The Effect of Tax Incentives on Local Private Investments and Entrepreneurship: Evidence from the Tax Cuts and Jobs Act of 2017

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Abstract

This paper studies the impact of a place-based tax credit policy, the Opportunity Zone program created under the Tax Cuts and Jobs Act of 2017, on local private investments and entrepreneurship. Using a difference-in-differences approach and comparing census tracts designated as Opportunity Zones and other eligible but non-designated tracts, I find that the policy has drawn significantly more private investments to economically distressed areas. Surprisingly, however, these private investments have led to decreases in local new business registration. The decrease in entrepreneurship was mainly in the non-tradable sector, which is more sensitive to local conditions than the tradable or construction sector. Further robustness tests suggest that the above results are causal. I provide one explanation for the above findings that more private investments went to existing and older firms in Opportunity Zones, discouraging potential entrepreneurs from competing with the better-financed firms locally.

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1 Introduction

Entrepreneurship is crucial for economic growth and job creation (Decker, Haltiwanger, Jarmin, & Miranda, 2014). Over the past three decades, however, there has been a decline in entrepreneurship in the U.S., especially in economically distressed communities (Pugsley & Şahin, 2019).[1] Lack of access to capital is often cited as one of the largest handicaps for starting businesses in economically distressed communities.[2] Policymakers have undertaken many efforts to revitalize the economies of these towns and expand possibilities for the people who live there. Among them are the place-based programs that target neighborhoods instead of focusing on a group of people or a type of firm. Although place-based policies have attracted much debate and usually cost billions of dollars, little is known about their effects on local private investments and entrepreneurial activity, despite mixed findings from academic literature on local economic growth and employment. This paper studies the impact of a recent place-based tax policy in the U.S., the Opportunity Zone program of 2017, on local private investments and entrepreneurship.

The Opportunity Zone program was introduced under the Tax Cuts and Jobs Act of 2017 (TCJA). The aim of the program is to draw long-term private investments to neighborhoods with high poverty and sluggish business growth by providing investors with tax incentives on the invested capital gains they earned from elsewhere. 8,762 out of 42,160 eligible census tracts, primarily low-income communities, were designated as Opportunity Zones. Investors who reinvest their capital gains from out-of-zone businesses into in-zone businesses for a qualified period can enjoy certain levels of tax delays and tax benefits, depending on the length of the investment (from five years to ten years).

[1] According to the Economic Innovation Group, the number of business establishments and employment fell by 8.3% and 6.7% for average distressed zip codes from 2010 to 2013, respectively, while average prosperous zip codes observed increases of 8.8% and 17.4% in business establishments and employment, respectively. The full report is available at https://eig.org/wp-content/uploads/2016/02/2016-Distressed-Communities-Index-Report.pdf.

[2] "One significant handicap for these communities has been the lack of access to loans, grants, and venture capital needed to start or expand a small business." (The U.S. Senate Republican Policy Committee, 2019).

As the first attempt at place-based policy by the U.S. government in the past ten years, the Opportunity Zone is different from other government programs that target either specific types of firms or groups of people. In addition, the Opportunity Zone program involves much less government effort compared to other previous place-based policies as the government is only responsible for the selection of zones and offer tax incentives while in most of the previous practices, the government also actively participated in selecting businesses to locate inside the zones, monitoring in-zone companies, and providing infrastructure.[3] The importance of understanding the effects of the Opportunity Zone program goes beyond evaluating the policy itself as it also sheds light on how the government can better design and launch place-based policies.

In this paper, I use a difference-in-differences (DiD) approach and compare census tracts designated as Opportunity Zones with other eligible but not-designated tracts before and after the implementation of the Opportunity Zones policy. I find that the Opportunity Zone policy effectively introduced private investments to economically distressed areas. Compared to the non-designated tracts, Opportunity Zones experienced a 1 percent larger increase in the number of private investment deals and a 15 percent larger increase in the amount of private investments. When examining specific sectors, I observe significant increases in private investments to both real-estate-related firms and other businesses except financial firms. Several additional tests show support of causality. The estimation of the coefficient dynamics provides supportive evidence for the parallel trend assumption required by the DiD approach. I also perform a propensity score matching based on census tracts' observable characteristics, and the findings from the baseline regressions are robust using the matched sample.

I then examine the impact of the Opportunity Zone policy on local entrepreneur-

[3]The Opportunity program is estimated to have an annual cost of $1.6 billion between 2018 and 2027. Some criticize that the expensive program would only drive up local real estate development and housing prices, crowding out low-income residents. Others worry that the program would only benefit the rich and increase inequality, given that only 7 percent of Americans report taxable capital gains on their tax returns, according to a report by the New York Times (see https://www.nytimes.com/2019/08/31/business/tax-opportunity-zones.html).

ship. Inflows of private investments are likely to alleviate the capital constraints of potential entrepreneurs and boost local entrepreneurship (Cagetti & De Nardi, 2006; Evans & Jovanovic, 1989). Surprisingly, I find that the policy had a significantly negative impact on local business formation, analyzing the large dataset that contained more than 8 million business registration records during the sample period and collected from states' business registers. The results show that Opportunity Zones, on average, experienced a 2.3 percent greater decrease in the total number of new businesses incorporated (1.9 percent for for-profit firms and 1.8 percent for non-profit firms). To show that the decrease in new business formation was not trivial, I break down the decrease by the ex-post survival period and by the legal type of new firms. I show that the decrease in business formation was greater in magnitude with larger statistical significance for firms that could survive for a longer time ex-post (at least 1 year). When looking at the business structure of firms incorporated, I observe that the decrease was more significant and greater for firms that registered as a "corporation" than a "limited liability company" or other types such as partnerships or sole propriety.

Why the Opportunity Zone has successfully drawn more private investments to economically distressed census tracts but led to decreases in local entrepreneurship? One explanation is that existing firms received more private investments and used the additional financial resources to build up their competitive advantages such as pricing, advertisement, hiring, which discouraged potential entrepreneurs from starting up their businesses and competing with the existing firms locally, leading to a decrease in local entrepreneurship. I support this explanation by showing that the increases in private investments are four to five times larger for firms that have registered for at least one year than those yet-to-be-formed or just-incorporated companies. The tax-saving incentives provided by the Opportunity Zone policy, combined with the limited time for investors to select target companies, have shaped investors' preference toward less-risky, existing firms rather than newly-formed firms with little information, short operating history,or

uncertain future. Additionally, I show that the small business lending subsidized by the government agency Small Business Administration (SBA) did not help alleviate the shift in equity investing toward existing and older firms in Opportunity Zones. The SBA lending to firms more than one-year-old did not experience significant decreases. In contrast, the lending to less than one-year-old firms significantly decreased.

To examine which type of entrepreneurship was more affected by the policy, I decompose local business formation into four sectors as in Mian and Sufi (2014).[4] Then, I perform the previous DiD analysis and find that the Opportunity Zone had a significantly negative impact on local entrepreneurship in the non-tradable sector, which is more sensitive to local conditions. However, there was no significant impact on the formation of businesses in the tradable sector or the construction sector. The above decomposition of the decrease in local entrepreneurship provides further support for the explanation that the private investments introduced by the Opportunity Zone policy helped the local incumbents to maintain their market position while discouraging new business formation.

Further, I examine the real effects of the Opportunity Zone policy. I first show that there was no significant change in local housing price in Opportunity Zones after the policy implementation, compared to other eligible but non-designated census tracts. I do not observe a significant increase in the number of mortgage applications in Opportunity Zones. I show that the number of people (by various education or poverty levels) moving into the Opportunity Zones did not change significantly compared to other eligible but non-designated census tracts. Additionally, the total number of employment in counties with more population living in census tracts designated as Opportunity Zones did show significant changes compared to other counties. The above results together picture that despite costing billions of taxpayers' money, the policy had limited economic impact in

[4]Even though the business registration dataset does not provide the industry classification code, I use the machine learning approach and train an algorithm using company names and geographical locations to predict the sector of local companies. The trained model based on Logistic Regression achieves a prediction accuracy of 83%.

terms of geographical mobility and employment. One reason for the limited real effect is closely related to the decrease in the formation of new businesses in Opportunity Zones: Previous literature has documented that younger firms create more jobs than existing and older firms (Adelino, Ma, & Robinson, 2017).

This paper provides important policy implications. Future policymakers need to take consideration of the potential distributional effects across businesses with different levels of riskiness when offering market-based tax incentives. One potential better way is to provide higher tax incentives riskier firms such as new businesses or non-real-estate firms.

The rest of the paper is organized as follows. Section 2 discusses the contribution of this study to related literature. Section 3 introduces the institutional background of the Opportunity Zone policy. Section 4 describes the data sources and variable construction. Section 5 shows the empirical strategy and results of the impact on local private investments and entrepreneurship. Section 6 provides the explanation of the above findings. Section 7 tests whether the Opportunity Zone program had real effects on the local economy. Section 8 concludes the paper and discusses the policy implications.

2 Literature Review

This paper contributes to several strands of literature. First of all, this paper builds on literature that studies government's role in motivating entrepreneurial activity (Bayar, Chemmanur, & Liu, 2019). Many types of government programs have been created to address market failures associated with entrepreneurial finance (Hall, 2002). One type includes government awards and grants. Lerner (2000), Audretsch, Link, and Scott (2002), and Howell (2017) show that the awards provided by the U.S. Small Business Innovation Research (SBIR) positively impact firms' R&D investment, commercialization, subsequent firm growth, the probability of receiving subsequent VC financing, and innovation output. Da Rin, Nicodano, and Sembenelli (2006), however, find no evi-

dence that public R&D spending has a positive effect on innovation using European data while Babina, He, Howell, Perlman, and Staudt (2020) show that industry grants, compared to government grants, lead to greater appropriation of intellectual property. There are also government-sponsored venture capitalists (GVCs) who invest equity in entrepreneurial firms, as shown by Brander, Du, and Hellmann (2015) that GVCs help firms obtain more funding than private VCs. Another type of government intervention in the entrepreneurial finance market is providing loans to small business such as the Small Business Administration in the U.S.[5] This paper adds to this literature by focusing on another type of policy, place-based tax incentives, on local entrepreneurial activity.

Second, this paper contributes to the literature that examines the impact of tax policies on the local economy. Previous papers have studied the impact of corporate tax rates on economic growth (Romer & Romer, 2010), employment (Suárez Serrato & Zidar, 2016), innovation (Mukherjee, Singh, & Žaldokas, 2017), and reallocation of establishments and employment within companies (Giroud & Mueller, 2019). Others have look at the effectiveness of tax credits on encouraging corporate R&D spending (Bloom, Griffith, & Van Reenen, 2002; Z. Chen, Liu, Suárez Serrato, & Xu, 2021; Wilson, 2009). In terms of the effect of promoting entrepreneurship, the results of previous studies depend on the type of policy and whether the policy targets on a group of people, a neighborhood, or a type of firms. Curtis and Decker (2018) show positive effects of lowering corporate taxes on new business formation. On the other hand, Denes, Howell, Mezzanotti, Wang, and Xu (2020) show that investor tax credits increase angel financing, but do not have a significant effect in boosting high-growth entrepreneurship. The place-based tax policies, targeting specific communities instead of targeting firms or people, have not been well studied of its impact on local entrepreneurship and my paper provides important policy evaluation and implications by studying the Opportunity Zone

[5]Brown and Earle (2017) show that SBA loans have a positive impact on the employment by small businesses and the taxpayer cost per job created is over $21,000. Denes, Duchin, and Hackney (2019) employ the changes in industry size standards and show positive impact of government subsidies, including loans, on the growths of employment and wages of small businesses.

program.

Third, this paper contributes to the literature on the effects of place-based policies. Most previous studies examine the past place-based policies which have involved much more government efforts(such as certifying and monitoring) than the Opportunity Zones, with mixed findings of the impact on local economic growth and employment (see Neumark and Simpson (2015) and Austin, Glaeser, and Summers (2018) for a summary of the studies).[6] After the introduction of the Opportunity Zone, there have been studies looking at its impact on local housing prices (J. Chen, Glaeser, & Wessel, 2019), commercial property prices (Sage, Langen, & Van de Minne, 2019), employment and wage growth (Arefeva, Davis, Ghent, & Park, 2020; Atkins, Hernandez-Lagos, Jara-Figueroa, & Seamans, 2020; Freedman, Khanna, & Neumark, 2021). My paper differentiates from the above studies by examining the impact of the policy on private investments and entrepreneurship and suggests potentially negative distributional effects of the policy on entrepreneurs and small business owners within affected regions, who were part of the group that the policy aimed to help.

