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Tennessee's Qualified Opportunity Zones: An Empirical Analysis of Tract Selection

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1 Introduction

Included in the enacted Tax Cuts and Jobs Act (P.L. 115-97) of 2017 was the initial legislation surrounding the Qualified Opportunity Zone ("QOZ"), a component of a new federal strategy to drive investment in America's impoverished and underserved communities. By making qualified investments into these zones, which are census tracts designated at the discretion of state governors, investors may take advantage of a myriad of tax incentives. However, this is not the government's first attempt at a place-based tax incentive program to drive investment into low-income tracts. In 2000, the New Markets Tax Credit ("NMTC") was enacted with the similar goal of promoting growth and capital access in depressed areas, but past research (discussed in Section 2.2) suggests that this program, despite driving further investment into gentrifying areas, has largely failed to revitalize poor, depressed areas. In Section 2, I seek to contrast the QOZ and NMTC programs as a means of predicting future outcomes, as well as future risks, of the QOZ program's designation of target areas.

After assessing relevant legislation, I conduct a preliminary analysis of tract selection in the state of Tennessee to compare various demographic variables for selected tracts versus eligible tracks that were not selected by the Governor. To do so, I use both Census data and American Community Survey time series data to understand the economic, geographic, and demographic trends in Governor Haslam's QOZ nominations. By conducting statistical analyses at various levels—regional, combined statistical area, and southeast US—I offer a thorough look into the attributes of the designated QOZs and how those attributes vary in different geographic groupings. Finally, I develop a socioeconomic change indicator comprised of a variety of measures to examine any selection trends toward either gentrifying, high-growth eligible tracts or slower-growth, more depressed tracts. An explanation of the methodologies used in the study can be found in section V while detailed statistical testing results and visualizations can be found in the included appendices.

2 Overview of Relevant Legislation

2.1 Qualified Opportunity Zone Legislation

The 2017 Tax Cuts and Jobs Act (P.L. 115-97), a major piece of tax reform legislation aimed at reducing corporate tax rates and simplifying taxes for individuals, included a federal strategy to drive investment in low-income and underserved American communities in the form of Qualified Opportunity Zones ("QOZs"). These zones, defined in Internal Revenue Code ("IRC") Section 1400Z, are designated at the discretion of state governors and provide incentives in the form of tax benefits.

To be eligible for selection as a QOZ, the tract must meet one of the following criteria as established by the IRC Section 45D(e): (i.) the tract has a poverty rate of 20 percent or higher; (ii.) for tracts in metropolitan areas, a median family income that is 80 percent or lower of the statewide or metropolitan area median family income, whichever is higher; (iii.) for tracts not in metropolitan areas, a median family income that is 80 percent or lower of the statewide median family income. In addition, up to 5 percent of selected tracts can be tracts contiguous to low-income communities, such that median family income does not exceed 125 percent of that of the qualifying adjacent tract. To determine the initial QOZs, governors were tasked with designating up to 25 percent of eligible tracts as opportunity zones by April 20, 2018. The statute provides no provision to change the selected tracts after designation, so it was particularly important for governors to weigh the eligible tracts to determine which would provide the best return on public investment. In the first round of designations, 8,762 tracts were designated among 42,176 eligible tracts, and only 2.6 percent of those were contiguous tracts (Theodos et al. 2018).

Qualified investments in Qualified Opportunity ("QO") funds are eligible to receive a variety of tax incentives but must meet certain requirements. QO funds are investment vehicles organized for the purpose of investing in a qualified opportunity zone, and are typically organized as a

corporation or partnership. Eligible investments into QO funds can include investments in securities, partnership interests, or "qualified opportunity zone business property," which is defined as tangible property used in a trade or business that meets the following criteria: (i.) the property was acquired by the QO fund by purchase after 2017; (ii.) the original use in the QOZ commenced with the QO fund or the QO fund substantially improves the property; (iii.) during substantially all of the QO fund's holding period, substantially all of the property was in a QOZ. In addition, the fund investment is only eligible if, during substantially all of the applicable holding period, the corporation, partnership, or business qualified as a "qualified opportunity zone business" by meeting the following criteria: (i.) substantially all of the tangible property owned or leased by the taxpayer is QOZ business property; (ii.) at least 50 percent of the business' total gross income is derived from the active conduct of the trade or business; (iii.) a substantial portion of the business' intangible property is used in the active conduct of the trade or business; (iv.) less than five percent of the average of the aggregate unadjusted bases of its property is attributable to nonqualified financial property; and (v.) is not a private or commercial golf course, country club, massage parlor, hot tub facility, suntan facility, racetrack, or other facility used for gambling, or any store the principal business of which is the sale of alcoholic beverages for consumption off premises. Further, corporate and partnership investments must be made in cash and QOZ businesses must be acquired by purchase (Blumenreich, Breaks, and Reaman 2018).

When a taxpayer realizes a gain from the sale or exchange of property, they are eligible for tax benefits if they invest an amount equal to that gain in a QO fund during the 180-day period beginning on the sale or exchange date. A QO fund is designed as a certified investment vehicle through which eligible taxpayers make their investments, and it is organized as a corporation or partnership for the purpose of investing in and holding at least 90 percent of its assets in QO property (Blumenreich, Breaks, and Reaman 2018). These tax benefits include:

(i.) Deferral of capital gains that would otherwise be due on the sale of appreciated stock (e.g., Amazon). The deferral reduces the net present value of the investor's capital gains tax liability.

(ii.) A future reduction of 10 to 15 percent of the capital gains tax liability if the investment is held by the taxpayer for five to seven years; and

(iii.) Permanent exclusion of capital gains earned on the appreciation of the opportunity zone investment for investments held for at least 10 years

To illustrate the incentives to taxpayers under The Tax Cuts and Jobs Act's designation of QOZs, consider the following examples:

Suppose a taxpayer has $25,000 of capital gain from the sale of land held for investment to an unrelated party on January 1, 2019. The gain will be deferred if the taxpayer invests at least $25,000 into a QO fund by June 29, 2019, which concludes the 180-day reinvestment period beginning with the date of sale or exchange. If the taxpayer sells the investment in the QO after five years (June 29, 2024), 0 percent of the deferred gain, or $2,500 is permanently excluded and only $22,500 of the $25,000 gain from the sale of Amazon will be recognized. An additional 5 percent will be permanently excluded if the investment is held at least seven years (June 29, 2026), decreasing the gain by an additional $1,250. Therefore, only $21,250 of the $25,000 gain from the sale of Amazon will be recognized. Furthermore, the 15 percent exclusion reduces the tax due on the sale from $5,000 (capital gains tax rate of 20% x $25,000) to $4,250, a savings of $750. Using a discount rate of 5 percent, the present value of $4,250 deferred for seven years is $3.020.40. The taxpayer has an effective tax rate of 12.1 percent, compared to the 20 percent capital gains rate for a reduction of nearly 40 percent..

2. Assume the same facts above in Example 1. This time, the taxpayer holds the investment for at least ten years, when the QO investment has appreciated to $50,000. The

taxpayer may, under IRC §1400Z-2(c), increase the basis in the QO investment to the fair market value at the date of sale or exchange, or $50,000. At this point, the taxpayer has a $25,000 non-taxable gain from an appreciation in the QO fund investment plus the tax savings outlined in Example 1 above.

3. By providing these significant tax benefits, the goal is to encourage investment and the flow of capital into underserved communities. Through an understanding of the characteristics of designated tracts, we can predict whether these zones will maximize public investment. However, as QOZs are a relatively new concept, investment and capital flows will need to be continually monitored going forward to accurately assess the scope of impact brought to the designated communities.

2.2 New Markets Tax Credit Legislation

To understand the potential value of the QOZ program, it is important to consider other location-specific tax incentive programs and assess their implications on the communities they serve. Established in 2000, the New Markets Tax Credit ("NMTC") is a federal program similarly aimed at encouraging investment in low-income census tracts by allowing investors to receive federal income tax credits by making an equity investment into a specific investment vehicle, the Community Development Entity ("CDE"). The CDE, which must be approved by the United States Treasury, will then serve as an intermediary between investors and businesses or non-profits, by making various debt or equity investments into a range of projects which can include: commercial, industrial, retail, manufacturing, healthcare, education, etc. These investments, called qualified low-income community investments ("QLICIs"), must be made within five years of the CDE acquiring the investment. The NMTC is often referred to as a public-private partnership, in that CDEs will often use investors' funds in conjunction with public subsidies when investing in certain projects. The tax benefits allotted to NMTC investors are quite different than those offered to QO fund investors—

NMTC investors are able to claim their awarded credits in seven years, in the amount of 5 percent of the investment for each of the first three years and 6 percent of the project for the remaining four years, totaling 39 percent of the project. Since its inception, the NMTC program has funded more than 4,800 projects and has issued tax credits with a total value of nearly $23 billion (Abravanel et. al. 2013).

The NMTC program receives a great deal of federal investment to pursue its various goals including: poverty alleviation, increased educational attainment, improved family quality of life, and the promotion of community renewal. Additionally, the government's desired outcome is a "spillover" effect in that by promoting these goals, area-wide investment will be stimulated and will enhance quality of life at a broader level (Kubish et. al. 2010). To study the effectiveness of this program on promoting equitable development, Drexel economist Matthew Freedman conducted an empirical study to assess these outcomes, titled "Place-based programs and the geographic dispersion of employment." The study's empirical model had the primary goal of examining the impact of that private investment which is subsidized by the NMTC on local labor markets, and to examine to what extent these benefits may be lessened by a tendency of organizations to hire outside LICs (Freedman 2014).

The study concludes that the program is ineffective in truly revitalizing poor, depressed areas due to certain policy considerations, and that the main beneficiaries are developers and those areas which are already experiencing gentrification. As the statute which defines the NMTC does not provide a provision specifying that subsidized businesses hire workers from inside these low-income areas, we see that many of these jobs are not going to residents of these low-income communities. The study finds that observed changes in the number and composition of resident jobs in communities in light of new subsidized investment are not consistent with non-resident jobs, while commute distances of workers in these communities have shown a general rise in light of new

subsidized investment in the region. In addition to the loophole which places no restriction on where subsidized businesses hire from, the formula which determines NMTC eligibility of census tracts considers only median family income, as the tracts cannot have a median family income which exceeds 80 percent of the statewide median family income. This provides eligibility to tracts which may see little-to-no benefit from these investments, such as tracts adjacent to college campuses or areas which are already gentrifying and would have received this investment regardless of the offered subsidies. With this being the case, we see that truly impoverished, depressed areas continue to be devoid of investment at the level of these other tracts, as developers and businesses are able to receive the same benefits in more attractive, higher growth-potential regions. In this scenario, the money being invested into these gentrifying areas "ends up being a pure transfer from taxpayers to developers or businesses that are lucky enough to be getting these subsidies," and provides a basis for the argument that vague legislation surrounding the NMTC has resulted in a percentage of the funds being misappropriated to regions or projects that may not maximize return (Freedman 2014).

