Stimulating Community Investment:
A Preliminary Evaluation of Opportunity Zones in the City of Chicago

By

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Abstract

The Tax Cuts and Jobs Act of 2017 included a special provision creating the Opportunity Zone program. Opportunity Zones are designated low-income census tracts that were designated to encourage investment in underinvested and overlooked community areas. The program offers a reduction in tax liabilities for capital gains. This paper uses a difference-in-difference model to offer a preliminary evaluation of the effects of the Opportunity Zone program on small business lending. I utilize tract level small business loan originations from the reporting requirements of the Community Reinvestment Act of 1977 to estimate the causal effects of the program. Small business lending trends in Opportunity Zone designated tracts are compared to the trends in low-income tracts that were eligible but unselected for the program using the difference-in-difference model. The results from the model demonstrate modest, but statistically insignificant, negative effects of the Opportunity Zone designation on lending for small businesses. The largely null results from this paper suggest that there may not be a clear relationship between OZ designation and small business lending, but more projects with longer time horizons and/or different socioeconomic metrics could conclude other findings.

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Introduction

Policy Background

The Tax Cuts and Jobs Act of 2017 created a new federal tax incentive program intended to spur investments in under-resourced, low-income communities across the country. Corporations and individuals can place their capital in special-purpose entities called Qualified Opportunity Funds (QOF) that will be invested into Opportunity Zones (OZ). The QOFs can finance a broad range of projects including commercial and industrial developments, housing, infrastructure, and existing and start-up businesses. These projects are intended to bring much needed outside capital into traditionally underinvested communities. At a time when the City of Chicago was experiencing a 5.2% decline in affordable housing (Institute for Housing Studies - DePaul University, 2021) and progress in real estate development in the South and West Sides had stalled (Ori 2020), the creation of these Opportunity Zones was seen as a welcome structural change to incentivize investment into both real estate developments and small businesses.

Politically, OZs were a bipartisan initiative. The idea behind the policy was originally authored by two economists Kevin Hassett and Jared Bernstein in "Unlocking Private Capital to Facilitate Economic Growth in Distressed Areas" (2015). In the Senate and the House, the policy officially codified as the *Investing in Opportunity Zones Act*, was pushed forward by Senators Tim Scott (R-SC) and Cory Booker (D-NJ) and Representatives Pat Tiberi (R-OH) and Ron Kind (D-WI). This act was incorporated into the Tax Cut and Jobs Act of 2017 and signed into law by former President Donald Trump ("Investing in Opportunity Act", 2018). Since the passage of the policy, there has been criticism about accountability and effectiveness. Initially, the policy had no reporting mechanism to evaluate impact on any geographic level and QOFs had a great deal of flexibility in the types of investments they pursued (Jacoby, 2019). Some of

these concerns were addressed by the Internal Revenue Service's addition of Form 8996 and 8997 which required the reporting of QOF investments and included sections for However, these reports are not publicly available and do not require investors to disclose any metrics related to social welfare of investment geographies (Treasury Inspector General for Tax Administration, 2022).

Policy Mechanics

OZs were created in order to promote social investments in distressed communities by encouraging partnerships between mission investors, philanthropic organizations, and mainstream actors in the capital market. Investors are given tax deferrals and relief on liabilities for their capital gains. Proponents of the incentive argue that the law has the potential to grow the pool of investors interested in investing in traditionally overlooked geographies and this inflow of capital can have a significant impact in the uplifting of communities. Under this scheme, traditional investors would be able to partner with or create community investment funds to strategically place their capital in projects that have the potential to succeed both economically and socially. The program provides three main tax benefits for the investment of unrealized capital gains. First, investors can reinvest assets with previously accumulated capital gains into QOFs and the existing capital gains will not be taxed until the end of 2026 or until the asset is sold. Second, depending on the length of one's investment the initial investment's basis can be increased to cut down on future tax liabilities. If the investment is held for at least 5 years, the basis increases by 10% of the deferred gain. If held for at least 7 years, the basis increases by 15% of the deferred gain. Lastly, for investments held for at least 10 years, investors pay no taxes on any capital gains produced through their investments in the QOF (however would still be held liable for the capital gains from their original investment prior to entering the QOF) (Tax

Policy Center, 2020). With the long-time horizon set-up by the TCJA for full tax relief on capital gains, it was intended that investors keep their money in QOFs for the long-run — providing a stable capital source that encourages consistency in communities.

With respect to the designation of OZs, community areas may qualify as an OZs once nominated by their state and certified by the US Treasury. Section 45D(e) of the Internal Revenue Code sets up the minimum parameters for low-income communities — this includes census tracts with a poverty rate of at least 20% or tracts where the median family income does not exceed 80% of the statewide median income. Only 25% of a state's low-income census tracts may be designated as OZs (I.R.S. 6 U.S. Code § 45D, 2022). The City of Chicago currently has 134 census tracts designated as OZs that were selected using data from the 2011-2015 US Census Bureau's American Community Survey as well as conversations with city aldermen to determine which tracts had the greatest investment potential and need (City of Chicago, 2018).

In terms of the types of investments encouraged by QOFs, aside from a few "sin" businesses that were excluded from the incentive, there are very few limitations as to what these investments look like. In the statute, to be eligible for investment, 50% of a business' income must come from active conduct of the business. Moreover, for real estate investments there is a "substantial improvement" clause which dictates that a QOF must spend at least as much on improving the property as it paid to acquire it (Theodos et al., 2020). While this incentive has the potential to attract a substantial amount of funding, there is some concern about whether these investments will be actualized. There is a significant amount of risk associated with such projects and investors may be weary towards making significant contributions to initiatives that will not yield commensurate returns.

Despite these challenges, there is a great deal of potential for the usage of OZs in new and innovative ways as the national economy continues to rebuild since the effects of the COVID-19 pandemic. The Tax Cuts and Jobs Act was signed into law in December of 2017, and it was not until mid-2018 when zones had started to be approved by the US Treasury. Prior to the COVID-19 pandemic and the national lockdowns that began March 2020, the tax scheme had only been fully operational for two years. In that time, the amount of investments done through QOF have remained relatively modest. The investments done so far have largely focused on mixed-use real estate development, and many have relied on a pairing of OZs with additional federal tax incentives, namely the Low-Income Housing Tax Credit (LIHTC). The LIHTC created a dollar-for-dollar tax credit for affordable housing investments under the Tax Reform Act of 1986 (Layser 2021). Small business and start-up investment activity has been overshadowed by these larger real estate development projects. As a result, researchers and politicians are urging policy changes that reprioritize diversified investment strategies that tackle neighborhood gentrification and displacement. Many believe that investing in small businesses can be an alternative that better uplifts struggling communities.