3 Institutional Background

The Opportunity Zone policy was introduced under the Tax Cuts and Jobs Act (TCJA) and signed into law on December 22, 2017. The main aim of this policy was to provide tax incentives to potential investors to re-invest capital gains to economically distressed communities and boost local economic development in these communities. More than 8700 census tracts were designated in the U.S. Figure 1 shows the geographical distribution of the Opportunity Zones.

[Insert Figure 1 about here]

The Opportunity Zone policy is the first place-based policy introduced in the U.S. in

[6] Tian and Xu (2022) show that the national high-tech zones in China, a place-based policy, positively affected local innovation and entrepreneurship.

the past decade. Previous place-based policies usually involve a lot of government efforts such as selecting firms for grants or tax benefits and monitoring their uses. Despite costing about $60 billion annually (Bartik, 2020), studies have shown mixed findings of the impact of place-based policies on local investment, employment, and economic growth (Busso, Gregory, & Kline, 2013; Freedman, 2012; Neumark & Kolko, 2010).[7] The Opportunity Zone program differentiates from most previous place-based policies by taking a more "market-based" approach as they "have no cap on participation and require no government approval" (Council of Economic Advisers, 2021).

The Opportunity Zone concept was first proposed by the Economic Innovation Group in 2015. In April 2016, the bill to create Opportunity Zones was first introduced in the Senate and House and reintroduced in February 2017 but did not get much attention. The introduction of the TCJA at the end of 2017 finally created Opportunity Zones. After the introduction, the U.S. Department of Treasury first identified 42,160 eligible census tracts out of 74,134 census tracts in the U.S. For a census tract to be eligible for the designation, it has to be a "low-income community" (LIC) that has a poverty rate higher than 20% or a median household income of less than 80% of the local median statewide household income, or the tract is contiguous to a LIC tract and has a relatively low household income. Governors could nominate up to 25% of a state's LIC census tracts for Opportunity Zone designation by March 21, 2018 (was later extended to April 20, 2018). Up to 5% of the total nominated tracts can be non-LIC but contiguous to a nominated LIC tract. In the end, 8,762 census tracts received the designation of Opportunity Zone, of which 8,534 were LICs, by the U.S. Treasury Department as Opportunity Zones in June 2018.

The benefits of investing capital gains received from out-of-zone businesses in Op-

[7]The most comparable precedents are the federal Empowerment Zones (EZ) and the New Markets Tax Credit (NMTC), which offer certain tax credits to companies located in a specific area. Compared to the Opportunity Zone program, the tax incentives offered in the EZ program target not only investments but also employment and property development. The size of the tax incentives is much smaller than the Opportunity Zone program. NMTC also targets economically distressed communities but the tax credits provided are capped and offered to companies on a competitive base.

portunity Zones are as following. First of all, taxes on the initial capital gain will be deferred until 2026 or when the asset is sold. In addition, upon investing the capital gain for at least seven years (five years), Opportunity Zone investors can receive a reduction of 15% (10%) on the amount of prior capital gains tax. Finally, for investment held for more than 10 years, investors will receive an increase in the tax basis that equals to the fair market value upon sale, effectively making the taxes due from new capital gains eliminated. To receive the tax benefits, investors need to invest capital gains into either Qualified Opportunity Zone (QOZ) businesses or Qualified Opportunity Funds (QOF). QOZ businesses need to have at least 50% of their gross income earning from trade, business, or service conducted in an Opportunity Zone and QOFs need to invest at least 90% of their assets into QOZ businesses. There is no other requirement for receiving the tax benefits except the investment period and the geographical location. 2018 is the first year for investments to qualify for participating the Opportunity Zone program.

Ideally, anyone with capital gains may invest in Opportunity Zones. In practice, however, most QOFs have filed for an exemption with the SEC under Regulation D, Rule (b) and Rule (c) limiting their offerings to mostly accredited investors. In the sense that they obtaining their funding from mostly accredited investors, QOFs are similar as other financial intermediaries with a focus on the private market such as angel groups, venture capital funds, and private equity funds. On the other hand, there are several differences between QOFs and the above financial intermediaries. The first is the restriction on the geographical location of the invested firms to be mainly in economically distressed areas designated as Opportunity Zones while other funds can freely invest in companies all over the U.S. The second difference is that investors need to invest their capital gains into a QOF within 180 days after their capital gains are triggered and QOFs are subject to the same restriction to invest their money into QOZ businesses within 180 days.[8] For other private funds such as venture capital (VC) funds, they do not have a specific

[8]The IRS relaxed the 180-day rules after the Covid outbreak in 2020, which is beyond this study's time scope and does not affect the results of this study.

deadline of finishing investment choices and Sorenson and Stuart (2001) shows that VC firms begin investing one year after closing a fund and invest 80% of their committed capital within the first three years. As later discussed in the paper, these differences between QOFs and other financial intermediaries can be the explanations of why the Opportunity Zone program and the associated QOFs have a negative effect on local entrepreneurship while the previous literature has in general found positive impact of venture capital, private equity, and angle investors on entrepreneurial activity (Ewens & Farre-Mensa, 2020; Samila & Sorenson, 2011; Xu, in press).

The Opportunity Zone has attracted much attention from investors and the dollar amount involved has been sizable. As of July 2021, more than 300 QOFs, with more than $64 billion investment capacity, have been created since the passage of the law.[9] Congress' Joint Committee on Taxation estimated that the loss of federal revenue over ten years created by the Opportunity Zone program to be at least $1.6 billion.[10]

4 Data

4.1 Data Sources and Variable Construction

4.1.1 Data on Private Investments

I collect data on private investments from Form D filings. Historically, information on private investment has been hard to observe, and very recently, some papers have started to use Form D filings to analyze private investments (Denes et al., 2020; Ewens & Malenko, 2020; Xu, in press). The federal securities laws require that firms who raise capital by conducting private placements file a Form D, a notice of an exemption for security offerings, with the SEC. Form D filings track information such as the name,

[9]There are 303 QOFs as of July 6, 2021, according to the OpportunityDB website (ttps://opportunitydb.com/funds/).

[10]Joint Committee on Taxation, "Estimated Budget Effects of the Conference Agreement for H.R. 1, the 'Tax Cuts and Jobs Act,'" JCX-67-17, https://www.jct.gov/publications.html?func=startdown&id=5053.

location, industry, incorporation year of filing firms, and the date and total offering amount of each filing. Firms are required to file Form D within 15 days after the first sale of securities in the offering. Failure of filing a Form D may incur consequences such as being prohibited from future private investments and constituting a felony.[11] Internet Appendix A shows a sample Form D.

Using the information from Form D filings, I construct two variables measuring local private investments occurred in a census tract and a given year, the natural logarithm of one plus the number of private investment deals (*Ln(Num_Inv+1)*) and the natural logarithm of one plus the dollor amount of private investment deals (*Ln(Amount_Inv+1)*). To further break down the impact of the policy on local private investments in across sectors, I category all the investment deals into three sectors (business, real estate, and finance) based on the industry information provided in Form D.[12]

4.1.2 Data on Business Registration

To examine how the Opportunity Zone policy impacts local entrepreneurship, I use local business registration data provided by *OpenCorporates*. *OpenCorporates* is an open database of companies all over the world and it collects information from business registers (or other regulatory sources). The database contains the company name, address, type, dates of incorporation and dissolution (if applicable) and other company information. Some recent studies have used data from *OpenCorporates* to obtain information such as the incorporation date and active status for private firms (Bogdani, Causholli, & Knechel, 2021; Ewens & Farre-Mensa, 2020).

I first geocode company addresses using the Census Geocoder API to obtain the

[11] See more details from the guidance issued by SEC on the Regulation D Rule 507 and the case of *Hamby v. Clearwater Consulting Concepts*.

[12] Item 4 in Form D provides the industry group of an issuer. I label firms in the "Banking and Financial Services" industry group as the "Finance" sector, "Real Estate" as a sector, and all the other industry groups as "Business" sector.

census tract code.[13] I then aggregate the number of companies incorporated for each census tract by their incorporation year. Specifically, I define *Ln(Num_NewFirm+1)* as the natural logarithm of one plus the number of new firms incorporated in a census tract and a given year. To further look into the types of firms incorporated, I aggregate the number of new firms incorporated by whether they are for-profit or non-profit and construct *Ln(Num_NewForProfit+1)* and *Ln(Num_NewNonProfit+1)*, the natrual logarithm of one plus the number of for-profit and non-profit firms incorporated in a census tract and a given year, respectively. To measure the quality of firms formed, I looked their survival period. I group firms into those that have maintain an active status for at least one year and two years after registration of business and those have not. Based on the legal structure of companies incorporated, I group new firms into those incorporated as a corporation, limited liability company, or other types such as a partnership for a given tract in a year. *OpenCorporates* does not provide business registration records in Delaware, Illinois, and Puerto Rico due to limited accessibility of the state government websites, therefore, the census tracts for these states are excluded in the analysis on local business formation.

4.1.3 Data on Small Business Lending

To examine the financing aspect of local entrepreneurial activity, I use data on lending under the Small Business Administration (SBA)'s 7(a) and 504 programs. Under the Freedom of Information Act, I am able to collect information for each borrower firm's name, address, loan approval date, loan amount, and other information. Using firm name and location, I match the business registration data with the SBA lending data. Then, I categorize the SBA loans by firm age: borrower firms registered for more than one year (or half year) and those not. I examine both the number of SBA loans and amount of

[13] When more than one address is provided for a company, I only use the business address instead of the mailing address. I excluded a firm from the sample when it only has one address and the address is associated with a P.O. box because the opportunity zone policy requires real business operation physically happens in a census tract.

SBA loans (*Num_SBALoan* and *Amount_SBALoan*) for each types of borrowers. The SBA loan observations are then aggregated to the census tract level by year.

4.1.4 Using Machine Learning to Assign Business Sector

One data challenge to perform cross-sectional analysis for this study is that Form D and *OpenCorporates* data do not have industry codes such as NAICS or SIC. I tackle this issue by taking a machine learning approach.[14] I first use the NETS database, which contains NAICS code, to train the model and then use the trained model to predict the sector of the firm.

To conduct machine learning, I first prepare the independent and dependent variables for both the training data set and prediction data set. I mainly use company names together with geographical information to predict the sector of a firm following Cuffe et al. (2019).[15] I use data from the NETS to form the training data. I first standardize the text data by lowering the case, removing punctuations, special characters, and stopwords. There are 2,420,466,463 unique words in the training data set before standardization and 224,911,471 unique words after. I then vectorize the words in company name using the Count Vectorization approach. Combining with the geographical information (zip code), I obtain a vector of information to predict a firm's sector.

Mian and Sufi (2014) categorize industries, based on the connectedness with local supply and demand, into four sectors: tradable, non-tradable, construction, and other. As the NETS database provides NAICS code, I then match the list of industry codes in the Appendix of Mian and Sufi (2014) with the four-digit NAICS code provided in NETS for each firm. To evaluate the model performance and select the model that has the best prediction accuracy, I split the NETS data sets into two data sets: 80% as the

[14] Many recent studies in economics and finance have used machine learning, see Mullainathan and Spiess (2017) for a survey.

[15] Cuffe et al. (2019) use company name as well as information web-scraped from Google Reviews to predict the industry code of firms. They first use the *word2vec* approach to analyze and vectorize the text information. They then adopt a *RandomForest* model to predict the industry code. Using this approach, they achieved a 59% accuracy in assigning correct NAICS sectors.

training set and 20% as the validation set. I train the model on the training set and then predict the sector in the validation set. I focus on three types of algorithms, Logistic Regression, XGBOOST, and Support Vector Machine. The prediction accuracy on the validation set is 82.7%, 80.5%, and 72.6%, respectively. Therefore, I choose the model trained with Logistic Regression and predict firms' sector.[16]

4.1.5 Data on Housing Prices and Mortgages

To examine whether the change in local housing prices serves as a mechanism of how policy impact local private investments and entrepreneurship, I look at data on housing prices as well as the mortgage applications. Federal House Finance Agency (FHFA) provides an annual housing price index (HPI) for each census tract. I collect the mortgage application information from the Home Mortgage Disclosure Act (HMDA) database. Given that the distribution is right-skewed for the raw HPI and the number of mortgage applications, I take a log transformation for these two variables.

4.1.6 Control Variables and Data on Geographical Mobility

To control for changes in local demographic and economic conditions, I include the population, median income, the percentage of white people alone, poverty rate, and unemployment rate for each census tract in a given year. The data for the control variables are from the annual American Community Survey (ACS), which is conducted among three million U.S. residents each year.

To examine whether changes in the geographical mobility is a mechanism of the policy to have an effect, I use census-tract-level data from ACS and look at the total number of people moved into a census tracts in a year. I also group the in-migrants to a census tract by their education level and poverty status.

[16] I have perform the same training process on the SBA loan datasets, which also provides the name, industry code, and geographical location of firms. The prediction accuracy are similar.