2.3 Comparative Analysis

With the enactment of the NMTC program happening almost 20 years ago, we have been able to assess both the scope of impact and the limitations of the program on meeting various revitalization initiatives. However, with the first round of QOZ designations taking place less than one calendar year ago, we are unable to yet make definitive conclusions about the effectiveness of the program. With tens of billions of dollars in new capital flows expected to benefit QOZs annually, it is important to understand both the risks and expectations of this new broadly-drafted provision, much of which can be performed by comparatively analyzing the new QOZ program with the existing NMTC program (Nitti 2019). To start, the type of financing differs between the two programs—while more than 85% of business investments under the NMTC program are financed through debt, QOZ investments must be equity-based (Freedman 2014). While the NMTC program

has a competitive application process and an annual allocation limit of approximately $3.5 billion per round, the QOZ program has no competition and no allocation limit. Because of this NMTC allocation limit and competitive application process, only a fraction of eligible tracts see NMTC investment in a particular year, and the absence of an allocation limit for the QOZ program could potentially result in more widespread investment into low-income communities. However, in addition to this lack of allocation limit, the QOZ program also does not require projects to undergo an approval process unlike the NMTC program. This freedom, despite allowing for the more efficient allocation of capital, could result in a similar trend of only a small fraction of QOZs receiving investment, due to the fact that investors have the freedom to flow capital only into those QOZ tracts which are most promising (Fenn 2018).

From a public policy perspective, the goal of these place-based tax incentive programs is to improve the economic situation of target areas, but broad provisions have limited the effectiveness of the NMTC program and have the significant potential to similarly limit the effectiveness of the new QOZ program. With the QOZ program not mandating an approval process for projects, we could see developers making decisions guided entirely by profitability and declining to make investments that will offer the most benefits to poor, depressed tracts. In theory, developers have the freedom to invest in heavily in projects such as luxury housing or retail in gentrifying tracts; despite the fact that capital flows would have likely been made to this region regardless of the QOZ program, developers may reap significant tax benefits while offering little-to-no socioeconomic impact on the area. Going forward, federal officials must closely examine the effectiveness of this program on improving economic circumstances of target areas and determine whether the vague provisions are truly resulting in more equitable capital flows, or if revisions to tighten the restrictions on investment need to be made to better maximize the return on public investment.

3 Tennessee's QOZ Designations

Following the signing of The Tax Cuts and Jobs Act in 2017, Tennessee Governor Bill Haslam and the Tennessee Department of Economic and Community Development ("TNECD") Commissioner Bob Rolfe submitted the nomination of 176 Opportunity Zones. In preparation for the nominations, county mayors submitted feedback to the state's working group, which is comprised of representatives from TNECD, the Tennessee Department of Environment and Conservation, Tennessee Housing Development Agency, Tennessee Valley Authority, and LaunchTN. In conjunction with the review of this feedback, the working group considered state priorities and development initiatives in the areas of business, retail, tourism, and low-income housing, among others. Following the submission of the nominations, all 176 tracts were approved for designation by the United States Department of Treasury and the Internal Revenue Service in May 2018 ("Governor Haslam, Commissioner Rolfe Announce" 2018).

3.1 Overview of Tennessee's Selected QOZs

A total of 985 Tennessee census tracts were eligible to be designated as QOZs (see Table 1). A total of 176 were designated, and of those, 170 were low-income communities and 6 were contiguous communities. Contiguous tracts represented 3.4 percent of all designated tracts, which is below the 5 percent allowed.

Under the statute which defines QOZs, there currently exists no provision to reclassify the tracts selected as QOZs after designation. Because of this, Governor Haslam faced a vital decision regarding tract selection to maximize the return on the public investment. To better understand how

Governor Haslam targeted his tract designations, I considered Urban Institute's tract-level summary data, which allowed me to effectively compare all designated tracts, designated low-income communities, designated contiguous tracts, eligible nondesignated tracts, and all tracts across a variety of measures including: economic, housing, demographic, education, and geography (see table 2). In assessing the tract characteristics, we can see that Governor Haslam did in fact select a more socioeconomically repressed group of tracts out of the eligible group. The group of designated tracts have significantly lower incomes, with designated tracts having an average median household income of $30,434, compared to an average median household income of $39,224 for eligible nondesignated tracts. Similarly, the designated tracts have an unemployment rate that is 2.57 percent higher and a poverty rate that is 10.04 percent higher than the eligible nondesignated tracts. Housing trends also show evidence of a focus on designating a more disadvantaged group of tracts out of those available. Designated tracts have an average median home value of $109,797 compared to $117,175 for eligible nondesignated tracts, an average rent of $632 compared to $721, and average homeownership rate of 48.79 percent compared to 62.91 percent. The designated tracts appear to be truly depressed, in that despite significantly lower average rents, they had an average of 23.77 percent of residents with a severe rent burden compared to 21.68 percent of residents in eligible nondesignated tracts and a vacancy rate of 16.08 percent compared to 14.86 percent. (See Table 2)

In analyzing tract selection, gentrification is important to consider, particularly as it relates to assessing a specific tract's need for federal subsidies. In a preliminary assessment of the initial round of designated QOZs, Urban Institute developed a tract-level comprehensive socioeconomic change index which flagged tracts that have experienced significant socioeconomic change between 2000-2016, using data from the 2000 Decennial Census and the 2012-2016 American Community Survey. To understand which tracts experienced significant socioeconomic change, Urban Institute flagged

tracts that were more than one standard deviation above the mean of all national census tracts on the composite socioeconomic index, which was calculated using an average of tract-level z-scores of the following measures: (i.) percentage-point change in the share of residents with a bachelor's degree or higher; (ii.) dollar change in median family income; (iii.) percentage-point change in the share of non-Hispanic white residents; and (iv.) change in average housing burden (Theodos et. al. 2018). To assess this change from a state-specific perspective, I aggregated the tract-level Tennessee QOZ data to determine that seven of the 176 designated tracts were flagged for having experienced significant socioeconomic change, representing 3.98 percent of all designated tracts, which is significantly higher than the 1.36 percent of eligible nondesignated tracts that were flagged. Further, each of these seven gentrifying tracts are in the immediate city limits of one of Tennessee's largest four cities (see Figure 1). Although these gentrifying tracts may need federal investment support less than others, the designation of QOZs in the urban cores of Chattanooga, Knoxville, and Nashville could further encourage the growth and vitalization of these already-promising metropolitan areas.

To assess the investment need of the various designated and eligible nondesignated tracts, Urban Institute developed a score of investment flows to tracts based on four components: (i.) commercial lending; (ii.) multifamily lending; (iii.) single-family lending; and (iv.) small business lending. The data sources used in calculation are 2011-2015 CoreLogic data of loans, 2011-2015 tract-level Home Mortgage Disclosure Act records, and 2011-2015 lender-level Community Reinvestment Act loan amounts. To develop the comprehensive investment score, Urban Institute created z-scores for each of the four component measures and averaged those to create a composite investment score. Finally, the z-scores were then ranked and placed into deciles to give each eligible low-income community and contiguous tract a ranking from 1 (low) to 10 (high) (Theodos et. al. 2018). To assess local capital access prior to QOZ designation, I aggregated tract-level for eligible

Tennessee tracts to arrive at an average investment score. The 176 census tracts that Tennessee designated as QOZs had a mean composite investment score of 5.36, while eligible nondesignated tracts had a mean composite investment score of 5.53, showing a slightly higher score of local capital access prior to designation. Using a two-sample t-test with an alpha level of 0.05, I found that there is not statistical significance in the difference of the mean composite investment score between designated tracts and eligible nondesignated tracts (see Methodology 5.2). I was able to conclude that, at the Tennessee state level, the designated tracts and eligible nondesignated tracts had similar access to capital prior to designation decisions.

3.2 Regional Analysis of Tennessee's Selected QOZs

To assess the variability in designation of QOZs across the state, I categorized Tennessee's QOZ tracts into three regions—Central, Eastern, and Western—according to the counties in which they are located. Tennessee's central region contains 46 designated QOZ tracts, the eastern region contains 62 designated QOZ tracts, and the western region contains 68 QOZ tracts. The specific county make-ups of the three regions are depicted in Table 3.

In the state of Tennessee, the central, eastern, and western regions vary socially, politically, and economically, so considering QOZ tract selection from a regional perspective can help provide insight into Governor Haslam's designations. To study these differences, I calculated two-sample t-tests to compare each of the regions across a variety of income, employment, housing, and education measures (see Methodology 5.1). The results of the t-test calculations show that while the designated QOZs in the central and eastern regions are similar across nearly all of the selected measures, those designated in the western region are considerably more disadvantaged across all of the income, employment, and housing measures, despite showing similar levels of educational

attainment. Using an alpha level of 0.05 to test, I determined statistical significance in the difference in the means of the following measures between the eastern and western regions and between the central and western regions: median household income, poverty rate, unemployment rate, median home value, severe rent burden, and vacancy rate (See Table 10 and Figure 3).

To further analyze tract selection from a regional perspective, I conducted a variety of region-level growth analyses to assess the types of areas Tennessee designated as QOZs. Using time series data from the American Community Survey, I calculated the population growth percentage from 2010-2016 for each of the three regions. Fueled by continued population growth in the Nashville metro area, the central region is the fastest growing of the three, up 5.02 percent in the six-year period to 2,307,458. The eastern region remains the most populous, up 1.46 percent in the six-year period to 2,390,233. The western region continues to lose residents, down 0.91 percent in the six-year period, and currently the least populous, at 1,951,713. Again considering the Urban Institute comprehensive socioeconomic change index, we see similar trends: the central region had the highest percentage of eligible tracts experiencing significant socioeconomic change across the measures, with 3.89 percent (11 out of 283) of tracts flagged; the eastern region had 1.98 percent (seven out of 354) of tracts flagged; and the western region had no tracts flagged. However, only three of the 11 tracts were designated in the central region and four of the seven tracts were designated in the eastern region.

Again considering Urban Institute's assigned tract-level investment scores, I aggregated this data at the regional level to assess prior capital access of both the designated tracts and the eligible nondesignated tracts. In continuing trend, I found that the tracts in the western region faced the most prior difficulty accessing capital, with a mean investment score of 4.74 for designated tracts and 4.98 for eligible nondesignated tracts. The tracts in the central region had the most favorable

prior access to capital, with a mean investment score of 5.89 for designated tracts and 6.32 for eligible nondesignated tracts. The eastern region was close behind, with a mean investment score of 5.63 for designated tracts and 5.40 for eligible nondesignated tracts. Again, we see economic similarity between the central and eastern regions while the western region lags behind. Using a two-sample t-test with an alpha level of 0.05, I found no statistical difference in the mean investment scores of the central and eastern regions, both for designated and eligible nondesignated tracts. However, I found statistical significance in the difference in mean investment scores when comparing the west region to both the east and central regions, both for designated and eligible nondesignated tracts.

