Go Code Colorado

Business Solutions Challenge 2022

Semi-Final Submission

Colorado PPP/PPS Loan Effectiveness and Potential Fraud

Description

Payroll Protection Program (PPP) loans have been generously granted since the beginning of the pandemic to help small businesses who are struggling to pay expenses such as payroll, rent, utility expenditures, and other expenses relating to the function of a business. Our project aims to analyze the distribution of these loans in the Grand Junction area to understand key factors that play a role in whether these loans are forgiven or not. We are using data from the Colorado Information Marketplace, the Small Business Administration (SBA) website, as well as a few other sources.

Literature Review

Payroll Protection Program (PPP) loans have been crucial to keeping businesses in our Country alive and well throughout the COVID-19 pandemic. Our group decided we wanted to further explore how PPP loans are being distributed throughout the state of Colorado, whether they have been effective in retaining jobs, and try to determine what characteristics indicate a potentially fraudulent loan. We want to observe individual PPP loan data, Colorado demographic data (by county), and small business data to get a broader picture of PPP/PPS loan distribution characteristics. Given that the PPP loan program as we know it began during the start of the COVID-19 pandemic, there isn't a long history of data and information beyond the past 2-3 years and there aren't many reliable sources that are procuring this data and information.

One source that we were able to find is a PPP loan database called pppdetective.org. The websites creator is a US citizen who noticed that within his city, certain businesses were not providing accurate information, and it was much easier for him as a resident of his city to discern which businesses were being truthful and which businesses had characteristics of fraudulent loans. He discusses organized and individual fraud. Organized fraud (although responsible for larger losses per loan) while easier to spot, is more difficult to deal with as it is typically a group of individuals, sometimes not even residing within the United States. Individual fraud is what we're going to focus on, as despite being responsible for smaller loses, this type of fraud is much more common, whether it be creating a completely fictious company, inaccurate representation of employees, salaries, etc. (Hamachek, 2022). Surprisingly, as of March 28th, 2022, only 178 people have been convicted for PPP fraud, but this number is sure to continue climbing as more and more loans are audited. The Pandemic Response Accountability Committee is also having some successful methods in determining fraud. In one instance, they were able to find a single phone number for a small gas station in Houston being used for upwards of 150 different loans. Inconsistencies like duplicated information can be used as a quick and easy indicator for potential fraud as well (Dilanian & Strickler, 2022).

Another recent study found that financial technology firms were more likely to have granted suspicious/potentially fraudulent loans. Despite making up only 29% of PPP loans, these financial technology firms were responsible for over 50% of suspicious loans. In addition, nine out of ten lenders with the highest rates of suspicious loans fell under the financial technology umbrella (Cowley, 2021). According to these firms facing scrutiny, a higher instance of suspicious loans makes sense in their eyes, as they focused on "riskier groups" such as solo entrepreneurs and smaller companies. We will take this into account and take a closer look at whether businesses categorized as self-employed or sole proprietorships had higher instances of not forgiven loans.

When trying to predict which characteristics we thought might factor into PPP loan forgiveness, one that came to mind was race/ethnicity. Not simply because we believe that certain races will be treated differently solely due to their race, but because different races tend to reside in different areas in terms of income and such, which could be a key factor in explaining how some individuals may have needed money to deal with pandemic hardships and turned to fraudulent loans. In one study, the researchers found that PPP loans didn't reach minority communities as effectively as they did Caucasian communities in both the first and second rounds of the program, with this discrepancy being less severe in the second round of the program (Fairlie, 2022). These results indicate that the race and ethnicity of the borrower may be significant in predicting certain loan characteristics, potentially whether a loan will be forgiven.

Datasets

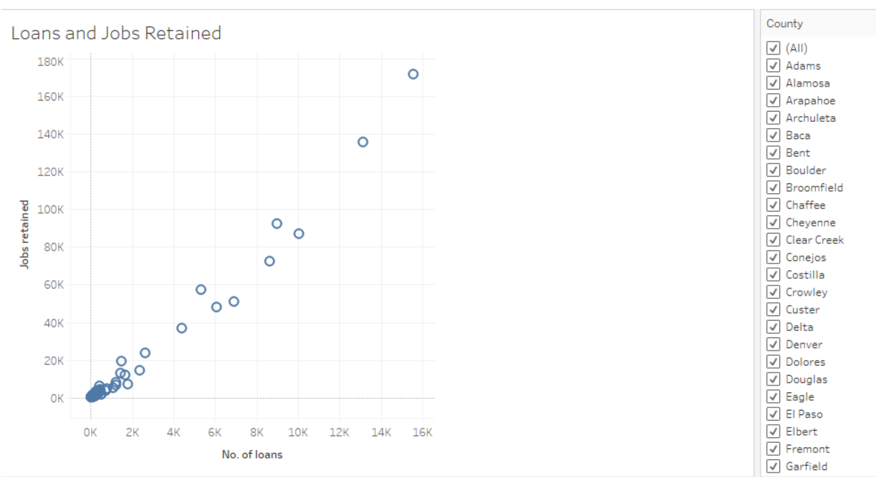
The data sources mentioned above were used to create two datasets used for our analysis, one with Colorado county data and another with information for each individual PPP/PPS loan in the city of Grand Junction. Our Grand Junction dataset had 3095 data points and our county dataset had 64, one for each county in Colorado. Before taking a closer look at Grand Junction, we will first look at how PPP loans have been distributed across the state of Colorado to determine whether they have been effective as a whole, in addition to whether Mesa County's loans were more or less effective than the average county in terms of job retention. Table 1 shows linear regression results between the number of loans distributed to each county and the number of jobs retained