4.2 Summary Statistics

Summary statistics are reported in Table 1. In the sample of this study, there are 42,171 census tracts which were eligible for designation of Opportunity Zones, among which 31,859 are low-income-communities (LIC) while the rest are non-LIC contiguous tracts. There are 8,761 census tracts in the sample that were designated as Opportunity Zones and 8,531 tracts are LICs. For most analyses in the paper, I only include the LIC tracts to make the treated and control groups more comparable. The main findings are all robust if including the non-LIC contiguous tracts. The sample period is from 2015 to 2019. All the tract-level amount variables are winsorized at the 1st and 99th percentiles to avoid data errors involving extreme values to drive the results.[17]

[Insert Table 1 about here]

As shown in Table 1, 24.7% of the tracts are Opportunity Zones while the rest tracts are eligible but non-designated. On average, a census tract receive 0.119 private investments per year with an average amount of $2.732 million and has around 10 new firms incorporated. An average census tract in the sample has 4,046 people with a median income of $39,156, a poverty rate of 22%, 61% of its people are white, and an unemployment rate of 11%.

5 Empirical Analysis and Results

5.1 Main Specification

The Opportunity Zone policy can serve as a natural experiment to local private investment and entrepreneurship. I use a difference-in-differences (DiD) approach to identify the impact of the Opportunity Zone policy on local private investments and

[17]The results are similar when not winsorizing these variables.

entrepreneurial activity. In the baseline regressions, I estimate the following equation:

$$Y_{i,t} = \alpha + \beta OZ_i * Post_t + Controls_{i,t-1} + \delta_t + \eta_i + \epsilon_{i,t}. \quad (1)$$

where i is a census tract and t represents a year. OZ is an indicator that takes a value of one if the tract was designated as an Opportunity Zone (OZ) and zero if it was eligible but not designated. *Post* is a dummy that equals zero prior to 2018 and one afterwards. To control for local demographic and economic characteristics, I include the natural logarithm of the population, the natural logarithm of the median income, the natural logarithm of the median age, poverty rate, percentage of white or black people, percentage of population without a high-school degree, and unemployment rate of census tract i in year *t-1* as control variables. To account for unobservable location-specific characteristics and time-specific trends, the DiD model further includes census tract fixed effects and year fixed effects. I cluster standard errors by tract.[18]

5.2 Identification Assumptions and Challenges

The difference-in-differences approach compares outcome variables before and after the policy between designated and eligible but non-designated census tracts. This identifications strategy relies on two main assumptions. First, I assume that changes in private investments would have been the same across census tracts with and without the designation as an Opportunity Zone, absent of the TCJA policy change (i.e., the parallel trend assumption). Second, I assume that the Opportunity Zone policy was not determined based on the level of local private investments and new business formation prior to the policy.

I take several steps to substantiate these assumptions and address potential concerns. One concern is that the selection of Opportunity Zones was not random and

[18]The main findings are robust when I use the alternative clustering options (see results in Table A1 in the Internet Appendix).

outcome variables such as private investments may have evolved differently between designated and non-designated tracts absent of the policy. I address this concern by plotting the annual coefficient estimates around the policy was introduced in 2017. As shown in Figures 2 and 3, local private investments and entrepreneurship did not diverge prior to the policy was introduced as the 95% confidence intervals all covers zero for 2015 and 2016. The differences between the treated tracts and control tracts started to enlarge significantly only after 2017. These two figures provide support for the parallel trend assumption required by the difference-in-differences approach.

[Insert Figures 2 and 3 about here]

Another concern is related to the differences in characteristics between the designated and non-designated tracts. Even though the difference-in-differences strategy requires only the pre-trends to be similar instead of the levels of other characteristics, some may still worry that non-balanced covariates may threaten the parallel trend assumption. To alleviate this concern, I have added tract-level control variables including population, median income, median age, percentage of white or black population, poverty rate, and unemployment rate to the baseline regressions. I also perform a propensity score matching (PSM) on pre-treatment characteristics for tracts designated as Opportunity Zones and keep the non-designated tracts with the highest propensity score within the same county as its matched control. I include state dummies to control for the state governors' political affiliation and its potential impact on the selection of tracts (Frank, Hoopes, & Lester, 2022). Column (1) of Table A2 shows the logit regression for producing the propensity score and Column (2) shows the logit regression running on the matched sample. One can observe that the independent variables lost significance in the matched sample and the pseudo R2 decreased from 0.055 to 0.0012, suggesting the pre-shock characteristics are comparable in the matched sample and not likely to explain the selection of the Opportunity Zone the matched sample. Table A3 shows the DiD results with a sub-sample with matched pairs from PSM and suggests

that the main findings are robust. To further ensure that the comparability of designated and non-designated census tracts, I conduct the analyses in the paper mainly using a sample that only contains tracts that are considered low-income communities (i.e., not include non-low-income but contiguous tracts), even though most results stay robust using all eligible census tracts (see Table A4).

5.3 Impact on Local Private Investments

I first study the impact of the Opportunity Zone policy on local private investments. As the main aim of the policy is to draw investments to economically distressed areas that otherwise would not be invested, it is important to first check whether the policy indeed has any effect on local private investments.

[Insert Table 2 about here]

Table 2 shows the results. In Columns (1) and (2), the dependent variable is the natural logarithm of one plus the number of private investment deals in census tract i and year t, *Ln(Num_Inv+1)*. In Columns (3) and (4), the dependent variable is replaced with the the natural logarithm of one plus the dollar amount of private investments, *Ln(Amount_Inv+1)*. I show the results when only county and year fixed effects are included with no control variables in columns (1) and (3) and with control variables in Columns (2) and (4). The coefficient estimates on $OZ * Post$ in Table 2 are all positive and significant at the 1% level. The magnitude of the coefficient estimates suggests that the effects are also economical sizable: The number and amount of private investments flowed into treated tracts (the Opportunity Zones) increased 1% and 14.2%, respectively, more than those eligible but not designated tracts after the policy shock.

[Insert Table 3 about here]

Next, I examine the impact of the Opportunity Zone policy on local private investments by sector. In Table 3, I group all the private investments into three categories based on the "industry" information provided in the Form D filings: Business, real es-

tate, and finance. The empirical specification is similar as in Table 2 and dependent variables are the number of deals (*Ln(Num_Inv+1)*) and the dollar amount of deals (*Ln(Amount_Inv+1)*). We observe that the coefficient estimates on $OZ * Post$ for investments in the business sector both statistically significant at 1% significance level, indicating that Opportunity Zones experienced a 0.9% larger increase in the number of investments and a 13.1% larger increase in the amount of investments, compared to other eligible but non-designated census tracts. I also observe that the Opportunity Zone policy had a positive and statistically significant impact on private investments in the real estate sector even though the size of the impact is smaller than on the business sector: Opportunity Zones experienced a 0.1% larger increase in the number of investments and a 2.1% larger increase in the amount of investments, compared to other eligible but non-designated census tracts. On the other hand, the policy does not have a statistically significant impact on the financial sector.

5.4 Impact on Local Entrepreneurship

The previous results show that Opportunity Zone policy has drawn significantly more private investments into treated census tracts compared to other non-designated zones after its implementation. How will the increased local investments affect local business formation? Some may argue that increased investments could help entrepreneurs relax their liquidity constraints and, therefore, foster local business formation (Evans & Jovanovic, 1989; Kihlstrom & Laffont, 1979; Knight, 1921). On the other hand, investors may have certain preferences toward existing older firms than newly-formed firms due to information frictions between investors and entrepreneurs about the quality of the firms. When existing local firms are equipped with more financial resources to build up their competitive advantages, potential entrepreneurs could potential be discouraged to start up businesses in the place. In this section, I empirically examine how the Opportunity Zone policy affect local business formation.

[Insert Table 4 about here]

Table 4 shows the impact of the Opportunity Zone policy on local entrepreneurship by running the same DiD regression illustrated by Equation (1). In Column (1), the dependent variable is the total number of new businesses registered in census tract i and year t (*Ln(Num_NewFirm+1)*). The coefficient estimate on $OZ * Post$ is negative and statistically significant at the 1% significance level. This suggests that census tracts that were designated as Opportunity Zones, on average, experienced a 2.7% larger decrease in local entrepreneurship compared to the other eligible but non-designated tracts after the introduction of the policy. In Columns (2) and (3), the dependent variables are replaced with the number of for-profit firms registered (*Ln(Num_NewForProfit+1)*) and the number of non-profit firms (*Ln(Num_NewNonProfit+1)*) registered in census tract i and year t. We observe negative and statistically significant coefficient estimates on $OZ*Post$, suggesting that both the establishment of for-profit firms and non-profit firms experienced significantly greater decreases after the introduction of the Opportunity Zone policy for the designated census tracts, compared to eligible but non-designated tracts.

I also examine the policy's impact by the heterogeneity of firms incorporated. I begin by showing that the decrease in local entrepreneurship appear in all types of businesses registered: corporation, limited liability company (LLC), or other types such as partnership. Table 6 shows that there was a decrease for all three types of firms registered with firms registered as a corporation had the largest decrease (2.5%), and LLC the second largest decrease (2.1%), and other types the least (0.5%).

[Insert Table 6 about here]

Next, I examine the heterogeneity of impact on firms with different survival length. In Table 5, I group all the new firms formed by whether or not they could survive for more than one or two years.[19] I find that the decreases are mainly in the firms that

[19]The information is also collected from *OpenCorporate*, which contains the date when a firm was incorporated and the date when it was dissolved.

can survive for a longer time. If the survival time can be considered as one measure of firm quality, this evidence indicate that the decrease in local entrepreneurship brought by the policy is a serious concern.

[Insert Table 5 about here]

To alleviate the concerns regarding the quality of the business registration data collected from *OpenCorporates*, I obtain data from the ZIP Codes Business Patterns (ZBP) provided by the Census Bureau and validate the results. Instead of counting the number of firms registered, the ZBP provides the statistics on the total number of establishments in a zip code. I calculate the changes in the number of establishments to as a proxy for local net creation of businesses.[20] As shown in Column (1) in Table A5 in the Internet Appendix, the Opportunity Zone policy had a negative effect on local net establishment creation, which is another proxy for local entrepreneurship, confirming the previous finding using the *OpenCorporates* data. The ZBP data also provides the employment size of establishments and I show that the decrease in local net creation of establishments was mainly concentrated in small ones (with less than 10 employees or between 10 and 50 employess) but not in large ones (with more than 50 employees).

6 Mechanisms

The previous findings show that the Opportunity Zone policy has generated positive impact on local private investments but negative impact on local entrepreneurship. In this section, I test the potential explanations for the above seemingly surprising findings. I first show that existing (older) firms receive significantly more financing resources (both equity and debt) than newly-formed firms in Opportunity Zones compared to other eligible census tracts, suggesting an unintended "crowding-out effect" of the policy. Anticipating that older firms would have better access to financial resources and

[20]Many studies in the economics and finance literature have used this data set to measure local entrepreneurship (see Adelino, Schoar, and Severino (2015) as an example).

competitive advantage with newly-formed firms, potential entrepreneurs chose not to open businesses in the Opportunity Zones. I corroborate this hypothesis by decomposing the local entrepreneurship into non-tradable, tradable, construction and other sectors following Mian and Sufi (2014). I also show that other hypotheses, related to housing price changes and geographical mobility, are unlikely to explain the previous findings on local private investments and entrepreneurship.

6.1 Older Firms Increased Access to Finance Than Newly-Formed Firms

The aim of the Opportunity Zone policy is to invite private investments to economically distressed communities that otherwise would not happen. The policy, however, does not have any restriction or requirement on which type of firm investors should to invest in. Which type of firms would be more attractive to investors for them to receive tax benefits? This question can be tested empirically. To link this question with the finding of the decrease in the number of new businesses formed after the introduction of the Opportunity Zone policy, I am particularly interested in the age of the firms that receive private investments.

[Insert Table 7 about here]

In Table 7, I group firms by whether or not they have been established for at least one year and examine the impact of the Opportunity Zone policy on local private investments received by the two groups of firms. The dependent variables are the number of investment deals (*Ln(Num+1)*) and the amount of deals (*Ln(Amount+1)*) like in Table 2. The other empirical specification is similar as in Equation (1). The first two columns in Table 7 suggest that the Opportunity Zone policy has invited 1% more private investment deals for firms that have been incorporated for at least one year (statistically significant at 1 percentage level) and 0.2% more for firms that are less than one-year old (statistically significant at 5 percentage level). The last two columns in Table 7 show that

the Opportunity Zone policy has invited 14% greater amount of private investments for more-than-one-year-old firms (statistically significant at 1 percentage level) compared to 3.5% more for less-than-one-year-old firms (statistically significant at 5 percentage level).