The results of the various regional analyses indicate that the tracts in the western region of Tennessee show the greatest signs of economic disadvantage, poverty, and depression, while the central region is currently the most promising for future growth. In selecting tracts to become QOZs, Governor Haslam designated the highest percentage of eligible tracts in this same order, with the highest designation percentage in the western region, followed by the eastern and central regions respectively. In the western region, 68 tracts were designated out of an eligible 349 (19.48 percent); in the eastern region, 62 tracts were designated out of an eligible 354 (17.51 percent); and in the central region, 46 tracts were designated out of an eligible 283 (16.25 percent).

3.3 CSA Analysis of Tennessee's Selected QOZs

The state of Tennessee has six Combined Statistical Areas ("CSAs"), which are comprised of a metropolitan statistical area and micropolitan statistical areas which show significant linkage economically or socially. The Tennessee CSAs and their specific county make-ups are depicted in Table 5. As examined in Section 3.2, the regions of Tennessee show varying levels of economic

disadvantage, with the western region in particular proving to be significantly more depressed than the central and eastern regions across a variety of measures. However, to better Tennessee's QOZ tract selection, I conducted the same analyses as in Section 3.2, but at the more granular CSA level. In doing so, we are able to assess trends in the designations of zones in Tennessee's urban cores and can better understand whether the regional analyses are truly representative of the three Tennessee regions, or if CSA outliers are potentially skewing the results of the regional analysis in either direction.

To study these differences, I calculated two-sample t-tests to compare each of the CSAs across a variety of income, employment, housing, and education measures (see Methodology 5.2). The results of the t-test calculations expectedly show signs of greater depression and need in the western region CSAs—Jackson and Memphis—in comparison to the other CSAs. I found statistical significance in the means of the following measures between both the Jackson and Memphis CSAs and all remaining CSAs: median household income, median home value, severe rent burden, and vacancy rate. In terms of poverty rate and unemployment rate, Memphis, followed by Jackson, had the highest rates across both metrics but the difference between the other CSAs was not significant enough to yield a p-value below 0.05. The results of the t-tests—particularly that despite having median home values that are a fraction of those of other CSAs, the CSAs in the western region still have the highest vacancy rate and the highest percentage of residents affected by a severe rent burden—indicate that urban cores in this region are truly depressed and lack opportunities and attractiveness of areas found elsewhere in the state.

To further analyze tract selection from a CSA perspective, I conducted a variety of CSA-level growth analyses to assess the types of areas Tennessee designated as QOZs. Using time series data from the American Community Survey, I calculated the population growth percentage from

2010-2016 for each of the six CSAs. Nashville's continued popularity as among job-seekers has produced the highest population growth rate, up a staggering 7.92 percent in the six-year period to 1,858,905. The Chattanooga CSA is up 3.27 percent to 522,299 while the Knoxville CSA is up 2.51 percent to 1,055,118. Despite its position at the bottom across the majority of the demographic statistics, the population of the Memphis CSA is up 1.40 percent to 1,037,881, ahead of the Johnson City and Jackson MSAs which are down 0.58 percent and 0.71 percent respectively.

Again considering Urban Institute's assigned tract-level investment scores, I aggregated this data at the CSA level to assess prior capital access of both the designated tracts and the eligible nondesignated tracts. The Memphis CSA has faced particular difficulty gaining access to capital, with a mean investment score of just 4.05 for designated tracts and 4.26 for eligible nondesignated tracts. On the contrary, the Nashville CSA has a mean investment score of 7.00 for designated tracts and 7.47 for eligible nondesignated tracts, almost twice that of the Memphis CSA. The Memphis and Nashville CSAs show statistical difference, in either direction, in the mean investment scores when compared to the Jackson, Johnson City, and Knoxville CSAs. These CSAs show similar prior investment levels at approximately 1.5 deciles above and below the Memphis and Nashville CSAs, respectively. Further, Chattanooga CSA showed slightly more favorable access to capital than the Jackson, Johnson City, and Knoxville CSAs, with a mean investment score of 6.72 for designated tracts and 6.53 for eligible nondesignated tracts.

The results of the various CSA analyses indicate similar conclusions to those drawn from the regional analysis. The CSAs in Tennessee's western region—Memphis and Jackson—show the greatest overall signs of economic disadvantage, poverty, and depression, while the growth and promise of the Nashville CSA is notable across all of the measures. For the remaining three CSAs—Chattanooga, Johnson City, and Knoxville—we see less economic disadvantage than the Jackson

and Memphis CSAs, but not the same level of consistent growth and future promise of the Nashville CSA. In terms of Governor Haslam's QOZ designations, a greater percentage of eligible tracts were designated in the two most depressed CSAs with 8 tracts designated out of an eligible 30 (26.67%) in the Jackson CSA and 35 tracts designated out an eligible 160 (21.88%) in the Memphis CSA. The Chattanooga, Johnson City, and Knoxville regions saw similar percentages of eligible tracts designated, at 18.84 percent, 17.57 percent, and 18.75 percent respectively. Finally, the fast-growing Nashville CSA saw the lowest percentage of eligible tracts designated, at 28 out of an eligible 194 (14.43 percent).

3.4 Analysis of Outlier Counties

To examine Governor Haslam's tract selection at the county level in search of patterns, I conducted an analysis of outlier counties, both in terms of median per capita income in 2016 and in terms of measured socioeconomic change from 2009-2016.

To assess outlier counties by income, I ranked each of Tennessee's 195 counties by median per capita income using 2016 census data to determine the ten counties with the highest median per capita income and the ten counties with the lowest per capita income (See Table 7, Figure 5). For the outliers with the highest per capita incomes—of which, 9 of 10 are in the metro area of either Chattanooga, Knoxville, Memphis, or Nashville—the counties saw fairly equal representation across regions with four counties from the central region and three counties from both the eastern and western regions. Of the outliers with the lowest per capita incomes, four counties were from both the eastern and western regions while just two were from the central region. In the state of Tennessee, outlier counties with the lowest per capita incomes—all of which being outside of a large metro area—have a higher percentage of eligible tracts designated as QOZs than outlier counties

with the highest per capita incomes, at almost twice the rate. The ten counties with the lowest per capita incomes saw an average of 27 percent of their eligible tracts designated as QOZs, while the ten counties with the highest per capita incomes saw an average of 13.56 percent of their eligible tracts designated as QOZs.

To index counties based on socioeconomic change, I mirrored the tract-level socioeconomic change index designed by Urban Institute but at a county level, indexing on the average of the county's z-scores of specific education, race, income, and housing measures (See Methodology 5.2, Table 8, Figure 6). For the outliers with the highest composite z-scores, half of the counties were from the central region, while three were from the eastern region and two were from the western region. For the outliers with the lowest composite z-scores, seven of the counties were from the western region, while two were from the eastern region and just one from the central region. In the state of Tennessee, outlier counties with the lowest socioeconomic change composite z-scores have a higher percentage of eligible tracts designated as QOZs than outlier counties with the highest socioeconomic change composite z-scores, again at almost twice the rate. The ten counties with the lowest socioeconomic change composite z-scores saw an average of 20.80 percent of their eligible tracts designated as QOZs, while the ten counties with the highest socioeconomic change composite z-scores saw an average of 12.04 percent of their eligible tracts designated as QOZs.

4 Comparative Analysis with Southeast Region

While conducting regional and CSA-level analyses can provide valuable insight as to the types of tracts Governor Haslam elected to designate as QOZs in Tennessee, it is also critical to compare Tennessee at a state-level to its peers. Designation decisions can be affected by a variety of factors, including: governor political affiliation, current public policy initiatives, state demographics, and

affected industries. As such, I aggregated economic, housing, demographic, and education data on QOZ tracts in the southeastern United States to use as a comparative benchmark for Tennessee (see Table 9).

In assessing the results, Tennessee is strikingly comparable to the southeast benchmark across a majority of the measures, as I did not find statistical significance in the difference in means for any of the economic measures (median household income, poverty rate, unemployment rate), housing measures (median home value, median rent/month, homeownership, percent of residents with a severe rent burden, vacancy rate), or education measures (percent of residents with a high school diploma or less, percent of residents with a bachelor's degree or higher). However, Tennessee designated a significantly higher percentage of QOZ tracts that received Urban Institute's socioeconomic change flag. In Tennessee, 3.98 percent of designated QOZ tracts were flagged for experiencing significant socioeconomic change compared to just 1.36 percent for eligible nondesignated tracts and 1.74 percent for all state tracts. In contrast, just 2.16 percent of designated QOZs in the southeast region were flagged for experiencing significant socioeconomic change compared to 1.63 percent of eligible nondesignated tracts and 2.02 percent for all region tracts.

As discussed in the overview of the QOZ program, there are potential risks and benefits to designating gentrifying tracts as QOZ. By designating these tracts as QOZs, we could potentially see a greater amount of investment than otherwise, considering the attractiveness of these high-growth areas. However, it is likely that these areas would have seen significant investment regardless of the tax incentives, thus neglecting the truly depressed regions and negatively affecting the return on public investment. Tennessee's designated tracts were flagged for socioeconomic change at almost twice the rate of those in the region as a whole, despite a lower percentage of flagged tracts in the eligible nondesignated, indicating that it took advantage of the opportunity to further encourage the

growth of these areas while its peers elected to leave a greater proportion of its eligible gentrifying tracts as nondesignated in favor of selecting more truly depressed tracts.

5 Methodology

5.1 t-test for Statistical Significance

In conducting my state, regional, and CSA-level analyses of Tennessee's QOZ designations, I conducted t-tests to compare QOZ designations across the following measures: median household income, poverty rate, unemployment rate, median home value, severe rent burden, vacancy rate, percent of residents with a high school diploma or lower, percentage of residents with a bachelor's degree or higher, percent of tracts flagged for socioeconomic change, and mean investment score. For the purposes of this study, the use of a two-sample t-test assuming unequal variances at an alpha level of 0.05 allowed me to determine, by way of a two-tail p-value, whether the differences in the mean values of the various measures were statistically significant when comparing the regions and CSAs within Tennessee as well as when comparing Tennessee to its peers in the southeastern United States. The following methodology was used to calculate:

Assuming that μ_1 and μ_2 are the means of the two populations in testing, and that $\delta = \mu_1 - \mu_2$, the null hypothesis for comparison is $H_0: \delta = 0$. The alternative hypothesis is: $H_1: \delta \neq 0$. As stated above, a Type 1 error probability (α) of 0.05 was selected and the t-value was generated using the formula:

$$t = \frac{\overline{x_1} - \overline{x_2}}{\sqrt{\left(\frac{{s_1}^2}{n_1} + \frac{{s_2}^2}{n_2}\right)}}$$

where $\overline{x_1}$ and $\overline{x_2}$ represent the sample means of the two sets of data, ${s_1}^2$ and ${s_2}^2$ represent the sample standard deviations of the two sets of data, and n_1 and n_2 represent the size of the two sets of data. The t-statistic follows approximately a t distribution, with estimated degrees of freedom:

$$\frac{\left(\frac{{s_1}^1}{n_1}+\frac{{s_2}^2}{n_2}\right)^2}{\frac{1}{n_1-1}\left(\frac{{s_1}^2}{n_1}\right)^2+\frac{1}{n_2-1}\left(\frac{{s_2}^2}{n_2}\right)^2}$$

The two-tail p-value was then determined using the t-statistic, and I assigned statistical significance to the difference of the means in the variables tested if said p-value was below 0.05.

