Did the Paycheck Protection Program Keep NYC Restaurants Alive?
Research Proposal
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Adam Childs, Ashkaan Moinzadeh, Chris Ratsimbazafy

Intended Audience: Policymakers and Legislators evaluating future economic assistance programs.

Overview

Across the United States, emergency mandates to limit the Coronaviral Infectious Disease 2019 (COVID-19) imposed drastic and immediate limitations on the restaurant and food service industry. In many cases, these limitations resulted in complete, state-wide shutdowns, and the resulting decrease in business activity resulted in the permanent closure of many businesses. On March 27th, 2020, the US Government signed into law the Coronavirus Aid, Relief, and Economic Security (CARES) Act, a $2.2 trillion package designed to provide emergency assistance for individuals, families and businesses impacted by the pandemic. An important provision within the CARES Act was the creation of the Paycheck Protection Program (PPP), which aimed to provide business applicants with forgivable loans to financially support them through the pandemic. PPP loans were designed as a financial incentive for small businesses to keep their employees on payroll. As such, disbursements could be used to cover payroll costs, rent, mortgage interests, as well as employee benefits and uninsured property damage due to looting or vandalism. Any small business, 501(c)(3) non-profit organization or sole proprietor could apply for the loan as long as they met the U.S. Small Business Administration's (SBA) size standards [1]. Prior to the program's close on May 31, 2021, a total of $780 billion in loans were disbursed, with $711 billion in loans forgiven as of March 27th, 2022 [2,3].

As one of the largest social and commercial cities in the U.S, New York City (NYC) saw nearly 100,000 PPP applications. Being one of the first cities to report positive cases in COVID-19 since March 1st, 2020, NYC proactively mandated executive orders that limited professional practice in healthcare, wholesale pharmaceutical sales, and all professions requiring participation within an enclosed space [4, 5, 6, 7]. In particular, the restaurant and food service industry, which uniquely depends on in-person customer service and physical proximity between its employees, experienced significant strains in revenue due to enforcements on seating capacity, customer vaccination status and interpersonal distance from legislative mandates [7]. A large number (5,111) of these businesses applied for, and received, PPP loans, yet a significant portion (18,539) did not. Given that approximately one third of NYC businesses had permanently closed during the pandemic, there is great value in investigating the efficacy of PPP loans in having prevented businesses from permanently closing.

NYC's restaurant industry is a linchpin for the city's cultural affairs, underlying infrastructure and larger economy. As of 2019, New York City restaurants provided over 317,000 jobs, paid $10.7 billion in wages citywide and amassed approximately $27 billion in taxable sales. Between 2009 and 2019, restaurant industry jobs grew by 61%

and the number of establishments increased by 44% to 23,650 [8, 9]. As researchers within the Mayor's Office of Data Analytics (MODA), our team works across all of NYC's agencies, and utilizes their respective databases, to address public policy issues. Our work relies on large-scale data reformatting and analysis to improve agency operations and making citywide data accessible to all New Yorkers. Given the significant role that restaurants play within New York City's economy, we aim to explore the impact of PPP loan provisions on NYC restaurant closures, and we propose tangential investigation within the following fields:

- Which lenders provided loans to restaurants?
- Which zip codes saw the highest number of loan applications?
- What degree of loans were ultimately forgiven?

The proposed study asks if the PPP assistance program significantly increased the survivability of restaurants and food service establishments in NYC between March 2020 and July 2022.

Research Question

Did the Covid '19 Paycheck Protection Program succeed in preventing permanent closure of New York City restaurants and food service businesses through July 2022? We define survival on two conditions: (1) the address and phone number of a sampled restaurant can be located through a Google search, and (2) the restaurant, upon receiving a phone call, confirms that the business is open or not permanently closed.

Sub-Questions:

- Are business failure rates, with or without PPP assistance, uniform across zip codes within NYC?
  - How do restaurant failure rates, with or without PPP assistance, differ among areas with the highest concentration of businesses?
- Are failure rates, for those that received PPP assistance, different across lenders?
- Did loan forgiveness impact the number of businesses that permanently closed?
  - Of the businesses that received loan forgiveness, how does permanent business closure measure to the dates that loan forgiveness was granted?
- Among restaurant recipients who received loans, were older restaurants more likely to survive the pandemic than newer ones?
- Did the PPP cause restaurants to survive at rates above historical norms?
  - Did this vary by restaurant age?