[Insert Table 8 about here]

In Table 8, I find similar crowding-out effect in loans offered under the Small Business Administration (SBA) program, another common financing source for entrepreneurs. I observe that the number of SBA loans and the total amount of SBA loans offered to firms that are less than one year old decreased significantly after the introduction of the Opportunity Zone policy for the treated census tracts compared to control tracts. On the other hand, the number and amount of SBA loans offered to firms that are at least one year old did not experience significant decreases.

The above findings show that the Opportunity Zone policy while bringing in private investments into economically distressed communities, have (unintended) distributional effects of financing sources among older and newly-formed firms. Potential entrepreneurs observe or anticipate this crowding-out effect against new firms would be deterred to start businesses in the areas that were designated as Opportunity Zones.

6.2 Declined Entrepreneurship in Sectors Sensitive to Local Competition

As investors prefer existing and older firms located in Opportunity Zones to put their money in, these firms can use the money to build their competitive advantage over the newly-formed firms. A rational potential entrepreneur should therefore not start up business in the Opportunity Zones to compete with the existing firms. If the above hypothesis holds, I should observe that the decline in local entrepreneurship mostly in sectors that are more sensitive to local competition.

[Insert Table 9 about here]

Following the definition in Mian and Sufi (2014), I categorize firms into non-tradable, tradable, construction, and other sectors. Table 9 shows the results of testing the impact of the Opportunity Zone on local entrepreneurship by sector. The coefficient estimate on $OZ * Post$ is negative and statistically significant for the non-tradable and other sectors while insignificant for the tradable and construction sectors. The results suggest that the decline in local entrepreneurship was mainly concentrated in sectors that are more sensitive to local demand and supply. Existing firms can use the additional financial resources brought by the Opportunity Zone to gain more competitive advantages locally such as lowering prices, making advertisement, and hiring labor. Sage et al. (2019) indeed find significant increases in local commercial property prices after the introduction of the policy in Opportunity Zones. Potential entrepreneurs, especially the ones in non-tradable sector, anticipate (or observe) that they would not have the same financial resources to compete with existing firms in the neighborhood, therefore, choose not to start the business.

7 Real Effects of the Opportunity Zone Program?

Even though the Opportunity Zone had a negative impact on the formation of new businesses, some may question if this is a cost worth considering if the policy had other positive impact on the local economy such as increasing the employment opportunities. In this section, I test whether there were any significant changes in local housing price and the number of mortgage applications in Opportunity Zones. I also examine if the number of people moving into the Opportunity Zones changed significantly compared to other eligible but non-designated census tracts. Finally, I compare the total number of employment in counties with more population living in census tracts designated as Opportunity Zones to other counties.

[Insert Table 10 about here]

Table 10 shows the impact of Opportunity Zone policy on local housing prices

and applications for housing mortgages. I collect the annual housing price index (HPI) for each census tracts provided by the Federal House Finance Agency (FHFA). The mortgage application information is from the Home Mortgage Disclosure Act (HMDA) database. The dependent variable is the natural logarithm of HPI ($LnHPI$) in Column (1) and the natural logarithm of one plus the number of total mortgage applications ($Ln(Num_mortgage+1)$). The rest of the empirical specification is the same as in Equation (1). One can observe that the coefficient estimates on $OZ * Post$ are statistically insignificant in either columns. The results indicate that the Opportunity Zone did not have a significant impact on the local housing market.[21]

[Insert Table 11 about here]

Table 11 shows the policy's impact on the total number of people moved into a census tract each year and the decomposition of these migrants using data from the American Community Survey. Column (1) shows the results when the dependent variable is the natural logarithm of one plus the total number of in-migrants to a census tract in a year. I do not observe a significant coefficient estimates on $OZ * Post$, suggesting there is no significant changes in the number of people who moved into Opportunity Zones after the introduction of the policy compared to other eligible but non-designated tracts. Columns (2) to (4) show the results when examining the number of in-migrants by the level of education (less than high-school, high-school degree, and bachelor's degree and above). Columns (5) to (7) show the effects on in-migrants decomposed by their poverty status (less than 100 percent, between 100 to 149 percent, and at or above 150 percent of poverty level). Again, I do not observe significant effects of the Opportunity Zone policy on the inflows of a specific group of people by education or by poverty status.

[Insert Table 12 about here]

I then examine whether the policy had any impact on local employment. I switch the observation unit to county level from census tract level due to data limitation. I

[21] J. Chen et al. (2019) also find no significant effects of the Opportunity Zone on local housing prices.

construct the treatment variable at the county level, $OZ\%$, the percentage of people reside in Opportunity Zones in a county. The other empirical specification is similar as in Equation (1) with the census tract fixed effect changed to county fixed effect and the clustering of standard errors set at the county level instead. Table 12 presents the results: The policy had no significant impact on the total number of employment in various counties differentially exposed to the Opportunity Zone policy with only increases in the employment in the construction and other sectors but not in the non-tradable and tradable sectors.

The above results together suggest that the Opportunity Zone policy has generated limited economic impact on geographical mobility and local employment. As discussed in the previous literature, younger firms create more jobs than the existing and older firms (Adelino et al., 2017). The limited real effect could be due to the decrease in the formation of new businesses.

8 Conclusion and Policy Implications

This paper studies the impact of a new place-based tax credit policy, the Opportunity Zone program of 2017, on local private investments and new business registration. Using a difference-in-differences approach and comparing census tracts assigned as Opportunity Zones and other eligible but non-designated tracts, I find that the policy had significantly positive effects on local private investments (both the number and amount of investment deals). However, these private investments led to decreases in local new business registration and loss of entrepreneurship was not trivial in terms of firm quality. The decrease in entrepreneurship was mainly significant in the non-tradable sector, which is more sensitive to local competition, but not in the tradable or construction sector. I show that the results are robust under a few additional tests, suggesting that the above relationships between the Opportunity Zone policy and local private investments and entrepreneurship are causal.

I provide one explanation for why the Opportunity Zone policy had positive impact on local private investments but negatively affected local entrepreneurship. I show that the increase in local private investments brought by the Opportunity Zone policy is much more considerable for existing firms than newly-formed firms. The results suggest that the tax incentives provided by the Opportunity Zone and its associated investment timing requirement have shifted investors' preference toward existing firms with a longer operating history and more information. In addition, I find that the government-sponsored small business loans did not alleviate the financial challenges of potential entrepreneurs: The SBA loans lent to new businesses decreased significantly in Opportunity Zones but did not change significantly for existing firms.

Further, I show that the Opportunity Zone policy did not seem to have positive real effects in the local economy. I show that local housing prices and the number of mortgage applications did not change. The number of people who moved into the Opportunity Zone did not experience significant increases either. County-level employment also did not change significantly. The results suggest that despite billions of taxpayers' money and hurting local business dynamism, the policy did not generate positive impact on local employment, which was partly due to the decrease in local entrepreneurship.

This paper provides important policy implications. One lesson from the Opportunity Zone policy is that policymakers need to be aware of the potential distributional effects when offering market-based tax incentives. The tax-saving incentives combined with the limited time in selecting investment targets might lead investors to avoid new firms with little information and prefer existing and older firms. Therefore, with good intentions to assist entrepreneurs and small businesses to have better access to financing resources, some policies might discriminate against and discourage potential entrepreneurs from starting new businesses, which are the primary force of creating jobs and boosting local economic growth (Haltiwanger, Jarmin, & Miranda, 2013). This paper sheds new light on the discussion about the optimal design of place-based programs and the role

of governments in promoting equal opportunities for households to accumulate wealth through business ownership (Cagetti & De Nardi, 2006).

Future policies need to have a more precise target: Instead of setting the goal at drawing private investments into economically distressed areas, the policy could be more effective if it aims at either increasing local employment or promoting the births of new local firms. Policymakers also need to be aware of investors' preference for mature businesses and real-estate firms, which usually have fewer job creations than the newborn businesses. The government could also offer higher tax credits to investors who put money in young firms in economically distressed areas. Overall, to address the inequality between the rich and poor in access to capital, the government needs to put more oversight on the destination of investments when providing tax credits to wealthy investors.

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Figures and Tables

Figure 1. Geographical Distribution of Opportunity Zones

This figure shows the geographical locations of the designated census tracts as Opportunity Zones created under the Tax Cuts and Jobs Act (TCJA) and signed into law on December 22, 2017. Areas marked in "red" are the census tracts designated as Opportunity Zones. Areas marked in "yellow" are the census tracts that are eligible for designation but not selected as Opportunity Zones.

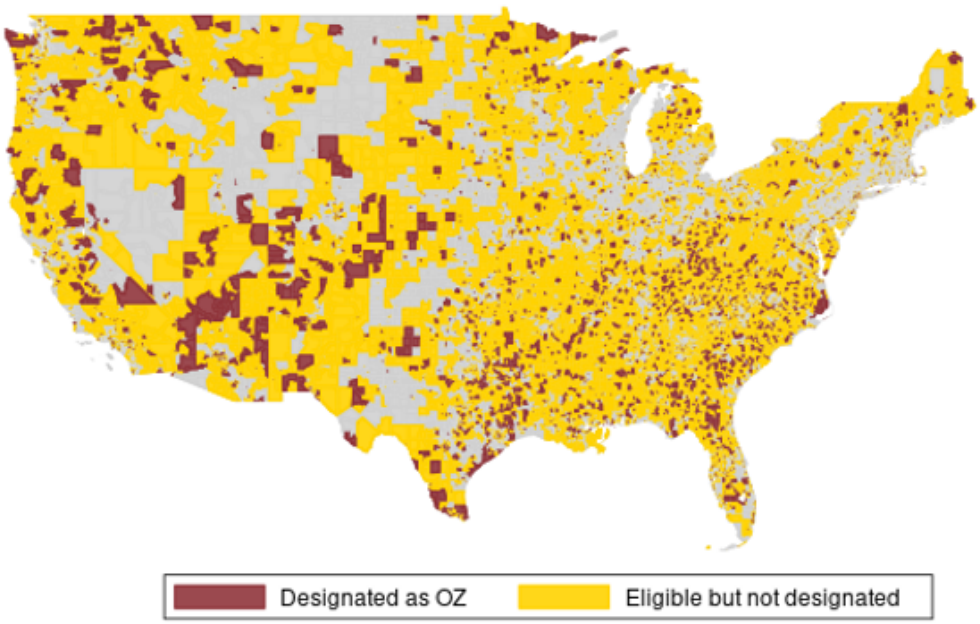


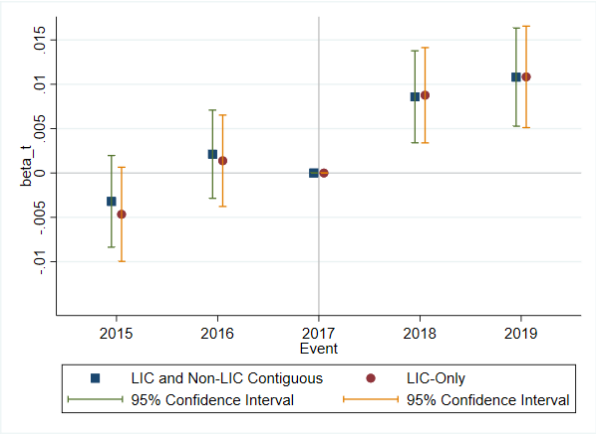
Figure 2. Coefficient Estimates on Private Investments

The figures show the coefficients plot around the Opportunity Zone policy by estimating the following model:

$$Y_{i,t} = \alpha + \beta OZ_i * Year_t + OZ_i + Controls_{i,t-1} + \delta_t + \eta_i + \epsilon_{i,t}$$

where $Year_t$ is a set of year indicator variables that equals one in year t. The benchmark group comprises of observations from 2017, when the Opportunity Zone policy was signed into law. OZ_i is a dummy that equals one if census tract i was designated as an Opportunity Zone and equals zero if the tract was eligible but not selected. Panel (a) shows the plot of coefficient estimates of β_t when the outcome variable is the natural logarithm of one plus the number of private investments. Panel (b) shows the plot of estimates of β_t when the outcome variable is the natural logarithm of one plus the amount of private investments. The center points show the point estimates of β_t and the vertical lines denote the 95% confidence intervals of β_t estimates. The blue square dots represent the coefficient estimates for a sample with both low-income-community (LIC) tracts and non-LIC but contiguous to LIC tracts. The red round dots represent the coefficient estimates for a sample with LIC tracts only.

