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Small Businesses, Criminal Histories, and the Paycheck Protection Program

There is a growing realization of the potential importance of business ownership for people with criminal history records (Hwang and Phillips, 2020). These individuals face many barriers to employment, and entrepreneurship can be a reasonable alternative to taking on wage work. However, most U.S. government domestic aid programs exclude individuals with criminal history records from receiving federal assistance—and, because the prevalence of criminal histories among small business owners is largely unknown, we do not know how many entrepreneurs are cut off from such assistance.

A recent example of a domestic aid program with restrictions for people with criminal history records is the Paycheck Protection Program (PPP), which President Donald Trump signed into law as part of the Coronavirus Aid, Relief, and Economic Security (CARES) Act on March 26, 2020 (Public Law 116-136, 2020). The PPP provided money for payroll, rent, mortgage interest, and utilities to small businesses (businesses with fewer than 500 employees). In its first two weeks, the PPP distributed over \$349 billion to approximately 1.7 million small businesses. However, small businesses owned by individuals with a criminal background were ineligible to receive funds.

KEY FINDINGS

- Nearly 4 percent of all small businesses had owners with a criminal history, and about 1.5 percent of all small businesses had owners with a felony record.

- An estimated 140,325 disqualifying felonies existed under the original PPP restrictions, and 212,655 small businesses had owners with a record of a felony in the last five years.

- Under the revised 2021 PPP restrictions, the number of businesses affected dropped by 95 percent, to 11,481.

- Under the original PPP restrictions, 343,198 employees were affected; this number was reduced by 95 percent, to 17,533, under the revised restrictions.

Initially, the PPP used a sweeping definition of *criminal background* for its restrictions. The definition applied to any owner of 20 percent or more of the equity of the applying business who

- was incarcerated
- was on probation
- was on parole
- was subject to formal criminal charges in any jurisdiction
- had been convicted of any felony, been placed on pretrial diversion, or been placed on any form of parole or probation (including probation before judgment) within the past five years (U.S. Small Business Administration [SBA], 2020).

Questions about criminal history appeared on the application form, and applicants were required to give the SBA permission to check their records.[1]

Following a lawsuit by the American Civil Liberties Union (Hayashi, 2020), the Trump administration limited the five-year felony restrictions to those convicted of fraud, bribery, embezzlement, or a false statement in a loan application or an application for federal financial assistance. For all other felonies, the restrictions were limited to a one-year window after conviction for those not incarcerated (SBA, 2020).

In February 2021, the Biden administration eliminated the one-year restriction for those with felony convictions who were not incarcerated (The White House, 2021). The restriction for those incarcerated was maintained because of concerns about creditworthiness (SBA, 2020).

Study Purpose

In this report, we estimate the number of small business owners who have a criminal history and the number of small business employees who were

Abbreviations	
CI	confidence interval
CJARS	Criminal Justice Administrative Records System
PPP	Paycheck Protection Program
SBA	U.S. Small Business Administration

potentially prevented from accessing PPP aid because of the original PPP felony restrictions. We also estimate how many small businesses and small business employees were potentially given access to PPP aid after the 2021 felony restriction revisions by the Biden administration.

We produce both a national estimate and an estimate focused on two states. At the national level, we applied an innovative method that used data from a consumer and background check data company. We worked with a data aggregation company that independently collects information on business ownership and information on criminal history records. Although these data sets are separate, each is indexed using the same process to uniquely identify associated individuals. As a result, at the national level, we were able to determine how many people who own small businesses also have a criminal history record. We were also able to examine the effects of felony restrictions by age, sex, race, state location, business size, and industry category. However, because of missing data in these demographic categories, we have low confidence in these results.

At the state level, we worked with a different data aggregation company that maintains a database on small businesses. We asked for a sample of small business owners in two states, Minnesota and North Carolina. We then searched for these individuals in publicly available state criminal history records data to estimate the number of small business owners who have a criminal history as well as those who might have been excluded from PPP aid under the five-year felony rules.

We compare our results from both the national- and state-level approaches with results from a recent study of PPP criminal history impacts on sole proprietorships (Finlay, Mueller-Smith, and Street, 2020). In this study, researchers drew from the Criminal Justice Administrative Records System (CJARS) to estimate the number of sole proprietors who have criminal history records that would exclude them from the PPP program; these estimates were made for seven states. In Michigan and Texas, the two states for which CJARS has the most-complete criminal history information, researchers estimated that as many as 2.6 to 3.2 percent of sole proprietors were ineligible for PPP loans based on one of the five

criminal history record restrictions described above. The CJARS study likely played a key role in the revisions of the PPP restrictions because it demonstrated the implications and impact of the criminal justice restrictions (Arnold Ventures, 2021).

We examine business ownership beyond sole proprietorship and in more areas than seven states, although our research focuses more narrowly on felony restrictions. As such, this report is an opportunity to both verify and extend the results of the CJARS study.

Results of National Analysis

Data and Methods

We used data from a consumer and background check data company to link information from individual criminal history records to business information about company ownership. This allowed us to create a nationwide estimate of the number of business owners who have been convicted of a crime in the past. It also allowed us to estimate how many might be affected by PPP felony restrictions. We do not have information on other aspects of individuals' criminal history records, such as current correctional status or whether an individual faces pending charges.

The consumer and background data warehousing company that provided our data both aggregates and organizes information from government and commercial sources across the United States. It sells data services to government and corporate decisionmakers to allow them to make informed decisions about providing credit, employment, rental housing, insurance, and more. Commercial companies that maintain criminal history records play a significant role in employment decisions in the United States (Bushway and Kalra, 2021; Lageson, Webster, and Sandoval, 2021). Although there are no estimates of the number of criminal history record checks done for the explicit purpose of lending, researchers have estimated that between 75 and 90 percent of all formal job applicants will face a criminal history record check at some stage in the hiring process (Bushway and Kalra, 2021).

We selected a consumer and background data company for our research because a bank disbursing PPP aid might use such a company for a quick background check on an applicant. Some of these companies also are useful resources for an analysis of the potential reach of PPP rules because they warehouse records across a broad variety of topical areas, using a common identification across these areas. This common identification allowed us to cross-match all individuals who were associated with business records and all individuals who were associated with criminal history records. The process of creating common identification for different areas is known as *entity resolution*. An entity resolution algorithm helps link possibly ambiguous characteristics (such as criminal history records) to an object or individual (Talley, 2011). As an example of linking business owners to criminal history records, if three individuals named William Smith were born in October 1980 and three individuals named Bill Smith were born in October 1980 and owned construction companies, the entity resolution algorithm could attempt to correlate each one of those records to one William Smith who was born on October 15, 1980, and who was convicted of a felony in a county court.

This company's entity resolution algorithm matched multiple characteristics to an individual, ensuring that all records—such as business records and criminal history records—pertaining to an individual were available through the database. After a limited evaluation of the data company's entity resolution algorithms, we believe that its methodology is more accurate than simpler record-matching approaches that use only a few of the characteristics that might be found in each record (e.g., name, date of birth). Although any semiautomated record-matching system will have some degree of error, we do not believe that this degree of error had a significant impact on our results.[2]

To the best of our knowledge, no previous research has made use of nationwide consumer and criminal history record data to examine the implications of a particular restriction on employment or business activity (Bushway and Kalra, 2021). For this study, we asked the consumer and background check company to search its criminal history and business records. We were particularly interested in the subpopulation of business owners who also had a criminal history record. We also asked them to identify both owners who had a felony or misdemeanor

conviction and the time elapsed since the conviction (with a preference for the felony if both existed). The total number of owners with felony convictions were also binned by the following categories: business size, industry, age, race, and sex. We did not receive any individually identifying information in this process.

