

# The Impact of Sports Stadiums on Commercial Activity: Evidence from a Business Improvement District

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## Abstract

Local government funding of sports stadiums is frequently justified as stimulating economic activity despite consensus contrary findings in the academic literature. Though some studies have identified positive neighborhood effects from stadiums on nearby residential property, scant research exists on highly-localized effects on commercial activity that is hypothesized to spur development. This analysis exploits the recent relocation of a professional baseball team from downtown Atlanta to a unique government Business Improvement District (Community Improvement District or CID) in suburban Cobb County to estimate the impact of the stadium development on commercial property values. The existence of multiple CIDs in the metro-Atlanta area provides the opportunity to estimate a counterfactual comparison absent the stadium to draw causal inference regarding the stadium's impact on economic activity using the synthetic control method. Comparisons indicate that the stadium lowered commercial property values below what they otherwise would have been, which is consistent with past studies that find little to no positive impact on economic activity, and that findings of positive impacts on residential property identified in previous studies may not be applicable to commercial activity.

Keywords: economic development, property values, sports stadiums, Business Improvement Districts, synthetic control method

JEL: H71, L83, R58, Z23

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## 1. Introduction

Local governments often subsidize sports venues for the stated purpose of stimulating commercial activity to promote economic development. The expectation is that consumer spending on sports spills over onto other local businesses and spurs additional activity via a multiplier. Though stadium proponents often tout fiscal benefits, most academic studies find that tangible economic benefits of hosting sports events (e.g., employment and wages) are small to non-existent, and that any benefits (pecuniary and non-pecuniary) are typically insufficient to justify the public funding provided (Coates 2007 and 2015, Coates and Humphreys 2008, Humphreys 2019).

One strand of the literature on stadium impacts that has produced mixed findings is in regard to spillover effects onto surrounding property. Several studies have found evidence of positive impacts of stadiums on nearby residential property values (Tu 2005, Ahlfeldt and Kavetsos 2014, Feng and Humphreys 2012 and 2018), though some findings indicate negative spillovers (Dehring, Depken, and Ward 2007, Humphreys and Nowak 2017). However, home prices more likely capture the capitalized value of residential amenities and disamenities rather than increased or decreased values from commercial activity. While non-business impacts are a relevant welfare consideration, support for public subsidies of sports venues typically relies on positive economic development externalities through business transactions. Therefore, this analysis observes nearby commercial property to identify changes in the capitalized value from economic activity as it is impacted by the stadium, which is relevant for identifying localized economic development effects.

In 2017, the Atlanta National League Baseball Club (ANLBC or Atlanta Braves) relocated its Major League Baseball (MLB) games from its downtown Atlanta stadium (Turner Field) to a new ballpark 10 miles to the north in the metro-Atlanta suburb of Cobb County. Unlike its predecessor, the new stadium (Truist Park) is part of a mixed-use development that surrounds the stadium with corporate, retail, and residential space, known as The Battery Atlanta.<sup>1</sup> The development was intended to serve as an anchor for further economic

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<sup>1</sup> The ballpark was initially named SunTrust Park, but it was rechristened Truist Park in 2020 when its corporate naming rights sponsor changed its name. To avoid confusion, I refer to the stadium by its current name.

development in the suburban business district of Cumberland. The club stated that it moved to be closer to the geographic center of its fanbase, which is largely concentrated on Atlanta's north side (Tucker 2013). The move would also boost revenue by attracting fans through the novelty effect of a new stadium (Coates and Humphreys 2004, Depken 2006, Poitras and Hadley 2006, Bradbury 2019).

In order to facilitate the move, Cobb County provided approximately \$300 million in subsidies, as well as other incentives, to assist with the \$672 million stadium construction costs and continued operation. The development was hailed as an economic "home run" for the County by local leaders due to the anticipated influx of economic activity induced by the new stadium, which would be sufficient to cover the subsidy costs (Klepal 2013). A report commissioned by the Cobb Chamber of Commerce, which supported the stadium project, estimated that the stadium's construction and operation generate approximately \$18.9 million annually on net to the County.<sup>2</sup> This estimate is contrary to the findings of most academic studies noted above.

A problem faced when analyzing the impact of a specific stadium project is to identify the counterfactual outcome of what economic activity in the surrounding area would be absent the venue. A simple intertemporal comparison of activity before and after construction does not capture the marginal impact of the stadium on the immediate surrounding area separate from the larger region's growth. While economic activity did increase in the Truist Park area following its construction, economic activity throughout the metro-Atlanta area similarly increased. ANLBC's relocation into a geographically-defined business district provides the opportunity to disentangle economic effects of the ballpark from general economic activity experienced by the larger region to estimate the localized economic development effect of a sports venue in a way that it has not been done before.

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<sup>2</sup> The commissioned Center for Economic Development Research (2018) report falls under what Coates and Humphreys (2008) describe as "promotional literature." The report is authored by a consultancy under contract, and it has not been subjected to peer review. It suffers from many basic errors (e.g., overstating benefits, understating costs, use of a proprietary black-box model, etc.) that render its conclusions to be non-credible; therefore, I do not address its content in this article. I cite it only to acknowledge my awareness of the report. If the author(s) take issue with my assessment, they are free to submit their report to an appropriate outlet for peer review.

Truist Park is located within the Cumberland Community Improvement District (CID). CIDs are a type of Business Improvement District (BID) in Georgia that commercial property owners form to support business activity in the area. Because the team moved within the same metropolitan area, it retained its local geographic identity with existing fan-consumers transferring their spending to a new local jurisdiction. An influx of baseball-related economic activity that previously did not exist in the area may increase overall output as fans from neighboring jurisdictions travel to Cobb County to attend baseball games. However, existing business activity may also be displaced by complementary entertainment businesses, nuisance externalities, and increased taxation to fund the ballpark. Humphrey and Zhou (2015) demonstrate that the introduction of a new sports facility into an area may generate agglomeration effects with winners and losers that can produce net gains or losses, depending on the characteristics of the district. Overall, the net effect for Cumberland is unclear, and the claimed gains are speculative.

Even if the net effect is negative or cancels out for the funding jurisdiction of Cobb County, sub-local development effects concentrated in a commercial district may be desirable to revitalize the area (Matheson 2019). One goal of building a stadium is to provide an anchoring focal point for a local entertainment district; thus, understanding localized development effects at a more granular level is needed. The movement of a professional baseball team from one part of the metropolitan area to another provides this opportunity.

The synthetic control method (SCM) is well-suited for generating counterfactual estimates of the district's economic activity absent the addition of Truist Park. Cumberland CID is compact and organized as a business district, which makes it ideal for capturing any localized "halo" effects from the new ballpark on surrounding economic activity. CIDs self-fund their operations through commercial ad valorem property taxes; therefore, district property has been assessed regularly over time using the same objective methods. Thus, changes in the value of all commercial property in the district are observable and should reflect the capitalized economic activity in the area. The treatment unit (Cumberland CID) has the virtue of being pre-selected for its economic cohesion more than two decades before the club announced its move, and other CIDs in the metro-Atlanta area are available serve as control units to construct a counterfactual comparison.

Using SCM, I estimate counterfactual commercial property values for Cumberland CID to identify the stadium's impact on the district through capitalized business activity. The comparison indicates that CID property values were lower than expected after the stadium opened: three years after opening, Cumberland CID property values were \$35,000 per acre less than they otherwise would have been absent the stadium. Thus, Truist Park's construction appears to have dampened property values, which is an indication of decreased economic activity, contrary to the expectations of stadium proponents but consistent with findings in the academic literature. The decline in property values may result from displacement of business activity that is hampered by stadium activity spillovers (e.g., traffic, crime, noise) or disincentivized by increased taxes implemented in the area to fund the stadium. The results also resolve the seeming contradiction between findings of positive impacts on stadium-area residential property and stadium impotence on economic activity.

## 2. Community Improvement Districts

CIDs are a type of BID formed by commercial property owners to provide supplemental public services (e.g., infrastructure and transportation improvements, public safety, and beautification) to enhance local economic development.<sup>3</sup> CIDs are authorized by the Georgia constitution and governed by a board of directors, which includes local government representation. As of 2019, Georgia had 25 active CIDs, most of which are located in metropolitan Atlanta. CIDs fund their operations through an ad valorem property tax on non-residential and non-exempt property in the district. CIDs may set a millage rate of no more than 25 mills on eligible property, with a typical range of three to five mills and an average millage of 4.7 mills.<sup>4</sup> This funding mechanism is fortuitous for the analysis of the spillover impact of Truist Park on local economic

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<sup>3</sup> BIDs are a common sub-local form of consensual self-governance that are common in the US. Researchers have examined how local business interests have organized BIDs to enhance the provision of public goods and facilitate commercial activity (e.g., Ellen et al. 2007, Brooks and Strange 2011, Meltzer 2011 and 2012).

<sup>4</sup> Kuhn, Larson, and Bourdeaux (2019) provide a detailed description of Georgia's CIDs and their operation. Ewoh and Zimmerman (2010) provides further historical background on CID creation in Georgia and their structure as BIDs.

development, because commercial property has been assessed and reported uniformly for all CIDs before and after the stadium was constructed.

The Georgia Department of Revenue reports aggregate property assessments for all CIDs on an annual basis. All commercial property is assessed at 40 percent of its “fair market value” which is taxed at a polity-determined millage rate.<sup>5</sup> The intent of the assessment is to determine the value that would be realized from a cash sale as it is usually sold. The Board of Tax Assessors for each county conducts its assessments, and the State Revenue Commissioner examines the digests of all counties to ensure that the property is assessed uniformly and equally between and within counties to reflect the market value of properties. CID legislation notes that tax assessments of CID properties are based on density and space to account for development height and provides a formula for determining the taxable base for mixed-use property, which helps promote uniformity across CIDs (Kuhn et al. 2019). Annual assessment of property within CIDs provides a reasonable estimate of property values within compact districts formed for similar economic purposes; therefore, assessed value per acre serves as the unit of observation for this analysis.