(a) Number of Private Investments



(b) Amount of Private Investments

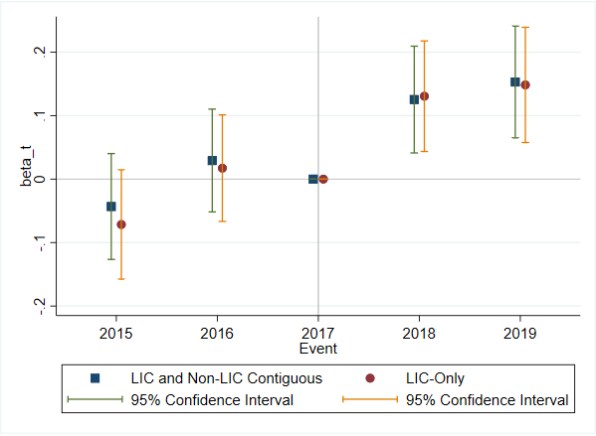


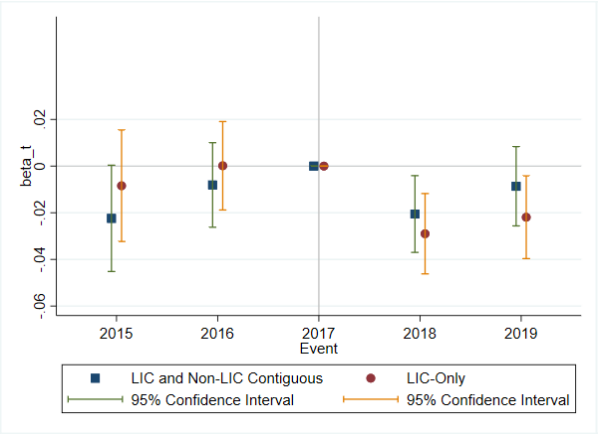
Figure 3. Coefficient Estimates on New Business Formation

The figures show the coefficients plot around the Opportunity Zone policy by estimating the following model:

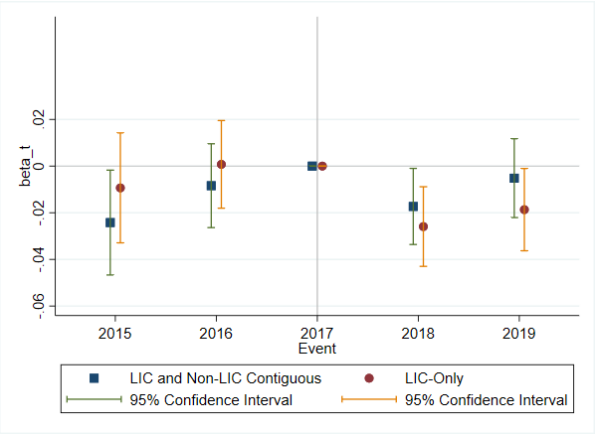
$$Y_{i,t} = \alpha + \beta OZ_i * Year_t + OZ_i + Controls_{i,t-1} + \delta_t + \eta_i + \epsilon_{i,t}$$

where $Year_t$ is a set of year indicator variables that equals one in year t. The benchmark group comprises of observations from 2017, when the Opportunity Zone policy was signed into law. OZ_i is a dummy that equals one if census tract i was designated as an Opportunity Zone and equals zero if the tract was eligible but not selected. Panel (a), (b) and (c) shows the plot of coefficient estimates of β_t when the outcome variable is the natural logarithm of one plus the number of total new firms formed, the natural logarithm of one plus the number of new for-profit firms formed, and the natural logarithm of one plus the number of new non-profit firms formed, respectively. The center points show the point estimates of β_t and the vertical lines denote the 95% confidence intervals of β_t estimates. The blue square dots represent the coefficient estimates for a sample with both low-income-community (LIC) tracts and non-LIC but contiguous to LIC tracts. The red round dots represent the coefficient estimates for a sample with LIC tracts only.

(a) Number of New Firms



(b) Number of New For-Profit Firms



(c) Number of New Non-Profit Firms

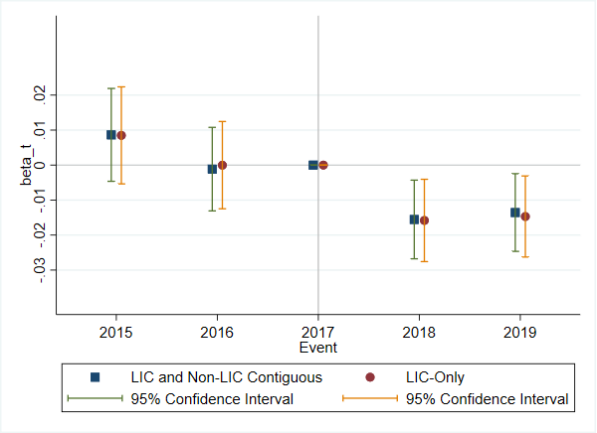


Table 1. Summary Statistics

This table displays the summary statistics for the data used in this study. The observation unit is a census-tract-year. Variable construction and data sources are introduced in Section 4.

	N	Mean	SD	Min	Median	Max
OZ	154,566	0.247	0.431	0.000	0.000	1.000
Num_Inv	154,566	0.118	2.257	0.000	0.000	641.000
Amount_Inv ($milions)	154,566	2.732	92.635	0.000	0.000	15,422.180
Num_NewFirm	154,566	10.343	47.016	0.000	3.000	4,739.000
Num_NewForProfit	154,566	9.804	45.735	0.000	2.000	4,628.000
Num_NewNonProfit	154,566	0.540	1.954	0.000	0.000	202.000
Population (thousands)	154,509	4.046	1.892	0.011	3.801	40.616
Median Income ($thousands)	154,509	39.156	12.987	2.499	38.141	181.125
Median Age	154,509	35.860	7.501	21	35.1	80.4
Poverty Rate (%)	154,509	22.181	9.976	3.356	20.619	51.164
White Alone (%)	154,509	61.206	28.727	1.061	67.339	99.339
Black Alone (%)	154,509	23.000	27.929	0.000	10.426	100.000
Unemployment Rate (%)	154,509	10.827	6.116	1.190	9.603	30.999
%NoHighSchool	154,509	20.867	11.883	0.000	18.630	100.000

Table 2. Impact of Opportunity Zones on Private Investment

This table shows the impact of the Opportunity Zone policy on local private investments. Specifically, I shows the results of the DiD analysis by estimating the following model:

$$Y_{i,t} = \alpha + \beta OZ_i * Post_t + Controls_{i,t-1} + \delta_t + \eta_i + \epsilon_{i,t}.$$

where i is a census tract, t represents a year. The dependent variables are the natural logarithm of the one plus the number of private investment deals invested in census i and year t (*Ln(Num_Inv+1)*) and the amount of private investment deals invested (*Ln(Amount_Inv+1)*). *OZ* is an indicator that takes a value of one if the tract was designated as an Opportunity Zone (OZ) and zero if it was eligible but not designated. *Post* is a dummy that equals zero prior to 2018 and one afterwards. Control variables include the population, median income, median age, poverty rate, percentage of white or black people, unemployment rate, and percentage of population without a high-school degree of a census tract in a given year. I also control for year and tract fixed effects. Standard errors are clustered at the census tract level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1) *Ln(Num_Inv+1)*	(2) *Ln(Num_Inv+1)*	(3) *Ln(Amount_Inv+1)*	(4) *Ln(Amount_Inv+1)*
*OZ*Post*	0.011***	0.011***	0.158***	0.158***
	(0.002)	(0.002)	(0.032)	(0.032)
Population		0.018**		0.270**
		(0.008)		(0.122)
Median_Income		0.010		0.112
		(0.006)		(0.087)
Median_Age		0.003		0.105
		(0.008)		(0.120)
%White		0.000*		0.005***
		(0.000)		(0.002)
%Black		-0.000		0.001
		(0.000)		(0.003)
Poverty_Rate		0.000*		0.005**
		(0.000)		(0.002)
Unemp_Rate		-0.000		-0.001
		(0.000)		(0.002)
%NoHighSchool		0.000		0.001
		(0.000)		(0.002)
Constant	0.042***	-0.230**	0.603***	-3.612**
	(0.000)	(0.099)	(0.003)	(1.479)
Observations	154,563	154,490	154,563	154,490
R-squared	0.733	0.733	0.579	0.579
Tract FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Table 3. Impact of Opportunity Zones on Private Investment by Sector

This table shows the impact of the Opportunity Zone policy on local private investments by sector. In Columns (1)-(3), the dependent variable is the natural logarithm of one plus the number of private investment deals in a specific sector invested in census i and year t (*Ln(Num_Inv+1)*). In Columns (4)-(6), the dependent variable is the natural logarithm of one plus the amount of private investment deals in a specific sector invested (*Ln(Amount_Inv+1)*). *OZ* is an indicator that takes a value of one if the tract was designated as an Opportunity Zone (OZ) and zero if it was eligible but not designated. *Post* is a dummy that equals zero prior to 2018 and one afterwards. Control variables include the population, median income, median age, poverty rate, percentage of white or black people, unemployment rate, and percentage of population without a high-school degree of a census tract in a given year. I also control for year and tract fixed effects. Standard errors are clustered at the census tract level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Ln(Num_Inv+1)			*Ln(Amount_Inv+1)*		
	Business	*Real Estate*	*Finance*	*Business*	*Real Estate*	*Finance*
*OZ*Post*	0.010***	0.001*	-0.000	0.147***	0.021**	-0.008
	(0.002)	(0.001)	(0.000)	(0.031)	(0.010)	(0.007)
Population	0.021***	-0.000	-0.000	0.308**	0.050	0.002
	(0.008)	(0.003)	(0.001)	(0.122)	(0.047)	(0.024)
Median_Income	0.008	0.002	0.001	0.095	0.039	0.010
	(0.006)	(0.002)	(0.001)	(0.086)	(0.025)	(0.017)
Median_Age	0.004	-0.001	0.002*	0.106	0.005	0.037
	(0.007)	(0.002)	(0.001)	(0.116)	(0.035)	(0.025)
%White	0.000*	-0.000	0.000	0.005**	0.001	0.000
	(0.000)	(0.000)	(0.000)	(0.002)	(0.001)	(0.000)
%Black	-0.000	-0.000***	0.000	0.001	-0.002*	0.000
	(0.000)	(0.000)	(0.000)	(0.003)	(0.001)	(0.000)
Poverty_Rate	0.000*	-0.000	0.000	0.005**	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.002)	(0.001)	(0.000)
Unemp_Rate	-0.000	-0.000	-0.000	-0.001	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.002)	(0.001)	(0.001)
%NoHighSchool	0.000	-0.000	0.000	0.002	-0.001*	0.000
	(0.000)	(0.000)	(0.000)	(0.002)	(0.001)	(0.000)
Constant	-0.249**	-0.013	-0.014	-3.771**	-0.774	-0.259
	(0.097)	(0.033)	(0.017)	(1.466)	(0.544)	(0.318)
Observations	154,490	154,490	154,490	154,490	154,490	154,490
R-squared	0.731	0.514	0.500	0.578	0.446	0.420
Tract FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Table 4. Impact of Opportunity Zones on New Business Formation

This table shows the impact of the Opportunity Zone policy on local new business formation. The dependent variables are the natural logarithm of the one plus the number of total new firms registered in census i and year t (*Ln(Num_NewFirm+1)*), the number of for-profit businesses registered (*Ln(Num_NewForProfit+1)*), and the number of non-profit businesses registered (*Ln(Num_NewNonProfit+1)*). *OZ* is an indicator that takes a value of one if the tract was designated as an Opportunity Zone (OZ) and zero if it was eligible but not designated. *Post* is a dummy that equals zero prior to 2018 and one afterwards.This analysis does not include census tracts in Delaware, Illinois, and Puerto Rico due to data coverage. Control variables include the population, median income, median age, poverty rate, percentage of white or black people, unemployment rate, and percentage of population without a high-school degree of a census tract in a given year. I also control for year and tract fixed effects. Standard errors are clustered at the census tract level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	Ln(Num_NewFirm+1)	*Ln(Num_NewForProfit+1)*	*Ln(Num_NewNonProfit+1)*
*OZ*Post*	-0.023**	-0.019**	-0.018***
	(0.010)	(0.010)	(0.004)
Population	-0.049	-0.040	-0.042**
	(0.040)	(0.039)	(0.018)
Median_Income	0.088***	0.085***	0.019
	(0.026)	(0.025)	(0.012)
Median_Age	0.152***	0.149***	0.004
	(0.044)	(0.043)	(0.020)
%White	-0.001*	-0.001*	0.000
	(0.001)	(0.001)	(0.000)
%Black	-0.005***	-0.005***	-0.001**
	(0.001)	(0.001)	(0.000)
Poverty_Rate	0.003***	0.003***	0.001**
	(0.001)	(0.001)	(0.000)
Unemp_Rate	0.001*	0.001	0.001***
	(0.001)	(0.001)	(0.000)
%NoHighSchool	-0.004***	-0.004***	-0.001***
	(0.001)	(0.001)	(0.000)
Constant	0.594	0.534	0.398*
	(0.467)	(0.462)	(0.216)
Observations	147,565	147,565	147,565
R-squared	0.851	0.849	0.619
Tract FE	YES	YES	YES
Year FE	YES	YES	YES