Some individual owners were reported to be affiliated with multiple entities, and our analysis takes this into account. (We also were provided with counts of individuals affiliated with multiple entities.) However, because of the limitations of this aggregation procedure, individual owners would count twice if they were affiliated with businesses in different industries, which would place them into different aggregation bins in the data. Similarly, a single business could be counted twice if it has multiple owners who have felonies. Depending on how often this occurred in the data, both of these limitations could result in an artificially higher estimate of the proportion of small business owners with a criminal history. We have no direct information on how often this occurred, but the broad agreement of our prevalence estimates with Finlay, Mueller-Smith, and Street's (2020) estimates and with our state-level analyses (which use a different dataset) suggests that the extent of this double counting may have been small.

Using this information, we produce national estimates of the number of small business owners who have records of any felony conviction and of those who have a felony conviction within the past five years (we define these as *recent felonies*). We estimate these numbers at the national and state levels, within industry, for various business sizes, and by characteristics of the owner. Furthermore, we estimate how many small business owners would have been affected by changes in PPP eligibility implemented in the past year to relax the restrictions against those with criminal histories. Specifically, we limit our analysis to felonies that were known to be related to fraud, counterfeiting, forgery, bad checks, or bribery.

Numbers of Criminal History Records and Business Records

Criminal offense information was matched to 2.2 million records affiliated with individuals whose title was "business owner" in one of the 50 U.S. states or Washington, D.C.; these individuals were affiliated with 3.4 million small businesses. We used the SBA definition of *small* (500 or fewer employees) to identify small businesses from business records. This designation potentially included some large businesses whose size is unknown; however, most businesses that we identified were noted as having fewer than 500 employees in the consumer and data background company records.[3]

As is typical for consumer and criminal history data collected from hundreds of public and commercial sources from across the country, significant portions of many variables—such as business size, offense type, and race—were incomplete. We used statistical methods to impute the missing values for the quantity of most interest to this report—whether a record with an unknown felony status could realistically be inferred to be a recent felony. Because of the scale of missing values for other characteristics (such as race, sex, and age), we did not impute them. We acknowledge that the statistical model assumes that the information that is available to us—such as category of offense (e.g., arson, assault), age of individual, and state—are sufficient for inferring felony status. Our model is at best an approximation and is likely to be subject to mis-specification.

We used an approach known as a *doubly robust estimator* to estimate how many offenses of unknown felony status could reasonably be inferred to be recent felonies (hereafter, *inferred felonies*) (Bang and Robins, 2005). In this approach, we used two pieces of information to infer missing recent felonies.

First, we used the probability of felony status being unknown given everything we already know about the individual and business. For example, if most of the records in North Carolina have unknown felony status, a greater burden would be placed on the observed felonies to inform us about missing ones in that state. This type of model is known as a *propensity score model*.

Second, we used the probability of a record being a recent felony given everything we know about the individual and business. If most of the records that are observed to have assault as the offense category are recent felonies, then we might be inclined to think that a record listed as an assault with unknown

felony status could very well be a recent felony. This type of model is referred to as an *outcome model*.

We used location (state) and category of offense, sex, race, age of the individual, industry, and size of business in the propensity score and outcome models, each of which was estimated with logistic regression. The eventual estimator combines the propensity score and outcome model with the observed data so that, if either model is correct, the final estimate will be consistent.[4]

In addition to reporting estimates of the number of businesses affected by PPP restrictions nationwide, we also report estimates by owner and business characteristics. These include state, age, race, business size, and industry. However, many of these characteristics remain unknown. Because we do not know the extent of missing data across races, industries, and ages, we consider our subgroup estimates possibly to be lower than reality. For example, our estimate of female business owners affected by restrictions might be much higher if we could identify the sex of every owner.

Furthermore, our estimates of the numbers of employees who possibly were affected by PPP aid restrictions are conservative because we do not know the exact number of employees in each business. Business sizes are known only in broad categories (fewer than five employees, five to nine, ten to 19, 20 to 99, and 100 to 499), and many business sizes are unknown. Our conservative estimates assign the lowest number of employees within each band to a business. For example, if the business is categorized as having five to nine employees, we assume that they have five employees. In line with that approach, businesses of unknown size are assumed to have one employee. This is because we do not have sufficient information in the rest of the data to confidently estimate what the business size is likely to be. Our

assumption likely leads to an undercount of employees that could be helped by the policy changes. Finally, when an owner is known to be affiliated with multiple businesses in the same industry, we only count one such business for the purpose of estimating the number of affected employees. Therefore, our estimate of affected employees could reasonably be considered a lower bound.

Estimated National Prevalence of Small Business Owners with a Felony Conviction

We first estimate the number of small business owners who had at least one felony conviction at some point in time. Table 1 presents our estimates of the numbers of small business owners with any criminal history. We estimate that nearly 4 percent of all small businesses have owners with a criminal history and about 1.5 percent of all small businesses have owners with a felony record. These estimates are likely low because they are based on records that are known to have gaps and that cover a limited period (in many states, records more than 20 years old were not warehoused).

In comparison, Shannon et al. (2017) estimated that 8 percent of all U.S. adults have at least one felony conviction. There are many reasons why business owners might have a lower prevalence of felony convictions than the general population. One of those reasons could be the barriers to loans and other assistance that make it harder for those who have a felony record to become business owners. However, a nontrivial number of individuals with felony records still have become business owners.

Among the 2.2 million individuals listed as small business owners in the data, 65,045 were identified as

TABLE 1

Overall Estimates of Criminal History Among Small Business Owners

|	Business Owners (95-percent CI)	Associated Businesses (95-percent CI)	Prevalence (95-percent CI)
Any criminal history	1,136,309 (1,090,427–1,182,190)	1,730,790 (1,676,849–1,784,730)	3.83% (3.71%–3.95%)
Any felony record	433,013 (419,612–446,415)	661,113 (644,981–677,244)	1.46% (1.43%–1.50%)

NOTE: CI = confidence interval.

having recent felonies. These owners were affiliated with 97,295 small businesses; therefore, small businesses with owners having listed recent felonies were 0.22 percent of the 45.2 million total businesses in the data.[5]

In addition, 1.4 million records had unknown crime status.[6] We estimated that about 75,000 recent felonies were affiliated with about 115,000 businesses among these records with unknown felony status.

We then estimate the number of small business owners who faced the original restrictions embedded within the PPP loan program (see Figure 1). The original restrictions barred anyone with a felony conviction in the last five years (recent felonies).

Our final estimated total is that there were 140,325 disqualifying felonies (95-percent CI 136,148–144,502) and that 212,655 small businesses had owners with a record of a recent felony (95-percent CI 207,450–217,861). This is an estimated overall prevalence of 0.47 percent of all businesses (95-percent CI 0.46–0.48 percent).