5.2 County-Level Socioeconomic Change Flag

The use of Urban Institute's tract-level socioeconomic change index allowed us to better understand whether Governor Haslam selected growing or gentrifying tracts compared to slow-growth, depressed tracts. To understand tract selection from a county perspective, I designed a composite county-level socioeconomic change index comprised of educational, income, race, and housing data to build upon the methodology employed to create the tract-level index. Specifically, I created the index with the following measures: (i.) percentage point change in the share of county residents with a bachelor's degree or higher from 2009-2016; (ii.) percentage point change in county's median per capita income from 2010-2016; (iii.) percentage point change in non-Hispanic white residents from 2010-2016; and (iv) change in average annual growth rate ("AAGR") of annual housing units from 2010-2016. As my source of data, I used time series data from the 2009-2013 and 2012-2016 American Community Survey estimates. In similar fashion to the Urban Institute index, I calculated a composite average z-score for each county, which takes into account individual z-scores from each of the four included measures. The composite z-scores for each county were calculated with the following equation:

$$z_{county} = \frac{\sum(z_{edu}, z_{inc}, z_{wht}, z_{hous})}{n}$$

where Z_{edu} is the z-score of percentage point change in share of residents age 25+ with a bachelor's degree, Z_{inc} is the z-score of the percentage point change in median per capita income, Z_{wht} is the z-

score of the percentage point change in the share of non-Hispanic white residents, Z_{hous} is the z-score of the AAGR of the number of annual housing units, and n is the numerical count of measures included in the index. The measure-specific z-scores for the arguments of the summation were calculated using the following equations:

$$z_{edu} = \frac{\Delta x_{edu} - \mu}{\sigma},$$

where Δx_{edu} is the percentage point change in the share of the specific county residents with a bachelor's degree from 2009-2016, μ is the mean of the percentage point change in residents age 25+ with a bachelor's degree across all Tennessee counties, and σ is the standard deviation of the percentage point change in residents age 25+ with a bachelor's degree across all Tennessee counties;

$$z_{inc} = \frac{\Delta x_{inc} - \mu}{\sigma},$$

where Δx_{inc} is the percentage point change in the median per capita income of county residents from 2010-2016, μ is the mean of the percentage point change in the median per capita income across all Tennessee counties, and σ is the standard deviation of the percentage point change in median per capita income across all Tennessee counties;

$$z_{wht} = \frac{\Delta x_{wht} - \mu}{\sigma},$$

where Δx_{wht} is the percentage point change in the county's share of non-Hispanic white residents from 2010-2016, μ is the mean of the percentage point change the share of non-Hispanic white residents across all Tennessee counties, and σ is the standard deviation of the percentage point change in the share of non-Hispanic white residents across all Tennessee counties; and

$$z_{hous} = \frac{AAGR_{hous} - \mu}{\sigma},$$

where $AAGR_{hous}$ is the average annual growth rate of the specific county's annual number of housing units from 2010-2016, μ is the mean of the AAGR of the number of annual housing units across all Tennessee counties, and σ is the standard deviation of the AAGR of the number of annual housing units across all Tennessee counties.

6 Conclusion

The signing of the 2017 Tax Cuts and Jobs Act (P.L. 115-97) gave way to a new form of location-specific tax incentive program, the Qualified Opportunity Zone, which differs from existing programs like the New Markets Tax Credit in that it is not funding-capped and there is no approval process. In my review of past literature, I find that the NMTC program largely failed to revitalize truly poor, depressed regions but helped encourage the further growth of areas that are already gentrifying. As state governors were responsible for selecting a group of census tracts for QOZ designation out of an eligible pool, I conducted a preliminary assessment of tract selection in the state of Tennessee to understand the types of areas Governor Haslam elected to designate.

Consistently across all of my statistical measures, I find that the regions, metropolitan areas, and counties of western Tennessee are significantly more impoverished, depressed, and slow-growth than areas in the rest of the state. In accordance, Governor Haslam designated a higher percentage of eligible tracts in these areas than in the rest of the state. However, in assessing the selection of gentrifying tracts which were flagged for having experienced significant recent socioeconomic change, Tennessee chose to select a far higher percentage of gentrifying tracts out of its eligible pool than did the southeast region as a composite benchmark.

In the coming years, it will be important to assess the implications of the QOZ program to understand if target areas are experiencing significant improvement in things like quality of life and

capital access, or if the program's legislation simply provides opportunities to maximize after tax profits to developers with little impact on target communities.

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Table 1: Selection Statistics of Tennessee QOZ Designations

Census-tract classification	*Designated QOZs*	*Eligible Nondesignated*	*All eligible*
Low-income communities			
N	170	532	702
Contiguous communities			
N	6	277	283
Total (N)	**176**	**810**	**985**

Source: Urban Institute state-by-state analysis of opportunity zones
Notes: Data from 2016 United States Census

Table 2: Tennessee QOZ Demographic Statistics

Characteristic	*All Designated*	*Designated LIC*	*Designated Contiguous*	*Eligible Nondesignated*	*All tracts*
Economic (avg. or avg. %)					
Median household income	$30,434	$29,932	$44,636	$39,224	$48,647
Poverty rate	32.07%	32.70%	14.50%	22.04%	18.81%
Unemployment rate	11.79%	11.9%	7.4%	9.25%	8.24%
Housing (avg. or avg. %)					
Median home value	$109,797	$109,669	$113,267	$117,175	$149,953
Median rent/month	$632	$632	$651	$721	$806
Homeownership	48.79%	47.83%	73.22%	62.91%	65.73%
Severe rent burden	23.77%	23.98%	17.72%	21.68%	20.43%
Vacancy rate	16.08%	16.13%	14.52%	14.86%	12.63%
Demographic (avg. %)					
White alone	60.25%	59.52%	80.82%	70.97%	73.31%
Black alone	31.89%	32.60%	11.65%	20.28%	18.30%
Hispanic	4.42%	4.45%	3.38%	5.58%	4.81%
Asian American	0.93%	0.94%	0.45%	1.01%	1.45%
Younger than 18	22.10%	22.06%	23.15%	22.30%	22.22%
Older than 64	14.30%	14.19%	17.37%	15.61%	15.35%
Education (avg. %)					
Age 25+ with HS deg. or less	58.67%	58.65%	59.16%	55.06%	48.33%
Age 25+ with Bach. deg. +	15.66%	15.74%	13.24%	17.83%	24.09%
Socioeconomic change flag %	3.98%	4.11%	0.00%	1.36%	1.74%
Geography (%)					
In a metro area	68.18%	68.82%	50.00%	67.78%	75.82%
In a micro area	15.34%	14.71%	33.33%	17.04%	13.36%
Non-core-based stat. area	16.48%	16.47%	16.67%	15.19%	10.82%

Source: Urban Institute state-by-state analysis of opportunity zones
Notes: data from 2016 United States Census

Table 3: Tennessee Counties Classified by Region

Region	*Tot. Population*[1]	*n QOZ*	*Counties*
Central	2,307,458	46	Bedford, Cannon, Cheatham, Clay, Coffee, Davidson, DeKalb, Franklin, Giles, Grundy, Jackson, Lincoln, Macon, Marion, Marshall, Maury, Moore, Overton, Pickett, Putnam, Robertson, Rutherford, Sequatchie, Smith, Sumner, Trousdale, Van Buren, Warren, White, Williamson, Wilson
Eastern	2,390,233	62	Anderson, Bledsoe, Blount, Bradley, Campbell, Carter, Claiborne, Cocke, Cumberland, Fentress, Grainger, Greene, Hamblen, Hamilton, Hancock, Hawkins, Jefferson, Johnson, Knox, Loudon, McMinn, Meigs, Monroe, Morgan, Polk, Rhea, Roane, Scott, Sevier, Sullivan, Unicoi, Union, Washington
Western	1,951,713	68	Benton, Carroll, Chester, Crockett, Decatur, Dickson, Dyer, Fayette, Gibson, Hardeman, Hardin, Haywood, Henderson, Henry, Hickman, Houston, Humphreys, Lake, Lauderdale, Lawrence, Lewis, Madison, McNairy, Montgomery, Obion, Perry, Shelby, Stewart, Tipton, Wayne, Weakley

[1]Population estimates per 2016 United States Census

Table 4: Tennessee QOZ Demographic Statistics by Region

	Central Region		Eastern Region		Western Region	
Characteristic	*Designated*	*All Eligible*	*Designated*	*All Eligible*	*Designated*	*All Eligible*
N tracts	*46*	*283*	*62*	*354*	*68*	*349*
Economic (avg. or avg. %)						
Median household income	$32,064	$41,314	$31,860	$36,597	$28,031	$35,737
Poverty rate	31.14%	21.35%	29.22%	22.90%	35.31%	26.78%
Unemployment rate	11.02%	7.82%	10.74%	9.06%	13.26%	11.88%
Housing (avg. or avg. %)						
Median home value	$129,762	$126,603	$115,825	$117,066	$89,376	$100,181
Median rent/month	$647	$750	$610	$654	$642	$720
Homeownership	47.33%	71.41%	55.86%	71.89%	43.08%	71.72%
Severe rent burden	22.25%	19.93%	22.09%	20.77%	26.32%	25.08%
Vacancy rate	13.43%	11.63%	14.67%	15.69%	19.15%	17.27%
Demographic (avg. %)						
White alone	60.98%	69.76%	78.36%	84.84%	43.24%	52.48%
Black alone	28.66%	17.90%	14.01%	8.43%	50.38%	40.08%
Hispanic	5.99%	7.88%	4.30%	3.90%	3.46%	4.84%
Asian American	1.01%	1.57%	0.60%	0.75%	1.17%	0.77%
Younger than 18	23.41%	22.88%	21.60%	20.53%	21.66%	23.52%
Older than 64	13.54%	13.77%	15.39%	17.54%	13.82%	14.48%
Education (avg. %)						
Age 25+ with HS deg. or less	59.50%	53.87%	58.78%	56.21%	58.00%	56.69%
Age 25+ with Bach. deg. +	16.35%	20.46%	15.99%	16.98%	14.88%	15.47%
Socioeconomic change flag %	6.52%	3.89%	6.45%	1.98%	0.00%	0.00%
Geography (%)						
In a metro area	65.22%	67.49%	67.74%	72.32%	70.59%	63.61%
In a micro area	17.39%	20.14%	17.74%	17.23%	11.76%	13.47%
Non-core-based stat. area	17.39%	12.37%	14.52%	10.45%	17.65%	22.92%

Source of Data: American Community Survey 2012-2016

Table 5: Tennessee QOZs Classified by Combined Statistical Area

CSA	*Tot. Population*[1]	*n QOZ*	*Counties*
Chattanooga[2]	522,299	13	Bradley, Hamilton, Marion, Polk, Sequatchie
Jackson	163,719	8	Chester, Gibson, Madison
Johnson City	414,044	13	Carter, Hawkins, Sullivan, Unicoi, Washington
Knoxville	1,055,118	24	Anderson, Blount, Cocke, Grainger, Hamblen, Jefferson, Knox, Loudon, Roane, Sevier, Union
Memphis[3]	1,037,881	35	Fayette, Shelby, Tipton
Nashville	1,858,905	28	Cannon, Cheatham, Dickson, Davidson, Hickman, Macon, Maury, Robertson, Rutherford, Smith, Sumner, Williamson, Wilson

[1]Population estimates per 2016 United States Census

[2]The Chattanooga CSA also includes Georgia's Walker, Catoosa, and Dade counties. These counties are excluded for the purpose of conducting a state-specific analysis.