Table 5. Heterogeneous Impact on Local Entrepreneurship By Survival Period

This table shows the impact of the Opportunity Zone policy on local new business formation by the length of time a firm can survive. The dependent variables are the natural logarithm of the one plus the number of total new firms that survived for more than one (or two) years and those that did not. *OZ* is an indicator that takes a value of one if the tract was designated as an Opportunity Zone (OZ) and zero if it was eligible but not designated. *Post* is a dummy that equals zero prior to 2018 and one afterwards. This analysis does not include census tracts in Delaware, Illinois, and Puerto Rico due to data coverage. Control variables include the population, median income, median age, poverty rate, percentage of white or black people, unemployment rate, and percentage of population without a high-school degree of a census tract in a given year. I also control for year and tract fixed effects. Standard errors are clustered at the census tract level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)
	Survive >1 Years	*Survive ≤1 Year*
*OZ*Post*	-0.023**	-0.002
	(0.010)	(0.002)
Population	-0.050	0.019**
	(0.040)	(0.008)
Median_Income	0.090***	-0.001
	(0.026)	(0.005)
Median_Age	0.150***	0.021**
	(0.044)	(0.008)
%White	-0.001*	-0.000
	(0.001)	(0.000)
%Black	-0.005***	-0.000*
	(0.001)	(0.000)
Poverty_Rate	0.003***	0.000
	(0.001)	(0.000)
Unemp_Rate	0.001*	0.000
	(0.001)	(0.000)
%NoHighSchool	-0.004***	0.000
	(0.001)	(0.000)
Constant	0.593	-0.168*
	(0.466)	(0.096)
Observations	147,565	147,565
R-squared	0.851	0.441
Tract FE	YES	YES
Year FE	YES	YES

Table 6. Heterogeneous Impact on Local Entrepreneurship By Business Structure

This table shows the impact of the Opportunity Zone policy on local new business formation by the types of firms incorporated. The dependent variables are the natural logarithm of the one plus the number of total new firms registered in census i and year t as a corporation, the number of firms registered as a limited liability company, and other types of firms. *OZ* is an indicator that takes a value of one if the tract was designated as an Opportunity Zone (OZ) and zero if it was eligible but not designated. *Post* is a dummy that equals zero prior to 2018 and one afterwards. This analysis does not include census tracts in Delaware, Illinois, and Puerto Rico due to data coverage. Control variables include the population, median income, median age, poverty rate, percentage of white or black people, unemployment rate, and percentage of population without a high-school degree of a census tract in a given year. I also control for year and tract fixed effects. Standard errors are clustered at the census tract level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	Corporation	*Limited Liability Company*	*Other*
*OZ*Post*	-0.023***	-0.016*	-0.010***
	(0.006)	(0.010)	(0.003)
Population	-0.037	-0.033	-0.016
	(0.025)	(0.039)	(0.014)
Median_Income	0.051***	0.079***	0.001
	(0.018)	(0.025)	(0.010)
Median_Age	0.095***	0.134***	0.001
	(0.029)	(0.043)	(0.015)
%White	-0.001**	-0.001	0.000
	(0.000)	(0.001)	(0.000)
%Black	-0.004***	-0.004***	0.000
	(0.001)	(0.001)	(0.000)
Poverty_Rate	0.002***	0.003***	-0.000
	(0.000)	(0.001)	(0.000)
Unemp_Rate	0.001**	0.001	-0.000*
	(0.001)	(0.001)	(0.000)
%NoHighSchool	-0.002***	-0.003***	-0.000
	(0.001)	(0.001)	(0.000)
Constant	0.315	0.358	0.327*
	(0.307)	(0.463)	(0.168)
Observations	147,565	147,565	147,565
R-squared	0.809	0.828	0.772
Tract FE	YES	YES	YES
Year FE	YES	YES	YES

Table 7. Impact on Private Investments by Firm Age

This table shows the impact of the Opportunity Zone policy on local private investments grouped by the age of firms that received the investments. The dependent variable in Columns (1) and (2) is the natural logarithm of one plus the total number of private investments (*Ln(Num_Inv+1)*) received by firms that are at least one-year old or less than one-year old census tract i and year t, respectively. The dependent variable in Columns (3) and (4) is the natural logarithm of one plus the total amount of private investments (*Ln(Amount_Inv+1)*) received by firms that are at least one-year old or less than one-year old census tract i and year t, respectively. *OZ* is an indicator that takes a value of one if the tract was designated as an Opportunity Zone (OZ) and zero if it was eligible but not designated. *Post* is a dummy that equals zero prior to 2018 and one afterwards. Control variables include the population, median income, median age, poverty rate, percentage of white or black people, unemployment rate, and percentage of population without a high-school degree of a census tract in a given year. I also control for year and tract fixed effects. Standard errors are clustered at the census tract level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively..

	(1)	(2)	(3)	(4)
	Ln(Num_Inv+1)		*Ln(Amount_Inv+1)*	
	One Year and Above	*Less Than 1 Year*	*One Year and Above*	*Less Than 1 Year*
*OZ*Post*	0.010***	0.002**	0.140***	0.035**
	(0.002)	(0.001)	(0.031)	(0.016)
Population	0.020**	0.004	0.278**	0.063
	(0.008)	(0.004)	(0.118)	(0.069)
Median_Income	0.009	0.004	0.121	0.037
	(0.006)	(0.003)	(0.086)	(0.044)
Median_Age	0.004	0.000	0.109	0.028
	(0.007)	(0.003)	(0.115)	(0.057)
%White	0.000*	-0.000	0.005**	0.000
	(0.000)	(0.000)	(0.002)	(0.001)
%Black	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.003)	(0.001)
Poverty_Rate	0.000	0.000**	0.003	0.002*
	(0.000)	(0.000)	(0.002)	(0.001)
Unemp_Rate	-0.000	0.000	-0.002	-0.000
	(0.000)	(0.000)	(0.002)	(0.001)
%NoHighSchool	0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.002)	(0.001)
Constant	-0.248***	-0.063	-3.722***	-0.943
	(0.094)	(0.050)	(1.426)	(0.799)
Observations	154,490	154,490	154,490	154,490
R-squared	0.727	0.579	0.576	0.450
Tract FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Table 8. Impact on SBA Lending by Firm Age

This table shows the impact of the Opportunity Zone policy on local Small Business Administration (SBA) lending grouped by the age of firms that received the investments. The dependent variable in Columns (1) and (2) is the natural logarithm of one plus the total number of SBA loans (*Ln(Num_SBALoan+1)*) received by firms that are at least one-year old or less than one-year old census tract i and year t, respectively. The dependent variable in Columns (3) and (4) is the natural logarithm of one plus the total amount of SBA loans (*Ln(Amount_SBALoan+1)*) received by firms that are at least one-year old or less than one-year old census tract i and year t, respectively. *OZ* is an indicator that takes a value of one if the tract was designated as an Opportunity Zone (OZ) and zero if it was eligible but not designated. *Post* is a dummy that equals zero prior to 2018 and one afterwards. Control variables include the population, median income, median age, poverty rate, percentage of white or black people, unemployment rate, and percentage of population without a high-school degree of a census tract in a given year. I also control for year and tract fixed effects. Standard errors are clustered at the census tract level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Ln(Num_SBALoan+1)		*Ln(Amount_SBALoan+1)*	
	One Year and Above	*Less Than 1 Year*	*One Year and Above*	*Less Than 1 Year*
*OZ*Post*	-0.005	-0.005***	-0.010	-0.077**
	(0.005)	(0.002)	(0.059)	(0.031)
Population	0.028	-0.020***	0.613***	-0.251**
	(0.018)	(0.008)	(0.235)	(0.116)
Median_Income	-0.021*	-0.004	-0.220	-0.055
	(0.012)	(0.005)	(0.156)	(0.079)
Median_Age	-0.000	-0.010	0.091	-0.058
	(0.020)	(0.008)	(0.264)	(0.125)
%White	-0.000	-0.000	-0.006	-0.003
	(0.000)	(0.000)	(0.004)	(0.002)
%Black	-0.001*	-0.000	-0.011**	-0.003
	(0.000)	(0.000)	(0.006)	(0.003)
Poverty_Rate	0.001*	0.000	0.010**	0.004
	(0.000)	(0.000)	(0.004)	(0.002)
Unemp_Rate	-0.001**	-0.000	-0.008*	-0.004
	(0.000)	(0.000)	(0.005)	(0.002)
%NoHighSchool	-0.000	0.000	-0.003	0.001
	(0.000)	(0.000)	(0.005)	(0.002)
Constant	0.281	0.292***	0.957	3.617**
	(0.213)	(0.091)	(2.796)	(1.404)
Observations	154,490	154,490	154,490	154,490
R-squared	0.516	0.368	0.435	0.347
Tract FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Table 9. Heterogeneous Impact on Local Entrepreneurship By Sector

This table shows the impact of the Opportunity Zone policy on local new business formation by categorizing firms into sectors following Mian and Sufi (2014). The dependent variables in Columns (1), (2), and (3) are the natural logarithm of the one plus the number of total new firms in the non-tradable, tradable, construction, and other sector registered in census i and year t, respectively. OZ is an indicator that takes a value of one if the tract was designated as an Opportunity Zone (OZ) and zero if it was eligible but not designated. *Post* is a dummy that equals zero prior to 2018 and one afterwards. This analysis does not include census tracts in Delaware, Illinois, and Puerto Rico due to data coverage. Control variables include the population, median income, median age, poverty rate, percentage of white or black people, unemployment rate, and percentage of population without a high-school degree of a census tract in a given year. I also control for year and tract fixed effects. Standard errors are clustered at the census tract level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1) *Non-tradable*	(2) *Tradable*	(3) *Construction*	(4) *Other*
*OZ*Post*	-0.016***	-0.003	-0.005	-0.021**
	(0.005)	(0.002)	(0.006)	(0.009)
Population	0.014	-0.007	-0.021	-0.053
	(0.018)	(0.007)	(0.023)	(0.038)
Median_Income	-0.001	0.008	0.025	0.084***
	(0.012)	(0.005)	(0.016)	(0.025)
Median_Age	-0.000	0.004	0.068***	0.140***
	(0.020)	(0.008)	(0.026)	(0.042)
%White	-0.000	-0.000	-0.000	-0.001*
	(0.000)	(0.000)	(0.000)	(0.001)
%Black	-0.001**	-0.000	-0.002***	-0.005***
	(0.000)	(0.000)	(0.001)	(0.001)
Poverty_Rate	0.000	0.000*	0.000	0.003***
	(0.000)	(0.000)	(0.000)	(0.001)
Unemp_Rate	0.000	-0.000	-0.000	0.002**
	(0.000)	(0.000)	(0.000)	(0.001)
%NoHighSchool	-0.001	0.000	-0.002***	-0.003***
	(0.000)	(0.000)	(0.000)	(0.001)
Constant	0.184	0.000	0.252	0.575
	(0.216)	(0.090)	(0.282)	(0.452)
Observations	147,565	147,565	147,565	147,565
R-squared	0.568	0.388	0.722	0.847
Tract FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Table 10. Impact of Opportunity Zones on Housing Price and Mortgage Applications

This table shows the impact of the Opportunity Zone policy on local housing price and mortgage applications. The dependent variables are the natural logarithm of the housing price index provided by the Federal House Finance Agency (FHFA) and the natural logarithm of the one plus the number of total housing mortgages in census i and year t (*Ln(Num_mortgage+1)*). *OZ* is an indicator that takes a value of one if the tract was designated as an Opportunity Zone (OZ) and zero if it was eligible but not designated. *Post* is a dummy that equals zero prior to 2018 and one afterwards. Control variables include the population, median income, poverty rate, percentage of white people, and unemployment rate of a census tract in a given year. Control variables include the population, median income, median age, poverty rate, percentage of white or black people, unemployment rate, and percentage of population without a high-school degree of a census tract in a given year. I also control for year and tract fixed effects. Standard errors are clustered at the census tract level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1) *Ln(HPI)*	(2) *Ln(Num_mortgage+1)*
*OZ*Post*	-0.001	0.005
	(0.002)	(0.005)
Population	0.173***	0.122***
	(0.008)	(0.021)
Median_Income	-0.000	-0.016
	(0.005)	(0.014)
Median_Age	0.054***	0.007
	(0.008)	(0.024)
%White	-0.000***	0.000
	(0.000)	(0.000)
%Black	-0.001***	0.000
	(0.000)	(0.001)
Poverty_Rate	-0.001***	-0.000
	(0.000)	(0.000)
Unemp_Rate	-0.004***	-0.001***
	(0.000)	(0.000)
%NoHighSchool	-0.000	0.000
	(0.000)	(0.000)
Constant	3.735***	-0.314
	(0.094)	(0.253)
Observations	89,325	154,490
R-squared	0.981	0.509
Tract FE	YES	YES
Year FE	YES	YES