FIGURE 1

Estimate of Disqualifying Felonies and Affected Businesses Under the Original and Revised Paycheck Protection Plan Restrictions
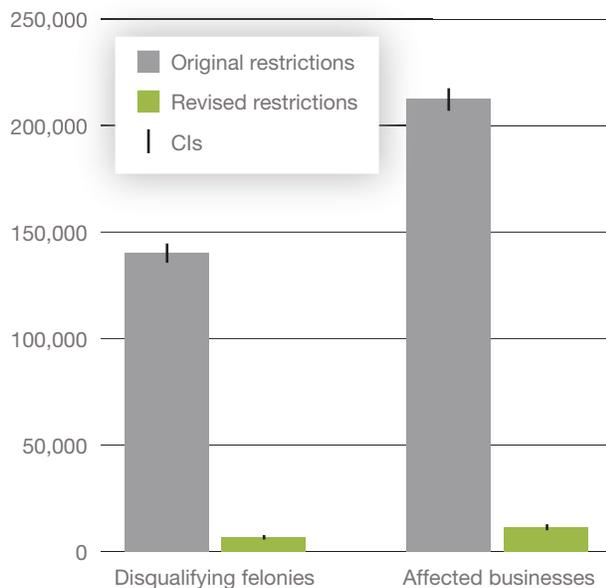
NOTES: Under the original felony restrictions, 0.47 percent of our nationwide estimate of 45,159,461 small businesses were affected. Under the revised restrictions, 0.03 percent were affected—a reduction of 95 percent.

We estimate that under the revised 2021 PPP restrictions, the number of businesses affected dropped by 95 percent—from 212,655 (0.47 percent of small businesses) to 11,481 (0.03 percent of small businesses). This 95-percent drop corresponds to the drop in disqualifying recent felonies, which fell to only 6,956 under the revised restrictions.

We also estimate the number of employees affected by both sets of PPP restrictions. We estimate that 343,198 employees (95-percent CI 336,767–349,629) were affected by the original PPP restrictions; this number was reduced by 95 percent to 17,533 (95-percent CI 16,399, 18,666) under the revised PPP.

Effects by Business Size

We also examine how business and owner characteristics were associated with being affected by both sets of PPP restrictions.

Most small businesses affected by PPP restrictions were relatively small (even for small businesses) or of unknown size (see Figure 2). For example, the number of very small businesses (with fewer than five employees) affected under the original PPP is more than 40 times larger than that of small businesses with over 100 employees.

However, when the number of employees is taken into consideration, affected larger small businesses have roughly the same number of affected employees as ones of a smaller size (see Figure 3). Companies with 20 to 99 employees actually have the most affected employees under the revised restrictions (3,979, 95-percent CI 3,385–4,573). The restriction revisions caused a drop of up to 97 percent in the number of affected businesses (regardless of size).

Effects by State

We also examine the recent felony prevalence by state. We find that as many as 1.8 percent and as few as 0 percent of businesses in a state might have been affected by the original PPP restrictions. Under the revised PPP restrictions, most states experienced a reduction of between 90 and 97 percent in affected businesses, which is consistent with our findings at the national level. Under the revised restrictions, the range of affected businesses dropped to between 0.14 and 0 percent per state. However, given the incompleteness

FIGURE 2

Estimates of Businesses Affected Under the Original and Revised Paycheck Protection Plan Restrictions, by Business Size
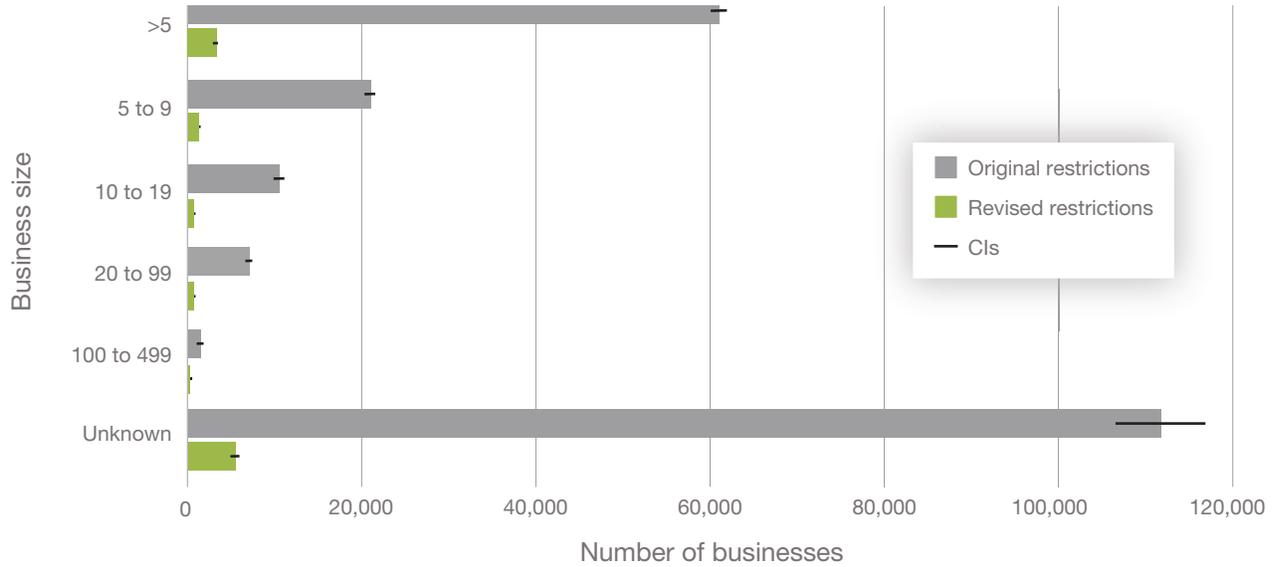
NOTE: Employee estimates were conservative: When an owner was known to be affiliated with multiple businesses, only one business was used to contribute to the employee estimate. In addition, employee estimates were on the lower end of each size band; for example, all companies in the five-to-nine employee size band were assumed to have only five employees.