Chicago's Opportunity Zones

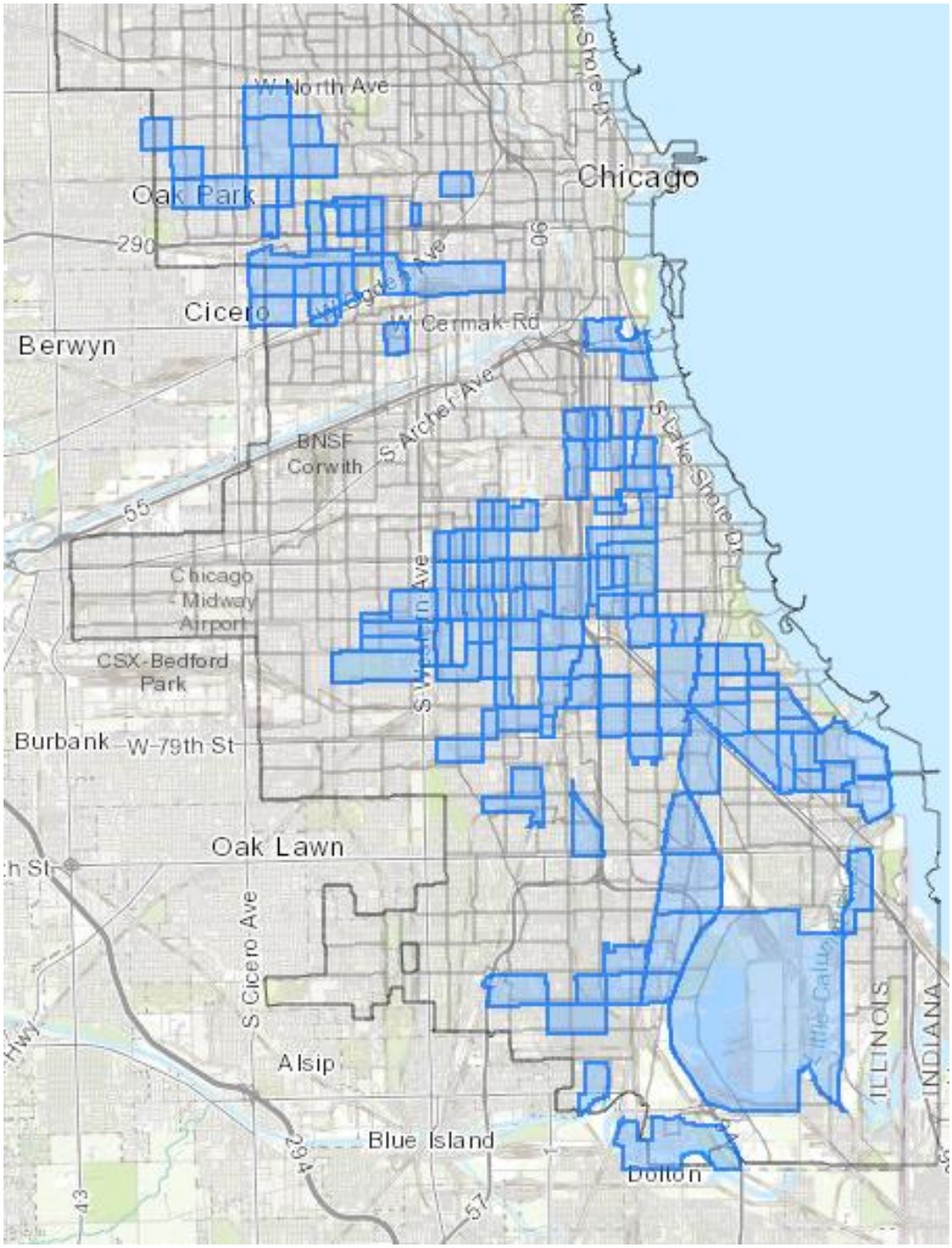
Chicago's 134 Opportunity Zones are on average more socio-economically disadvantaged than other parts of the city, county, and state. Table 1 shows some key demographic characteristics of Chicago and Illinois from the American Community Survey's five-year estimates of 2018 (U.S. Census Bureau, 2018). OZs have a poverty rate of 34.3%, are 92% non-white, have an employment rate five times higher than the state average, and are severely undereducated on the city and state levels. These zones have a high potential for impact and need structural support to ensure that the are getting the required amount of attention. Figure

A shows a map of Chicago's OZs (City of Chicago, 2018). Selected tracts are in the City's south and west sides and correspond to the areas of greatest need and investment capability. Chicago has a lot of potential to utilize this program to its fullest extent. The city has strong philanthropic organizations that are committed to economic development, relatively strong public transportation, and a large amount of vacant industrial land. The city, mission oriented individuals, and private investors have the potential to work together to further community goals and benefit all residents within the city.

Table 1: Demographic Characteristics of Chicago's Opportunity Zones

	Chicago's Opportunity Zones	Chicago	Illinois
Median Household Income	$29,949	$55,198	$63,575
% Living in Poverty	34.30%	15.47%	9.37%
% Non-White	91.99%	50.56%	28.33%
% Labor Force that is Unemployed	21.82%	5.95%	4.27%
% of Income Spent on Rent	39.4%	30.1%	29.5%
% with H.S. Diploma or More	17.40%	46.14%	54.82%
% with a Bachelor's Degree or More	5.78%	38.39%	34.07%

Figure 1: Map of Chicago's Opportunity Zones



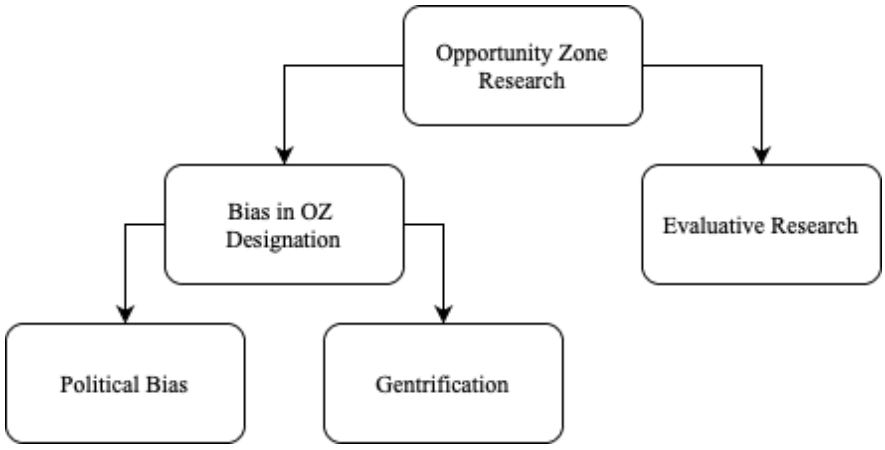
City of Chicago. Opportunity Zones [Computer Map]. 2018.

This paper will use Chicago as a case study to understand the effectivity of the Opportunity Zone designation in uplifting and bringing financial capital to underinvested communities. As discussed earlier, an overlooked part of the policy is its emphasis on encouraging small business investment in addition to real estate projects, and this study will aim to evaluate if small business activity has grown in Chicago's OZs compared to other low income communities in the city. Small business activity in this context will be defined as the dispersal of small business loans in their aggregate through datasets associated with the Community Reinvestment Act of 1977. In short, this study will compare small business lending in tracts that were designated as Opportunity Zones to those that were eligible but not designated. In order to conduct this analysis, I will first begin by summarizing existing literature in this space to thoroughly understand the current academic theories surrounding Opportunity Zone success. Then I will lay out my methodology and the statistical model that will be used to analyze the aforementioned small business loan data. Next, I will discuss the key findings from running the statistical model and discuss what they mean in the context of this paper. Lastly, I will offer policy recommendations and a conclusion where I will share this paper's key takeaways.

Literature Review

Opportunity Zones remain a new feature of the federal tax code (having only been fully implemented since mid-2018), and as a result, there is limited academic research on the topic. In this literature review, I will trace the current landscape of academic literature on OZs and demonstrate where this study fits in. Current research falls into two main categories: determining if there was bias in the selection of OZs and preliminary evaluations on effectiveness. In determining bias, researchers are typically focusing on political affiliation bias and the pre-trends in gentrification that may have influenced the designation. With respect to effectivity analysis, researchers are primarily conducting preliminary analyses of key economic indicators and attempting to understand how those have changed as a result of the OZ designation. Figure B visually demonstrates these key areas of OZ research.

Figure B: Current Landscape of Academic Literature



Before diving into literature it is important to note that as a result of the policy's relative newness, there is no centralized repository of OZ data that is easy to find or analyze. Researchers have relied on data from existing government or private sector resources to conduct their analyses. In fact, in 2020, the Government Accountability Office released a report recommended

the need for improved oversight of OZs to determine if the tax incentive was being used efficiently. Under the statute, there is no government agency is clearly given the responsibility to collect, evaluate, and report data on OZ performance. While the IRS administers and collects information about the tax incentive for compliance purposes, there is no interagency communication to evaluate outcomes. The report found that the US Department of Treasury would be the optimal agency to evaluate tax expenditures. The report also called upon Congress to indicate what questions were important to address and what outcomes (such as employment and housing) are important to analyze (US Government Accountability Office, 2020). This report captures the frustration that researchers have faced when attempting to evaluate OZs designation biases and effectiveness. The preliminary literature that exists has typically relied on case studies and/or external data, and it is important to preface that before understanding existing literature.