CIDs also have the advantage of capturing the connectedness of the business community through natural cohesion rather than physical distance. Estimating proximity effects by concentric circles of distance, though not inappropriate, may not fully capture how spillovers are dispersed through roads and agglomeration or disrupted by geographic features, traffic bottlenecks, or other barriers that limit spillovers. The varying sizes of CIDs is evidence that commercial externalities differ by community. That CID boundaries have been pre-selected for reasons unrelated to the treatment enhances their desirability as subjects for a natural experiment.

Cumberland CID was Georgia’s first CID, created in 1988 by local business leaders who encouraged the state legislation that brought all CIDs into existence. It is situated in southern Cobb County on the northwest border of Fulton County, with the cities of Atlanta (to the southeast) and Sandy Springs (to the east). Within Cobb, the city of Smyrna lies on its western border, which is the district’s closest incorporated city in the

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<sup>5</sup> Department of Revenue (2020) reports that fair market value is defined by statute as “the amount a knowledgeable buyer would pay for the property and a willing seller would accept for the property at an arm's length, bona fide sale.” This website also provides relevant information regarding tax assessment discussed in this section.

county. Cobb's largest city of Marietta is five miles to its northwest. Cumberland contains the major junction of Interstate 75, which runs between Atlanta and Chattanooga, Tennessee, and Interstate 285, which is the highway loop around Atlanta. Though Cumberland is not in the center of Atlanta, it existed as a concentrated business district many years before Truist Park was built and operates independent of any city in unincorporated Cobb County.

Cumberland CID is one of 12 CIDs located in four core metro-Atlanta counties of Cobb, DeKalb, Fulton, and Gwinnett that have had their property assessed as a CID since 2010, which provides one decade of observations for each CID. Figure 1 maps the CID locations and old and new baseball stadiums within the metro-Atlanta area. The CIDs are located throughout the metro area, though most CIDs are located on the north side of the city's center and situated along major roads or interchanges. Their geographies range from spherical and compact to sprawling and elongated. Some CIDs are isolated while others share borders and may overlap by a small margin. Perimeter-Dekalb and Perimeter-Fulton are distinct CIDs located in separate counties that cooperate in their operation. The property values of these business districts ought to vary similarly with the economic fortunes of metro-Atlanta and thus serve as appropriate control units to generate a counterfactual estimate of a Cumberland CID that did not construct the stadium.

Table 1 lists the CIDs along with several attributes. The CIDs in the sample were founded between 1998 and 2010. They range in size from approximately 700 to 11,500 acres (mean of 3,700) and extend from zero to 25 miles (mean of 14) from Atlanta's downtown. Cumberland CID is approximately 4,352 acres and is located 10 miles to the northwest of downtown Atlanta.<sup>6</sup> Thus, Cumberland does not appear to an outlier among CIDs.

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<sup>6</sup> In 2014, Cumberland increased its boundaries by about one acre to include part of the Chattahoochee National Recreation Area. This land is not assessed as taxable; therefore, I include this boundary as the acreage for the entire sample for consistency.

Figure 1. Metro-Atlanta CIDs

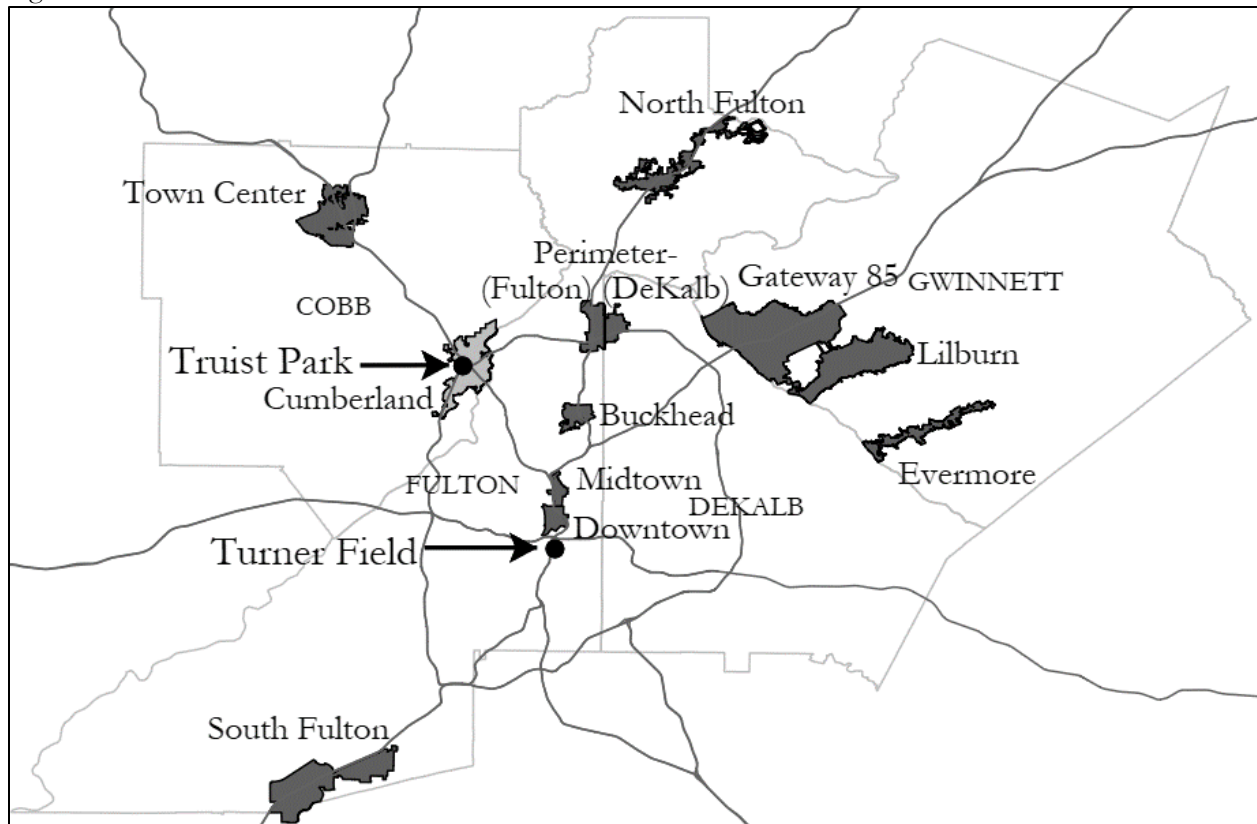


Table 1. Metropolitan CID Descriptions by County

CID	Closest Cities	Year Founded	Relation to City Center			Land Area		
			Direction	Distance (miles) <sup>†</sup>	Distance (km)	Acres	Miles <sup>2</sup>	km <sup>2</sup>
<i>Cobb County</i>								
Cumberland	Smyrna	1988	NW	10.5	17	4,352	6.80	17.61
Town Center	Kennesaw	1997	NW	23	37	4,339	6.78	17.56
<i>DeKalb County</i>								
Perimeter-DeKalb	Dunwoody/Brookhaven	1999	N	13	21	1,018	1.59	4.12
<i>Fulton County</i>								
Buckhead	Atlanta	1999	N	7	11	1,120	1.75	4.53
Downtown	Atlanta	1995	-	0	0	934	1.46	3.78
Midtown	Atlanta	1997	N	2	3	678	1.06	2.75
Perimeter-Fulton	Sandy Springs	1999	N	12	19	1,581	2.47	6.40
North Fulton	Alpharetta	2003	N	22	36	3,635	5.68	14.71
South Fulton	Fairburn/South Fulton	1999	SW	17	28	6,528	10.20	26.42
<i>Gwinnett County</i>								
Evermore	Snellville	2003	NE	22	35	2,240	3.50	9.07
Gateway 85 <sup>‡</sup>	Norcross	2006	NE	17	28	11,456	17.90	46.36
Lilburn	Lilburn	2010	NE	17	28	6,150	9.61	24.89

<sup>†</sup> Distance measured from state Capitol to CID headquarters or local city hall (if headquarters is not in CID). <sup>‡</sup> Changed name from Gwinnett Village in 2017.



### 3. Empirical Analysis

#### 3.1 Motivation

I seek to measure the impact of the stadium development on the value of surrounding property in the Cumberland CID. An attribute of using CIDs for estimating local development externalities onto nearby property is that the districts are composed of members whose business interests overlap. Cumberland CID represents a compact region to measure spillover effects on neighborhood businesses. CID property values reflect the scarcity of commercial property and should capitalize the present discounted value of economic activity in the area as well as capture any non-pecuniary amenities and disamenities from the stadium. If the stadium confers external benefits on nearby businesses to stimulate economic activity (as proponents of stadiums subsidies contend), then property values in Cumberland should increase relative to what property values would be if the CID had not received the stadium.

Several previous studies have used home prices to estimate spillover effects from sports stadiums to capture external effects capitalized into residential property values. While studies of stadiums on employment, wage, and wealth effects are largely consistent, estimates of stadium effects on property values are mixed, with some studies finding positive effects on nearby home prices that diminish with distance, while fewer studies identify negative effects.

Tu (2005) examines the relocation of Washington, DC's professional football team to the suburb of Landover, Maryland, six miles away from its previous stadium. This relocation is similar to ANLBC's move to from a downtown area to a suburban community; however, it differs in the fact that professional football teams host eight regular-season games a year, which is far fewer than the MLB standard of 81 games. The study finds that residential properties near the stadium increased more in value than locations further away following the stadium's announcement, and further increased after opening. Humphreys and Feng (2012) use a hedonic housing price model to estimate the correlation between stadium proximity median house value by census block using a large sample of US stadiums hosting major-league professional sports teams for baseball, basketball, hockey, and football. The authors identify housing values negatively correlated with distance,

which indicates the existence of positive externalities from stadiums. Ahlfeldt and Kavetsos (2014) examines changes in residential home prices near two London, England soccer stadiums that were replaced by new stadiums in the same or nearby locations. The study identifies increased property values upon the stadiums' construction announcements that vary with characteristics of the stadiums. Feng and Humphreys (2018) examine home sale prices in Columbus, Ohio following the construction of two new professional hockey and soccer stadiums in the city's center. Estimates identify positive impacts on housing values close to both stadiums that decays with distance.

