × Missing	0.019	0.232***		
LLC × 0	0.031***	0.494***		
LLC × 1	0.067***	0.258***	0.245***	0.339***
LLC × 2	0.011	0.256***	0.242***	0.256***
LLC × > 2	0.007	0.300***	0.301***	0.261***
LLC × Missing	0.079***	0.196***		
Sole Proprietorship × 0	0.020**	0.124***		
Sole Proprietorship × 1	0.111***	0.203***	0.451***	0.584***
Sole Proprietorship × 2	0.012	0.265***	0.372***	0.353***
Sole Proprietorship × > 2	0.017*	0.256***	0.387***	0.323***
Sole Proprietorship × Missing	0.053***	0.131***		
Subchapter S Corporation × 0	0.011	0.172***		
Subchapter S Corporation × 1	0.023*	0.130***	0.238***	0.199***
Subchapter S Corporation × 2	0.016	0.054	0.193***	0.131***
Subchapter S Corporation × > 2	0.005	0.110***	0.150***	0.075***
Subchapter S Corporation × Missing	0.028	0.286***		
Self-Employed × 0	0.01	0.029**		
Self-Employed × 1	0.122***	0.850***	0.651***	0.676***
Self-Employed × 2	0	0.829***	0.25	0.083
Self-Employed × > 2	0.125***	0.865***	0	0.333*
Self-Employed × Missing	0.03	0.122***		
Non-Profit Organization × 0	0.022	0.267**		
Non-Profit Organization × 1	0.015	0.237***	0.405***	0.246***
Non-Profit Organization × 2	0.013	0	0	0.07
Non-Profit Organization × > 2	0.007	0.163**	0.1	0.031
Non-Profit Organization × Missing	0	0		
Independent Contractors × 0	0	0.050***		
Independent Contractors × 1	0.117***	0.643***	0.440***	0.686***
Independent Contractors × 2	0.167**	0.143*		0.4
Independent Contractors × > 2	0.167*	0.320***		
Independent Contractors × Missing	0	0.161***		
Single Member LLC × 1			0.706***	0.840***
Single Member LLC × 2			0.469***	0.4
Single Member LLC × > 2			0.522***	0.600***
Observations	14,907	70,590	998,371	359,414

Note: Only business types of interest are reported. * p<0.05, ** p<0.01, *** p<0.001. Single Member LLCs are only available in the 2021 data.

Section A2: Geocoding

We independently geocoded the data to assess the SBA’s reported results and to be able to separate low- from moderate-income tracts.

Table A2: Comparison of Low- and Moderate-Income Tracts in 2021 PPP Data

		SBA's LMI	
		No	Yes
Authors' geocoded LMI	No	3,697,751	418,329
	Yes	493,030	1,507,147

Comparing our results to the SBA-reported indicator, we found that 5,204,898 of our geocoded observations match the LMI indicator provided by the SBA, while 911,359 of our observations are inconsistent with the SBA’s coding. Of these 911,359, we define 493,030 loans as being in low- and moderate-income tracts, while the SBA does not, and we find that 418,329 of the geocoded loans are not in low- and moderate-income tracts, while the SBA defines them as being in those tracts.

To determine the source of these inconsistencies, we randomly select 100 observations from each category of nonmatches for manual geocoding.²³ For observations that we do not define as low and moderate when the SBA does, 19 out of the 100 observations have incorrect income tracts when we reverse geocode them into the FFIEC database. Similarly, 17 of the 100 selected observations that we do define as low and moderate income while the SBA does not have incorrect income tracts. These results indicate that more than 80 percent of the observations in which our LMI definition does not match the SBA’s coding are incorrectly classified by the SBA. Furthermore, more than half of the observations that have incorrect census tracts from our geocoding procedure actually lie on the border of two census tracts. An address is considered to be bordering two census tracts if the address shares a street with a neighboring census tract. This result indicates that most of the observations that are incorrectly geocoded are at least in close proximity to the correctly geocoded census tract.

²³ We manually reverse geocode each of these randomly selected observations by entering the address into the FFIEC’s geocoder tool to obtain the census tract code, which can be accessed at <https://geomap.ffiec.gov/ffiecgeomap/>.

Section A3: Majority Race and Ethnicity of Census Tracts

We use census-tract-level population data from 2015-2019 American Community Survey (ACS) data to determine the majority race/ethnicity of each census tract in our data. Since these data do not provide population counts for Guam and the Virgin Islands, we drop loans that are coded in these areas.

First, we identify census tracts in which Hispanic residents are the majority of the total population of the census tract. Next, for census tracts that do not have a Hispanic majority, we identify the proportion of residents who are non-Hispanic whites, non-Hispanic Blacks, non-Hispanic Asians, and non-Hispanic Native American/Alaskan Native. Census tracts that have a non-Hispanic racial majority are coded accordingly. We do not consider individuals who are mixed race as having a racial majority. Census tracts that do not have a racial or ethnic majority are classified as having “No Majority.”

There are three census tracts in which there is a non-Hispanic Native Hawaiian/Pacific Islander majority. Given the small number of tracts in this category, we choose to add them to the “No Majority” tracts.