FIGURE 3

Estimates of Employees Affected Under the Original and Revised Paycheck Protection Plan Restrictions, by Business Size
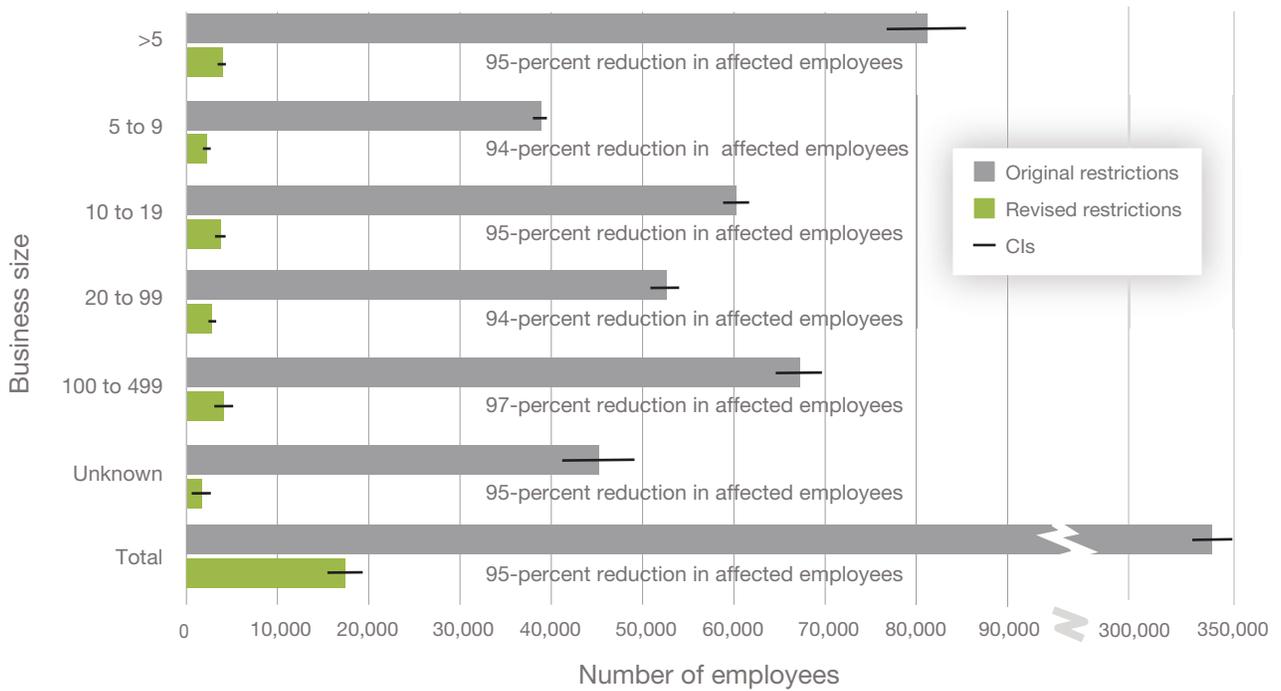
NOTE: Employee estimates were conservative: When an owner was known to be affiliated with multiple businesses, only one business was used to contribute to the employee estimate. In addition, employee estimates were on the lower end of each size band; for example, all companies in the five-to-nine employee size band were assumed to have only five employees.

of criminal history reporting at the state level nation-wide (Lageson, Webster, and Sandoval, 2021), we believe our lower bound of 0 percent is more likely to be the result of the lack of data than an actual finding. When we modify our nationwide prevalence estimate to the 29 states in which we believe there is good state-wide court coverage,[7] we estimate the overall preva-lence as 0.65 percent (95-percent CI 0.63–0.67 per-cent) rather than 0.47 percent. As a result, we view our nationwide estimates as a lower bound of the number of businesses that have been affected by the changes in initial PPP restrictions.

Effects by Industry Category

The impact of the PPP restriction also varies dra-matically across industry categories. We estimate that about 27,000 retail businesses (95-percent CI 26,651–27,721) and about 25,000 construction businesses (95-percent CI 24,376–25,3900) had owners with recent felonies, and each of these was reduced by 94 to 95 percent by the change in PPP restrictions (Figure 4). The industry with the lowest number of recent felonies was management of com-panies and enterprises:[8] We estimate that only 125 businesses were affected by the original PPP restric-tions and that the number was reduced by 89 percent under the revised PPP. Only one additional industry had a reduction in affected businesses that was less than 90 percent (information, which experienced an 89-percent reduction).

The difference across states mentioned in the previous paragraph also could be caused by variation in criminal justice policies. For example, the same crime could be a misdemeanor in one state but a felony in another. This is particularly pertinent to our research because of the current progress of marijuana legalization. Some states, such as Florida and Texas, offer diversion programs to large numbers of people after their first felonies; if an offender completes a diversion program, their arrest record might be sealed or expunged. This could radically alter the number of people affected by felony restrictions. It also is at least possible that states with more-punitive policies have higher concentrations of minorities (McElhattan, 2021). Future research could examine how state crimi-

nal justice policies affect the levels of criminal history penetration separately from offending.

Effects by Race

Among the affected businesses, we estimate that

- 93,640 had owners who were White
- 31,620 had owners who were Black
- 4,212 had owners who were Hispanic
- 2,753 had owners who were Asian or Pacific Islander
- 437 had owners who were American Indian or Alaskan Native
- 79,279 had owners of unknown race and ethnicity.

Under the revised restrictions, those numbers were reduced by more than 86 percent for all racial and ethnic categories (Table 2). Although the changes in affected businesses were not dramatically differ-ent across race and ethnic categories, we recognize that there is significant potential for variation across racial and ethnic categories within specific states. This is partly because of the differences in states' racial and ethnic makeup and the widely differing policies associated with expungements and sealing records among states (Burton et al., 2021). We did confirm that the background check data are regularly updated to remove records that have been sealed or expunged. However, because of the number of miss-ing values, the data provided still were insufficient to produce reliable race and ethnicity estimates of the differential impact of the changes in PPP restrictions at the state level.

Although we do not have complete data on race, we find that the original PPP restrictions differen-tially affected Black individuals. The nationwide data that we have in which the race of the owner is known suggest that 24 percent of the businesses affected by the original restrictions were owned by Black indi-viduals. This percentage could be much higher if Black owners are overrepresented among owners who have a missing racial status in the records.

Effects by Sex and Age

The reduction in businesses affected after the revi-sion of the PPP restrictions is estimated to be higher

FIGURE 4

Estimate of Businesses Affected by Original and Revised Paycheck Protection Plan Restrictions, by Industry Category
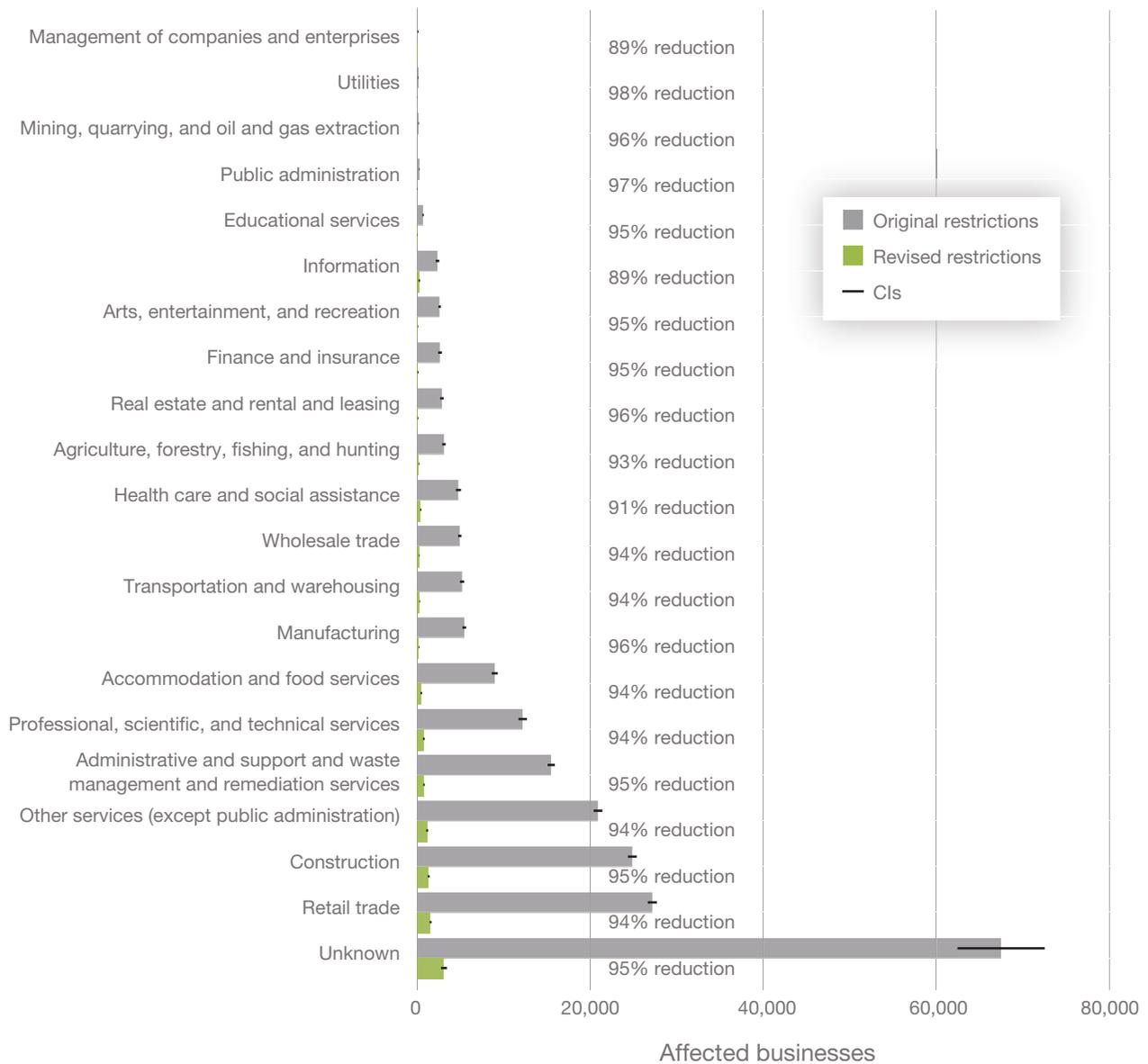
NOTE: Each industry was identified by its two-digit North American Industry Classification System code.