Dehring, Depken, and Ward (2007) examines changes in residential property values following announcements of proposed professional football stadiums in the Dallas-Fort Worth metro-area. The analysis considers multiple announcements for two sites, which had differing impacts. Announcements regarding a relocation to downtown Dallas increased property values, and property values declined when the relocation site was abandoned. However, subsequent announcements that the suburb of Arlington, Texas would host the team (which it would do) decreased property values by an amount that is roughly consistent with the added tax burden to fund the public contribution to the stadium. Humphreys and Nowak (2017) uses a different approach by examining the change in property values in areas that lost professional basketball teams in Seattle, Washington and Charlotte, North Carolina. The authors identify increased residential property values in the host neighborhoods of both cities after losing the teams, which indicates that the arenas generated disamenities to the surrounding communities.<sup>7</sup>

A shared trait of these studies is that they use residential home sales to measure changes in property values; however, housing prices likely are not the most appropriate metric for measuring the capitalized economic impact on business activity. While home prices reflect the opportunity cost of land, which includes commercial operations, zoning restrictions and structural inertia limit their ability capture business spillovers. Home prices also reflect intangible amenities from living near the stadium that may not be applicable to

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<sup>7</sup> Proximity effects have also been identified among voters, which reflects resident preferences. Coates and Humphreys (2006) identifies voter preferences associated with proximity to new sports facilities, indicating positive spillovers for residents. Ahlfeldt and Maenning (2012) find voters prefer sports stadiums at alternate sites further away from their homes.

business. Thus, residential property may not properly capture spillovers that primarily accrue to commercial activity that would drive the hypothesized economic growth that is touted by proponents of stadium subsidies.

To my knowledge, only one study has examined the effect of a sports venue on commercial property. Propheter (2018) examines commercial rental income surrounding a professional basketball arena in Brooklyn, New York, finding that the value of rental space increased closer to the area after it opened, indicating increased business revenue from economic activity related to the venue. However, Brooklyn (a borough of New York City) is unique among US cities and differs considerably from unincorporated Cobb County.

This study similarly studies stadium impacts on commercial property by focusing on a activity in a BID. While CIDs do include domiciles within their geographic boundaries, they are organized primarily to facilitate commerce by their nature. Changes in CID property values should better reflect the economic effects of the stadium on business activity than residential property. In Georgia, commercial property is assessed annually for the purpose of collecting taxes in the district. Thus, I use the state's property assessments of CID commercial property as the primary measure of CID property values.

### 3.2 Basic Comparison

If Truist Park confers development externalities on surrounding businesses, then property values should increase (positive) or decrease (negative) relative to other CIDs following the introduction of the stadium. I begin with simple comparison of changes in property values over time, which does not indicate a positive impact. Figure 2 maps the percentage difference in assessed property value since 2016—the year prior to Truist Park's opening—from 2010-2019. Cumberland's property value growth is unremarkable among CIDs. Figure 3 reports the linear growth path for Cumberland compared to the average of other CIDs since 2016, which shows that Cumberland grew at a slower rate than other CIDs. Thus, a simple comparison of Cumberland to other metro-Atlanta CIDs does not indicate an increase in business activity that was not experienced by the other districts.

Figure 2. Percent Difference in CID Property Values Relative to 2016

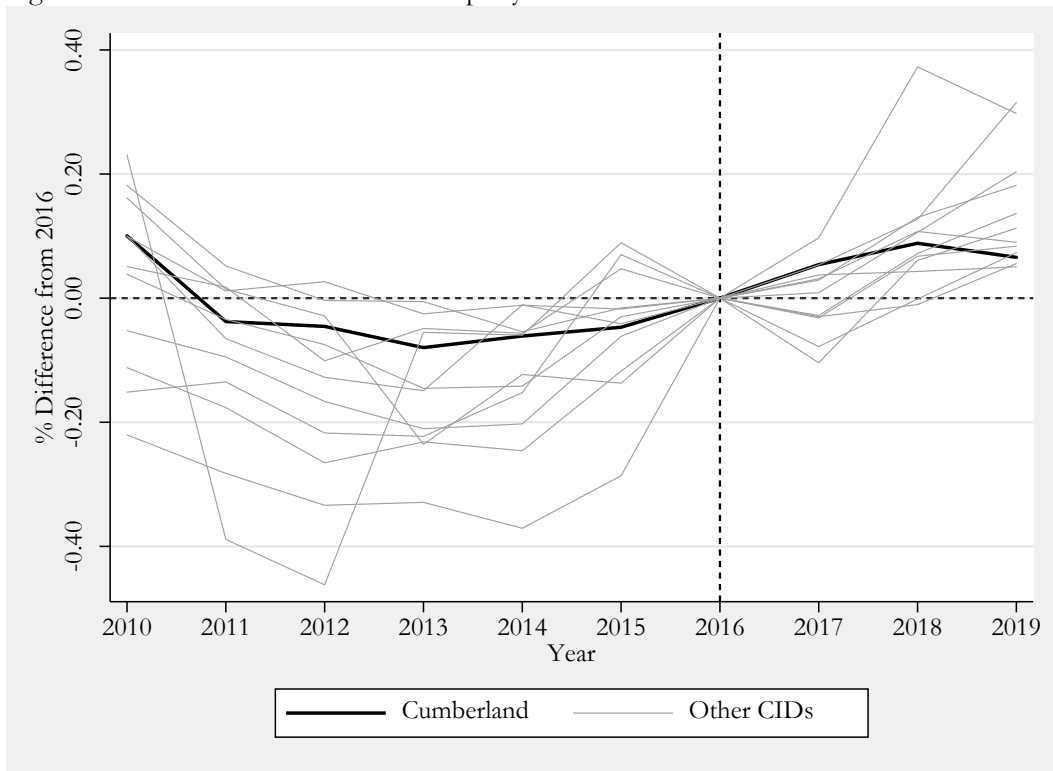
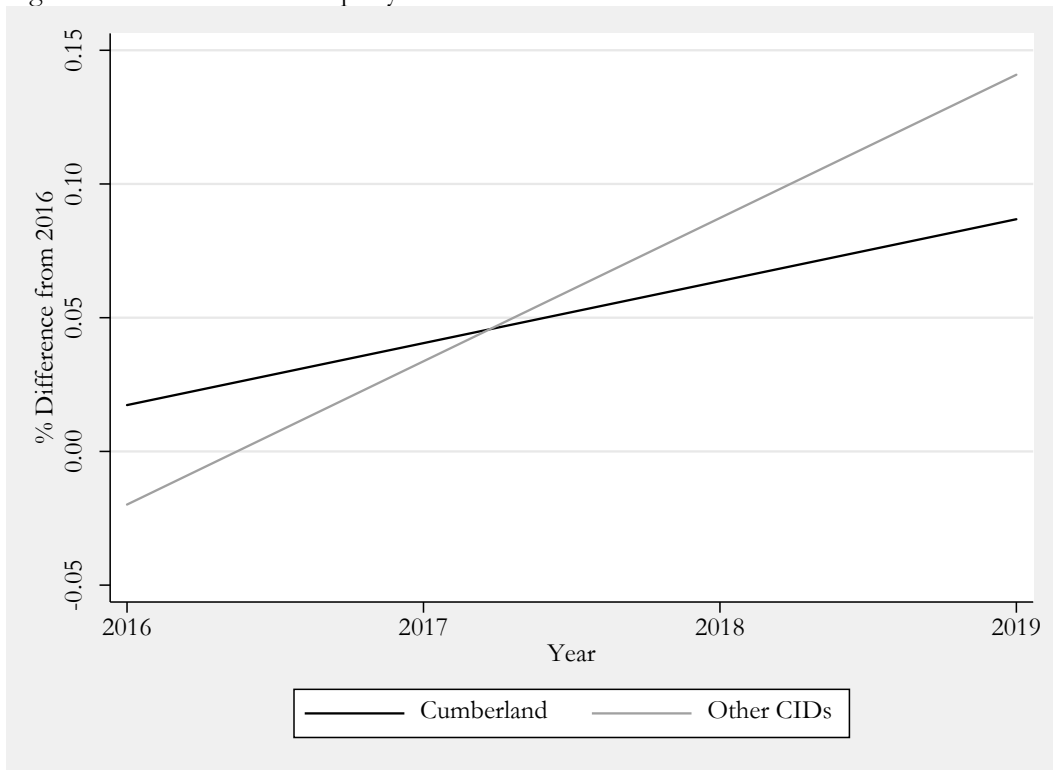


Figure 3. CID Growth in Property Values Since 2016



### 3.3 Synthetic Control Method

The synthetic control method (SCM) is an analytical method designed to elicit causal inference from interventions through a case study that accounts for relevant characteristics of the treated unit. SCM was developed by Abadie and Gardeazabal (2003) and furthered by Abadie, Diamond, and Hainmueller (2010 and 2015). Athey and Imbens (2017) describes SCM as “arguably the most important innovation in the policy evaluation literature in the last 15 years,” because it builds a counterfactual comparison more similar to the treated observation than a single control unit or the mean of multiple units (p. 9). In the context of the economic impact of sports franchises on local economies, Islam (2019) uses SCM to examine the impact of a city adding a professional football team on employment growth, finding little positive impact.