Section A4: Fintech Lending

To classify lenders in the PPP loan data, we start by using the routing numbers from the Paycheck Protection Program Liquidity Facility (PPPLF) transaction-specific disclosures. According to the PPPLF term sheet (Federal Reserve Board, 2021),²⁴ the Federal Reserve Bank of Cleveland lent to CDFIs (routing number beginning with “041”), the Federal Reserve Bank of Minneapolis lent to SBLFs (routing number beginning with “091”), and the Federal Reserve Bank of San Francisco lent to other non-bank borrower types (routing number starting with “121”). We initially classify lenders with the Federal Reserve Bank of San Francisco as fintechs.

That said, certain exceptions arise when classifying lenders with routing numbers and we made adjustments after checking lender websites. For example, Justine Petersen Housing & Reinvestment Corporation is a lender that would have been classified as a fintech due to the lender’s routing number. Their website identifies this lender is a CDFI, consistent with relatively low volume of loans that this lender financed (less than 600 loans in 2020 and 2021).

Two fintech lending networks also require direct recoding. As noted by Cowley and Koeze (2021), a fintech, Womply, produced a large number of loans as a registered loan agent that assisted borrowers to connect with lenders who underwrote the loans based on a Womply application. Womply’s PPP lender network consists of 12 entities: Benworth Capital, DreamSpring, Fountainhead, Fundbox, Funding Circle, Harvest Small Business Finance, Kabbage, Lendio, OnDeck, SmartBiz Loans, Sunshine State Economic Development Corporation, and TMC Financing. We do not see loans facilitated by Lendio, OnDeck, SmartBiz Loans, or TMC Financing in our data, but these entities may have loans that were originated by a

²⁴ <https://www.federalreserve.gov/newsevents/pressreleases/files/monetary20210625a1.pdf>

banking partner such as Celtic, Web Bank, or Cross River. Blueacorn is a similar fintech loan agent that worked exclusively with two CDFIs: Capital Plus Financial and Prestamos.

To account for these partnerships, we code five lenders identified as CDFIs or SBLFs in the PPPLF as fintechs: DreamSpring, Prestamos, Capital Plus, Fountainhead SBF LLC, and Harvest Small Business Financing. In 2020, only three of these lenders (Harvest Small Business Finance, Fountainhead SBF LLC, and Prestamos) financed loans, comprising a very small share (0.2 percent) of all 2020 PPP loans. These five lenders financed more than 24 percent of all 2021 PPP loans. The two banks most associated with fintechs were active in both 2020 and 2021: Cross River Bank and Celtic Bank financed 3.8 percent and 2.9 percent of all 2020 PPP loans and 4.5 percent and 0.3 percent of all 2021 PPP loans, respectively. Overall, loans financed by institutions that were partnered with Blueacorn and Womply comprised about 29 and 22 percent of PPP loans connected with fintechs in 2021 respectively.

We also cross checked our fintech classifications with Griffin, Krueger, Mahajan (2023) and Erel and Liebersohn (2022) In the PPPLF there are also several lenders classified as SBLFs, CDFIs, or banks that these papers classify as fintechs. We follow these papers in classifying Ally Bank, American Express National Bank, Axos Bank, BSD Capital (operating as Lendistry), Capital One, FinWise Bank, First Internet Bank of Indiana, Green Dot Bank, Intuit Financing, Live Oak Banking Company, Newtek Small Business Finance, Readycap Lending, the Bancorp Bank, and TIAA as fintechs. Several of these lenders look like fintechs, but they were not particularly active in PPP loans.

Finally, our review of lenders identified three other fintech lenders. LendingClub, a well-known fintech, made loans as a bank after acquiring a fintech-focused bank in 2021: Radius Bank. Banking publications also list Sunrise Banks as fintech, although its loan counts are not large enough to alter any of our conclusions.

Table A5: Number of Loans Financed by Specific Fintechs

Lending Institution	Loans (2020)	Loans (2021)
A10Capital, LLC	0	19,613
Ally Bank	920	137
American Express National Bank	6,962	0
American Lending Center	554	21,140
Amur Equipment Finance, Inc.	166	27,104
Axos Bank	852	50
BSD Capital, LLC dba Lendistry	3,542	203,162
Benworth Capital*	579	310,096
Capital One, National Association	15,672	9,268
Capital Plus Financial, LLC†	0	394,972
Celtic Bank Corporation	147,196	19,997
Cross River Bank	194,381	285,604
DreamSpring*	0	25,982
FC Marketplace, LLC (dba Funding Circle)*	6,134	10,632
FinWise Bank	699	0
First Internet Bank of Indiana	447	275
Fountainhead SBF LLC*	2,766	269,164
Fundbox, Inc.*	14,231	0
Green Dot Bank	17	24
Harvest Small Business Finance, LLC*	5,345	402,585
Intuit Financing Inc.	18,509	0
Itria Ventures LLC	3,267	169,659
Kabbage, Inc.*	161,136	18,781
LendingClub Bank, National Association	0	2,680
Live Oak Banking Company	11,045	3,886
MBE Capital Partners	23,895	20,633
Newtek Small Business Finance, Inc.	11,550	15,598
Prestamos CDFI, LLC†	937	443,553
Radius Bank	5,479	0
Readycap Lending, LLC	34,258	71,941
Square Capital, LLC	0	72,515
Sunrise Banks, National Association	1,840	1,944
Sunshine State Economic Development Corporation*	72	6,848
TIAA Bank, A Division of	273	0
The Bancorp Bank	1,288	636
TimePayment Corp.	0	687
WebBank	76,402	43,207
Total	750,414	2,872,373

Note: this table lists all fintech lenders that we identify in the dataset. * indicates a lender partnered with Womply and † indicates a lender related to Blueacorn.