for businesses owned by men (96 percent reduction) than for those owned by women (92 percent reduction; see Table 3). Businesses with owners of unknown sex had a reduction of 94 percent. However, because business with owners of unknown sex might not be evenly distributed between male and female, it is important not to rely too heavily on this finding.

Reductions in affected businesses tended to be about 95 percent for businesses with owners of any age (see Table 4).

TABLE 2

Estimate of Businesses Affected by Original and Revised Paycheck Protection Plan Restrictions, by Race/Ethnicity of Owner

Race/Ethnicity	Affected Businesses, Original PPP Restrictions (95-percent CI)	Affected Businesses, Revised PPP Restrictions (95-percent CI)	Reduction
White	93,640 (90,696–96,583)	4,782 (4,520–5,044)	95 percent
Unknown	79,279 (75,276–83,282)	4,357 (4,014–4,700)	95 percent
Black	31,620 (30,280–32,960)	1,981 (1,861–2,101)	94 percent
Hispanic	4,212 (3,904–4,519)	133 (97–168)	97 percent
Asian/Pacific Islander	2,753 (2,041–3,464)	100 (67–132)	96 percent
Other	715 (612–819)	103 (80–127)	86 percent
American Indian/Alaskan Native	437 (381–492)	24 (14–35)	95 percent

TABLE 3

Estimate of Businesses Affected by Original and Revised Paycheck Protection Plan Restrictions, by Sex of Owner

Sex	Affected Businesses, Original PPP Restrictions (95-percent CI)	Affected Businesses, Revised PPP Restrictions (95-percent CI)	Reduction
Male	125,473 (122,099–128,847)	5,584 (5,301–5,868)	96 percent
Female	28,651 (26,910–30,391)	2,361 (2,204–2,518)	92 percent
Unknown	58,532 (54,971–62,094)	3,536 (3,222–3,849)	94 percent

TABLE 4

Estimate of Businesses Affected by Original and Revised Paycheck Protection Plan Restrictions, by Age of Owner

Age	Affected Businesses, Original PPP (95-percent CI)	Affected Businesses, Revised PPP (95-percent CI)	Reduction
18–25	3,527 (3,045–4,009)	127 (97–156)	96 percent
26–35	29,698 (28,050–31,345)	1,453 (1,334–1,572)	95 percent
36–45	59,960 (57,410–62,510)	3,308 (3,099–3,517)	94 percent
46–55	54,046 (51,760–56,332)	3,129 (2,938–3,320)	94 percent
56–65	32,224 (30,573–33,874)	1,593 (1,466–1,720)	95 percent
>65	13,223 (12,159–14,287)	580 (481–679)	96 percent
Unknown	19,978 (17,051–22,905)	1,291 (1,005–1,577)	94 percent

State-Level Analysis: Minnesota and North Carolina

Data and Methods

Because we lacked direct visibility into the contents and comprehensiveness of our national-level data, we conducted an additional analysis at the state level to examine the data and findings in more detail.

We chose Minnesota and North Carolina for our analysis because these states make criminal history data available freely online, using name and date of birth as identifiers. To obtain name and date of birth information for small business owners, we worked with the company DatabaseUSA to obtain a random sample of data for small business owners (DatabaseUSA, undated). DatabaseUSA linked two

existing datasets: (1) a marketing dataset with information about businesses and (2) Exec@Home, an executive-level dataset that contained information about business executives.

We worked with DatabaseUSA to randomly sample these linked business records across different industry sectors (see Table 5). We attempted to oversample two industries—construction and hospitality—in which we expected felony prevalence would be higher because of anecdotal evidence.[9]

The sample we requested from DatabaseUSA was limited in its coverage. The initial dataset covered all small businesses. However, because we also needed owner names and dates of birth, we limited the sample frame to those Exec@Home records that provide job title, name, and full date of birth. Furthermore, much of the Exec@Home date of birth data only provide the month and year of birth. In those cases, DatabaseUSA populates the data for day of birth with the first day of the birth month. As a result, actual first-of-the-month birth dates are indistinguishable from placeholder dates. Therefore, we excluded all first-of-the-month birthdates from the sampling frame, which eliminated 56 percent of possible sample records.

A final decision that we made before sampling was how to determine an individual's level of ownership in the business. Because of the varied nature of DatabaseUSA's sources (e.g., business registration records, yellow page listings, conference registrations), several personal titles (e.g., owner, president, vice president, manager, chief executive officer) could indicate a significant ownership interest in a small business. However, to minimize potential ambiguity, we ultimately only sampled from Exec@Home records in which the individual's title was owner. If we included other titles, our prevalence findings would likely change but could be less accurate, as the PPP restrictions apply only to individuals with a 20-percent or larger ownership stake.

Using this final sample frame, we asked DatabaseUSA to randomly sample its records by state and business sector using our sampling targets. The "received" column in Table 5 summarizes the number of records we received from DatabaseUSA.

Table 6 provides an overview of the age distribution of owners in the DatabaseUSA data versus the distribution of owners in the summaries of the national consumer and background data discussed in the previous section. One peculiar

TABLE 5

Business Owner Information Requested from DatabaseUSA

State	Sector	Received	Criminal History Match	Felony Within Five Years
Minnesota	Hospitality	1,395	66	2
	Construction	1,393	55	4
	All other	1,389	36	1
North Carolina	Hospitality	844	14	0
	Construction	844	27	0
	All other	395	9	1
Total		6,260	207	8

TABLE 6

Selected Age Distributions in Business Owner Data Sources

	Percentage of Owners in Age Group					
	18 to 25	26 to 35	36 to 45	46 to 55	56 to 65	65 and older
DatabaseUSA	0	0.2	4.4	18.5	35.1	41.7
National Consumer and Background Data[a]	1.1	11.4	20.8	23.2	19.4	12.5

[a] 11.7 percent of ages were unknown.

feature of the sample of owners that we received from DatabaseUSA was the age of the individuals included. DatabaseUSA's age distribution was skewed much more toward older owners. Because older individuals are less likely to commit crimes of any kind, this means that we were likely to find a lower prevalence of recent criminal histories through the DatabaseUSA owner sample. This skewed age distribution for business owners was a key limitation of our approaches for Minnesota and North Carolina.