[3]The Memphis CSA also includes Arkansas's Crittenden county and Mississippi's Desoto, Marshall, Tate, and Tunica counties. These counties are excluded for the purpose of conducting a state-specific analysis.

Table 6: Tennessee QOZ Demographic Statistics by Combined Statistical Area

	Chattanooga		Jackson		Johnson City		Knoxville		Memphis		Nashville	
Characteristic	*Designated*	*All Eligible*	*Designated*	*All Eligible*	*Designated*	*All Eligible*	*Designated*	*All Eligible*	*Designated*	*All Eligible*	*Designated*	*All Eligible*
N tracts	*13*	*69*	*8*	*30*	*13*	*74*	*24*	*128*	*35*	*160*	*28*	*194*
Economic (avg. or avg. %)												
Median household income	$31,462	$37,359	$25,075	$36,637	$29,783	$36,517	$33,992	$37,408	$25,304	$32,924	$30,829	$42,452
Poverty rate	32.37%	24.22%	36.14%	25.56%	27.53%	21.51%	29.48%	23.63%	40.40%	32.39%	26.46%	21.68%
Unemployment rate	13.13%	10.19%	13.34%	11.37%	10.50%	8.10%	9.90%	8.51%	15.00%	13.93%	11.08%	7.57%
Housing (avg. or avg. %)												
Median home value	$146,525	$128,587	$69,913	$97,493	$101,377	$113,805	$116,588	$125,281	$87,807	$86,988	$143,415	$150,652
Median rent/month	$608	$712	$613	$682	$600	$612	$653	$696	$682	$801	$683	$818
Homeownership	47.75%	55.69%	42.06%	59.67%	54.56%	69.10%	54.49%	60.37%	32.15%	46.14%	36.97%	52.88%
Severe rent burden	22.48%	20.91%	29.97%	26.95%	20.89%	20.31%	24.92%	21.88%	30.08%	30.65%	23.36%	21.69%
Vacancy rate	15.84%	14.22%	21.84%	15.40%	12.64%	18.32%	14.56%	16.62%	19.12%	17.67%	11.99%	10.06%
Demographic (avg. %)												
White alone	59.39%	68.07%	33.63%	58.76%	88.82%	92.51%	75.53%	83.26%	23.19%	24.17%	46.59%	61.10%
Black alone	33.27%	22.70%	61.68%	36.74%	6.20%	2.58%	13.87%	8.41%	70.15%	67.06%	43.10%	24.79%
Hispanic	2.80%	5.81%	2.47%	2.14%	1.95%	2.26%	7.02%	4.96%	3.37%	6.26%	6.42%	9.49%
Asian American	0.87%	0.89%	0.55%	0.78%	0.50%	0.69%	0.58%	0.99%	1.86%	0.97%	1.37%	2.02%
Younger than 18	20.70%	21.27%	22.71%	21.92%	22.71%	19.78%	23.23%	20.50%	21.43%	24.98%	24.02%	24.79%
Older than 64	14.48%	15.21%	13.70%	16.14%	13.70%	19.00%	13.80%	16.45%	12.12%	11.97%	10.21%	11.61%
Education (avg. %)												
Age 25+ with HS deg. or less	59.28%	52.67%	59.76%	54.71%	57.19%	55.35%	55.86%	53.01%	54.96%	53.57%	56.32%	50.60%
Age 25+ with Bach. deg. +	17.29%	18.82%	14.42%	18.37%	14.88%	17.82%	17.43%	18.76%	16.47%	16.81%	18.43%	22.63%
Socioeconomic change flag %	23.08%	8.70%	0.00%	0.00%	0.00%	0.00%	4.17%	0.78%	0.00%	0.00%	10.71%	5.67%

Source of Data: American Community Survey 2012-2016

Table 7: QOZ Designations of Outlier Counties, by Median Per Capita Income

Counties with Highest Per Capita Incomes:				
County	*Median Per Capita Income*	*n QOZ*	*n Eligible Tracts*	*% Designated*
Williamson	$93,028	0	3	0.00%
Davidson	$59,304	18	98	18.37%
Fayette	$52,292	1	6	16.67%
Hamilton	$48,449	7	40	17.50%
Knox	$46,577	8	47	17.02%
Shelby	$46,321	32	145	22.06%
Wilson	$45,811	0	9	0.00%
Sumner	$45,292	2	13	15.38%
Loudon	$45,292	2	7	28.57%
Decatur	$41,554	0	4	0.00%
Avg. %				**13.56%**

Counties with Lowest Per Capita Incomes:				
County	*Median Per Capita Income*	*n QOZ*	*n Eligible Tracts*	*% Designated*
Grundy	$29,690	1	4	25.00%
Jackson	$29,445	1	4	25.00%
Hardeman	$27,692	1	6	16.67%
Morgan	$27,894	0	5	0.00%
Scott	$27,877	1	5	20.00%
Lauderdale	$27,419	2	8	25.00%
Wayne	$26,181	1	4	25.00%
Hancock	$25,891	1	2	50.00%
Bledsoe	$24,364	1	3	33.33%
Lake	$22,555	1	2	50.00%
Avg. %				**27.00%**

Sources of Data: Urban Institute tract-level data on all opportunity zones, American Community Survey 2012-2016

Table 8: QOZ Designations of Outlier Counties, by Measured Socioeconomic Change

Counties with Highest Socioeconomic Change z-score:				
County	*z-score*	*n QOZ*	*n Eligible Tracts*	*% Designated*
Williamson	2.19	0	3	0.00%
Wilson	1.24	0	9	0.00%
Fayette	1.13	1	6	16.67%
Davidson	0.97	18	98	18.37%
McNairy	0.69	0	7	0.00%
Blount	0.68	4	14	28.57%
Hamilton	0.61	7	40	17.50%
Moore	0.54	0	0	0.00%
Union	0.52	1	4	25.00%
Bedford	0.49	1	7	14.29%
Avg. %				**12.04%**

Counties with Lowest Socioeconomic Change z-score:				
County	*z-score*	*n QOZ*	*n Eligible Tracts*	*% Designated*
Stewart	-0.57	1	3	33.33%
Carroll	-0.60	1	7	14.29%
Shelby	-0.61	32	145	22.06%
McMinn	-0.67	2	10	20.00%
Jackson	-0.70	1	4	25.00%
Madison	-0.72	6	15	40.00%
Bledsoe	-0.76	1	3	33.33%
Decatur	-0.84	0	4	0.00%
Crockett	-1.07	1	5	20.00%
Perry	-1.12	0	2	0.00%
Avg. %				**20.80%**

Sources of Data: Urban Institute tract-level data on all opportunity zones, American Community Survey 2012-2016

Table 9: Southeast Region QOZ Demographic Statistics

Census-tract classification	*Designated QOZs*	*Eligible Nondesignated*	*All SE Tracts*
Descriptives (N)			
Total number of tracts	1,508	6,698	12,854
Low-income communities	1,464	4,556	6,020
Contiguous	41	2,142	2,183
Economic (average or average %)			
Median household income	$30,794	$39,502	$48,045
Poverty rate	32.25%	22.69%	19.65%
Unemployment rate	13.59%	10.04%	9.20%
Housing (average or average %)			
Median home value	$101,451	$117,682	$150,695
Median rent/month	$684	$769	$854
Homeownership	50.45%	62.21%	65.01%
Severe rent burden	26.54%	22.71%	21.67%
Vacancy rate	17.37%	16.23%	15.09%
Demographic (average %)			
White alone	43.50%	57.16%	61.04%
Black alone	45.07%	30.19%	27.03%
Hispanic	8.00%	8.99%	7.90%
Asian Americans	1.04%	1.42%	1.82%
Younger than 18	23.00%	22.39%	22.28%
Older than 64	14.64%	15.64%	15.95%
Education (average %)			
Age 25+ with HS or Less	56.24%	51.18%	45.38%
Age 25+ with Bach. Deg +	15.90%	19.26%	25.15%
Socioeconomic change flag (%)	2.16%	1.63%	2.02%
Geography (%)			
In a metro area	67.86%	69.16%	75.18%
In a micro area	17.74%	17.05%	14.42%
Non–core-based statistical area	14.40%	13.79%	10.40%

Source: Urban Institute state-by-state analysis of all opportunity zones, 2016 United States Census
Notes: Southeast region is defined in this study as Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee

Table 10: Summary t-test Results for Regional Analysis

	Variable 1	Variable 2	Variable 1	Variable 2	Variable 1	Variable 2
	Central	**East**	**East**	**West**	**Central**	**West**
Median Household Income						
Mean	32064.34783	31859.56452	31859.56452	28031.16176	32064.34783	28031.16176
Variance	88846008.14	65682856.05	65682856.05	86896551.99	88846008.14	86896551.99
Observations	46	62	62	68	46	68
Hypothesized Mean Difference	0		0		0	
df	88		128		96	
t Stat	0.118412696		2.504154911		2.25134151	
P(T<=t) two-tail	0.906010544		0.013531548		0.026644214	
t Critical two-tail	1.987289865		1.97867085		1.984984312	
Poverty Rate						
Mean	0.31136483	0.292212747	0.292212747	0.353116301	0.31136483	0.353116301
Variance	0.022905777	0.013537596	0.013537596	0.017274339	0.022905777	0.017274339
Observations	46	62	62	68	46	68
Hypothesized Mean Difference	0		0		0	
df	82		128		87	
t Stat	0.71559705		-2.802177461		-1.522533588	
P(T<=t) two-tail	0.47627295		0.00586537		0.131502078	
t Critical two-tail	1.989318557		1.97867085		1.987608282	
Unemployment Rate						
Mean	0.110218858	0.107376075	0.107376075	0.13257372	0.110218858	0.13257372
Variance	0.00348156	0.003498286	0.003498286	0.005439024	0.00348156	0.005439024
Observations	46	62	62	68	46	68
Hypothesized Mean Difference	0		0		0	
df	97		126		109	
t Stat	0.247329389		-2.157433589		-1.791707517	
P(T<=t) two-tail	0.805176065		0.032869508		0.075954582	
t Critical two-tail	1.984723186		1.978970602		1.98196749	
Median Home Value						
Mean	129762.2222	115824.5902	115824.5902	89375.80645	129762.2222	89375.80645
Variance	3166534677	3002745552	3002745552	1807097930	3166534677	1807097930
Observations	45	61	61	62	45	62
Hypothesized Mean Difference	0		0		0	
df	94		113		78	
t Stat	1.274490273		2.987617708		4.048487771	
P(T<=t) two-tail	0.205631366		0.003449201		0.000120598	
t Critical two-tail	1.985523442		1.981180359		1.990847069	
Severe Rent Burden						
Mean	0.222488933	0.220902773	0.220902773	0.263186977	0.222488933	0.263186977
Variance	0.005287184	0.008676034	0.008676034	0.009911106	0.005287184	0.009911106
Observations	46	62	62	68	46	68
Hypothesized Mean Difference	0		0		0	
df	106		128		111	
t Stat	0.099353573		-2.501684068		-2.520641353	
P(T<=t) two-tail	0.921045198		0.013621801		0.013135212	
t Critical two-tail	1.982597262		1.97867085		1.981566757	
Vacancy Rate						
Mean	0.134276919	0.146710425	0.146710425	0.191483841	0.134276919	0.191483841
Variance	0.004078125	0.002914653	0.002914653	0.006191598	0.004078125	0.006191598
Observations	46	62	62	68	46	68
Hypothesized Mean Difference	0		0		0	
df	87		119		108	
t Stat	-1.067478244		-3.810490372		-4.267417291	
P(T<=t) two-tail	0.288709122		0.000221044		4.25944E-05	
t Critical two-tail	1.987608282		1.980099876		1.982173483	
Percent High School or Lower						
Mean	0.595040327	0.587819119	0.587819119	0.580028943	0.595040327	0.580028943
Variance	0.009168503	0.012133569	0.012133569	0.012952764	0.009168503	0.012952764
Observations	46	62	62	68	46	68
Hypothesized Mean Difference	0		0		0	
df	103		128		107	
t Stat	0.363330096		0.39641479		0.76032877	
P(T<=t) two-tail	0.717102937		0.692459139		0.44873024	
t Critical two-tail	1.983264145		1.97867085		1.98238337	
Percent Bachelor's Degree +						
Mean	0.163468567	0.159918859	0.159918859	0.14883284	0.163468567	0.14883284
Variance	0.006966038	0.013493729	0.013493729	0.008051645	0.006966038	0.008051645
Observations	46	62	62	68	46	68
Hypothesized Mean Difference	0		0		0	
df	106		115		101	
t Stat	0.184771312		0.604749315		0.890962476	
P(T<=t) two-tail	0.853761466		0.546536963		0.375066836	
t Critical two-tail	1.982597262		1.980807541		1.983731003	

Data Source: 2016 United States Census

Table 11: Summary t-test Results for CSA Analysis (part 1)

	Variable 1	Variable 2	Variable 1	Variable 2	Variable 1	Variable 2
	Chatt.	**Jackson**	**Chatt.**	**Johnson City**	**Chatt.**	**Knoxville**
Median Household Income						
Mean	31462.077	25075.25	31462.07692	29782.77	31462.07692	33992.25
Variance	90803674	65072025	90803674.24	37431473	90803674.24	87011055.93
Observations	13	8	13	13	13	24
Hypothesized Mean Difference	0		0		0	
df	17		20		24	
t Stat	1.6425743		0.534685511		-0.776757039	
P(T<=t) two-tail	0.1188379		0.598761974		0.444890874	
t Critical two-tail	2.1098156		2.085963447		2.063898562	
Poverty Rate						
Mean	0.3236625	0.3613958	0.323662468	0.275317	0.323662468	0.294772231
Variance	0.0270193	0.021282	0.027019265	0.00826	0.027019265	0.012828648
Observations	13	8	13	13	13	24
Hypothesized Mean Difference	0		0		0	
df	16		19		18	
t Stat	-0.548147		0.92803258		0.565180335	
P(T<=t) two-tail	0.5911575		0.365030921		0.578928133	
t Critical two-tail	2.1199053		2.093024054		2.10092204	
Unemployment Rate						
Mean	0.1313389	0.1334075	0.131338899	0.104982	146525	0.098963447
Variance	0.007053	0.0056154	0.007052952	0.001588	0.007052952	0.003236227
Observations	13	8	13	13	13	24
Hypothesized Mean Difference	0		0		0	
df	16		17		18	
t Stat	-0.058638		1.02230616		1.243942864	
P(T<=t) two-tail	0.9539668		0.320964568		0.229477084	
t Critical two-tail	2.1199053		2.109815578		2.10092204	
Median Home Value						
Mean	146525	69912.5	146525	101376.9	146525	116587.5
Variance	9.398E+09	488664107	9397892955	2.54E+08	9397892955	2221394185
Observations	12	8	12	13	12	24
Hypothesized Mean Difference	0		0		0	
df	13		12		14	
t Stat	2.636735		1.593519702		1.011658486	
P(T<=t) two-tail	0.0102615		0.137028069		0.328867277	
t Critical two-tail	1.7709334		2.17881283		2.144786688	
Severe Rent Burden						
Mean	0.2248077	0.2997278	0.224807676	0.208894	0.224807676	0.249238835
Variance	0.0042881	0.0079138	0.004288109	0.008942	0.004288109	0.012057503
Observations	13	8	13	13	13	24
Hypothesized Mean Difference	0		0		0	
df	12		21		35	
t Stat	-2.06283		0.498829745		-0.846870551	
P(T<=t) two-tail	0.0614626		0.623084379		0.40282094	
t Critical two-tail	2.1788128		2.079613845		2.030107928	
Vacancy Rate						
Mean	0.1584472	0.2184073	0.158447204	0.126449	0.158447204	0.145645684
Variance	0.0016616	0.0027148	0.0016616	0.003444	0.0016616	0.003300525
Observations	13	8	13	13	13	24
Hypothesized Mean Difference	0		0		0	
df	12		21		32	
t Stat	-2.774113		1.614572083		0.785891186	
P(T<=t) two-tail	0.0168331		0.121329579		0.43771215	
t Critical two-tail	2.1788128		2.079613845		2.036933343	
Percent High School or Lower						
Mean	0.5927868	0.5976307	0.5927868	0.571913	0.5927868	0.558598612
Variance	0.0155664	0.0068722	0.015566437	0.00846	0.015566437	0.014588435
Observations	13	8	13	13	13	24
Hypothesized Mean Difference	0		0		0	
df	19		22		24	
t Stat	-0.106817		0.485543533		0.80464636	
P(T<=t) two-tail	0.9160539		0.632091328		0.428923175	
t Critical two-tail	2.0930241		2.073873068		2.063898562	
Percent Bachelor's Degree +						
Mean	0.172897	0.1442136	0.172896987	0.166683	0.172896987	0.174339315
Variance	0.0246338	0.0041501	0.024633763	0.007386	0.024633763	0.016500272
Observations	13	8	13	13	13	24
Hypothesized Mean Difference	0		0		0	
df	17		19		21	
t Stat	0.5838369		0.125203856		-0.028382522	
P(T<=t) two-tail	0.5669968		0.901677432		0.977625067	
t Critical two-tail	2.1098156		2.093024054		2.079613845	

Data Source: 2016 United States Census

Table 11: Summary t-test Results for CSA Analysis (part 2)

	Variable 1	Variable 2	Variable 1	Variable 2	Variable 1	Variable 2
	Chatt.	**Memphis**	**Chatt.**	**Nashville**	**Jackson**	**Johnson City**
Median Household Income						
Mean	31462.07692	25303.65714	31462.07692	30829	25075.25	29782.76923
Variance	90803674.24	107485772	90803674.24	106959469.8	65072024.79	37431473.36
Observations	13	35	13	28	8	13
Hypothesized Mean Difference	0		0		0	
df	23		25		12	
t Stat	1.942040945		0.192595674		-1.418510116	
P(T<=t) two-tail	0.064477224		0.848831633		0.181487504	
t Critical two-tail	2.06865761		2.059538553		2.17881283	
Poverty Rate						
Mean	0.323662468	0.404019716	0.323662468	0.357336761	0.361395765	0.275317204
Variance	0.027019265	0.015955394	0.027019265	0.027671965	0.02128204	0.008260427
Observations	13	35	13	28	8	13
Hypothesized Mean Difference	0		0		0	
df	18		24		10	
t Stat	-1.596240489		-0.608084023		1.499418913	
P(T<=t) two-tail	0.12784191		0.548843609		0.164655498	
t Critical two-tail	2.10092204		2.063898562		2.228138852	
Unemployment Rate						
Mean	0.131338899	0.149999473	0.131338899	0.110799894	0.133407459	0.104981884
Variance	0.007052952	0.006781293	0.007052952	0.003434886	0.00561544	0.001588244
Observations	13	35	13	28	8	13
Hypothesized Mean Difference	0		0		0	
df	21		18		9	
t Stat	-0.687704266		0.796343159		0.990190213	
P(T<=t) two-tail	0.49916507		0.436210357		0.347953907	
t Critical two-tail	2.079613845		2.10092204		2.262157163	
Median Home Value						
Mean	146525	87806.89655	146525	143418.5185	69912.5	101376.9231
Variance	9397892955	3144872808	9397892955	4542189259	488664107.1	254298589.7
Observations	12	29	12	27	8	13
Hypothesized Mean Difference	0		0		0	
df	14		16		12	
t Stat	1.966466677		0.100714075		-3.503745466	
P(T<=t) two-tail	0.069392248		0.92102868		0.004351744	
t Critical two-tail	2.144786688		2.119905299		2.17881283	
Severe Rent Burden						
Mean	0.224807676	0.300818676	0.224807676	0.233595388	0.299727758	0.208894332
Variance	0.004288109	0.008578705	0.004288109	0.00437956	0.007913769	0.008941944
Observations	13	35	13	28	8	13
Hypothesized Mean Difference	0		0		0	
df	31		24		16	
t Stat	-3.169987041		-0.398509108		2.218048337	
P(T<=t) two-tail	0.003421112		0.693778233		0.041370828	
t Critical two-tail	2.039513446		2.063898562		2.119905299	
Vacancy Rate						
Mean	0.158447204	0.19122812	0.158447204	0.119860494	0.21840729	0.126448653
Variance	0.0016616	0.00601198	0.0016616	0.002609976	0.002714848	0.003444497
Observations	13	35	13	28	8	13
Hypothesized Mean Difference	0		0		0	
df	40		29		16	
t Stat	-1.893913561		2.595453905		3.740761406	
P(T<=t) two-tail	0.065484216		0.014670416		0.001782182	
t Critical two-tail	2.02107539		2.045229642		2.119905299	
Percent High School or Lower						
Mean	0.5927868	0.549594043	0.5927868	0.563150474	0.597630743	0.571913222
Variance	0.015566437	0.017944734	0.015566437	0.008748971	0.0068722	0.008459528
Observations	13	35	13	28	8	13
Hypothesized Mean Difference	0		0		0	
df	23		19		16	
t Stat	1.044472518		0.762698586		0.661874212	
P(T<=t) two-tail	0.307120838		0.455008725		0.517471781	
t Critical two-tail	2.06865761		2.093024054		2.119905299	
Percent Bachelor's Degree +						
Mean	0.172896987	0.164734231	0.172896987	0.184316116	0.144213609	0.166683207
Variance	0.024633763	0.012514707	0.024633763	0.008347835	0.004150102	0.007386108
Observations	13	35	13	28	8	13
Hypothesized Mean Difference	0		0		0	
df	17		16		18	
t Stat	0.171991703		-0.243842583		-0.681546563	
P(T<=t) two-tail	0.865474895		0.81045182		0.504201069	
t Critical two-tail	2.109815578		2.119905299		2.10092204	