Study Design

We will conduct a quantitative study to measure survival rates of NYC restaurant or food service establishments receiving PPP assistance through July 2022. In brief, our sample groups will be prepared using data provided by the SBA and NYC Department of Health and Mental Hygiene (DOHMH). A survey script will be designed and deployed through Amazon Mechanical Turk (AMT), to poll our control and treatment groups to confirm the business is not closed. Our collected data will be analyzed through

descriptive statistics, and the statistical significance of our hypothesis test will be assessed through Chi Squared Testing and One-Tailed T-Testing.

Data

We identify all New York City-based restaurants (regardless of whether or not they received a PPP loan) using New York DOHMH's New York City Restaurant Inspection Results [10]. An inspection is required to occur, at a minimum, once every 12 months for every restaurant and food service establishment. Each row within the Health Inspection Results pertains to a unique inspection report for a given business which includes address, data related to inspection date/type. This will be our population of uniquely identified restaurants. Early analysis indicates a set of over 23,000 restaurants and food service establishments with inspections in the 12 months prior March 2020.

We are able to identify restaurants and food service businesses that were granted PPP loans through examination of publicly available PPP loan application data from the U.S. SBA [11]. This database includes data across all business types, but we select only restaurants and food service businesses that applied for and received loans under the Paycheck Protection Program.

- Each row within the tables of the SBA PPP database corresponds to a unique loan application submitted by a business. These rows include information about the loan approval amount, current loan status and forgiveness amount.
- The SBA PPP data also includes borrower information (e.g. name, address, city, number of employees, race/ethnicity) as well as lender details (e.g. lender ID, name, city, state).
- The SBA PPP data includes business address and how long the business has been in operation at the time the loan application was submitted.

Sample

The group of interest represents all New York City-based restaurants that were
1. operating prior to the onset of the COVID-19 pandemic in March 2020, and
2. applied for and received loans through PPP.

We begin by collecting all loan application data under the PPP program until January 2nd, 2022. Afterwards, we intend to reduce the dataset to all New York City-based entities by filtering on the "Borrower City" field. Finally, we will filter for all New York City-based restaurants by selecting the NAICS code (72251) that refers to "Restaurants and Other Eating Places". This industry code includes full-service restaurants (722511), limited-service restaurants (722513), cafeterias and buffets (722514), as well as snack and nonalcoholic beverage bars (722515) [12]. After compiling a list of all New York City-based restaurants that received a PPP loan, we will select a random sample of our

treatment group and assess whether or not these restaurants "survived" the pandemic, i.e. are either open or are closed as of July 2022.

The control group will be composed of a stratified sample of 1000 restaurants and food service establishments that did not receive PPP loans, stratified by restaurant location zip code. The treatment group will be defined as a random sample of 1000 restaurants that applied for, and were granted, PPP loans, stratified by zip code.

Variables and/or Intervention

For both our treatment and control groups, we will organize a standard manual verification script to be distributed to surveyors through Amazon Mechanical Turk, following the outline:

      1) A single Google search for each restaurant and its respective street address as listed in the DOHMH Health Inspection records, and
      2) A single phone call to the listed number, within the listed business hours to confirm the business' operation status.

We will provide contracted Mechanical Turk surveyors with intersecting lists of restaurants to ensure that each business is screened by three surveyors with the majority result accepted. Each survey script will strictly limit the steps to discover the business phone number, and verify the business is not closed. The use of Mechanical Turk ensures a strict separation of data collection and our research team.

Statistical Methods

Our null hypothesis: New York City restaurants and food service business survival rates from March 2020 to July 2022 are the same among those that received PPP loans, and those that did not receive PPP loans.

With a $p < 0.05$, we will evaluate if there is an impact of PPP on the survival of restaurant or food service businesses within New York City through the use of a Chi-squared test. We will apply the Chi-squared test with 1 degree of freedom, comparing failure counts in the treatment against an expected value defined by the number of business failures in the control group. We deem the Chi Square test appropriate to address our research question because our outcome variables are defined by frequencies of business failure for each business group, which are culminations of boolean values that always scale between magnitudes of 0 and 1.

Given that we are testing the increased likelihood that a restaurant receiving a PPP loan survived the pandemic, we plan to apply a one-tailed test. While we are assessing the degree to which a PPP loan impacts an establishment's survivability, we are also interested in whether the loan had a positive or negative effect on our outcome.