SCM is a generalization of difference-in-differences in comparing observations before and after a treatment. SCM uses observations of similar units not receiving a treatment to serve as control observations to construct a hypothetical counterfactual untreated unit to estimate what the expected outcome would be without the intervention. Characteristics of donor units are compared to the treated unit prior to receiving the treatment in order to select appropriate units and weights to estimate a post-treatment period outcome if the intervention had not occurred. If the treated unit experiences outcomes that are markedly different than the counterfactual estimate, it indicates that the intervention was a likely cause of the difference. In this case, the addition of a new ballpark development to Cumberland CID is the treatment being evaluated.

The placement of Truist Park in a defined business district provides a natural donor pool of metro-Atlanta districts to construct a synthetic Cumberland CID that did not receive the treatment of a new MLB stadium-anchored development. Like Cumberland, untreated CIDs are self-taxing districts created for the purpose of promoting business endeavors within their borders and represent potential alternate hosts for the ballpark; therefore, changes these districts without a stadium provide insight as to how Cumberland CID property would have been valued without a ballpark.<sup>8</sup>

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<sup>8</sup> ANLBC’s President and Director of Development Mike Plant stated that the organization considered other “north metro” options for a stadium site. He provided one example of a location in Doraville, Georgia, which is located near the Perimeter and Gateway 85 CIDs. (Marietta Daily Journal 2019, A6).

I use the real value per acre of CIDs as the dependent variable. Normalizing the assessed value by CID acreage accounts for differences in the physical sizes of CIDs. Mean value per acre varies considerably among CIDs, ranging from \$10,000 to \$2.4 million with a mean of \$738,576 and median of \$290,731. Cumberland’s value per acre of \$296,034 lies in the middle of the districts and is similar to the other CIDs for the other variables as well. I use several variables measuring economic conditions to select the donor regions to contribute to the synthetic counterfactual CID. Table 2 reports their means during the entire sample period.

Table 2. Sample CID Means of Independent Variables

CID	Value per Acre	Commercial (%)	Millage Rate	County Value per Acre	Ln (Income per Capita)
<b>Cumberland</b>	<b>\$296,034</b>	<b>99.98%</b>	<b>36.065</b>	<b>\$159,463</b>	<b>\$10.821</b>
Buckhead	\$1,850,500	98.20%	46.818	\$185,643	\$11.339
Downtown	\$1,924,512	98.57%	48.818	\$185,643	\$10.256
Evermore	\$104,778	82.34%	39.794	\$124,170	\$10.349
Gateway 85	\$39,794	93.57%	39.794	\$124,170	\$9.876
Lilburn	\$9,969	95.02%	42.824	\$124,170	\$10.026
Midtown	\$2,431,491	99.49%	48.818	\$185,643	\$10.849
North Fulton	\$285,427	95.38%	37.800	\$185,643	\$10.740
Perimeter-Dekalb	\$952,615	99.58%	44.400	\$159,330	\$10.956
Perimeter-Fulton	\$784,821	100.00%	37.781	\$185,643	\$10.871
South Fulton	\$29,689	47.19%	41.541	\$185,643	\$10.091
Town Center	\$153,287	99.41%	34.455	\$159,463	\$10.249
			<i>All CIDs</i>		
Mean	\$738,576	92.39%	41.576	\$163,718	\$10.535
Median	\$290,731	98.39%	40.668	\$172,553	\$10.545
			<i>Non-Cumberland CIDs</i>		
Mean	\$778,807	91.70%	42.077	\$164,105	\$10.509
Median	\$285,427	98.20%	41.541	\$185,643	\$10.349

Financial values expressed in 2018 dollars.

Georgia’s CIDs were developed to facilitate commercial activity to fund public goods such as accessibility, noise control, and congestion management in primarily commercial districts. Though CIDs serve mostly retail and wholesale business, some CIDs have significant industrial components. The Georgia Department of Revenue classifies property values by codes, including commercial property, which it defines as “all real and personal property utilized as a business unit the primary nature of which is the exchange of goods and services at either the wholesale or retail level” (DOR 2017). The percent of the CID’s gross digest value classified as commercial accounts for the concentration of commercial activity in the district.

There are many local government units throughout metro-Atlanta, each offering an array of government services for varying levels of taxes. Local government units primarily raise funds through property taxes, and it is the sole tax instrument that CIDs can use to fund their endeavors. The cumulative property tax rate on CID property in each district reflects the cost that property owners must pay, and government services provided in the district, which affect property values. Total millage includes taxes levied by counties, cities, CIDs, school systems, and other special service districts.<sup>9</sup> During the sample, cumulative millage rates within CIDs ranged from 33.50 to 50.46 mills, with an average rate of 41.51 mills.

Table 3 reports the total tax rates in mills by CID and year and separated by county. Cobb CIDs' total millage rates are lower than CIDs in other metro-Atlanta counties; however, Cumberland's total millage rate increased above Town Center's millage in 2014 when a special tax was instituted on property that includes the CID to assist with funding the stadium (discussed in Section 5).

Table 3. Local Property Tax Millage by CID and Year

CID	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Mean
<i>Cobb</i>											
Cumberland	33.500	35.010	35.010	34.810	37.310	37.010	36.200	36.200	37.800	37.800	36.065
Town Center	33.500	35.010	35.010	34.810	33.610	34.410	33.750	33.750	35.350	35.350	34.455
<i>DeKalb</i>											
Perimeter-DeKalb	42.120	44.540	47.800	46.970	44.290	45.140	42.680	43.327	43.695	43.434	44.400
<i>Fulton</i> <sup>†</sup>											
Buckhead	46.415	46.685	48.455	46.471	48.240	47.468	47.265	47.366		44.089	46.939
Downtown	48.415	48.685	50.455	48.471	50.240	49.468	49.265	49.366		46.089	48.939
Midtown	48.415	48.685	50.455	48.471	50.240	49.468	49.265	49.366		46.089	48.939
North Fulton	37.533	37.803	37.803	37.733	39.302	38.002	37.933	37.926		36.665	37.856
Perimeter-Fulton	37.514	37.784	37.784	37.714	39.283	37.983	37.914	37.907		36.646	37.837
South Fulton	39.283	41.983	42.033	41.683	43.372	41.982	41.749	41.742		40.475	41.589
<i>Gwinnett</i>											
Evermore	38.800	38.570	38.570	40.600	40.600	40.429	40.026	40.360	40.069	39.919	39.794
Gateway 85	38.800	38.570	38.570	40.600	40.600	40.429	40.026	40.360	40.069	39.919	39.794
Lilburn	43.060	42.830	43.020	43.090	43.090	42.899	42.496	42.830	42.539	42.389	42.824

<sup>†</sup>2018 reporting of Fulton assessments is incomplete. Fulton 2018 millage rates are interpolated.

To account for the changes in the property value in the region surrounding the CID, I include the total

<sup>9</sup> Georgia collected state property tax until 2015. Because the state millage rate was uniform across all property in the state, I do not include it as a part of the millage rate. Fulton County reporting of tax assessments for 2018 is incomplete; therefore, millage rates are interpolated for this year.

assessed value per acre for all property in the county hosting the CID. I also include the log of income per capita of each CID to proxy the wealth of residents living in the CID. Income estimates were collected from all census tracts that overlapped with each CID.

Following Abadie, Diamond, and Hainmueller (2010), I include several lags of the dependent variable to capture information unique to each CID that is not captured by the covariates. I consider several lag specifications, but the best model includes the lags of assessed value per acre in 2010, 2013, and 2016—which are the beginning, middle, and end of the pre-treatment sample—as well as the average of all three years.

SCM estimates the counterfactual value per acre in the Cumberland CID by selecting a weighted group of donor control CIDs that resemble Cumberland’s actual value per acre prior to the treatment of Truist Park. The algorithm selects donor units and variable weights that minimize the root mean squared prediction error (RMSPE) of the pre-treatment outcomes.<sup>10</sup>

## 4. Results

### 4.1 Counterfactual Comparisons

The algorithm for constructing the synthetic control selects its weights from four CIDs: Midtown, Perimeter-DeKalb, Perimeter-Fulton, and Town Center. Midtown is a business district within the heart of the city center, just to the north of downtown. Like Cumberland, the adjacent Perimeter CIDs (in their respective counties) are located at junction of Interstate-285 (the city’s outer-belt interstate colloquially known as “the Perimeter”) and another major highway (State Road 400) on the edge of the city of Atlanta. Town Center lies farther from the city center than Cumberland along Interstate-75 at the junction with spur route Interstate-575. Town Center is in Cobb County, where its inhabitants are subject to similar taxes and services. The selected control units share many qualities with Cumberland and appear to be appropriate for estimating counterfactual performance. Table 4 reports the pre-treatment means for Cumberland, its synthetic

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<sup>10</sup> I use the computer program Synth for Stata developed by SCM developers to estimate the counterfactual Cumberland CID value per acre (Abadie, Diamond, and Hainmueller 2011).



counterpart, and all other CIDs. The synthetic estimate is superior to the average of all CIDs and closely resembles Cumberland.

Table 4. Pre-Treatment Means for Treated, Synthetic, and All Non-Treated CIDs

	Cumberland CID		Mean of 11 Control CIDs
	Treated	Synthetic	
Commercial %	0.9997	0.9929	0.9198
Millage Rate	35.550	35.619	42.266
County Value per Acre	152,979	154,090	156,268
Ln (Income per Capita)	10.808	10.330	10.500
Value per Acre (2010)	324,541	319,855	836,392
Value per Acre (2013)	271,408	267,467	694,001
Value per Acre (2016)	294,911	291,992	793,135
Value per Acre (2010, 2013, 2016)	296,953	293,105	774,509

Figure 4 maps Cumberland’s actual value per acre over time along with its counterfactual estimate. The vertical short-dashed line marks the opening of Truist Park in 2017. The stadium hosted its first exhibition game on March 31. Select businesses in the associated development opened to the public after that and the team hosted its first regular season game on April 14. Businesses in the surrounding development opened up over the course of the year, and The Battery Atlanta development was 50-percent operational by then end of 2017 (Gargis 2017).