Bias in OZ Designation

I will begin by walking through literature that attempts to evaluate bias in OZ designation. As mentioned earlier, these types of studies fall into two categories: (1) political affiliation bias and (2) trends in gentrification that influence tract selection.

Frank et al. (2020) in their paper *What Determines Where Opportunity Knocks?* examine the role of political affiliation in the designation of OZs. Under the policy, Governors had the primary authority in choosing their respective states' OZs. In their study, Frank et al. measure the extent to which political affiliation influenced governors' selection of OZs. The paper uses a linear probability model to estimate if affiliation impacted selection at the census tract level. The dependent variable in the model was the tract's selection status, the independent variable is a dummy variable for if the state representative for that tract was from the same party, and the model also included controls for poverty rate, median household income, population, percent of

population that is white, level of urbanization, education outcomes, employment rate, socioeconomic change, and investment potential. It was found that governors are, on average, 7.6% more likely to select a census tract as an Opportunity Zone when the tract's state representative is a member of the governor's political party. Selection based on political affiliation is greatest in Republican-governed states where the effect increases to 13.2%. Despite this evidence of political bias, descriptive statistics reveal that OZ are also on average poorer than other eligible tracts.

A study conducted by Alm et al. (2020) aimed to estimate the impact of economic and political variables on the governors' decisions to choose which areas among the eligible would receive the OZ status. Similar to Frank et al., this paper relies on a linear probability model to determine which factors influenced selection, but this study also includes logit estimation (which is a statistical model to determine probability when there are two potential outcomes). The researchers found that the process was relatively technocratic, with the strongest factors that influenced OZ selection being indicators of economic distress such as higher rates of unemployment, welfare receipt of lower median income. However, political factors played a significant role in the designation process as well, with Democratic representation being negatively associated with OZ designation and governor political affiliation being positively associated with tract selection. A trend of note was that both Democratic and Republican states preferred areas with higher educational attainment, possibly as an indicator for earning potential, political engagement, or an early sign for demographic transition.

In addition to political favoritism towards state representatives, Duarte et al. (2020) evaluated how voting data and political contributions from investors played a role in influencing OZ selection. The paper finds that tracts with strong support for the governor in the last state

election were 5% more likely to be selected as an OZ. Moreover, using data from FollowTheMoney and VentureXpert researchers were able to follow the economic interests of private equity and venture capital investors in select states to determine that campaign contributions by investors were associated with a 6.4% to 13.3% greater probability of OZ designation for tracts hosting their business interests. This paper also leads to a discussion about how the tracts that were designated as OZs may have been on different economic trajectories compared to those eligible but not designated.

Beyond political factors, it seems intuitive that state governments would want to prioritize tracts that would have the most to gain from the OZ incentive (i.e. those that were experiencing demographic shifts, early stage gentrification, or a high amount of investor interest). Barth et al. (2019) utilized Alabama as a case study to evaluate the factors that were significant in OZ selection. The research found that while on average OZs may fare worse than eligible communities, governors did not select the most distressed communities. Regression analysis was conducted to determine that poverty rate, median family income, population, and percentage of minority populations were significant factors in choosing OZs; however, there were found to be a number of outlying OZs that fared better than the average eligible census tract. Moreover, the paper found that many OZs in Alabama had an anchor institution like a university, but in cases like these poverty rate statistics were skewed by university students who filed taxes as independents but relied heavily on parental contribution for living expenses. Theodos et al. (2018) at the Metropolitan Housing and Communities Policy Center under the Urban Institute released a report creating scoring metrics for *Investment* and *Socioeconomic Change*. The investment score was calculated based on tract level commercial, small business, and family lending trends. The socioeconomic change score was built to understand

demographic transition and was developed using race, income, and education data from the American Community Survey. Their analysis found a number of OZs that were experiencing demographic shifts and/or had a high investment score. While no statistical analysis was conducted to determine correlation, this information is helpful to keep in mind when understanding the bias that went into OZ designation.

Evaluating Opportunity Zones

Before diving into research concerning the preliminary evaluation of OZs, literature relating to past tax incentives of a similar type can be helpful in understanding what outcomes are important to analyze. Layser (2021) discusses the similarities between the Low Income Housing Tax Credit provision of the Tax Reform Act (LIHTC) of 1986 and the Opportunity Zone provision. The LIHTC was another wide-sweeping change to federal taxes under former President Ronald Reagan and this provision offered a similar incentive to encourage traditional investors into typically underinvested communities. The LIHTC offered tax credits for expenses incurred when developing affordable housing. This paper not only discussed the potential ways in which the OZ incentive will interact with the existing LIHTC incentive, but also how existing literature can be used as roadmap for an evaluative analysis of OZs. There is an abundance of federal and academic literature on the effectiveness of the program that should not be ignored.

The last major component of literature related to OZs has been the preliminary evaluation of policy effectiveness. A handful of studies have taken a look at specific economic outcomes and have adopted differing statistical and econometric techniques to understand how behavior and demographics have shifted as a result of the OZ designation. Researchers have focused on outcomes such as employment, commercial activity, home prices, and other easily available tract-level data points that can help determine if there have been any economic change since the

enactment of the TCJA. Research in this area has been rather limited given the short amount of time that has elapsed since the passage of the policy, limited government involvement, and the COVID-19 pandemic. Some preliminary statistics were released by The Council of Economic Advisers in August of 2020 giving an initial assessment of OZs. The report found that QOFs have raised $75 billion in private capital by the end of 2019 and that approximately 270+ QOZs were established in just over a year. The report also claimed that there was a 29% increase in private equity investment for eligible OZ businesses compared to businesses in eligible but unselected tracts (Council of Economic Advisors, 2020). Aside from government reports that offer descriptive statistics on investment growth, some academic research has also been conducted to understand if there have been any causal changes in key socioeconomic outcomes.

Corinth et al. (2021) released a preliminary report that aimed to evaluate the impact of OZs on commercial investment and economic activity. The paper utilized data related to commercial investments from Real Capital Analytics and created a quality index for restaurants using cell phone data from SafeGraph. Researchers utilized two different approaches for statistical analysis: (1) a difference-in-difference analysis that compared changes in outcome variables for OZs with changes in tracts that were eligible but not selected as OZs and (2) a fuzzy regression discontinuity analysis that utilized poverty rate and median income cutoffs to create a control group. Both analyses revealed that OZs did not significantly increase investment and only yielded a small increase in restaurant quality. A major caveat of the results was that because of the limitations in the dataset the research did not capture investments smaller than $2.5 million and it remains unclear if OZs are having an impact on smaller investments into businesses.

Chen et al. (2019) conducted a similar analysis to compare single-family housing price growth in OZs to those in eligible but unselected tracts. In addition to just low income

communities, this paper compared OZs to their contiguous geographic neighbors by using zip-codes as a proxy. Research found that housing prices may have gone up in OZ tracts after their enactment in 2018, but that increase seems to have been less than 1%. It was also found that the OZ status increased prices in commercial areas, but reduced prices in residential areas. Like other research, Chen et al. cautions any causal links because the study only analyzed 15 months of data.

Lastly, Freedman et al. (2021) following the experimental set-up of past researchers utilized a simple difference-in-difference model to estimate any causal effects of the program. For this paper, restricted-access ACS data was used for 2013 – 2019 that measures outcomes at the tract-level on an annual basis. The researchers use overall employment, the employment-to-population ratio, average earnings, and the poverty rate as their four main outcome variables. In the difference-in-difference model, OZ tracts are compared with eligible but unselected low-income communities. It was found that there is limited evidence of any positive effects of the OZ designation on the economic conditions of targeted tracts. The difference-in-difference model found some evidence of increasing employment rates and reductions in poverty, but these are statistically indistinguishable from zero when the tracts are controlled.

As shown from these three papers, evaluative research has compared trends in designated OZ tracts with those in eligible but undesignated low-income communities to see if the OZ designation had any statistically significant impact on the economic indicators tracked. Because of the short time frame and limited data, the results are somewhat contradictory and are usually statistically insignificant. Most researchers are employing a difference-in-difference model to estimate the causal effects of the OZ designation and are typically focusing on a couple of related economic indicators at a time.