Table 11. Impact of Opportunity Zones on Geographical Mobility

This table shows the impact of the Opportunity Zone policy on the geographical mobility for current residents who moved in within last one year. The dependent variable in Column (1) is the natural logarithm of one plus the total number of movers into census tract i and year t within the last one year (*Ln(Num_migrants+1)*). In Columns (2) to (4), the dependent variables are the number of move-ins by education: the natural logarithm of one plus the number of movers that do not have a high-school degree, have a high-school degree, and have a bachelor's degree or above, respectively. In Columns (5) to (7), the dependent variables are the number of move-ins by their poverty status: the natural logarithm of one plus the number of movers that are below 100 percent of the poverty level, 100 to 149 percent of the poverty level, at or above 150 percent of the poverty level, respectively. *OZ* is an indicator that takes a value of one if the tract was designated as an Opportunity Zone (OZ) and zero if it was eligible but not designated. *Post* is a dummy that equals zero prior to 2018 and one afterwards. Control variables include the population, median income, median age, poverty rate, percentage of white or black people, unemployment rate, and percentage of population without a high-school degree of a census tract in a given year. I also control for year and tract fixed effects. Standard errors are clustered at the census tract level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Ln(Num_migrants+1)					
		Education			Relative to Poverty Level		
	All Move-ins	Less than High School	High School	Bachelor's or Above	< 100%	[100%, 149%]	≥ 150%
*OZ*Post*	-0.007	0.001	0.004	0.009	0.009	0.005	0.009
	(0.004)	(0.012)	(0.009)	(0.012)	(0.010)	(0.015)	(0.007)
Population	0.575***	0.549***	0.620***	0.456***	0.496***	0.575***	0.545***
	(0.028)	(0.053)	(0.041)	(0.052)	(0.047)	(0.064)	(0.041)
Median_Income	0.023	0.024	-0.032	0.117***	-0.017	-0.440***	0.245***
	(0.015)	(0.035)	(0.026)	(0.034)	(0.028)	(0.043)	(0.024)
Median_Age	-0.188***	0.171***	0.124***	0.071	-0.328***	-0.474***	-0.077**
	(0.024)	(0.055)	(0.040)	(0.055)	(0.046)	(0.070)	(0.035)
%White	-0.001***	-0.002*	-0.000	-0.002**	-0.001	-0.001	-0.001
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
%Black	-0.001**	-0.000	0.001	-0.005***	-0.001	0.001	-0.002**
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Poverty_Rate	0.002***	0.003***	0.001	-0.002**	0.023***	-0.017***	-0.004***
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Unemp_Rate	0.003***	0.002**	0.005***	0.001	0.005***	0.006***	0.001
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
%NoHighSchool	0.000	0.031***	-0.005***	-0.006***	0.000	0.005***	-0.001*
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	1.976***	-2.377***	-0.890*	-1.292**	1.622***	5.568***	-1.197***
	(0.295)	(0.628)	(0.472)	(0.599)	(0.532)	(0.753)	(0.452)
Observations	154,484	154,484	154,484	154,484	154,484	154,484	154,484
R-squared	0.923	0.785	0.811	0.845	0.814	0.735	0.885
Tract FE	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES

Table 12. The Impact of Opportunity Zones on County Employment (Total and By Sector)

This table shows the impact of the Opportunity Zone policy on the number of employment. I collect the total number of employment from the County Business Patterns from the Census Bureau. The dependent variables are the natural logarithm of the number of employment in county i and year t by sector. *OZ%* is a continuous variable that equals the percentage of population that resides in Opportunity Zones of the total population that resides in the eligible census tracts in the same county (the results of using the percentage of all the county population is shown in the Appendix). *Post* is a dummy that equals zero prior to 2018 and one afterwards. Control variables include the population, median income, poverty rate, percentage of white people, and unemployment rate of a census tract in a given year. I also control for year and county fixed effects. Standard errors are clustered at the county level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
	Ln(Employment+1)				
	Total	*Non-Tradable*	*Tradable*	*Construction*	*Other*
*%OZ*Post*	-0.014	-0.015	0.039	0.123**	0.053
	(0.012)	(0.034)	(0.116)	(0.063)	(0.037)
Population	0.928***	0.453**	0.348	-0.052	-0.116
	(0.131)	(0.181)	(0.590)	(0.281)	(0.265)
Median_Income	-0.013	0.287**	0.618*	-0.045	0.006
	(0.036)	(0.129)	(0.327)	(0.172)	(0.166)
Median_Age	0.193	0.874**	-0.096	0.582	0.540
	(0.124)	(0.359)	(0.540)	(0.388)	(0.456)
%White	0.004	0.005	0.006	-0.001	-0.002
	(0.005)	(0.003)	(0.009)	(0.005)	(0.004)
%Black	-0.000	0.005	-0.021	-0.010	-0.013*
	(0.002)	(0.008)	(0.022)	(0.012)	(0.007)
Poverty_Rate	0.001	0.007*	-0.005	-0.007	0.002
	(0.002)	(0.004)	(0.010)	(0.005)	(0.004)
Unemp_Rate	-0.008***	-0.002	-0.003	-0.009*	0.000
	(0.002)	(0.003)	(0.010)	(0.005)	(0.005)
%NoHighSchool	0.000	-0.001	-0.006	-0.006	0.006
	(0.002)	(0.004)	(0.010)	(0.005)	(0.008)
Constant	-1.557	-4.423	-5.979	5.152	6.804**
	(1.191)	(2.956)	(6.996)	(3.665)	(3.038)
Observations	15,707	15,707	15,707	15,707	15,707
R-squared	0.996	0.989	0.941	0.979	0.991
County FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Internet Appendix - Not for Publication

The Effect of Tax Incentives on Local Private Investments and Entrepreneurship: Evidence from the Tax Cuts and Jobs Act of 2017

Jiajie Xu

A Additional Tests

Table A1. Impact of Opportunity Zones on Local Private Investment: Alternative Options of Clustering the Standard Errors

This table shows the impact of the Opportunity Zone policy on local private investments under alternative options of clustering the standard errors. The dependent variables are the natural logarithm of the one plus the number of private investment deals invested in census i and year t (*Ln(Num_Inv+1)*) and the amount of private investment deals invested (*Ln(Amount_Inv+1)*). *OZ* is an indicator that takes a value of one if the tract was designated as an Opportunity Zone (OZ) and zero if it was eligible but not designated. *Post* is a dummy that equals zero prior to 2018 and one afterwards. Control variables include the population, median income, median age, poverty rate, percentage of white or black people, unemployment rate, and percentage of population without a high-school degree of a census tract in a given year. I also control for year and tract fixed effects. Standard errors are clustered at the county level, county and year level, or state and year level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Ln(Num_Inv+1)			*Ln(Amount_Inv+1)*		
*OZ*Post*	0.011***	0.011***	0.011**	0.158***	0.158***	0.158***
	(0.002)	(0.002)	(0.002)	(0.029)	(0.030)	(0.029)
Population	0.018*	0.018	0.018	0.270*	0.270	0.270*
	(0.010)	(0.010)	(0.009)	(0.150)	(0.138)	(0.122)
Median_Income	0.010*	0.010	0.010	0.112	0.112	0.112
	(0.006)	(0.006)	(0.006)	(0.093)	(0.123)	(0.114)
Median_Age	0.003	0.003	0.003	0.105	0.105	0.105
	(0.007)	(0.010)	(0.010)	(0.104)	(0.148)	(0.150)
%White	0.000*	0.000	0.000	0.005***	0.005**	0.005
	(0.000)	(0.000)	(0.000)	(0.002)	(0.002)	(0.003)
%Black	-0.000	-0.000	-0.000	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.003)	(0.002)	(0.003)
Poverty_Rate	0.000**	0.000	0.000	0.005**	0.005	0.005
	(0.000)	(0.000)	(0.000)	(0.002)	(0.003)	(0.003)
Unemp_Rate	-0.000	-0.000	-0.000	-0.001	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.002)	(0.003)	(0.003)
%NoHighSchool	0.000	0.000	0.000	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.002)	(0.004)	(0.005)
Constant	-0.230**	-0.230	-0.230	-3.612**	-3.612	-3.612
	(0.096)	(0.141)	(0.137)	(1.554)	(2.324)	(2.051)
Observations	154,490	154,490	154,490	154,490	154,490	154,490
R-squared	0.733	0.733	0.733	0.579	0.579	0.579
Tract FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Cluster of SE	County	County*Year	State*Year	County	County*Year	State*Year

Table A2. Logit Regressions for Propensity Score Matching

This table shows the logit regressions when the dependent variable is the indicator variable for Opportunity Zones (OZ) before and after the propensity score matching procedure. Independent variables include the population, median income, poverty rate, percentage of white people, and unemployment rate, percentage of population without high-school degree of a census tract at the end of 2017. I also include the level and the past two-year growth of private investments and new firm registrations. I include a set of dummy variables for each state. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1) Pre-PSM *OZ*	(2) Post-PSM *OZ*
Population	0.507**	-0.441
	(0.256)	(0.299)
Median_Income	-11.420***	-1.134
	(0.716)	(0.833)
%White	0.007***	0.001
	(0.001)	(0.001)
%Black	0.007***	0.001
	(0.001)	(0.001)
Poverty_Rate	0.010***	0.001
	(0.002)	(0.003)
Unemp_Rate	0.030***	0.004
	(0.003)	(0.003)
%NoHighSchool	0.006***	0.002
	(0.002)	(0.002)
Num_Inv	-0.120	0.019
	(0.120)	(0.137)
Amnt_Inv	0.040***	-0.000
	(0.009)	(0.010)
New_Firm	0.271***	0.025
	(0.022)	(0.025)
Num_Inv_Growth	-0.122*	0.005
	(0.067)	(0.080)
Amnt_Inv_Growth	-0.000	0.007
	(0.000)	(0.005)
New_Firm_Growth	-0.010	-0.001
	(0.007)	(0.007)
Constant	22.926***	3.334
	(1.762)	(2.047)
Observations	30,904	15,210
Pseudo R2	0.0550	0.0012
State Dummies	YES	YES

Table A3. Impact of Opportunity Zones on Local Private Investment: Propensity-Score-Matched Sample

This table shows the impact of the Opportunity Zone policy on local private investments using a propensity-score-matched sample. The dependent variables are the natural logarithm of the one plus the number of private investment deals invested in census i and year t (*Ln(Num_Inv+1)*) and the amount of private investment deals invested (*Ln(Amount_Inv+1)*). *OZ* is an indicator that takes a value of one if the tract was designated as an Opportunity Zone (OZ) and zero if it was eligible but not designated. *Post* is a dummy that equals zero prior to 2018 and one afterwards. Control variables include the population, median income, poverty rate, percentage of white people, and unemployment rate of a census tract in a given year. I also control for year and county fixed effects. Standard errors are clustered at the county level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Ln(Num_Inv+1)		*Ln(Amount_Inv+1)*	
*OZ*Post*	0.013***	0.013***	0.210***	0.210***
	(0.003)	(0.003)	(0.039)	(0.039)
Population		0.019		0.348*
		(0.013)		(0.201)
Median_Income		0.014		0.244*
		(0.010)		(0.138)
Median_Age		-0.001		0.139
		(0.012)		(0.179)
%White		0.000		0.005*
		(0.000)		(0.003)
%Black		-0.000		0.001
		(0.000)		(0.004)
Poverty_Rate		0.000		0.008**
		(0.000)		(0.003)
Unemp_Rate		-0.000		-0.001
		(0.000)		(0.003)
%NoHighSchool		0.000		0.006*
		(0.000)		(0.004)
Constant	0.052***	-0.265*	0.751***	-5.780**
	(0.001)	(0.161)	(0.008)	(2.375)
Observations	76,043	76,030	76,043	76,030
R-squared	0.737	0.737	0.593	0.594
Tract FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
PSM	YES	YES	YES	YES
# of Tracts	15210	15210	15210	15210

Table A4. Impact of Opportunity Zones on Private Investment: Include All Eligible Tracts