Data Source: 2016 United States Census

Table 11: Summary t-test Results for CSA Analysis (part 3)

	Variable 1	Variable 2	Variable 1	Variable 2	Variable 1	Variable 2
	Jackson	**Knoxville**	**Jackson**	**Memphis**	**Jackson**	**Nashville**
Median Household Income						
Mean	25075.25	33992.25	25075.25	25303.6571	25075.25	30829
Variance	65072024.79	87011055.93	65072024.8	107485772	65072024.8	106959470
Observations	8	24	8	35	8	28
Hypothesized Mean Difference	0		0		0	
df	14		13		14	
t Stat	-2.60030929		-0.0682344		-1.6641584	
P(T<=t) two-tail	0.02096471		0.94663741		0.1182938	
t Critical two-tail	2.144786688		2.16036866		2.14478669	
Poverty Rate						
Mean	0.361395765	0.294772231	0.36139577	0.40401972	0.36139577	0.35733676
Variance	0.02128204	0.012828648	0.02128204	0.01595539	0.02128204	0.02767196
Observations	8	24	8	35	8	28
Hypothesized Mean Difference	0		0		0	
df	10		10		13	
t Stat	1.178710232		-0.7635657		0.06719855	
P(T<=t) two-tail	0.265799243		0.46276035		0.94744615	
t Critical two-tail	2.228138852		2.22813885		2.16036866	
Unemployment Rate						
Mean	0.133407459	0.098963447	0.13340746	0.14999947	0.13340746	0.11079989
Variance	0.00561544	0.003236227	0.00561544	0.00678129	0.00561544	0.00343489
Observations	8	24	8	35	8	28
Hypothesized Mean Difference	0		0		0	
df	10		11		10	
t Stat	1.190720867		-0.5543989		0.78728314	
P(T<=t) two-tail	0.261260376		0.59039925		0.44937298	
t Critical two-tail	2.228138852		2.20098516		2.22813885	
Median Home Value						
Mean	69912.5	116587.5	69912.5	87806.8966	69912.5	143418.519
Variance	488664107.1	2221394185	488664107	3144872808	488664107	4542189259
Observations	8	24	8	29	8	27
Hypothesized Mean Difference	0		0		0	
df	26		30		32	
t Stat	-3.765569056		-1.3743513		-4.8541062	
P(T<=t) two-tail	0.00085903		0.17951346		3.0353E-05	
t Critical two-tail	2.055529439		2.04227246		2.03693334	
Severe Rent Burden						
Mean	0.299727758	0.249238835	0.29972776	0.30081868	0.29972776	0.23359539
Variance	0.007913769	0.012057503	0.00791377	0.0085787	0.00791377	0.00437956
Observations	8	24	8	35	8	28
Hypothesized Mean Difference	0		0		0	
df	15		11		9	
t Stat	1.307276436		-0.0310511		1.95384965	
P(T<=t) two-tail	0.210803771		0.97578502		0.08245529	
t Critical two-tail	2.131449546		2.20098516		2.26215716	
Vacancy Rate						
Mean	0.21840729	0.145645684	0.21840729	0.19122812	0.21840729	0.11986049
Variance	0.002714848	0.003300525	0.00271485	0.00601198	0.00271485	0.00260998
Observations	8	24	8	35	8	28
Hypothesized Mean Difference	0		0		0	
df	13		15		11	
t Stat	3.331951787		1.2021865		4.73821345	
P(T<=t) two-tail	0.005405086		0.24792675		0.0006112	
t Critical two-tail	2.160368656		2.13144955		2.20098516	
Percent High School or Lower						
Mean	0.597630743	0.558598612	0.59763074	0.54959404	0.59763074	0.56315047
Variance	0.0068722	0.014588435	0.0068722	0.01794473	0.0068722	0.00874897
Observations	8	24	8	35	8	28
Hypothesized Mean Difference	0		0		0	
df	18		17		13	
t Stat	1.019120428		1.29699586		1.0073994	
P(T<=t) two-tail	0.32164894		0.21196025		0.33212656	
t Critical two-tail	2.10092204		2.10981558		2.16036866	
Percent Bachelor's Degree +						
Mean	0.144213609	0.174339315	0.14421361	0.16473423	0.14421361	0.18431612
Variance	0.004150102	0.016500272	0.0041501	0.01251471	0.0041501	0.00834784
Observations	8	24	8	35	8	28
Hypothesized Mean Difference	0		0		0	
df	25		18		16	
t Stat	-0.867389643		-0.6931987		-1.4030952	
P(T<=t) two-tail	0.393978279		0.49703282		0.17969633	
t Critical two-tail	2.059538553		2.10092204		2.1199053	

Data Source: 2016 United States Census

Table 11: Summary t-test Results for CSA Analysis (part 4)

	Variable 1	Variable 2	Variable 1	Variable 2	Variable 1	Variable 2
	Johnson City	**Knoxville**	**Johnson City**	**Memphis**	**Johnson City**	**Nashville**
Median Household Income						
Mean	29782.7692	33992.25	29782.7692	25303.6571	29782.7692	30829
Variance	37431473.4	87011055.9	37431473.4	107485772	37431473.4	106959470
Observations	13	24	13	35	13	28
Hypothesized Mean Difference	0		0		0	
df	34		37		36	
t Stat	-1.6504843		1.83620043		-0.4042146	
P(T<=t) two-tail	0.10805304		0.0743734		0.6884464	
t Critical two-tail	2.03224451		2.02619246		2.028094	
Poverty Rate						
Mean	0.2753172	0.29477223	0.2753172	0.40401972	0.2753172	0.35733676
Variance	0.00826043	0.01282865	0.00826043	0.01595539	0.00826043	0.02767196
Observations	13	24	13	35	13	28
Hypothesized Mean Difference	0		0		0	
df	30		30		38	
t Stat	-0.5687864		-3.8959894		-2.035468	
P(T<=t) two-tail	0.57373489		0.00050778		0.04882099	
t Critical two-tail	2.04227246		2.04227246		2.02439416	
Unemployment Rate						
Mean	0.10498188	0.09896345	0.10498188	0.14999947	0.10498188	0.11079989
Variance	0.00158824	0.00323623	0.00158824	0.00678129	0.00158824	0.00343489
Observations	13	24	13	35	13	28
Hypothesized Mean Difference	0		0		0	
df	32		43		33	
t Stat	0.37540852		-2.5327425		-0.3718151	
P(T<=t) two-tail	0.70983368		0.01504817		0.71240745	
t Critical two-tail	2.03693334		2.0166922		2.0345153	
Median Home Value						
Mean	101376.923	116587.5	101376.923	87806.8966	101376.923	143418.519
Variance	254298590	2221394185	254298590	3144872808	254298590	4542189259
Observations	13	24	13	29	13	27
Hypothesized Mean Difference	0		0		0	
df	31		36		31	
t Stat	-1.4364981		1.1994073		-3.067907	
P(T<=t) two-tail	0.16087674		0.23820446		0.00444903	
t Critical two-tail	2.03951345		2.028094		2.03951345	
Severe Rent Burden						
Mean	0.20889433	0.24923883	0.20889433	0.30081868	0.20889433	0.23359539
Variance	0.00894194	0.0120575	0.00894194	0.0085787	0.00894194	0.00437956
Observations	13	24	13	35	13	28
Hypothesized Mean Difference	0		0		0	
df	28		21		18	
t Stat	-1.1694119		-3.0095523		-0.8501172	
P(T<=t) two-tail	0.2520967		0.00667446		0.40642617	
t Critical two-tail	2.04840714		2.07961384		2.10092204	
Vacancy Rate						
Mean	0.12644865	0.14564568	0.12644865	0.19122812	0.12644865	0.11986049
Variance	0.0034445	0.00330052	0.0034445	0.00601198	0.0034445	0.00260998
Observations	13	24	13	35	13	28
Hypothesized Mean Difference	0		0		0	
df	24		28		21	
t Stat	-0.956886		-3.0997721		0.34811006	
P(T<=t) two-tail	0.34816526		0.00438224		0.73122286	
t Critical two-tail	2.06389856		2.04840714		2.07961384	
Percent High School or Lower						
Mean	0.57191322	0.55859861	0.57191322	0.54959404	0.57191322	0.56315047
Variance	0.00845953	0.01458843	0.00845953	0.01794473	0.00845953	0.00874897
Observations	13	24	13	35	13	28
Hypothesized Mean Difference	0		0		0	
df	31		31		24	
t Stat	0.37530754		0.65434427		0.28234685	
P(T<=t) two-tail	0.70998752		0.51771555		0.78009822	
t Critical two-tail	2.03951345		2.03951345		2.06389856	
Percent Bachelor's Degree +						
Mean	0.16668321	0.17433931	0.16668321	0.16473423	0.16668321	0.18431612
Variance	0.00738611	0.01650027	0.00738611	0.01251471	0.00738611	0.00834784
Observations	13	24	13	35	13	28
Hypothesized Mean Difference	0		0		0	
df	33		28		25	
t Stat	-0.2160577		0.06405685		-0.5990872	
P(T<=t) two-tail	0.8302728		0.9493801		0.55450533	
t Critical two-tail	2.0345153		2.04840714		2.05953855	

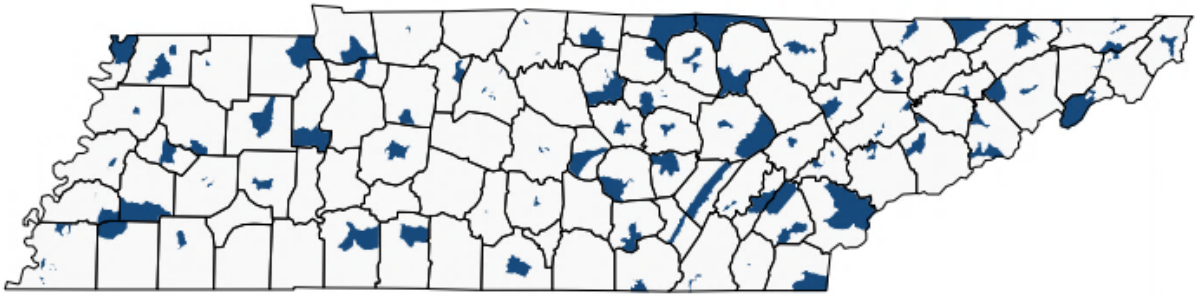
Data Source: 2016 United States Census

Table 11: Summary t-test Results for CSA Analysis (part 5)