Potential Risks

Our population is drawn from Health Inspection records for the 12 months prior to March 2020. We recognize that this is a lagging indicator of the life of these businesses. However, both the treatment and control will be equally affected by any businesses that failed before the availability of the PPP program.

We recognize that there may be fraud within some subset of the PPP loan applicants, with this program enacted on an emergency timeline, and as such oversight reduced to speed disbursements [13]. There may be:

1) loans granted to entities that did not necessarily need the assistance, or
2) loans granted to businesses that may not have existed prior to the pandemic

We accept that complete fraud control is outside the scope of this study. However, our use of the Health Inspection records controls for the second concern by defining our population as only restaurants and food service places that were visited by a government official within the 12 months leading to March 2020.

In the period that this study covers, we recognize there were many assistance and business risk mitigation programs introduced in this non-normative time, e.g. Restaurant Act, Covid restaurant surcharge fee, relaxation of regulations regarding outdoor dining, and alcoholic beverage delivery and carry-out made lawful. This study limits scope to the impact of the PPP, while encouraging future research across these variables.

Deliverables

At the conclusion of this study, targeting August 1st, 2022, we will deliver a research report analyzing our collected data, and addressing our primary research question, "Did the Covid '19 Paycheck Protection Program succeed in preventing permanent closure of New York City restaurants and food service businesses through July 2022?"

We will use our collected data to analyze potential moderating variables; lender, if the loan was forgiven, and the business location (zip code). We will also compare historical rates of restaurant survival rates [14] with our two groups (PPP and non-PPP participants from March 2020 through July 2022) in order to understand the appropriateness of the magnitude of PPP assistance provided to the restaurant industry.

As part of our remit as researchers within the Mayor's Office for Data Analytics (MODA), we will publish our findings and make our collected data and source code available within Open Data for all New Yorkers to access. We do this to encourage open research and promote reproducibility.

Works Cited

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Statement Of Contribution

Adam Childs

Contributions include:

- Led the initial Study Design section
- Focused the Research Question and collected initial Sub-Questions
- Collected references and fact-checked other sections, providing feedback and edits
- Worked to ensure we have a path from available / acquirable data in order to answer our research question with sufficient rigor.
- Authored initial draft of Potential Risks and Deliverables sections
- Contributed to outline of the Presentation
- Revision of my section of the presentation, authored my content, provided feedback to teammates
- Multiple proof-reading runs across the Research Design document

The project went well, the team worked together across all aspects of the project. The Study is looking very good. Nothing jumps out as particularly deficient across either the study design or the presentation. Truly enjoyed working with my teammates on this, and am proud of our deliverables.

Ashkaan Moinzadeh

Contributions include:

- Led the Overview and PPT design sections
- Explored the SBA PPP and NYC Restaurant data dictionary in order to determine relevant variables worth studying.
- Drafted a project roadmap to serve as a structure for all future project expectations and deliverables.
- Contributed to the Overview, Research Question, Data, Study Design, and Statistical Methods sections.
- Proof-read the document multiple times.
- Collected references for works-cited that concerned legislative documents and third-party statistics.

I believe that we successfully designed our research project. Communication was very effective between team members, and tasks were well divided. If we had to conduct this project again, I would not change any critical components of our design. The only change may be that we could have implemented a fraud-weeding protocol, but within the

Chris Ratsimbazafy

Contributions include:

- Led the Data section
- Defined our role as researchers within Mayor's Office of Data Analytics (MODA)
- Collected and provide wider historical context of CARES Act and PPP as well as researched the scope and influence of New York City's restaurant industry

- Contributed to and revised Overview, Sample, Variables and/or Intervention, Statistical Method sections
- Examined SBA PPP data availability and concatenated master dataset which includes all loan application data (10MM rows) from onset of PPP till January 2nd, 2022
- Prepared dataset to only include New York City-based restaurants (5000 rows) and relevant columns (borrower/lender information, loan details, business type, etc.)
- Identified DOHMH New York City Health Inspection Results dataset as proxy for master list of all New York City-based restaurants.

I thoroughly enjoyed working on this research design study with both Adam and Ashkaan. They were both diligent in producing high quality analysis and punctual when it came to internal deliverables. If we were to reconduct this study, we could have identified another business type, i.e. retail, that may be less susceptible to changes in personal preference as are restaurants.