Small Business Lending in Chicago

This study will focus on Chicago as a case-study to measure OZ effectiveness using small business loan data. Despite being the third largest city and one of the most socioeconomically segregated, Chicago has not been utilized as a case study for academic literature related to OZs and this paper will provide new insight on the utilization of the incentive in a city as large and diverse as Chicago. Small business loan data was chosen as the outcome of interest because business growth is one of the policy's major goals and it has been overlooked in existing literature. Corinth et al. (2021) focused their study on commercial activity but did not analyze investments smaller than $2.5 million. In underinvested communities, loans and equity investments are likely to be under that amount. Similar to existing literature this paper will utilize a simple difference-in-difference model to estimate the causal effects of the policy. The details of this model will be explained in the methodology section of this paper. This paper will experience some of the same limitations as existing evaluative literature including limited access to long-term data seeing how OZ designations were not finalized until mid-2018. Despite that, research like this is important to understand the early-stages of the policy and encourage any changes in policy implementation. Ideally, the results from this study will add to the general knowledge of OZ effectiveness and encourage future research in the topic after more time has elapsed.

To summarize, this paper will utilize tract level data on small business lending to offer a preliminary evaluation of OZs in the City of Chicago. This evaluation will be rooted in the trends seen in small business loan data for OZ designated tracts and be compared to eligible but undesignated low-income tracts using a difference-in-difference model. Small business activity has not been used as an indicator in studies like this one, and Chicago has yet to be a geography of focus when conducting evaluative studies on OZs.

Methodology

Data Collection

As specified in the policy, a census tract is eligible for Opportunity Zone selection if it qualifies as a "low-income community" by the Internal Revenue Service (IRS). The IRS designates tracts as "low-income" if the poverty rate is at least 20% or if the median family income does not exceed 80% of the statewide median income (I.R.S. 6 U.S. Code § 45D, 2022). The first step in completing my analysis was identifying the tracts in the City of Chicago that could qualify for OZ designation. Poverty rate and median family income statistics were found using the 2018 American Community Survey (ACS) and accessed using the *tidycensus* package in R developed by Kyle Walker and Matt Herman (Walker & Herman, 2021). Once tract level demographic data was obtained, it was found that there were 469 tracts that had poverty rates greater than or equal to 20% or median family incomes less than or equal to $50,860 (80% of Illinois' statewide median income of $63,575) in 2018. Of these 469 tracts, 134 were nominated and confirmed as Opportunity Zones by the City of Chicago and the U.S. Department of Treasury, respectively. These 134 tracts will serve as the treatment group for this study and the remaining 335 eligible low-income communities will be used as controls. Table 2 below provides a summary of basic demographics in the treatment and control groups from 2018. There are significant differences between the make-up of the treatment and control groups because the City of Chicago made a conscious effort to designate the tracts most "in-need" as OZs. However, these differences remain consistent throughout the 10 year sample for this study and precautions will be taken to help control for any effects of endogeneity in the model. Moreover, the statistical model for this paper relies heavily on an analysis of pre-trends among treatment and control groups, and as it will be discussed later this assumption was met.

Table 2: Key Descriptive Statistics for Control and Treatment Groups

	Low-Income Community (Control)	Opportunity Zone (Treatment)
Median Household Income in 2018	$39,759	$28,695
Poverty Rate in 2018	25.84%	36.62%
Percent of Population that is Black in 2018	43.58%	85.40%

Under the Community Reinvestment Act (CRA) of 1977, financial institutions report the services they provide in low- and moderate-income neighborhoods in order to be compliant with policy regulations. This data is compiled and easily accessible through the Federal Financial Institutions Examination Council's (FFIEC) online website. Aggregate reports for CRA lending information are available by Metropolitan Statistical Area (MSA) from 1996 up until 2020. Fortuitously, lending is aggregated on a tract-by-tract basis and this data was used to access small business loan originations in Chicago. These reports yielded four main outcomes of interest: total loan amount per tract for loans less than or equal to $100,000, total loan amount per tract for loans greater than $100,000 but less than or equal to $250,000, total loan amount per tract for loans greater than $250,000, and total loan amount per tract for loans to businesses with annual revenues less than or equal to $1,000,000. For this study, data from 2013 – 2020 was pulled from the set. The outcome variables were available as total dollar amounts for each census tract; however, each tract had differing populations. In order to adjust for that, each year's total dollar amount for the outcome variables was divided by that corresponding year's tract population from the ACS in order to find per capita values.

To combat the wide-ranging demographic make-up of control and treatment groups that were shown earlier some precautions were taken to limit experimental bias. In anticipation for

the need to control, three additional variables were added to the final data frame: the percent of the population living in poverty, the percent of the population that is black, and the median household income. Moreover, a tier variable was added in order to bucket tracts into four distinct groups and see if there was significant changes in small business lending at different poverty rate levels. Tracts were assigned to Tier 1 if their 2018 poverty rate was less than or equal to 20%, Tier 2 if the rate was greater than 20% but less than or equal to 30%, Tier 3 if the rate was greater than 30% but less than or equal to 50%, and Tier 4 if the rate was greater that 50%. Table 3 below shows the some key statistics from each of the four tiers.

Table 2: Key Descriptive Statistics for Data Tiers

	Average Poverty Rate in 2018	Median Household Income in 2018	Average Percent Black in 2018	Number of Observations
Tier 1	15.27%	$42,632	40.66%	1078
Tier 2	24.59%	$42,613	45.46%	2090
Tier 3	38.30%	$28,454	71.12%	1727
Tier 4	57.55%	$17,605	93.91%	264
Full Data	28.92%	$36,597	55.52%	5159

Data Analysis

The data collection process resulted in a longitudinal observational data frame, and in analyzing this data, the difference-in-difference (DID) technique was applied. DID is a quasi-experimental econometric design that aims to estimate a causal effect by using longitudinal data. The treatment and control groups are used to obtain a counterfactual estimate and this is then compared with the policy intervention's actual effect on the treatment group. DID is often used to estimate the effect of large-scale programs and policies and compare the changes in outcome variables over time. For a DID, the treatment and control groups must be similar and have similar pre-trends in the outcome variables, but the intervention must only be applied to the

treatment group. Using the differences in outcomes resulting from the control group not receiving the treatment, a causal effect of the intervention can be found (Columbia Public Health, 2013).

DID relies on a few assumptions in order to estimate causal effects (Lechner, 2010): (1) the intervention must be unrelated to the outcome at baseline, (2) the Stable Unit Treatment Value Assumption (SUTVA), and (3) parallel trends assumption. In this study, the treatment and control groups were selected using demographic characteristics that are unrelated to the outcome variables of small business lending, so the first condition is satisfied. SUTVA requires that the response of a particular unit depends on only the treatment that the unit was assigned — essentially minimizing any spillover effects. It can be assumed that since the OZ tax benefit is geographically limited to a select group of census tracts, individuals that are incentivized by the benefit will initially limit their investing to the selected tract itself instead of contiguous low-income tracts.

The parallel trends assumption is the most critical in determining appropriate application of the DID model. It is required that without the intervention, the difference between the treatment and control group is constant over time controlling for other factors. In this circumstance, one can assume that LICs and OZs would have near similar pre-trends and respond to "shocks" in a similar way. If parallel trends are not met, the resulting model will result in biased estimates of the causal effects. While there is no statistical test for parallel trends, since multiple pre-treatment data points are available, visual inspection can be used to ensure parallel trends. Figures B, C, D, and E show the relevant pre-trends for the four outcome variables. The green line in these graphs correspond to the average aggregate loan originations per capita across all tracts classified as low income communities (control) and the orange line

corresponds to the average aggregate loan originations per capita across all tracts classified as an OZ. Prior to the implementation year of 2018 (vertical dashed line) all four outcomes are generally parallel (or would be within the range of being parallel if margins of errors were included for sample averages), thus the parallel trends assumption holds and DID can be used.