During the pre-treatment period, the actual and synthetic property values move together, declining during the first three years of the decade and increasing after that. Following the stadium opening in 2017, their growth paths diverge, with property values in synthetic Cumberland increasing above observed property values. CID property values in Cumberland actually declined in 2019, two years after the stadium opened. Figure 5 presents the annual differences between observed and synthetic values, which highlights the divergence. The average post-treatment predicted gap was approximately -\$16,000, and by 2019, the predicted gap was -\$35,000.

Figure 4. Observed and Synthetic Cumberland CID Property Values

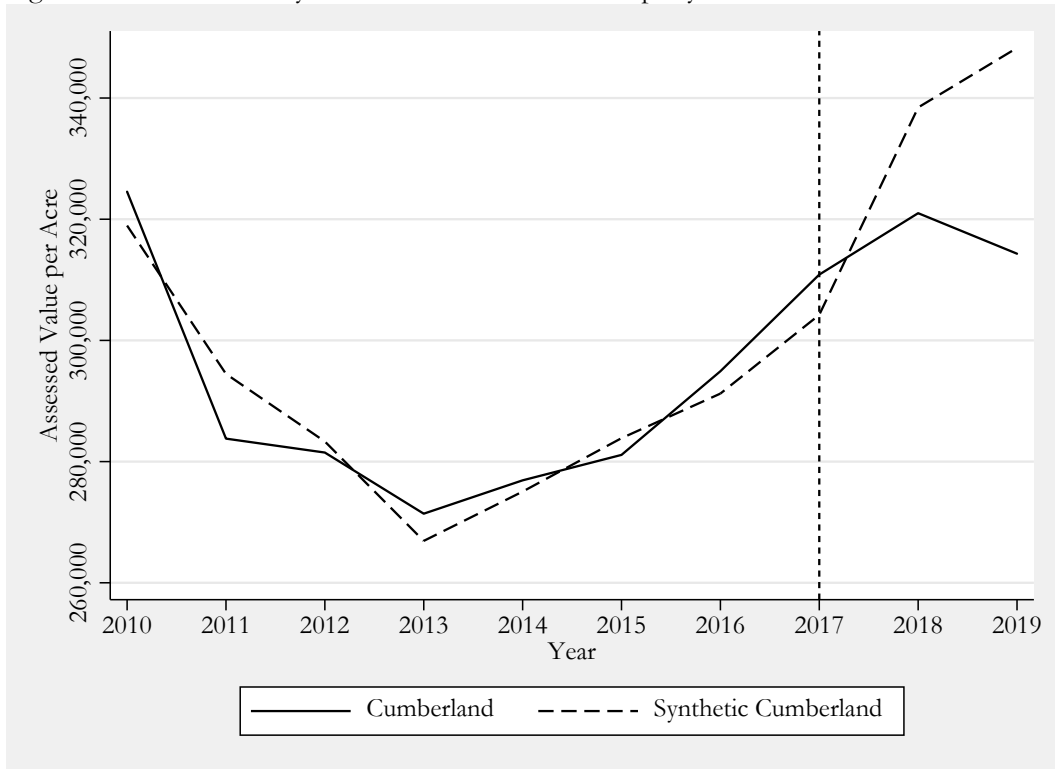
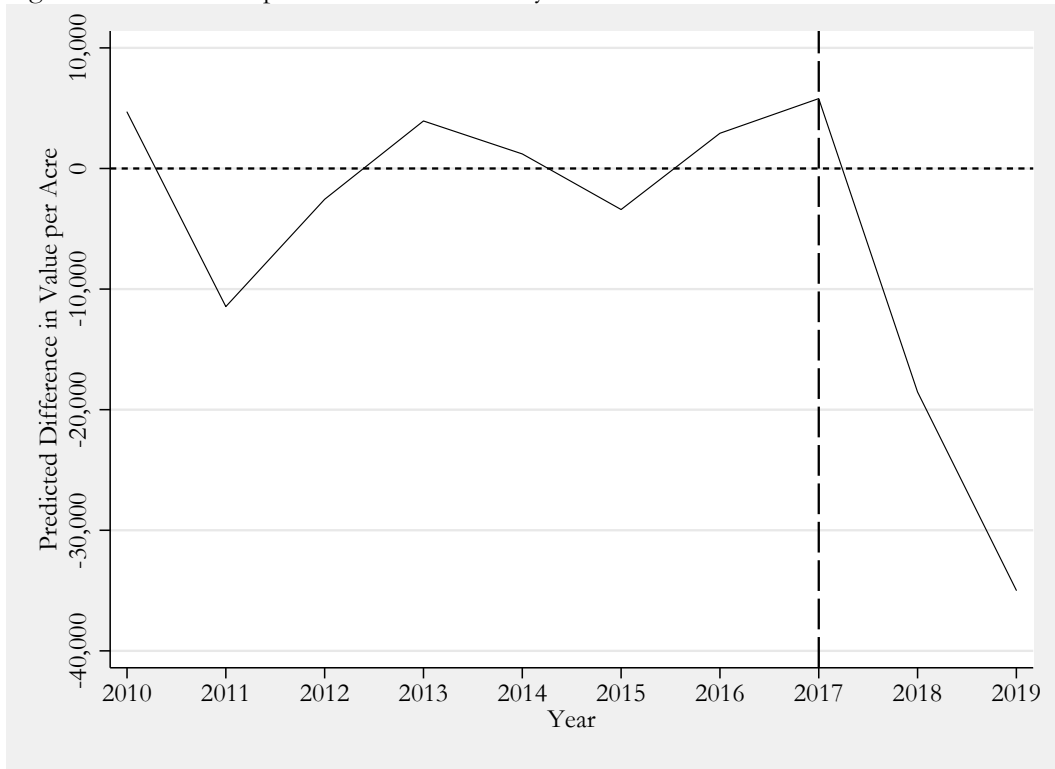


Figure 5. Predicted Gap Between Actual and Synthetic Cumberland CID



The difference in property values indicates that the presence of the stadium development lowered property values in Cumberland over what they would otherwise have been absent the stadium. The negative gap is not consistent with positive development spillovers and indicates a devaluation of nearby property in the district, contrary to the assertion of stadium proponents.

#### 4.2 Robustness

To be certain that the estimates are not an artifact of model specification, I consider estimates using alternate covariates. Table 5 reports the donor and covariate weights for several models to permit comparisons between different covariate groups. The models presented are representative of available models to convey the general impact of the variable choices on donor and covariate weights. The weighting of units and covariates are affected by covariates chosen; however, the general findings do not differ greatly across specifications. The estimates in Figures 4 and 5 are based on Model 1. I discuss several alternate specifications of covariates for estimating the synthetic Cumberland below, and I explain why Model 1 is preferred.

Model 1 has the second lowest RMSPE and is constructed from four donor CIDs. Town Center bears the greatest weight, which is unsurprising given that the CID is also in Cobb County. Model 2 is similar, but it uses the mean of value per acre during the entire pre-treatment period instead of the mean of the 2010 (beginning), 2013 (middle), and 2016 (end) observations. It includes one additional donor CID (Downtown), but its weighting is only one percent. It has the lowest RMSPE of the models, which might make it a superior specification choice; however, 98.98 percent of covariate weights are determined by the lags, which means the counterfactual is determined almost entirely by past value per acre without consideration of the CIDs' economic factors. Its post-treatment gap is only slightly less than the selected specification. Model 1 is preferable, because it predicts nearly as well as Model 2 and its estimates derive from both the economic (40 percent) and lagged (60 percent) covariates.

Model 3 uses only dependent variable lags as covariates, which results in all districts in the donor pool being selected as donor units. The lags-only estimate produces the highest RMSPE of the models and predicts a negative gap that exceeds Model 1.

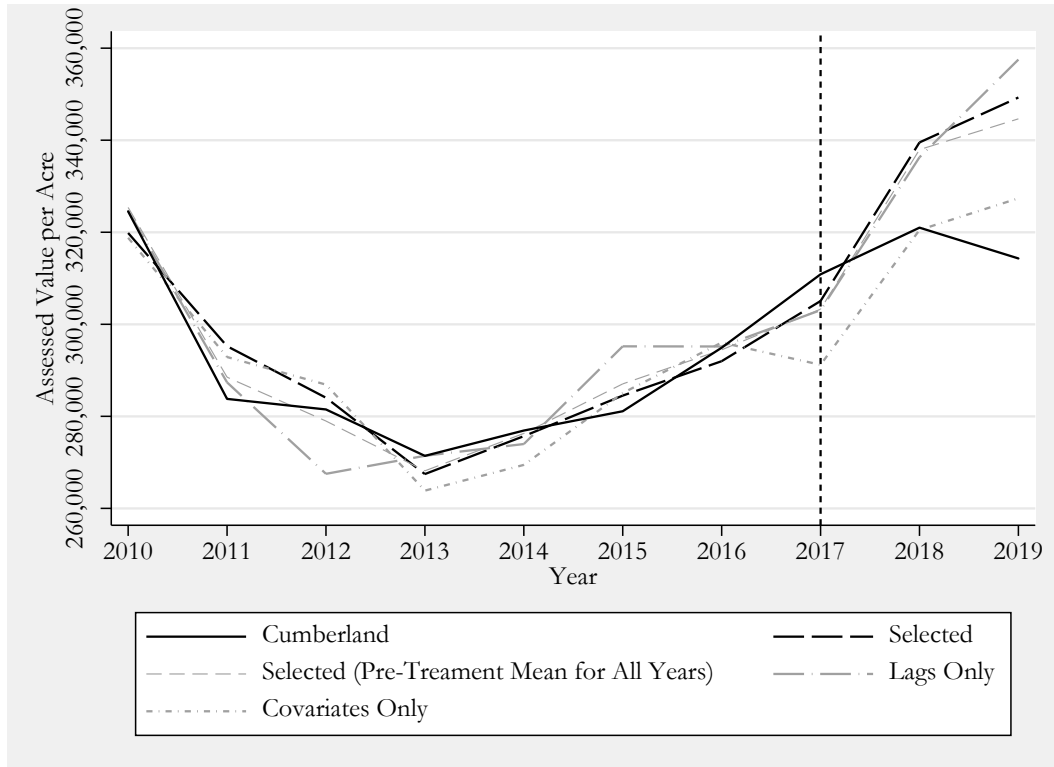
Table 5. Donor and Covariate Weights for Alternate Synthetic Counterfactual Estimates