Table 1: Number of Loans and Jobs Retained Regression

Variable	Coefficients	P Value
Intercept	-1652.223	0.017
No. of loans	9.939	0.000

This regression offers a lot of relevant information in terms of PPP loan effectiveness. With an R^2 value of 0.9787, we determine that 97.87% of the variance in the number of jobs retained is due to the number of loans granted in a county. P values are statistically significant at the 99% level, and our slope coefficient tells us that for each loan granted, an additional 9.939 jobs are retained. This clear linear relationship can be evidenced in a scatter plot as well.

Graph 1: Loans and Jobs Retained Scatter Plot



In addition to this graph, we can look at Mesa County specifically and see if the relationship between loans and jobs retained falls in line with other counties. With 2,644 loans and 23,893 jobs retained, Mesa County has an average of 9.04 jobs retained per loan, just slightly below the state average of 9.939. Now that we know Mesa County is not an outlier and its loan effectiveness rates are nearly equal to the average, it makes sense to look deeper into the characteristics of the individual loans within the county.

Table 2 shows a few key differences between loans that have been forgiven and those that have not within Grand Junction.

Table 2: Characteristics of Forgiven and Not Forgiven Loans

Loan Information	Forgiven	Not Forgiven
Term	39.06	56.24
Jobs Reported	5.24	3.48
% Non-Profit	3.21%	1.85%
% Self-Employed	1.95%	8.62%
% Sole Proprietor	14.62%	27.38%

The data from this table indicates that not forgiven/potentially fraudulent loans tend to have a longer-term length, less jobs reported, are more likely to be categorized as self employed or a sole proprietor and are less likely to be categorized as a nonprofit.

While looking closely at the NAICS code we, selected the top five industries with highest amount of approval for Payroll Protection plans. By looking at the graphs you see the skewness in data when looking at the top two industries in Mesa County. First NAICS code 722511 there must have been an over reporting in jobs the first time around since first draw of the loan which labeled PPP in table has 863 jobs and average employee received $4757.16 while the second time around which is labeled as PPS in the table 338 jobs were reported and the dollars received by each employee also goes up. A similarity can also been seen in the NACIS code 621210. Where first draw of the payment protection plans each employee received $17006.08 however in second draw of the payment protection plans each employee only received $4815.61 that is huge disparity therefore is big possibility of over reporting of jobs.

Table 3: NAICS Code Differences

Nacis Code	Industry Name	Processing Methoc	Jobs Reported	Approval Amoun	Average
722511	Restaurant	PPP	863	4105435	4757.16686
722511	Restaurant	PPS	338	2444058	7230.940828
621210	Doctors of Dental Surgery	PPP	211	3588283	17006.08057
621210	Doctors of Dental Surgery	PPS	397	1911800	4815.617128
621111	Offices od Physicans	PPP	241	2471990	10257.21992
621111	Offices od Physicans	PPS	61	689516	11303.54098
541110	Attorney's Office	PPP	166	1872005	11277.13855
541110	Attorney's Office	PPS	44	465898	10588.59091
531210	Real State	PPP	190	1870359	9843.994737
531210	Real State	PPS	78	710493	9108.884615

This analysis has a few key takeaways. First and foremost, the PPP loan program has proven its effectiveness throughout Colorado when it comes to retaining jobs. Additionally, it appears that there are a plethora of variables that can be used to indicate whether a loan is potentially fraudulent. The longer the loan and the less jobs reported, the more likely a business is to have taken a potentially fraudulent loan. Potentially fraudulent loans are also more likely if a business is categorized as self-employed or a sole proprietorship, and less likely if categorized as a non-profit. Surprisingly, the NAICS code of the business was not a significant predictor in whether a loan would be forgiven or not. The Pandemic Response Accountability Committee could utilize this information in conjunction with the variables they've already found to be of interest in identifying suspicious loans (loan granted by financial tech company, race of borrower, self-employed) to create a system in which certain loans will be looked at more closely based on their term length, number of jobs reported, and their business type.

References

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