Figure B: Loans Less than or Equal to $100,000 at Origination

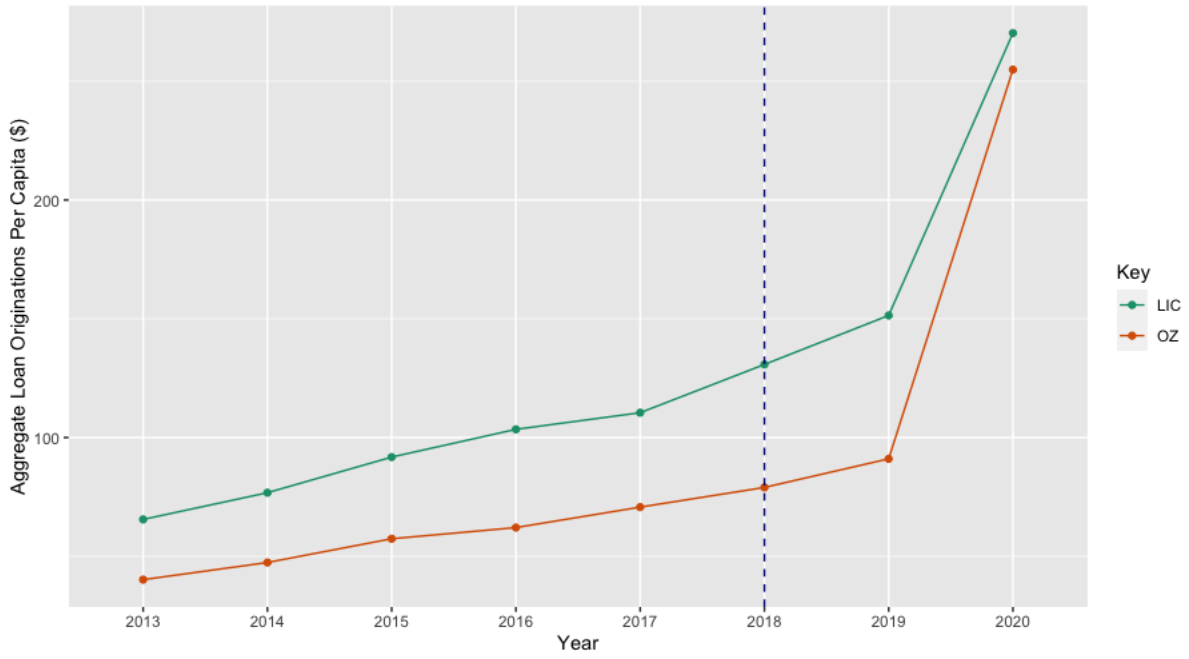


Figure C: Loans Greater than $100,000 but Less than $250,000 at Origination

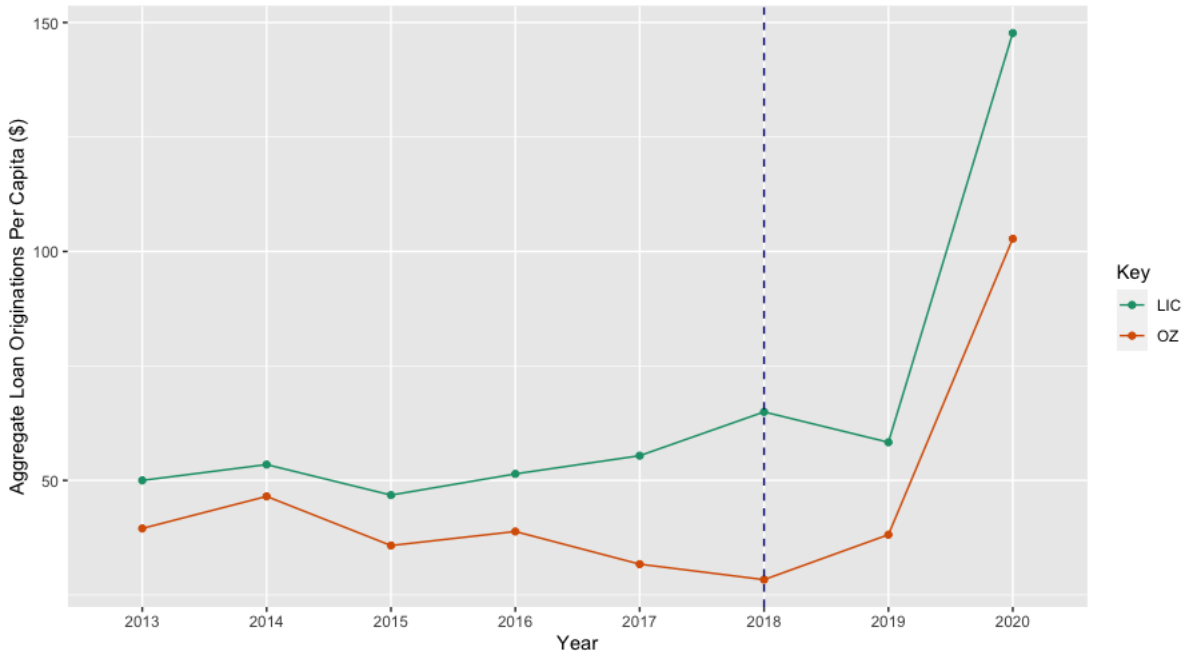


Figure D: Loans Greater than $250,000 at Origination

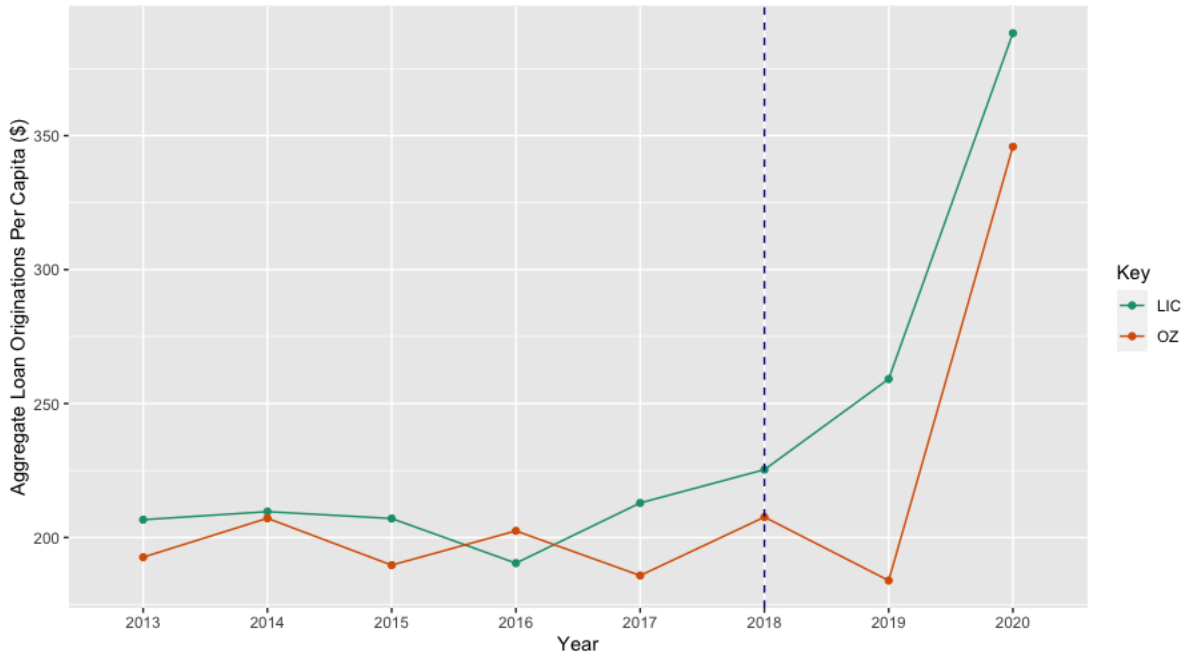
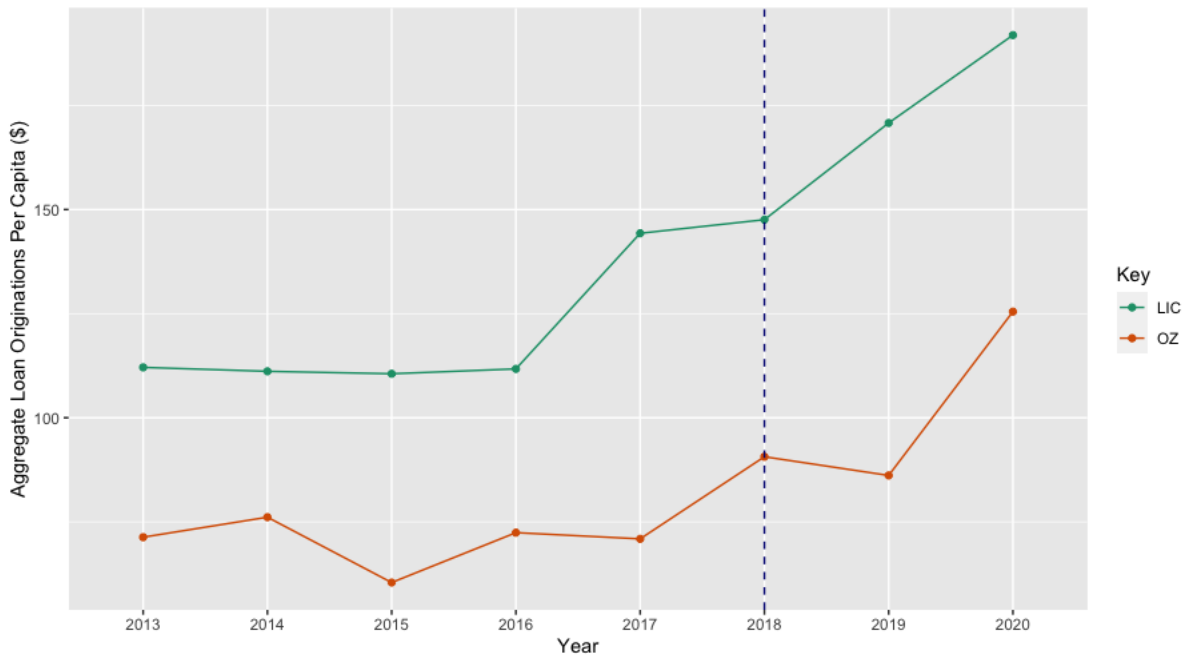