To check for criminal histories among the business owners from the DatabaseUSA sample, we searched the public criminal history records in Minnesota and North Carolina using name and date of birth. We conducted these searches online for Minnesota, using the state's public criminal history website (Minnesota Public Criminal History, webpage, undated-b). North Carolina provides a web-based search and a database download option (North Carolina Department of Public Safety, webpage, undated-a; North Carolina Department of Public Safety, webpage, undated-b). For North Carolina, we downloaded the database and ran the matches offline.[10] (For both states, we only had conviction data, not nonconviction data.)

There were two key differences between these two sources. First, Minnesota removes public criminal history records 15 years after an individual completes their sentence (Minnesota Public Criminal History, webpage, undated-a). North Carolina provides a much more comprehensive history of individuals' past criminal activity. This means that our estimates of any criminal history for individuals in Minnesota will necessarily be lower than Minnesota's real-world equivalent; as a result, our estimate for any criminal activity for Minnesota should be viewed as a minimum estimate.

Second, name-based matching approaches will inevitably produce false positives (individuals incorrectly matched because they have the same name/aliases and date of birth) and false negatives (e.g., individuals with histories who were not matched because of inconsistency in name/aliases or date of birth). Minnesota's criminal history search site searches across known aliases associated with a particular date of birth. However, we did not have additional aliases to match for the North Carolina

data. Therefore, we likely had fewer false positives and more false negatives for both our North Carolina overall criminal history matches and our North Carolina under-five-year criminal history matches; our estimate is likely lower than the real-world criminal history prevalence.

For both states, we had information only for offenses committed within these states. We necessarily missed any offenses committed in other jurisdictions. Again, this means that our estimates should be seen as a lower bound. For the purposes of this analysis, for any situation where multiple crimes were returned for a match, we retained only the most recent record.

Given these limitations, we believe that false positive and false negative problems are likely to be much more prevalent in this matching process than in a whole-record entity resolution algorithm match (as discussed in the earlier section).

Results

Ultimately, we estimate that a minimum of 3.4 percent of the owners of small construction businesses and a minimum of 2.5 percent of the owners of small hospitality businesses in Minnesota and North Carolina had some criminal history (see Figure 5). Overall, 2.5 percent of owners across all industries had some criminal history. This number is less than the 4.5 percent we found in the national data. Of those, less than 1 percent had felonies on their records and less than 0.3 percent had a felony within the past five years.

Table 7 provides a further insight into these numbers. The majority of data matches were for owners with misdemeanors in their history who owned businesses with fewer than 25 employees. Although we have information on businesses with 100 to 500 employees in our "owner" data set, none of those owners were matched to criminal history data.

Although these numbers of owners are small, they could represent a large number of employees who could be affected if the small business they work for is disqualified from PPP benefits. According to the U.S. Census Bureau (2020), approximately 6,000,000 small businesses employed nearly 61,000,000 individuals. If all 0.3 percent of those

FIGURE 5

Estimated Prevalence of Criminal Histories Among Small Business Owners in Minnesota and North Carolina
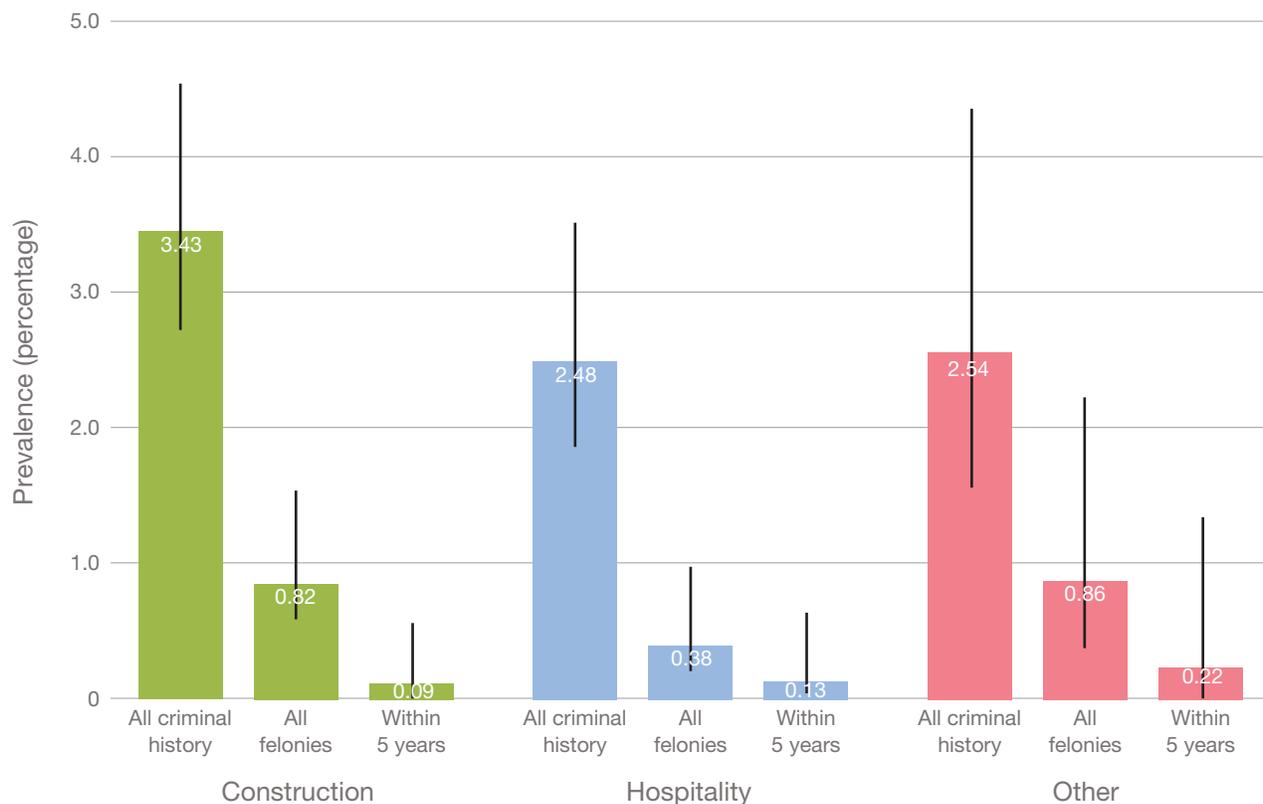
NOTE: Data weighted to reflect the distribution of small businesses in the 2012 Survey of Business Owners.

TABLE 7

Estimates of Business Owners with Criminal History, by Sector, Severity of Crime, and Business Size

Sector	Severity	Business Size		
		Under Five Employees	Five to 24 Employees	25 to 99 Employees
Hospitality	Misdemeanor	17	46	8
Hospitality	Felony	1	5	1
Construction	Misdemeanor	26	43	2
Construction	Felony	2	9	—
Other	Misdemeanor	23	16	1
Other	Felony	4	—	—

NOTES: These data include all criminal history records, not only felonies and misdemeanors committed with the past five years. These data include records from both Minnesota and North Carolina.

businesses were at risk (or excluded), then roughly 180,000 businesses employing nearly 1.8 million individuals could be affected by felony restrictions.