This table shows the impact of the Opportunity Zone policy on local private investments with all the eligible census tracts included (both low-income communities (LIC) and non-LIC but contiguous tracts). The dependent variables are the natural logarithm of the one plus the number of private investment deals invested in census i and year t (*Ln(Num_Inv+1)*) and the amount of private investment deals invested (*Ln(Amount_Inv+1)*). *OZ* is an indicator that takes a value of one if the tract was designated as an Opportunity Zone (OZ) and zero if it was eligible but not designated. *Post* is a dummy that equals zero prior to 2018 and one afterwards. Control variables include the population, median income, poverty rate, percentage of white people, and unemployment rate of a census tract in a given year. I also control for year and county fixed effects. Standard errors are clustered at the county level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Ln(Num_Inv+1)	*Ln(Num_Inv+1)*	*Ln(Amount_Inv+1)*	*Ln(Amount_Inv+1)*
*OZ*Post*	0.010***	0.010***	0.143***	0.144***
	(0.002)	(0.002)	(0.031)	(0.031)
Population		0.020***		0.257**
		(0.008)		(0.113)
Median_Income		0.011**		0.134*
		(0.005)		(0.080)
Median_Age		-0.001		0.019
		(0.007)		(0.111)
%White		0.000**		0.005***
		(0.000)		(0.002)
%Black		-0.000		0.000
		(0.000)		(0.003)
Poverty_Rate		0.000		0.003*
		(0.000)		(0.002)
Unemp_Rate		-0.000		-0.000
		(0.000)		(0.002)
%NoHighSchool		0.000		0.002
		(0.000)		(0.002)
Constant	0.043***	-0.253***	0.626***	-3.426**
	(0.000)	(0.092)	(0.002)	(1.366)
Observations	205,876	205,800	205,876	205,800
R-squared	0.739	0.739	0.580	0.580
Tract FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

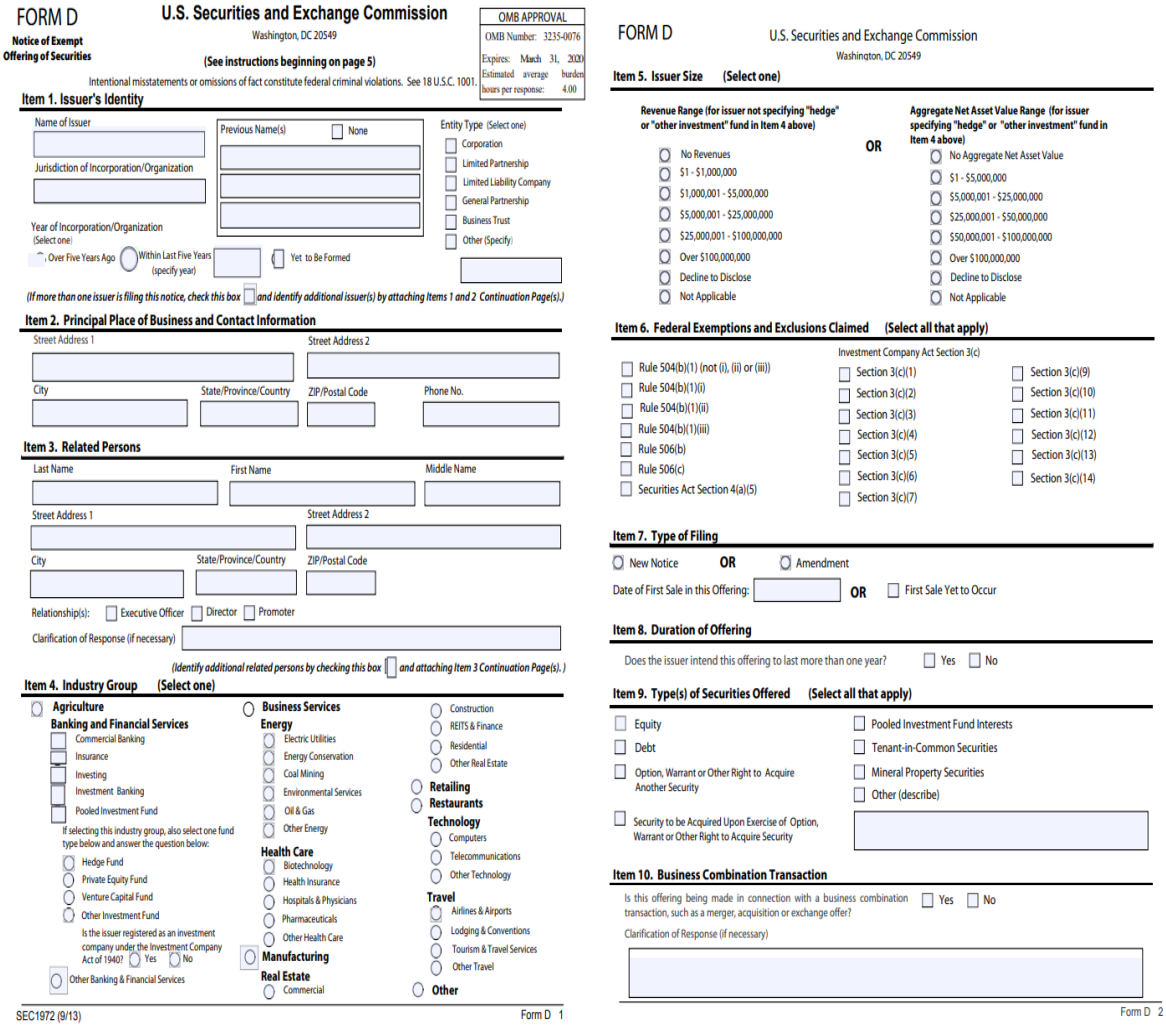
Table A5. Changes in Local Establishments by Employment Size

This table shows the impact of the Opportunity Zone policy on changes in the number of establishments by zip code. I collect the number of establishments by zip codes from the Zip Codes Business Patterns from the Census Bureau. The dependent variables are the natural logarithm of the absolute value of the changes in the number of establishments in zip code i and year t (*sign(Chg_Estab)*Ln(|Chg_Estab.|)* by the size of employment. The dependent variable in Column (1) is the number of establishments of all sizes while it is the number of establishments when the size of employment is less than 10, from 10 to 49, from 50 to 99, and equal or more than 100 in Columns (2) to (5), respectively. *OZ%* is a continuous variable that equals the percentage of population in a zip code that resides in Opportunity Zones. *Post* is a dummy that equals zero prior to 2018 and one afterwards. Control variables include the population, median income, poverty rate, percentage of white people, and unemployment rate of a census tract in a given year. I also control for year and census tract fixed effects. Standard errors are clustered at the county level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1) *All Emp. Sizes*	(2) *Emp.<10*	(3) *10≤Emp.<50*	(4) *50≤Emp.<100*	(5) *Emp.≥100*
*OZ%*Post*	-0.082***	-0.075***	-0.077***	0.006	0.008
	(0.023)	(0.023)	(0.018)	(0.010)	(0.010)
OZ%	0.034	0.019	0.047***	-0.038***	-0.018***
	(0.021)	(0.018)	(0.012)	(0.007)	(0.006)
Population	0.217***	0.161***	0.109***	-0.043***	-0.050***
	(0.014)	(0.013)	(0.005)	(0.002)	(0.002)
Med_Income	0.513***	0.430***	0.178***	0.072***	0.056***
	(0.059)	(0.055)	(0.025)	(0.016)	(0.012)
%White	-0.002**	-0.001*	-0.001*	-0.000	0.000
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Poverty_Rate	0.002	0.002	0.003***	0.000	0.000
	(0.002)	(0.001)	(0.001)	(0.001)	(0.000)
Unemp_Rate	-0.006***	-0.003	-0.005***	0.001	-0.000
	(0.002)	(0.002)	(0.001)	(0.000)	(0.001)
Constant	-7.443***	-6.140***	-3.006***	-0.473***	-0.208*
	(0.650)	(0.619)	(0.264)	(0.166)	(0.123)
Observations	122,989	122,989	122,989	122,989	122,989
R-squared	0.151	0.101	0.056	0.038	0.069
County FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

B Form D

Form D is used to file a notice of an exempt offering of securities with the SEC. The federal securities laws require the notice to be filed by companies that have sold securities without registration under the Securities Act of 1933 in an offering made under Rule 504 or 506 of Regulation D or Section 4(a)(5) of the Securities Act.[22] The figure below shows the first two pages of the Form D that firms file for exemption of registration to the SEC.



FORM D

Notice of Exempt Offering of Securities

U.S. Securities and Exchange Commission

Washington, DC 20549

(See instructions beginning on page 5)

Intentional misstatements or omissions of fact constitute federal criminal violations. See 18 U.S.C. 1001.

OMB APPROVAL

OMB Number: 3235-0076

Expires: March 31, 2020

Estimated average burden hours per response: 4.00

Item 1. Issuer's Identity

Name of Issuer

Previous Name(s) None

Entity Type (Select one)

Corporation

Limited Partnership

Limited Liability Company

General Partnership

Business Trust

Other (Specify)

Jurisdiction of Incorporation/Organization

Year of Incorporation/Organization (Select one)

Over Five Years Ago

Within Last Five Years (specify year)

Yet to Be Formed

(If more than one issuer is filing this notice, check this box and identify additional issuer(s) by attaching Items 1 and 2 Continuation Page(s).)

Item 2. Principal Place of Business and Contact Information

Street Address 1

Street Address 2

City

State/Province/Country

ZIP/Postal Code

Phone No.

Item 3. Related Persons

Last Name

First Name

Middle Name

Street Address 1

Street Address 2

City

State/Province/Country

ZIP/Postal Code

Relationship(s): Executive Officer Director Promoter

Clarification of Response (if necessary)

(Identify additional related persons by checking this box and attaching Item 3 Continuation Page(s).)

Item 4. Industry Group (Select one)

Agriculture

Banking and Financial Services

Commercial Banking

Insurance

Investing

Investment Banking

Pooled Investment Fund

If selecting this industry group, also select one fund type below and answer the question below:

Hedge Fund

Private Equity Fund

Venture Capital Fund

Other Investment Fund

Is the issuer registered as an investment company under the Investment Company Act of 1940? Yes No

Other Banking & Financial Services

Business Services

Energy

Electric Utilities

Energy Conservation

Coal Mining

Environmental Services

Oil & Gas

Other Energy

Health Care

Biotechnology

Health Insurance

Hospitals & Physicians

Pharmaceuticals

Other Health Care

Manufacturing

Real Estate

Commercial

Construction

REITS & Finance

Residential

Other Real Estate

Retailing

Restaurants

Technology

Computers

Telecommunications

Other Technology

Travel

Airlines & Airports

Lodging & Conventions

Tourism & Travel Services

Other Travel

Other

SEC1972 (9/13)

Form D 1

FORM D

U.S. Securities and Exchange Commission

Washington, DC 20549

Item 5. Issuer Size (Select one)

Revenue Range (for issuer not specifying "hedge" or "other investment" fund in Item 4 above)

No Revenues

$1 - $1,000,000

$1,000,001 - $5,000,000

$5,000,001 - $25,000,000

$25,000,001 - $100,000,000

Over $100,000,000

Decline to Disclose

Not Applicable

OR

Aggregate Net Asset Value Range (for issuer specifying "hedge" or "other investment" fund in Item 4 above)

No Aggregate Net Asset Value

$1 - $5,000,000

$5,000,001 - $25,000,000

$25,000,001 - $50,000,000

$50,000,001 - $100,000,000

Over $100,000,000

Decline to Disclose

Not Applicable

Item 6. Federal Exemptions and Exclusions Claimed (Select all that apply)

Rule 504(b)(1) (not (i), (ii) or (iii))

Rule 504(b)(1)(i)

Rule 504(b)(1)(ii)

Rule 504(b)(1)(iii)

Rule 506(b)

Rule 506(c)

Securities Act Section 4(a)(5)

Investment Company Act Section 3(c)

Section 3(c)(1)

Section 3(c)(2)

Section 3(c)(3)

Section 3(c)(4)

Section 3(c)(5)

Section 3(c)(6)

Section 3(c)(7)

Section 3(c)(9)

Section 3(c)(10)

Section 3(c)(11)

Section 3(c)(12)

Section 3(c)(13)

Section 3(c)(14)

Item 7. Type of Filing

New Notice OR Amendment

Date of First Sale in this Offering: OR First Sale Yet to Occur

Item 8. Duration of Offering

Does the issuer intend this offering to last more than one year? Yes No

Item 9. Type(s) of Securities Offered (Select all that apply)

Equity

Debt

Option, Warrant or Other Right to Acquire Another Security

Security to be Acquired Upon Exercise of Option, Warrant or Other Right to Acquire Security

Pooled Investment Fund Interests

Tenant-in-Common Securities

Mineral Property Securities

Other (describe)

Item 10. Business Combination Transaction

Is this offering being made in connection with a business combination transaction, such as a merger, acquisition or exchange offer? Yes No

Clarification of Response (if necessary)

Form D 2

[22] See more information on the website of the SEC: https://www.sec.gov/smallbusiness/exemptofferings/formd.