Figure E: Loans to Businesses with Less than or Equal to $1,000,000 in Annual Revenue



The following model will be used in this analysis to determine the effect of the treatment on the four outcome variables.

$$y = \beta_0 + \beta_1 T + \beta_2 I + \beta_3 (T \times I) + \varepsilon$$

$$T = \begin{cases} = 1 \text{ if in Treatment Group} \\ = 0 \text{ if in Control Group} \end{cases}$$

$$\mathrm{I} = \begin{cases} = 1 \text{ if Post} - \text{Policy (i.e.} \geq 2018) \\ = 0 \text{ if Pre} - \text{Policy} \end{cases}$$

The coefficient of interest is β_3, which is the coefficient for the interaction of the two dummy variables I and T. This coefficient will demonstrate the effect of the treatment (OZ designation) on the per capita loan originations at the tract level. As will be shown in the *Findings* section, control variables may be added to this basic regression to help control for other factors that may influence the amount of small business loans given out.

Findings

This paper aims to determine the effect of Opportunity Zone designation on small business loan activity at the tract level utilizing a simple difference-in-difference model. While results varied with differing loan amounts and business size, there does not seem to be any consistent statistically significant changes in loan originations. This section will walk through the results from the four outcome variables (total loan amount per tract for loans less than or equal to $100,000, total loan amount per tract for loans greater than $100,000 but less than or equal to $250,000, total loan amount per tract for loans greater than $250,000, and total loan amount per tract for loans to businesses with annual revenues less than or equal to $1,000,000) and offer a discussion on the Average Treatment Effect on the Treated (ATT) using β_3 from the DID model.

Outcome 1: Loans Less Than or Equal to $100,000

The CRA dataset provided total loan amounts per tract for loans less than or equal to $100,000 and as mentioned earlier these values were divided by the tracts population for that year to get a per capita value. Table 4 shows the significance table created using this outcome variable using controls and subsets of the sample. The DID estimator reveals that in a majority of the tests the OZ designation decreased per capita small business loan amounts for loans less than $100,000; however, none of these estimators are statistically significant.

Columns (1) and (2) show the full sample of data utilizing all 134 OZ treatment tracts and the 335 LIC controls. The DID coefficient reveals a $16.559 decrease in per capita loan totals for originations less than $100,000, but this is value drops to only a $0.126 decrease once tracts are controlled for median income and poverty rate.

Columns (3), (4), (5) and (6) reference the four different tiers of tracts that were constructed using 2018 poverty rates in the methodology section. The DID coefficient reveals a $0.8708 increase in per capita loan totals for Tier 1 (tracts with poverty rate less than or equal to 20% in 2018) and a $22.75 increase in per capita loan totals for Tier 4 (tracts with poverty rate greater than 50% in 2018). In Tiers 2 and 3 decreases in per capita loan totals are seen of $34.378 and $5.890 respectively.

None of these results are statistically significant and are likely due to chance alone. It is also worth noting that the outcome variable of loans less than $100,000 had the strongest parallel pre-trends as seen in Figure B and this outcome likely offers the most powerful causal estimator from the DID model.

Table 4: Loans Less Than or Equal to $100,000 Significance Table

Outcomes	(1) Full Sample	(2) Full Sample w/ Controls	(3) Tier 1	(4) Tier 2	(5) Tier 3	(6) Tier 4
Intercept β_0	75.278 (2.496)	14.89 (11.16)	73.3829 (3.8859)	85.806 (4.204)	58.112 (4.681)	54.02 (12.31)
Treatment β_1	-25.951*** (4.669)	-12.06* (4.996)	-20.6520 (11.5988)	-42.799*** (10.762)	-3.942 (6.600)	-20.48 (15.58)
Time β_2	108.877*** (4.779)	101.3*** (4.794)	108.0588*** (7.4410)	116.112*** (8.051)	98.790*** (8.964)	74.78** (23.58)
DID β_3	-16.559 (8.941)	-12.64 (8.879)	0.8708 (22.2099)	-34.378 (20.607)	-5.890 (12.637)	22.75 (29.82)
Median Income β_4		1.588e-03*** (1.886e-04)				
Poverty Rate β_5		8.991 (19.20)				
Number of Observations	5159	5159	1078	2090	1727	264

Outcome 2: Loans Greater Than $100,000 but Less Than or Equal to $250,000

Another outcome from the CRA was total loan amounts per tract for loans that are greater than $100,000 but less than or equal to $250,000 at origination. These values were also adjusted by the tract's yearly population and were analyzed on a per capita basis. Table 5 shows the significance table created using this outcome variable using controls and subsets of the sample. The DID estimator was consistently negative and even statistically significant for some of the analyses conducted. This implies that the OZ designation may have decreased the amount of per capita small business lending (for loan amounts in between $100,000 and $250,000) compared to other eligible low income communities.

Columns (1) and (2) show the full sample of the data utilizing all 134 treated OZ tracts and the 335 control LIC tracts. The DID coefficient reveals statistically significant decreases in per capita small business lending at this level of loan amount. For the full sample without controls, per capita loan totals decreased by $29.473, but this drops to only a $0.2757 decrease once controlling for tract poverty rate and median income. These results are significant at the 99% level.

Columns (3), (4), (5) and (6) reference the four different tiers of tracts that were constructed using 2018 poverty rates in the methodology section. The DID coefficients are consistently negative and statistically insignificant. The confidence intervals at the 95% level include positive and negative values and the true effect of the policy is unclear.

While some of these results are statistically significant, it is worth noting that this outcome variable had relatively weak parallel trends with the control and treatment groups beginning diverge in 2016 (Figure C). The DID estimator should be interpreted cautiously.