These figures are likely to be a lower bound in terms of the criminal history prevalence of small business owners. In particular, we are much more likely to have experienced false negatives in terms of name matching, and we do not know of crimes that might have been committed in other jurisdictions (e.g., federal, other states).

Comparison with Previous Research Estimates

When the original PPP felony restrictions were created in March 2020, there were no direct estimates of how many businesses might be affected by these restrictions. In June 2020, Finlay, Mueller-Smith, and Street used the new CJARS to estimate that as many as 1.7 percent of sole proprietorships might be ineligible for the first version of the PPP because of current or prior criminal justice involvement. CJARS has administrative criminal justice data from seven states; the U.S. Census Bureau then links the criminal justice information with information on individual tax returns maintained at the U.S. Census Bureau. The tax data identifies sole proprietorships, a subset of the small business types affected by the PPP restrictions.

According to Finlay, Mueller-Smith, and Street's study, more than 250,000 self-employed business owners in these seven states had one or more dis-

qualifying events under the original restrictions. This result is a combination of five factors:

1. being in prison
2. being on parole
3. being on probation
4. having a pending felony charge
5. having one or more felony in the past five years.

The final factor had the largest single impact.

Results varied by state: Texas had the highest estimate of disqualified owners (3.2 percent) and New Jersey and Pennsylvania had the lowest estimate (0.6 percent).

This important study had two limitations. First, the researchers only examined data from seven states; second, the researchers only considered sole proprietorships. Individuals involved in partnerships or other small businesses were not included. As a result, this study did not provide a national picture of how many small business owners have criminal history records. Therefore, federal programs that restrict small business eligibility using owners' criminal history records lacked an information base for informing policy and program decisions about the impact of criminal history record restrictions. It makes sense to compare our estimates with the relevant numbers from Finlay, Mueller-Smith, and Street's study.

In Table 8, we compare our state-specific estimates of prevalence of felony convictions in the past five years with the CJARS estimates of those with a recent felony.

TABLE 8

Comparison of RAND and Criminal Justice Administrative Records System Estimates of Prevalence of Recent Felonies

State	RAND National Estimate (percentage)	RAND State Estimate (percentage)	CJARS Estimate (percentage)
Texas	1.16	—	1.00
North Carolina	0.87	0.23	0.70
Pennsylvania	0.49	—	0.60
Wisconsin	1.63	—	0.70
Michigan	0.44	—	2.00
Minnesota	0.20	0.11	—
New Jersey	0.05	—	0.60

Our estimates are in broad agreement with the CJARS estimates. Their estimate in North Carolina (0.70 percent) is close to our estimate of 0.87 percent (CI 0.67 to 1.06 percent), and our estimates are even closer to Finlay, Mueller-Smith, and Street's estimates for Texas (1.16 percent and 1.00 percent, respectively) and Pennsylvania (0.49 percent and 0.60 percent, respectively). We found much lower rates than Finlay, Mueller-Smith, and Street did in Michigan (0.44 percent versus 2.00 percent) and New Jersey (0.05 percent versus 0.60 percent) and higher rates in Wisconsin (1.63 percent versus 0.70 percent).

Our estimates might differ from those of Finlay, Mueller-Smith, and Street for two reasons. First, we are using different sources of information. Second, we use different definitions, particularly in the case of business ownership. These differences have different effects. We might expect that the tax data on sole proprietorship is more comprehensive than an assembled list of businesses, meaning that the estimates derived from CJARS should be larger than ours. However, we have a broader definition of business ownership than Finlay, Mueller-Smith, and Street do.

We also note that our consumer and background data provide only a limited window into the data maintained in each state while CJARS has extensively curated their data in the seven states studied, with the most complete data in Michigan and Texas. As a result, we are comfortable concluding that our estimates are low for such states as Michigan (for which our estimates are substantially lower than the CJARS estimates).

Conclusions

We estimate that 1.5 percent of businesses have owners who have been convicted of a felony; 8 percent of the general adult population have ever been convicted of a felony (Shannon et al., 2017). The SBA has a long record of imposing restrictions on loans and other aid to small businesses owned by individuals with criminal history records. This history could partly account for business owners being less likely to have felony records than the general population. Among those small business owners who did have felony convictions, we estimated that about a third

were explicitly prevented from participating in the PPP loan program as announced in March 2020, which disallowed applicants who had had a felony conviction in the past five years (0.47 percent of small businesses have owners who have a felony within the past five years, and 1.5 percent have owners who have any felony record). After pushback from advocates and policymakers, some of which was fueled by the timely research done by Finlay, Mueller-Smith, and Street, the Trump administration and then the Biden administration removed many of these restrictions. The restriction is now limited to those with convictions for fraud, bribery, embezzlement, a false statement in a loan application, or an application for federal financial assistance (Hayashi, 2020).

Building on Finlay, Mueller-Smith, and Street's research, we directly estimate that 201,174 more businesses were eligible for PPP funding as a result of the PPP revisions. The revisions also potentially affected 325,665 employees. The 2021 policy change represents an order of magnitude reduction in the prevalence of businesses affected by the restrictions (0.47 percent to 0.03 percent).

Given the limitations of our data, we believe that this estimate is a lower bound on the total number of affected businesses. Using the states where we are more confident in the statewide court records coverage, our prevalence estimates increase 38 percent (from 0.47 percent to 0.65 percent). As many as 81,000 businesses not captured in our data might be positively affected by the changes in restrictions.

Although we did not have complete racial data, the nationwide data that we do have suggest that Black-owned small businesses were more heavily affected by the original PPP felony restrictions. Twenty-four percent of the businesses affected by these restrictions were owned by Black individuals, and the percentage could be much higher if Black owners are overrepresented among owners with a missing racial status. The restrictions also did not affect all industries equally (Lageson, Webster, and Sandoval, 2021). The impact was particularly large in the retail, construction, waste management, and manufacturing sectors—sectors that historically include high numbers of people with criminal history records (Holzer, Raphael, and Stoll, 2006).

To the best of our knowledge, this is the first time that commercially collected and indexed criminal history data have been used by researchers to generate national estimates of the prevalence of criminal history records in the United States. In this report, we have compared our results from this new approach with results from other, more traditional efforts, including research using CJARS data and our own attempts to directly estimate the numbers using publicly available information in North Carolina and Minnesota (Finlay, Mueller-Smith, and Street, 2020).

The main challenge with any attempt to calculate the prevalence of criminal history in any subpopulation is the completeness of the criminal history record information in the background check data. In the current study, we identified states in which the criminal history record data aggregator appeared to have statewide access to court information. A comparison of the prevalence estimates showed that most of the states with the lowest estimates also were states in which the data aggregator did not have comprehensive statewide court information.

Missing data about key characteristics of individuals were a separate challenge. Without complete information in most or all records, it is difficult to answer some of the more detailed questions about potential biases resulting from missing data. Further documentation of the strengths and weaknesses of the consumer and background data would make similar analyses with this kind of data more valuable.