	1 Selected	2 Mean of All Pre- Treatment Years	3 Pre-Treatment Lags Only	4 Covariates Only	5 Alternate 2014 Treatment
<i>CID Donor Weights</i>					
Buckhead	0	0	0.007	0	0
Downtown	0	0.01	0.013	0	0.011
Evermore	0	0	0.555	0.037	0
Gateway 85	0	0	0.026	0	0
Lilburn	0	0	0.001	0	0
Midtown	0.035	0.021	0.041	0	0.036
North Fulton	0	0	0.019	0	0
Perimeter-DeKalb	0.068	0.065	0.042	0.036	0.059
Perimeter-Fulton	0.022	0.047	0.023	0.182	0.002
South Fulton	0	0	0.009	0	0
Town Center	0.875	0.857	0.265	0.745	0.893
<i>Covariate Weights</i>					
Commercial %	0.1786	0.0002		4.98E-05	0.0007
Millage Rate	0.1664	2.39E-09		0.9999	0.0004
County Value per Acre	0.0541	1.02E-05		5.67E-05	0.0026
Ln (Income per Capita)	0.0009	1.37E-10		8.75E-06	2.25E-05
Value per Acre (2010)	0.0608	0.3123	0.5054		0.7044
Value per Acre (2013)	0.1196	0.0005	0.4693		0.2919
Value per Acre (2016)	0.3647	0.0033	0.0170		
Value per Acre (2010, 2013, 2016)	0.0549				
Value per Acre (2010-2016)		0.6836	0.0083		
Value per Acre (2010, 2013)					5.88E-05
RMSPE	5,256	3,197	7,721	6,262	3,404
2019 Predicted Gap	-\$34,981	-\$30,340	-\$43,219	-\$13,063	
Post-Treatment Mean Gap (2017-2019)	-\$15,907	-\$13,241	-\$16,910	\$2,369	

Model 4 excludes all dependent variable lags and uses only the economic characteristics as covariates. It selects four CIDs from the donor pool, replacing Midtown with Evermore, and weighting Perimeter-Fulton more and Town Center less than Model 1. This model predicts lower property values for synthetic Cumberland in 2019; however, it does not predict as well as the selected model as it has the second-highest RMSPE. Furthermore, examination of the covariate weights reveals that its synthetic Cumberland is constructed almost entirely based on the millage rate (99.99 percent).

Figure 6 maps the actual value per acre and synthetic estimates for Cumberland CID in comparison to the different covariate specifications reported in Models 1 through 4. All alternate specifications estimate synthetic property values exceeding the actual property values by 2019, and the synthetic estimates do not differ greatly by covariate choice.

Figure 6. Comparison of Alternate Synthetic Counterfactual Estimates



Another important consideration is the timing of the treatment. Though the stadium opened in early-2017, its construction was unexpectedly announced in November 2013.<sup>11</sup> If the externalities were accurately anticipated, then the values should diverge when the stadium development was announced rather than upon opening. Thus, the change in value may have been capitalized into the value of property prior to 2017.

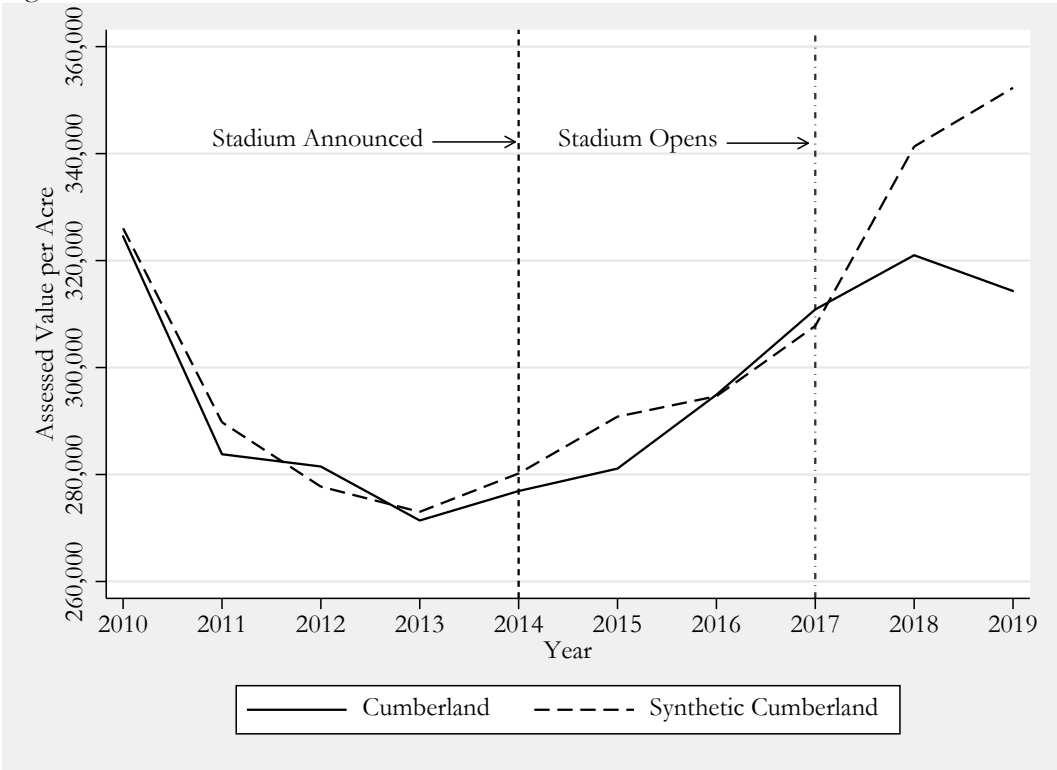
Previous studies have identified capitalization effects from announcements prior to stadium completion

<sup>11</sup> The announcement was sudden and unanticipated. ANLBC planned its move in secret and did not declare the move until the official announcement on November 11, 2013. At the time, the team had played in a relatively new stadium for only 16 years, and management had not discussed exploring moving to a new stadium publicly.

(Ahlfeldt and Kavetsos 2014, Dehring, Depken, and Ward 2007, and Tu 2005); hence, the true treatment period may pre-date the stadium opening in 2017. 2014 is the first year of property assessment following the announcement of Truist Park’s construction; therefore, I estimate an alternate counterfactual comparison using 2014 as the year the treatment was implemented.

Model 5 in Table 5 reports the weights using the 2014 as the beginning of the treatment period. The algorithm selects the same four donor CIDs employed in Model 1 plus Downtown (identical to Model 2). Figure 7 maps the comparison, which shows the actual and synthetic property values remain similar after 2014 before the prediction gap widens following 2017. The timing of the divergence has two implications.

Figure 7. Alternate 2014 Treatment

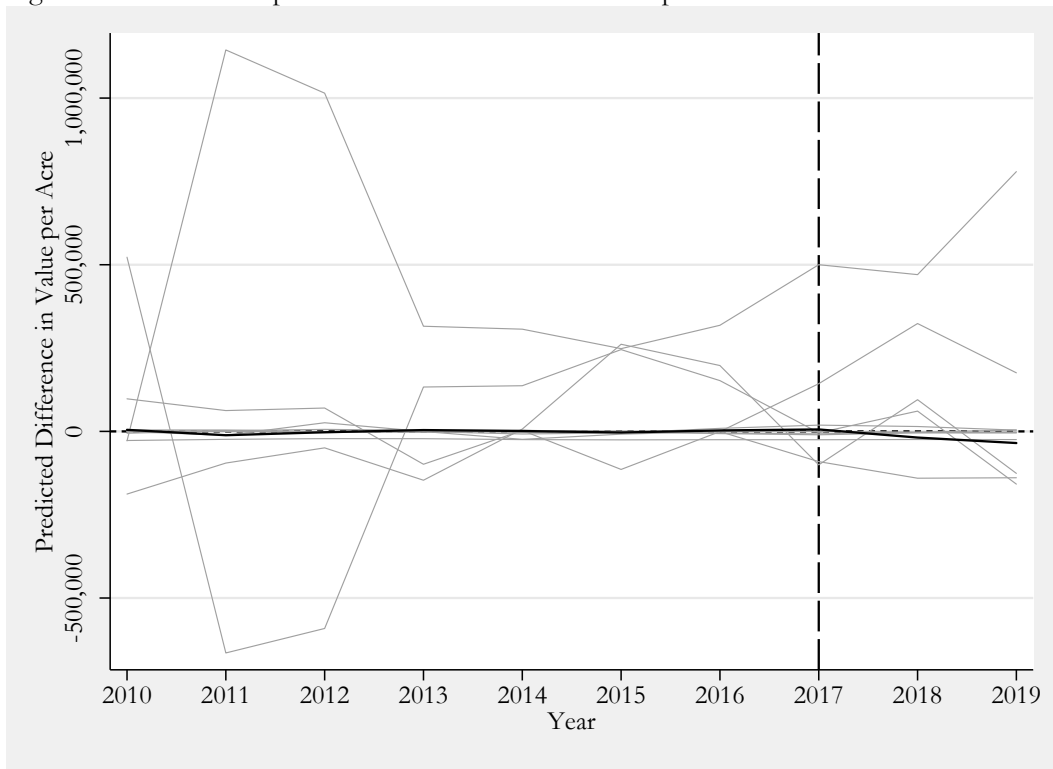


First, the divergence in timing indicates that the negative effect of the new stadium does not appear to have been capitalized into commercial property until after the stadium opened. The delay may be due to the uncertainty regarding how the stadium would impact surrounding businesses in the suburban location. Also, Tu (2005) finds an additional property value effect post-opening in addition to the announcement effect.