	Variable 1	Variable 2	Variable 1	Variable 2	Variable 1	Variable 2
	Knoxville	**Memphis**	**Knoxville**	**Nashville**	**Memphis**	**Nashville**
Median Household Income						
Mean	33992.25	25303.6571	33992.25	30829	25303.6571	30829
Variance	87011055.9	107485772	87011055.9	106959470	107485772	106959470
Observations	24	35	24	28	35	28
Hypothesized Mean Difference	0		0		0	
df	53		50		58	
t Stat	3.35757769		1.15927984		-2.1048348	
P(T<=t) two-tail	0.0014613		0.25184861		0.03964865	
t Critical two-tail	2.005746		2.00855911		2.00171748	
Poverty Rate						
Mean	0.29477223	0.40401972	0.29477223	0.35733676	0.40401972	0.35733676
Variance	0.01282865	0.01595539	0.01282865	0.02767196	0.01595539	0.02767196
Observations	24	35	24	28	35	28
Hypothesized Mean Difference	0		0		0	
df	53		48		49	
t Stat	-3.4714198		-1.6032643		1.22843379	
P(T<=t) two-tail	0.00103817		0.11543718		0.22515185	
t Critical two-tail	2.005746		2.01063476		2.00957524	
Unemployment Rate						
Mean	0.09896345	0.14999947	0.09896345	0.11079989	0.14999947	0.11079989
Variance	0.00323623	0.00678129	0.00323623	0.00343489	0.00678129	0.00343489
Observations	24	35	24	28	35	28
Hypothesized Mean Difference	0		0		0	
df	57		49		60	
t Stat	-2.8154448		-0.7375953		2.20366462	
P(T<=t) two-tail	0.00667742		0.46427809		0.03139703	
t Critical two-tail	2.00246546		2.00957524		2.00029782	
Median Home Value						
Mean	116587.5	87806.8966	116587.5	143418.519	87806.8966	143418.519
Variance	2221394185	3144872808	2221394185	4542189259	3144872808	4542189259
Observations	24	29	24	27	29	27
Hypothesized Mean Difference	0		0		0	
df	51		47		51	
t Stat	2.03001724		-1.6614754		-3.3433518	
P(T<=t) two-tail	0.04758661		0.10327503		0.00155693	
t Critical two-tail	2.00758377		2.01174051		2.00758377	
Severe Rent Burden						
Mean	0.24923883	0.30081868	0.24923883	0.23359539	0.30081868	0.23359539
Variance	0.0120575	0.0085787	0.0120575	0.00437956	0.0085787	0.00437956
Observations	24	35	24	28	35	28
Hypothesized Mean Difference	0		0		0	
df	44		37		60	
t Stat	-1.8865741		0.60947057		3.35480176	
P(T<=t) two-tail	0.06582751		0.54593726		0.0013813	
t Critical two-tail	2.01536757		2.02619246		2.00029782	
Vacancy Rate						
Mean	0.14564568	0.19122812	0.14564568	0.11986049	0.19122812	0.11986049
Variance	0.00330052	0.00601198	0.00330052	0.00260998	0.00601198	0.00260998
Observations	24	35	24	28	35	28
Hypothesized Mean Difference	0		0		0	
df	57		47		59	
t Stat	-2.5918668		1.69751389		4.38420845	
P(T<=t) two-tail	0.0121041		0.09621267		4.862E-05	
t Critical two-tail	2.00246546		2.01174051		2.00099538	
Percent High School or Lower						
Mean	0.55859861	0.54959404	0.55859861	0.56315047	0.54959404	0.56315047
Variance	0.01458843	0.01794473	0.01458843	0.00874897	0.01794473	0.00874897
Observations	24	35	24	28	35	28
Hypothesized Mean Difference	0		0		0	
df	53		43		60	
t Stat	0.26899594		-0.1500448		-0.4719258	
P(T<=t) two-tail	0.78897722		0.88143087		0.63869159	
t Critical two-tail	2.005746		2.0166922		2.00029782	
Percent Bachelor's Degree +						
Mean	0.17433931	0.16473423	0.17433931	0.18431612	0.16473423	0.18431612
Variance	0.01650027	0.01251471	0.01650027	0.00834784	0.01251471	0.00834784
Observations	24	35	24	28	35	28
Hypothesized Mean Difference	0		0		0	
df	45		41		61	
t Stat	0.29711705		-0.3177828		-0.764719	
P(T<=t) two-tail	0.76774438		0.75226262		0.44738723	
t Critical two-tail	2.01410339		2.01954097		1.99962358	

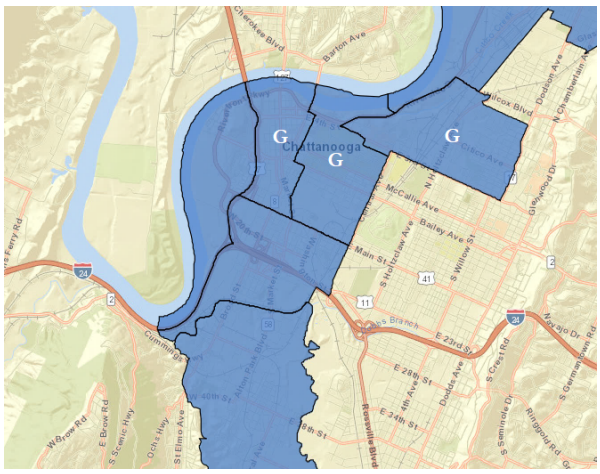
Data Source: 2016 United States Census

Figure 1: Map of Tennessee's Designated QOZs

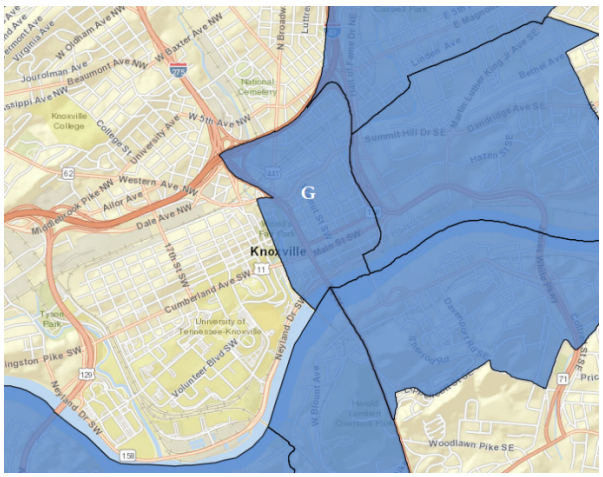


Notes: This map displays the 176 census tracts in Tennessee which have been designated as qualified opportunity zones. This data was obtained from the Tennessee Department of Economic & Community Development (2018).

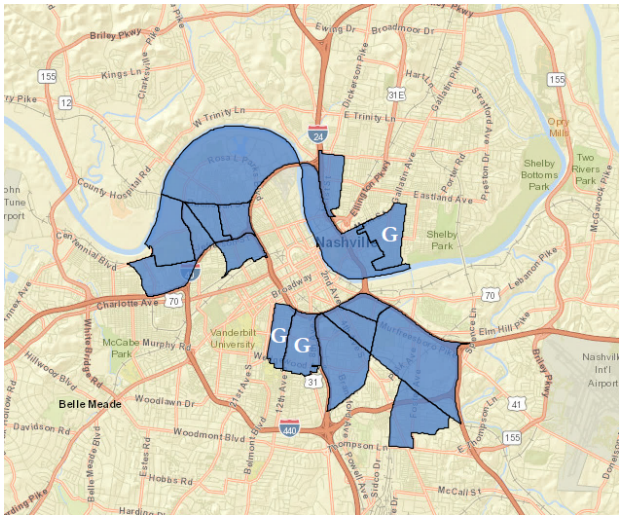
Figure 2: Maps of Tennessee Tracts Experiencing Measured Gentrification



Note: Tracts 47065002000, 47065003100, Hamilton County



Note: Tract 47093000100, Knox County



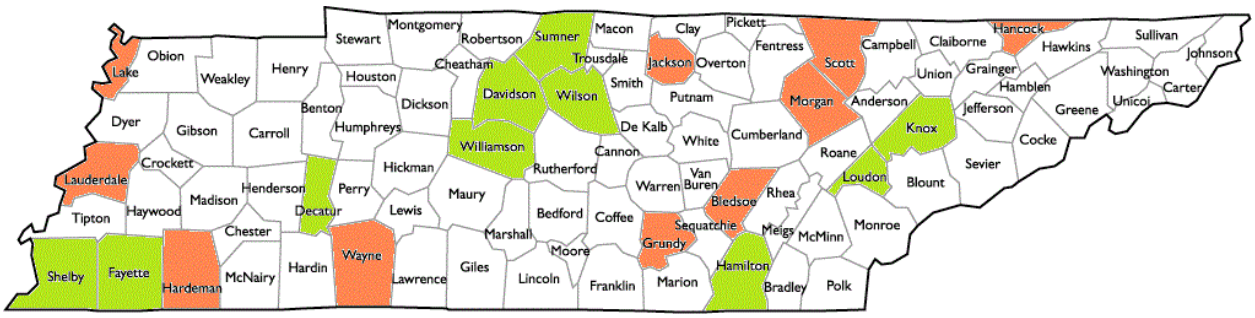
Note: Tracts 47037016200, 47037016300, 47037019200, Davidson County

Source: CDFI Fund, United States Department of Treasury

Figure 3: Histogram Dashboard for Regional Analysis Measures

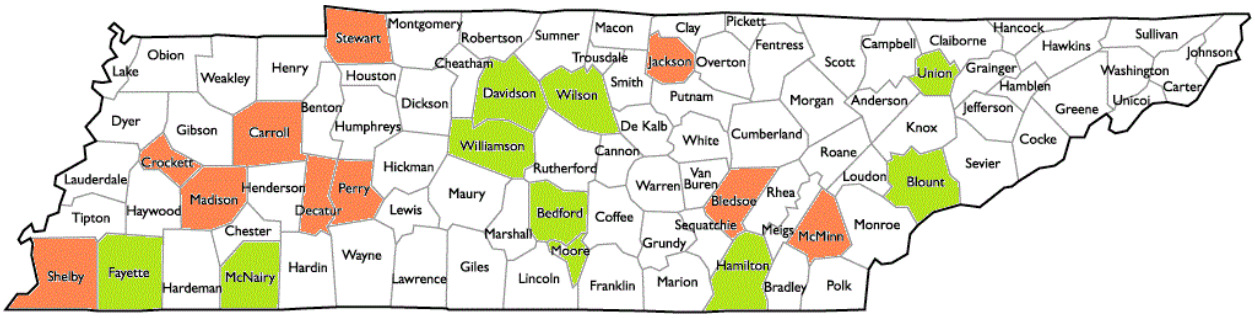
Figure 4: Histogram Dashboard for CSA Analysis Measures

Figure 5: Map of Outlier Counties, by Median Household Income



Notes: Counties highlighted in green are the ten counties with the highest median household income while the counties highlighted in red are the ten counties with the lowest median household income
Source: 2016 United States Census, World Atlas

Figure 6: Map of Outlier Counties, by Socioeconomic Change Index



Notes: Counties highlighted in green are the ten counties with the highest composite socioeconomic change z-score while the counties highlighted in red are the ten counties with the lowest composite socioeconomic change z-score
Source: 2009-2016 American Community Survey, World Atlas