The initial goal of this project was to measure the impact of PPP restrictions on small business owners with criminal history records and on their businesses. One key component of the restrictions—felony restrictions—was almost eliminated during the course of our research. Therefore, we were able to quantify the potential benefit of this relaxation in restrictions. Our data, which provided detailed information on convictions, were particularly appropriate for estimating the impact of this repeal. However, because we had not anticipated the repeal, we were unable to further estimate the positive effects of this decision. For example, we could not measure how many now-eligible small businesses were initially denied PPP loans or how many small businesses closed because of the inability to get assistance under the original PPP restrictions. We also do not have

evidence to support conjectures about the ripple effect of PPP restriction decisions on employees of the affected businesses. If small business owners with criminal history records are more likely to hire those with criminal history records, then the employees disproportionately affected by these decisions could be from racial minority groups that are more likely to have criminal history records.

Future research might help answer these important questions by targeting industries, such as construction, that have higher percentages of small businesses affected by criminal history record restrictions. Consumer and background check data could be used to identify businesses that have an owner or owners with criminal history records and that also received PPP loans. However, because consumer and background check companies expect to receive a fee for each search they conduct, project costs when searching for collections of businesses (e.g., from the list of businesses that received PPP loans) could rise more rapidly than when searching the summary data that we used for this analysis. At the very least, estimates from this report could be combined with information about the number of eligible businesses in each industry that actually received a PPP loan to provide a realistic number of the potential applicants who might have been turned away because of restrictions.

Because felony convictions often are a barrier to employment, entrepreneurship may well be a reasonable alternative for individuals with felony records. However, even these opportunities could be eliminated if such agencies as the SBA do not help people with felony records. We estimate that only 1.5 percent of businesses have owners with a felony record; however, 8 percent of the U.S. population has a felony record. Although there are many reasons why those with felonies might not own a business, aggressive enforcement of criminal history record restrictions might further alienate an already marginalized subpopulation that needs access to the formal labor market to complete integration into society (Brayne, 2014). Most research on re-entry after imprisonment does not fully engage with the possibilities and potential hurdles that face would-be entrepreneurs. As opportunities for gig work and other self-employment opportunities continue to expand, more needs to be done to understand the viability of this

path for those seeking to desist after a conviction. This research could expand on existing work that looks at the capital use and needs of minority-owned firms as a separate and distinct group (Robb, 2012).

One unique (if accidental) feature of this work is that it highlights the potential benefits of a policy intervention (the elimination of the original PPP felony restriction) designed to reduce the obstacles faced by those with criminal history records rather than another policy designed to limit their opportunities. It is our hope that, as more policies are implemented that aim to expand opportunities for those with criminal history records, researchers can more directly and purposefully estimate the harms and benefits of these policies for the people and communities most directly affected by them.

Endnotes

[1] It is unknown how these restrictions were implemented in practice. The SBA Inspector General's office criticized the SBA for generally lax administration (SBA, Office of Inspector General, 2021), and felony restrictions possibly were ignored. Nonetheless, written restrictions could have discouraged applicants who did not want to run afoul of federal rules (Brayne, 2014).

[2] For example, when working directly with state criminal history data, we checked for duplicate name and date of birth matches. We found one name–date of birth duplicate match in 4,177 checks for Minnesota and 8,514 name–date of birth duplicates in 1,347,810 records from North Carolina (a 0.02-percent and 0.6-percent duplicate rate, respectively). Given what we know about the commercial entity resolution algorithm, we have every reason to believe its error rates would be far smaller than what we found with our much more naive approach.

[3] The data from the aggregator indicated employee size as fewer than 500, and therefore technically excluded companies with 500 employees, a group that would have been included in the SBA definition.

[4] The estimator can be written

$$\sum_{i=1}^{n} W_i\{A_iY_i / \pi_i - \mu_i(A_i - \pi_i)/\pi_i\},$$

in which A_i is an indicator of knowing felony status, Y_i is an indicator of being affected by PPP restrictions, π_i is an estimate of the propensity score (probability of knowing felony status), and μ_i is an estimate of the outcome model (probability of being affected by PPP restrictions). W_i indicates the count of businesses in the grouping by business and owner characteristics.

The variance of the estimator can be written as

$$\sum_{i=1}^{n} (1 - \pi_1)W_i^2(Y_i - \mu_i)^2 / \pi_i.$$

This equation treats the felony missingness as the only source of randomness because the consumer data are not a random sample but a (near) census of criminal history records.

[5] This number could be compared with the 27.6 million total businesses with and without employees in the 2012 Survey of Business Owners conducted by the U.S. Census Bureau (U.S. Census Bureau, 2016).

[6] An additional 130,000 felonies had occurred earlier than the five-year cutoff, and 591,000 records were listed as misdemeanors or infractions.

[7] The company provided us with a list of sources from which they collect their data. We identified states in which the aggregator stated that they collected court data from a statewide source, usually the state administrative office of the courts. We are not publishing the list of states that the company considers to have good statewide court coverage because the company considers this information to be confidential and proprietary.

[8] *Management of companies and enterprises* is a North American Industry Classification System categorization that mostly applies to offices of holding companies and bank holding companies (North American Industry Classification System Association, undated).

[9] We did not have the consumer and background check results when we asked for the oversample and therefore did not focus on retail, which was highlighted in the national-level consumer and background data analysis.

[10] For North Carolina, we conducted only exact name matches. We did not attempt to use common nicknames, Soundex (which searches for similar-sounding names), or any other name alternatives for matching. The Minnesota website search has the advantage of returning results across all known aliases (alternative name matches).

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Acknowledgments

About This Report

The Paycheck Protection Program (PPP) has provided funds for payroll, rent, mortgage, and utilities to businesses with fewer than 500 employees to help ease the economic effects of the coronavirus disease 2019 pandemic. The PPP did not initially allow participation by companies owned by individuals with a criminal background. This definition of *criminal background* included individuals with felony convictions in the past five years.

Following pushback from policymakers and advocacy groups and a lawsuit by the American Civil Liberties Union, the Trump administration limited the five-year restrictions to certain felonies; for all other felonies, the restrictions were limited to a one-year window after conviction for those not incarcerated. In February 2021, the Biden administration further relaxed the PPP restrictions, removing the one-year window.

In this report, RAND researchers estimate the number of small business owners who have criminal history records. We also estimate how many small businesses and employees were potentially affected by the initial PPP restrictions and how these numbers changed under the revised 2021 restrictions. We use information from a consumer and background check company for some of our estimates, which collects and organizes data in a wide variety of domains and which links information from individual criminal history records with information about company ownership. To the best of our knowledge, this is the first time that commercially collected and indexed criminal history data have been used to generate national estimates of the prevalence of criminal history records in the United States.

This report was produced with the generous support of Arnold Ventures. The views expressed herein are the authors' alone and do not represent the opinions or positions of Arnold Ventures. This report should be of interest to criminal and civil justice researchers and to readers interested in the evolution of the use of data algorithms in research.

RAND Justice Policy Program

RAND Social and Economic Well-Being is a division of the RAND Corporation that seeks to actively improve the health and social and economic well-being of populations and communities throughout the world. This research was conducted in the Justice Policy Program within RAND Social and Economic Well-Being. The program focuses on such topics as access to justice, policing, corrections, drug policy, and court system reform, as well as other policy concerns pertaining to public safety and criminal and civil justice. For more information, email justicepolicy@rand.org.

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