Table 5: Loans Greater Than $100,000 but Less Than or Equal to $250,000 Significance Table

Outcomes	(1) Full Sample	(2) Full Sample w/ Controls	(3) Tier 1	(4) Tier 2	(5) Tier 3	(6) Tier 4
Intercept β_0	48.107 (2.826)	17.23 (12.74)	37.806 (3.501)	55.587 (4.357)	43.274 (6.665)	55.74 (10.49)
Treatment β_1	-4.440 (5.287)	-1.799 (5.707)	-2.175 (10.450)	-16.797 (11.152)	6.102 (9.396)	-26.82* (13.27)
Time β_2	42.221*** (5.411)	39.98*** (5.477)	45.494*** (6.704)	43.017*** (8.343)	40.052** (12.763)	15.15 (20.08)
DID β_3	-29.473** (10.123)	-27.57** (10.14)	-37.709 (20.010)	-26.911 (21.355)	-26.224 (17.992)	-10.94 (25.40)
Median Income β_4		6.347e-04** (2.154e-04)				
Poverty Rate β_5		28.06 (21.93)				
Number of Observations	5159	5159	1078	2090	1727	264

Outcome 3: Loans Greater Than $250,000

The CRA dataset also included an outcome for total loan amounts per tract for loans that were greater than $250,000 at origination. Like before, these values were adjusted to the per capita level using the respective tract's yearly population. Table 6 shows the significance table constructed with the DID technique using this outcome variable with controls and subsets of the sample. The DID coefficient was negative for all tests, but not statistically significant for any of the analyses. The coefficient suggests that the OZ designation may have decreased the amount of per capita small business lending (for loans greater than $250,000) but there is no strong statistical evidence to create a causal link.

Columns (1) and (2) show the full sample of the data utilizing all 134 treated OZ tracts and the 335 control LIC tracts. The DID coefficient reveals statistically insignificant decreases in per capita small business lending at this level of loan amount. For the full sample without controls, per capita loan totals decreased by $57.83, but this drops to a $49.32 decrease once controlling for tract poverty rate and median income. It is significant to note that these controls had less of an effect on this outcome than prior two where the coefficient was dropped almost to zero when controlling for poverty rate and median income.

Similar to before, columns (3), (4), (5) and (6) reference the four different tiers of tracts that were constructed using 2018 poverty rates in the methodology section. The DID coefficients are consistently negative and statistically insignificant. However, with this outcome poorer tracts had a greater decrease in per capita values. The Tier 4 DID coefficient for outcome 2 was -10.94 and for this outcome it was -112.65.

When looking at the pre-trends for this outcome (Figure D) we can see some overlaps—weakening the parallel trends assumption. The DID estimations should be interpreted cautiously.

Table 6: Loans Greater than $250,000 Significance Table

Outcomes	(1) Full Sample	(2) Full Sample w/ Controls	(3) Tier 1	(4) Tier 2	(5) Tier 3	(6) Tier 4
Intercept β_0	197.34 (13.12)	60.50 (59.17)	162.78 (17.01)	245.29 (22.92)	145.40 (25.26)	123.94 (55.10)
Treatment β_1	12.72 (24.55)	28.16 (26.50)	41.61 (50.78)	-57.45 (58.66)	77.58* (35.61)	65.18 (69.70)
Time β_2	93.59*** (25.13)	82.27** (25.43)	83.63* (32.58)	93.75* (43.88)	100.53* (48.37)	126.83 (105.52)
DID β_3	-57.83 (47.01)	-49.32 (47.10)	-11.11 (97.24)	-62.70 (112.32)	-64.10 (68.20)	-112.46 (133.47)
Median Income β_4		0.0030** (0.0010)				
Poverty Rate β_5		104.69 (101.82)				
Number of Observations	5159	5159	1078	2090	1727	264

Outcome 4: Loans to Businesses with Less Than or Equal to $1 Million in Annual Revenue

Lastly, the CRA dataset provided totals for loan amounts per tract for loans that were given to businesses with less than or equal to $1 million in annual revenue. As with other outcome variables, these tract-level values were also adjusted by the yearly tract population to yield per capita results. Table 7 shows the significance table that was created using the DID model. The DID coefficient was primarily negative and insufficient for all subsamples and tests with control variables.

Like with other outcomes, Columns (1) and (2) show the full sample of the data utilizing all 134 treated OZ tracts and the 335 control LIC tracts. The DID coefficient reveals statistically insignificant decreases in per capita small business lending for businesses less than $1 million in annual revenue. For the full sample without controls, per capita loan values decreased by $32.97, but this drops to only a $0.28 decrease once controlling for tract poverty rate and median income.

Columns (3), (4), (5) and (6) reference the four different tiers of tracts that were constructed using 2018 poverty rates in the methodology section. The DID coefficient is positive for Tier 1 tracts suggesting that for tracts with a poverty rate of less than or equal to 20% loans increased by $2.15 per capita. However, there is a large standard error and the coefficient is not statistically significant. The remainder of the tiers have statistically insignificant, negative DID values suggesting loan values decreased per capita. Tier 2 and 4 tracts had the most negative coefficients with decreases in loans per capita of $61.50 and $70.67 respectively.

None of the results were found to be statistically significant, and any variation in outcomes could potentially be attributed to chance alone. The pre-trends for this outcome were relatively strong with mostly parallel trends prior to treatment (Figure E) so causal estimation is stronger for this outcome than outcomes two and three.

Table 7: Loans to Businesses with Less Than or Equal to $1 Million in Annual Revenue Significance Table

Outcomes	(1) Full Sample	(2) Full Sample w/ Controls	(3) Tier 1	(4) Tier 2	(5) Tier 3	(6) Tier 4
Intercept β_0	112.172 (6.116)	25.31e+01 (27.54e+01)	100.790 (7.031)	132.47 (12.12)	83.932 (8.131)	103.8200 (25.5894)
Treatment β_1	-36.352** (11.442)	-22.90e+01 (12.34e+01)	-14.260 (20.987)	-55.20 (31.01)	-2.036 (11.463)	-70.6651* (32.3683)
Time β_2	57.906*** (11.711)	49.37e+01*** (11.84e+01)	60.792*** (13.464)	57.34* (23.20)	62.631*** (15.571)	-0.7993 (48.9999)
DID β_3	-32.974 (21.910)	-27.49e+01 (21.92e+01)	2.145 (40.187)	-61.50 (59.39)	-34.749 (21.950)	-70.6651 (32.3683)
Median Income β_4		2.025e-03*** (4.657e-04)				
Poverty Rate β_5		47.26 (47.40)				
Number of Observations	5159	5159	1078	2090	1727	264

Discussion

Most of the DID coefficients created using differing outcomes and analyses yielded negative, statistically insignificant outcomes. This implies that most of the time, the OZ designation is slightly decreasing per capita loans of all amounts to small businesses; however, these results are not statistically significant so the difference between the control and treatment groups could be due to chance alone or other factors like socioeconomic pre-trends that the model does not control for and/or consider. Despite there being mostly statistically insignificant results there are some trends that stick out.

With loans greater than $100,000 but less than or equal to $250,000, the DID coefficient is statistically significant even when controlling for the tract's poverty rate and median income. This would imply that there is statistically significant evidence that the OZ designation caused a reduction in mid-tier small business loans compared to other eligible low income communities. However, the pre-trends for this outcome begin to diverge in 2016, so there could be other factors that influence the decrease in loan amounts that are unaccounted for in this model. Moreover, given the limited number of post-treatment years any conclusions about causal effects should be made with extreme caution.

In addition to the mostly negative DID coefficients, the analysis also found a handful of DID models that yielded positive results (but still statistically insignificant). With loans less than or equal to $100,000, the DID coefficient for Tier 1 and Tier 4 tracts were positive. This could imply that loans of this size increased in total value in the tracts with poverty rates less than 20% and tracts with poverty rates greater than 50%. Perhaps investors prioritize investments of this size in tracts that are better off than others and also in those that are the worst off, but overlook the ones that fall in the middle (Tier 2 and 3).