Second, the alternate estimate provides a robustness check similar to the “in-time placebo” treatment suggested by Abadie, Diamond, and Hainmueller (2015). In their study estimating the economic consequences of reuniting East and West Germany, the authors select a treatment year that predates reunification to test the predictive power of the model. The synthetic estimate predicts the actual economy well before the premature placebo treatment is implemented, and it continues to predict the economy accurately up until the actual treatment was implemented, which supports the model’s predictive power. Similarly, the synthetic Cumberland generated from economic factors and a donor pool with pre-2014 observations predicts actual property values well after the placebo treatment and until the stadium opened. The prediction gap does not widen until 2017, which indicates that the gap identified following the stadium’s construction was not driven by the model’s lack of prediction power and that it derives from the stadium opening.

Another common robustness check of SCM estimates is an “in-space” placebo test that artificially assigns the treatment to the untreated donor units—in this case, non-Cumberland CIDs—to observe responses in comparison to the true treatment unit. This allows for the comparison of the stadium’s impact on Cumberland to the response exhibited by the other CIDs not receiving the stadium. Figure 8 maps the prediction gaps between observed and synthetic estimates for all CIDs when the placebo treatment is assigned to them. In comparison to the placebo treatments, the Cumberland gap is relatively small both before and after the treatment, even though its post-treatment is gap much more negative relative to the pre-treatment period (as reflected in Figure 4, whose y-axis has a more compact scale). Cumberland’s pre-treatment/post-treatment prediction gap ratio is the second largest among CIDs, which is consistent with a negative treatment effect of the stadium on property values. Cumberland’s response does not appear to be abnormal relative to any other unit receiving a placebo treatment, which is inconsistent with the hypothesized positive impact from the stadium treatment.

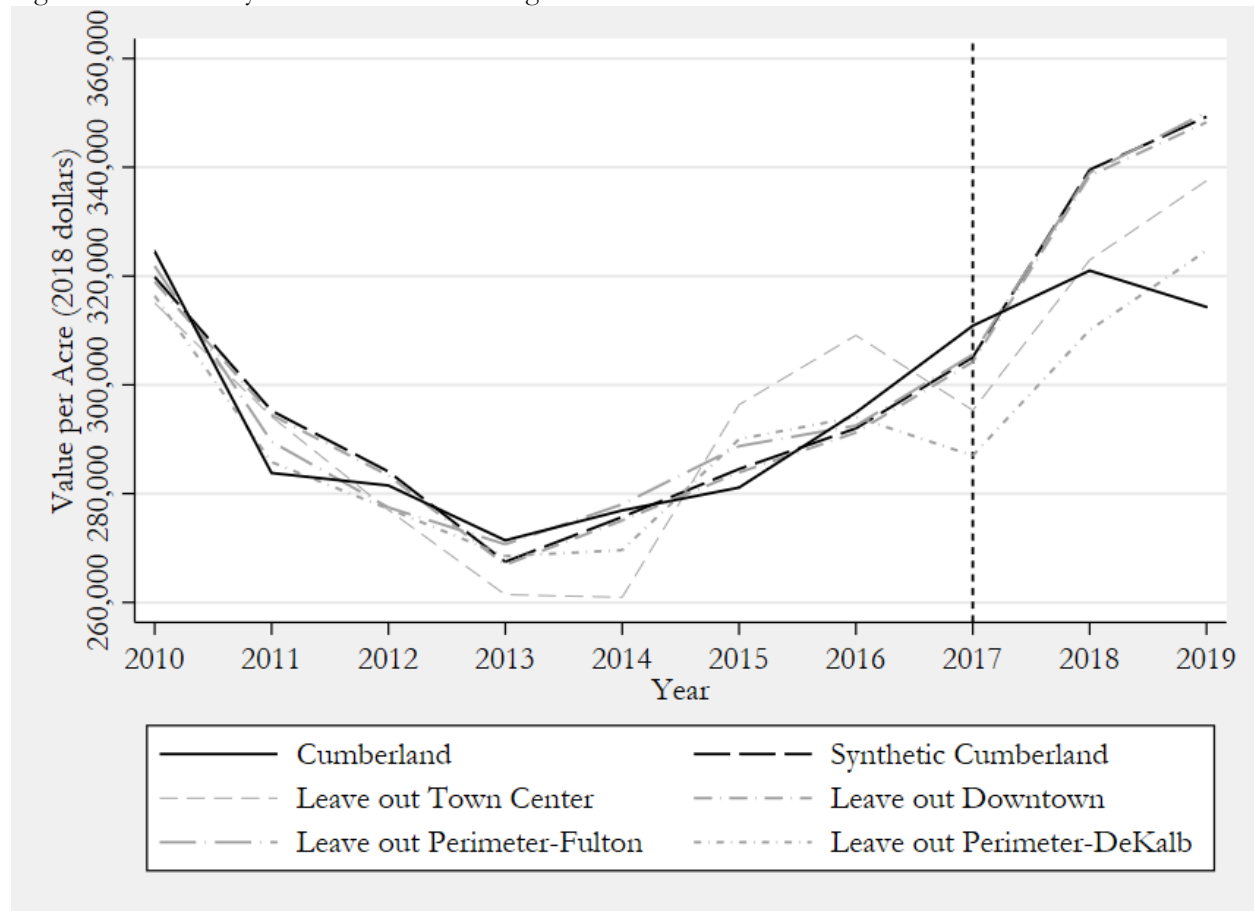
Figure 8. Prediction Gaps of CIDs In-Time Placebo Comparison



As a further robustness check, Abadie, Diamond, and Hainmueller (2015) proposes a “leave-one-out” test to examine the sensitivity of the estimates to changes in donor weights by omitting selected donors from successive estimates to identify how the results might be driven by specific donors. Figure 9 graphs the synthetic Cumberland estimated after omitting each of the selected four donors from the donor pool, one at a time, in separate estimations of the counterfactual. The estimated synthetic Cumberland exceeds the actual property value by 2019 for all donor configurations, which indicates that the observed negative impact does not appear to be particularly sensitive to donor selection. Estimates excluding Town Center and Perimeter-DeKalb result in greater deviations from the preferred synthetic Cumberland than Perimeter-Fulton and Downtown, which is not surprising. These CIDs receive greater weights because they are the most similar to Cumberland; therefore, removing either of them from the donor pool should reduce the goodness of fit.



Figure 9. Alternate Synthetic Controls Leaving One Control Unit Out



In summary, the robustness checks indicate that the negative deviation between actual and synthetic property values appears to be driven by changes in Cumberland and is not an artifact of sample selection or weighting that might come from changes in other CIDs. Furthermore, no positive impact is observed, which indicates that claims of a strong economic impact created by the stadium are not supported by changes in commercial property values. There is also the possibility that some other unobserved factor impacted Cumberland in 2017 relative to other CIDs; however, no omitted factors are obvious. I am not aware of any other factor that would dampen property values in Cumberland CID after 2017.

## 5. Implications

The finding that the opening of Truist Park is associated with a decline in commercial property values around the stadium is consistent with the large literature that finds little to no positive economic impacts on local economies, and some studies have found negative effects. Coates and Humphreys (1999) finds that professional sports franchises are associated with lower levels of per capita income in US cities. Coates and Humphreys (2003) finds that while professional sports may have a small positive effect on wages in the amusements and recreation sector, the gains are offset by decreased earnings in other sectors, which indicates the associated activity may crowd out other industries with higher multipliers, ultimately reducing overall economic activity.

Humphreys and Zhou (2015) demonstrates that new stadiums can incentivize business entry and exit, depending on the area's composition. Businesses without complementarities to baseball and the associated retail development would likely experience disrupted business from the area hosting 81 regular season games per year plus additional events. Harger, Humphreys, and Ross (2016) examine stadium openings in 12 US cities and find no evidence of new business openings and weak employment effects in food and beverage establishments that are limited to within one mile of the venue. The results indicate that stadiums do not appear to have strong agglomeration effects for related commercial activity. In addition, sports events are associated with negative externalities of crime (Yu et al. 2016, Pyun 2018), and traffic (Humphreys and Pyun 2018) that can harm commercial activity. Thus, the new park may have crowded out existing businesses that did not complement the stadium and associated development's function, and new establishments were not sufficient to offset the losses.

Cumberland was designed as a business district, which is why it organized as a CID, and not an entertainment district. Around the time the stadium development was announced, approximately three-fourths of commercial building space in the district was devoted to offices, with retail, hotels, and restaurants covering less than a quarter of the remaining space (Georgia Tech 2012). The negative shock from Truist Park on

Cumberland CID property indicates that BIDs may not be ideal locations for sports stadiums, and that professional sports venues may disrupt existing commercial activities that surround them.

Subsidies to fund the stadium are ultimately borne by taxpayers, and in Cobb County the largest share of tax burden was felt by Cumberland CID properties. In addition to county general fund and CID taxes, taxpayers near the stadium faced the addition of special service district (SSD) taxes on property and an additional hotel tax. The increased tax burden likely incentivized some businesses to leave the district, thereby lowering property values. Dehring, Depken, and Ward (2007) estimates that the decline in residential property values in Arlington, Texas was similar to the added local sales tax burden implemented to fund the new stadium. And though Tu (2005) identifies positive impacts on property values from a football stadium in Landover, Maryland, the stadium was largely privately funded, with a state-level subsidy; therefore, nearby residents did not experience a corresponding localized increased tax burden that might lower property values close to the stadium relative to property further away.

A unique attribute of using CIDs as the unit of analysis is the applicability to commercial economic development, particularly in a suburban environment and a business district to capture spillovers from new stadium projects on the broader economy via a multiplier. Some previous analyses that use residential home prices to capture spillover effects on surrounding property indicate that residents may value proximity to stadiums. Perhaps, the negative impact on commercial property identified in Cumberland does not translate to residential property.

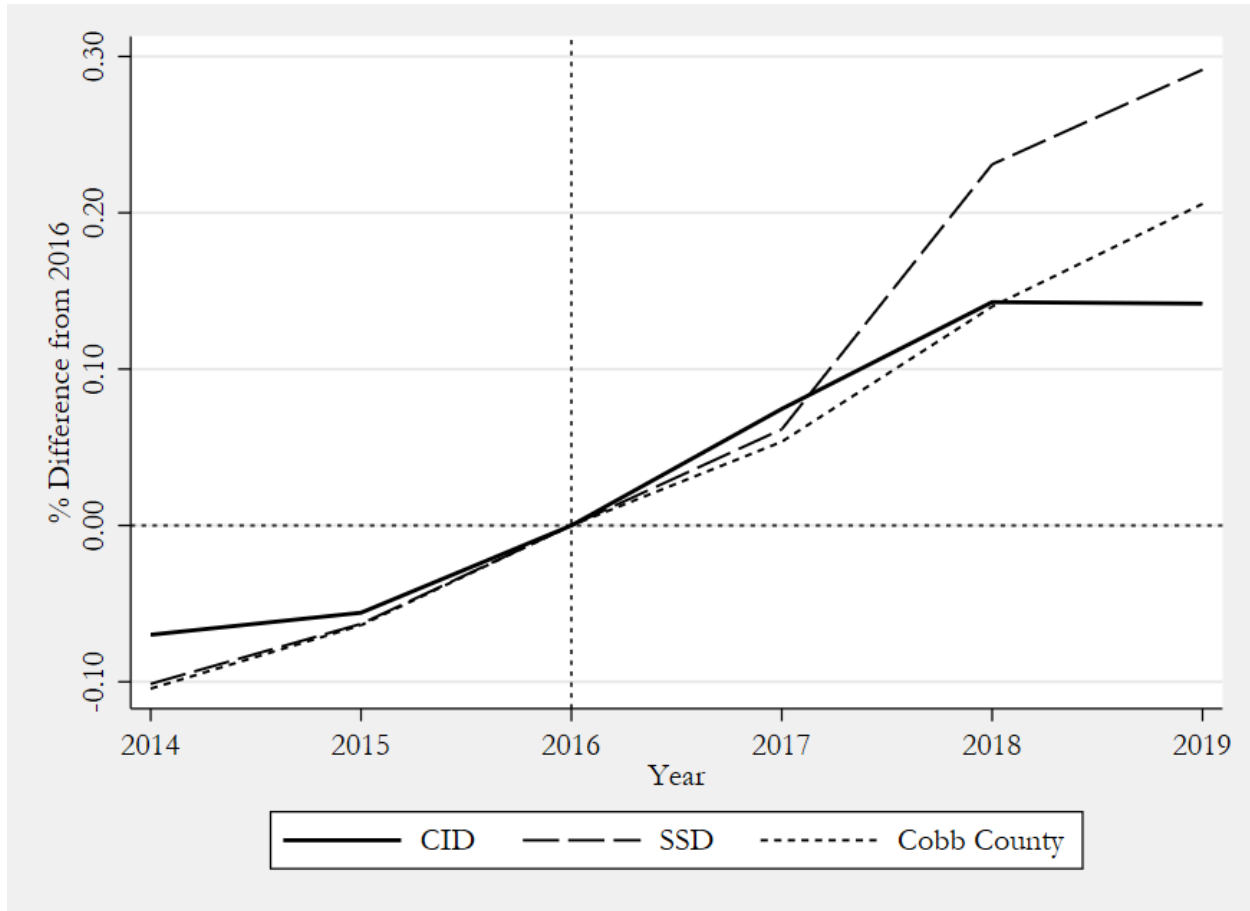
Though CIDs are explicitly forbidden from taxing residential properties within their boundaries—thus excluding them from the districts’ tax digests and the SCM estimates—Cobb County instituted a new concurrent tax on district residents through the creation of a special tax district (SSD) to help fund the stadium. The SSD’s borders largely overlap with Cumberland CID, and its taxes do apply to some residential property that is not taxed by the CID. The SSD boundaries were drawn to include multifamily residential properties (i.e., apartment complexes) expected to benefit from the stadium’s construction but excludes single-family and owner-occupied residential properties (Kuhn et al, 2017). Around the time the SSD was

created, approximately 80 percent of housing in the Cumberland area was multifamily housing, which represents 37 percent of the property within the CID boundary (Georgia Tech 2012).

The SSD's millage was intended to be 3 mills; however, it was set at 2.7 mills upon implementation and reduced to 2.45 mills by 2016. Cumberland CID has operated with its self-imposed maximum allowable millage rate of 5 mills since its inception, and tax revenue from this assessment does not directly fund stadium operations. When the stadium opened in 2017, Cumberland commercial property owners paid an additional millage of 7.45 mills relative to properties in unincorporated Cobb County outside a CID. The first Cumberland SSD assessments were recorded in 2014, and other CIDs lack similar SSDs for comparison; therefore, there are not sufficient observations to conduct rigorous pre- and post-treatment comparative analysis. However, comparisons with property growth of the Cumberland CID and Cobb County provide some indication of how commercial and residential properties may have capitalized the stadium's value differently.

Figure 10 maps the change in total assessed property value of the Cumberland CID and Cobb County in comparison to the Cumberland SSD as a percent of their 2016 values (the year prior to the stadium opening). From 2014 to 2017, the jurisdictions' property values increased at similar rates. In 2018, SSD values experienced a discrete jump and then continued to increase at the same rate as Cobb in 2019. CID properties did not experience the increased growth similar to SSD properties and declined relative to Cobb in 2019. While the data are limited, the divergence indicates that the stadium's negative impact on commercial property values is not evident in the overlapping SSD, which includes residential property.

Figure 10. Tax Digest Growth of Cumberland CID, SSD, and Cobb County



Thus, the finding that commercial property values were dampened following the introduction of a stadium does not necessarily conflict with previous studies that identify positive spillovers from stadiums on residential property and is consistent with findings of minimal economic impact. Matheson (2019) posits, without advocating, that findings of increased property values surrounding stadiums may indicate that stadiums can serve as neighborhood development tools, even if the impacts on the larger region cancel out. Coates (2007) finds that though public benefits and consumer surplus from hosting a stadium may be substantial to residents, estimates indicates that they are not large enough to justify the subsidies to construct stadiums. Amenities from stadiums may be seen as desirable to residents, but this does not necessarily translate into increased business activity. This finding is important, because the hypothesized economic

development benefits from stadiums derive from increased business activity, which should be capitalized into commercial property.

The findings differ from Prophet (2018), which does identify a positive impact of a basketball arena on nearby commercial rents. However, the differences between urban Brooklyn, New York and suburban Cobb County are extensive in terms of population density, transportation, commerce, and culture. The contrasting findings indicate that localized economic impacts of stadiums may differ by case and thus may not be generalizable across all projects. Researchers should be careful to account for local characteristics when making comparisons or predicting economic impacts of sports venues based on previous studies. It also highlights the need for further study of localized economic impacts of sports venues like Harger, Humphreys, and Ross (2016) and Chikish et al. (2019).

Previous studies have also identified changes in property values following announcements of a new stadium that are not evident in Cumberland, where an effect did not manifest until after the stadium opened. It is not clear why the impacts were not anticipated efficiently; however, the uniqueness of the project—moving an existing baseball team from a downtown to a business and retail development in the suburbs—may have created substantial uncertainty. Furthermore, some concern may have been warranted due to the recent move of ANLBC's minor-league Triple-A baseball franchise (Gwinnett Stripers) to Gwinnett County in 2008, which did not produce the promised economic development benefits (Klepal 2014). Negative externalities to existing businesses may not have been apparent until after the team stadium and its corresponding development opened and fully operational. Tu (2005) identifies an additional post-opening impact in addition to an announcement effect, which is consistent with a separate effect from opening that may result from ex-post adjustment, possibly from removed uncertainty.

## 6. Conclusion

Despite scant evidence that sports stadiums are effective drivers of local economic development, localities continue to build and subsidize new venues to stimulate commercial activity. The construction of Truist Park

in suburban Atlanta to host a professional baseball team provides the opportunity to examine the claim that sports stadium development projects promote economic activity. The ballpark's location in a BID (Cumberland CID) for which commercial property is regularly assessed permits a case study comparison to derive causal inference regarding the stadium's economic impact on the surrounding area.

This study uses the synthetic control method to create a counterfactual estimate of commercial property values for Cumberland CID absent the stadium using other metro-Atlanta CIDs. Comparisons estimate that property values fell relative to counterfactual estimates—a result that is robust to specification, control unit selection, and timing. Diminished commercial property values indicate that economic activity declined in the area following the introduction of the ballpark, and thus the hypothesized positive impact of the stadium on the local economy did not come to fruition. This finding is consistent with the vast literature on the economic impact of sports venues and events.

Lindsey (1963) finds that the popular baseball strategy of sacrificing an out with a bunt to advance a baserunner may be counterproductive, lowering the expected runs scored, on average. Similarly, the relative decline in property values surrounding the Truist Park indicates that sacrificing tax dollars to subsidize a baseball stadium appears to have decreased commercial activity rather than increased it. While proponents of subsidizing the Cobb baseball stadium have described it as an economic “home run,” this analysis indicates that the more appropriate baseball analogy is a sacrifice bunt.

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