Another trend of note is with the DID coefficient for Tier 4 tracts as the loan amounts increased. The coefficient started as a positive value in loans less than or equal to $100,000 but became more and more negative as the loan amount bucketing increased with a -112.46 coefficient for loans greater than $250,000. Loans in tracts with a poverty rate of greater than 50% may have experienced a shift in loan amounts as a result of OZ designation with more smaller loans going to businesses and lesser larger loans given to businesses that fall within these disadvantaged tracts.

Model Limitations

As discussed before, OZs began receiving certification mid-2018 and there is a limited time frame of data available since the enactment of the policy. This paper only analyzed a year and a half of post-policy implementation data, and most of this data was from the peak of the COVID-19 pandemic that created shocks in the global economy. It is difficult to make causal links about investment behavior given the small time frame of data available and the changes in behavior that the pandemic may have caused.

Moreover, this study picked 2018 as the first year of treatment, despite policy implementation starting in around March of 2020. Therefore, 2018 was not a full treatment year but given the annualized data available there was no method to distribute the treatment dummy variable on a month-by-month basis. In order to understand the effects of this choice additional analysis was conducted using 2019 as the treatment year and it was found that no significant changes were made to the DID coefficients. 2018 remained as the first year of treatment for the results because not only was it nearly a full year, but also investors likely anticipated the policy's implementation since the TCJA was passed in 2017 and would have time to modify their investment behavior accordingly.

Lastly, there may be factors that this model does not account for that influence small business lending. Perhaps, tracts with more college and high school educated citizens are more entrepreneurial and are more likely to apply for small business loans. A control for educational attainment could potential shift the results of the DID coefficients. There may be other factors beyond those than are measurable through the ACS that could influence small business loan values. This paper is only intended to offer a preliminary analysis of changes in small business lending as a result of OZ designation. Despite the limitations the DID model accomplishes the goals this paper sets up at the beginning and allows future researchers to build off of the results thus far. As more and more data becomes available, the model can be improved and a more robust estimator for causal effect can be determined

Policy Recommendations

Given the largely insignificant and negative results of this analysis there is not enough evidence to conclude any changes related to small business lending behavior as a result of the Opportunity Zone designation. However, the null results from this paper are still important to the future development and implementation of this policy. Preliminary results reveal a primarily negative DID coefficient for all outcomes suggesting that small business lending in tracts that were designated as OZs actually decreased when they were compared to tracts that were eligible for designation but were not nominated by state officials. While it is unclear what factors influence the results of the policy, this section will walk through why this paper may have yielded insignificant results and offer recommendations for how the policy could be modified to change small business lending behavior.

First, the incentive may not have been strong enough to encourage small business activity. Small businesses are inherently volatile and have a high failure rate. According to the Small Business Administration Office of Advocacy (2012), about 20% of US small businesses fail within the first year and 50% fail by the end of their fifth year. After 10 years only around one third of the businesses survive. Given that the tax incentive for OZ investments takes 10 years of holding to yield a full capital gains tax deferment, the risk for investors putting money into a QOF that invests heavily in small businesses is high. Investors may choose to prioritize more stable investment vehicles that result in more dependable returns. Moreover, the returns from investing in small businesses may not be large enough to warrant the risk. In order to address this concern, policy makers could add a provision to the law that develops a smaller tax deferment timeline for investments into businesses under a preset annual revenue threshold. For example, if a QOF investment is going into a business with less than $1 million in annual revenue then full capital gains tax deferment could occur after only five years of holding the investment rather than the usual ten.

Secondly, it may be difficult for small business owners and investors to fully understand the Opportunity Zone benefit. Typically, small business owners also have to pay capital gains taxes if/when they decide to sell their business. Under the policy as it currently stands, not only should these business owners be incentivized to hold on to their businesses for longer periods of time to reduce their tax liabilities, but also invest in the company to boost the value of the business when it comes time to sell. Ideally, this would mean that business owners apply for and receive loans for capital improvement projects. However, as we see with the results from this analysis that is not the case. It is possible that small business owners do not fully understand the implications of the opportunity zone incentive on their personal finances. While some online

resources exist for small business owners, they are likely underutilized. Further, business owners in underserved communities may be even less informed about changes to tax policy than in other areas. There is potential for greater transparency in the program's benefits through targeted outreach through the IRS. For small business owners there could potentially be a way to facilitate receiving the benefits of the program through a streamlined financial reporting processes.

Similarly, since this study analyzed small business loans it does not capture the potential for outside entities not headquartered within OZs to invest in business development within a selected tract. Larger branded businesses like Starbucks, MacDonald's, CVS, and other nationwide chains could utilize this benefit to receive a reduction in tax liability. For example, if Walmart decides to build a store in a OZ, investors for the project would receive the OZ tax benefit but that data point would not be captured by the dataset used in this analysis. Previous research conducted by Chen et al. (2019) seems to suggest that the OZ designation increased the likelihood of big-branded restaurant openings. While investment into OZs is encouraging, this could potentially be problematic because small businesses from within a tract may not be able to compete with insurgent outside actors. Moreover, with big-branded stores and outside actors moving in, there is a potential for gentrification. This phenomena would be consistent with the results from this analysis as we would see a reduction in small business lending for OZs. As discussed earlier, this cause for concern could be addressed by simplifying the tax incentive for small businesses and reducing the deferment holding requirement.

Lastly, theoretical literature analyzing the OZ incentive seems to imply that a greater focus will be placed on large scale commercial development projects and affordable housing. This is because of the policy synergies that come out of the OZ incentive with other market-based tax incentives like the Low Income Housing Tax Credit and the New Markets Tax Credit (Theodos,

et al., 2021). It would thus make sense that there is no change in the small business lending habits for OZs because the focus would be shifted. As discussed in the literature review, researchers found a slight increase in commercial real estate prices in OZs—indicative of a this greater focus put towards real estate development. While these projects are beneficial for the community at-large, business growth is also a key priority of the policy and should not be overlooked. As suggested with other policy concerns, it is key that changes to the policy are made in order to make small business growth an active priority. With changing demographics in OZs, small businesses are at risk of being pushed out of the market and policymakers should address those concerns by encouraging investments into local businesses.

Conclusion

This paper provides a preliminary evaluation of Opportunity Zones and their effectiveness in encouraging small business lending by using the City of Chicago as a case study. Datasets on small business lending that were reported to the Federal Financial Institutions Examination Council as a part of the Community Reinvestment Act of 1977 were pulled for the years 2013 – 2020. Four outcome variables were analyzed: tract level per capita loan amounts for loans less than or equal to $100,000, tract level per capita loan amounts for loans greater than $100,000 but less than or equal to $250,000, tract level per capita loan amounts for greater than $250,000, tract level per capita loan amounts for loans to small businesses with less than $1 million in annual revenue. A simple difference-in-difference model was used to compare changes for outcomes in low income tracts designated as Opportunity Zones to those in tracts eligible but not designated.

Using the coefficients for the DID estimator limited evidence is found for any changes resulting out of the OZ designation. Most of the results found statistically insignificant negative results — i.e. the OZ designation decreased loan amounts per capita. While some results were statistically significant (for loans in between $100,000 and $250,000) it is difficult to draw causal relations given the limitations of the study. Positive results — i.e. an increase in loan amounts per capita — were found with small loans (less than $100,000) made to Tier 1 (poverty rates less than 20% in 2018) and Tier 4 (poverty rates greater than 50%) tracts. However, most of these results can be ruled to chance alone with 95% confidence.

This research contributes to a growing list of papers concerning themselves with the preliminary evaluation of opportunity zone success throughout the country. This paper is the first

to utilize Chicago as a case study and the first to use CRA small business lending data for its outcome variables. Given the short time frame since policy implementation, more and continued research is needed to accurately understand the full implications of the policy. As more data becomes available on an annual basis this model can be reapplied and the results can be further solidified. In future efforts, researchers can focus on other socioeconomic metrics that relate to small business success including the percent of tract residents that are self-employed, openings of new businesses per tract, rate of small business failure, etc. These continued efforts can help shape future policies and ensure efficient collaborations between the public, private, and social sector are encouraged.

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