THE IMPACT OF COMMERCIAL DEVELOPMENT ON SURROUNDING RESIDENTIAL PROPERTY VALUES

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Executive Summary

This study examines the impact of commercial development on surrounding residential property values. The topic is explored utilizing an innovative approach that combines multiple data sources for the Atlanta, Georgia metropolitan area. Residential transaction prices in the neighborhood immediately surrounding a new commercial development are evaluated using a matched sample methodology and hedonic pricing models. Georgia MLS data – totaling over 1.5 million transactions of single-family detached properties – is merged with a registry of commercial property deliveries collected from CoStar Market Reports for Atlanta. CoStar Reports account for project delivery dates and property characteristics, such as property type, building size, category, and precise location.

Development impacts are evaluated at the .5, .75 and 1 mile radius surrounding the site. For each observation of a transaction that occurs within the specified radius, a matched sample is constructed that consists of all transactions from that calendar quarter in the same zip code (but outside the radius) for properties that have the same number of bedrooms, same number of bathrooms and were constructed within five years of the subject property. Only transactions that occur under normal sale conditions are considered. In doing so, the empirical results relate housing values for highly similar assets that are sold inside the radius to those that are sold just outside the radius but in the same zip code, and this comparison is made at all possible points in time relative to the project completion date. Valuation differences for properties sold inside the radius are

available as early as 20 years prior to and up to eight years following development completion. Fixed effects variables are applied to control for differences in submarkets, market timing within submarkets, property-specific physical attributes, and transaction-specific financial conditions – attempting to isolate the component of relative house price change that can be attributed to the introduction of a new commercial development.

Property types for new development considered in this study include industrial, office and retail spanning the period 2006 to 2014. Interactions between housing markets and commercial developments are revealed in the analysis, with project completions treated as an event study. Sites targeted for new industrial development exist in neighborhoods where values are relatively lower and already experiencing a downward trend in advance of the project completion. While price compression continues in the post-completion period, the trajectory is not significantly different than the counterfactual projection (supposing no industrial development had occurred). Industrial is one of the least desirable land uses, so it is not surprising to observe industrial development rights allocated in localities where housing values are on the decline. In close proximity to industrial development sites, a localized contraction in house prices appears during the predevelopment period and this may be the market response to a zoning change that allows the new project to be constructed. However, the focus in this study is on the impact of development completions and, lacking additional information about the particular timing of permitting and approvals, it is difficult to disentangle whether zoning changes cause prices to decline. Or, instead, do zoning changes that favor industrial development occur in areas that already have declining housing values? The sample of industrial developments includes a disproportionate count of large-scale projects (e.g.,

those delivering more than 150,000 square feet of gross leasable area), yet the existing trend is largely unaffected in the period that follows an industrial development completion.

By comparison, site selection for office development occurs in neighborhoods that are relatively more expensive, and at times when values are recently increasing. Post-completion, the trend stabilizes at elevated price points in recipient neighborhoods for new office buildings, yet the valuation spread is no longer increasing. Out of 273 new office developments identified for Atlanta during 2006 to 2014, a total of 252 are classified as either small projects (less than 100,000 square feet of building area) or suburban office (not located in Downtown, Midtown, Buckhead or Central Perimeter). The findings are heavily influenced by small projects and suburban office, rather than high-rise CBD office towers. Housing values appear largely unchanged by new office deliveries over the long-horizon.

In the immediate vicinity of retail development site, home prices are relatively lower than the surrounding area during the period leading up to the development. While the trend is trivial prior to completion, it is significantly impacted in the period immediately following a new retail delivery. Home prices inside the radius are initially relatively lower (even more so than before), but set on a path that is steadily increasing relative to comparables in the surrounding area. It takes only a couple of years for the initial reduction to be more than offset, and – within a few years after that – home prices inside the radius even surpass those in the surrounding area (when previously they were significantly lower). Of the three commercial real estate product types considered, proximity to retail development is the most likely to be considered a neighborhood

amenity and an important aspect to community revitalization – although it can take a few years for the submarket to fully incorporate positive price effects following the completion of a new shopping center.

Perhaps most surprising is the lack of evidence for negative and significant impacts of commercial developments on housing values. Scores of political arguments to the contrary are voiced at local debates across the nation, yet this research does not find substantive evidence of a negative interaction.

Background & Synthesis of Relevant Literature

Numerous neighborhood externalities have been evaluated for their impact on residential property values, including rail transit stations (Grass, 1992; Gatzlaff and Smith, 1993; Bowes and Ihlanfeldt, 2001; Debrezion, Pels and Rietveld, 2007), greenbelts and open spaces (Correll, Lillydahl and Singell, 1978; Bolitzer and Netusil, 2000; Irwin, 2002; Anderson and West, 2006), brownfields (Kaufman and Cloutier, 2006), airport noise (Espey and Lopez, 2000), churches (Carroll, Clauretie and Jensen, 1996), and landfills (Reichert, Small and Mohanty, 1992). The noted advantage from the existence of this extensive literature is in the existence of an established framework for estimating localized externality effects on residential property values. However, few studies consider the impact of commercial property development on residential property values. Yet, commercial development proposals arguably represent a very large component of policy debate in many jurisdictions across the nation, and NIMBY (not-in-my-backyard) is a recent addition to the modern vocabulary – even though it is not a recent concept.

Other studies discuss the political environment associated with commercial development proposals, including Feinerman, Finkelshtain and Kan (2004), Van der Horst (2007), and Schively (2007). The most closely related studies to the topic of a commercial development interaction tend to focus on the impact from very specific and niche products, such as Superfund sites (Kiel and Williams, 2007), livestock facilities (Herriges, Secchi and Babcock, 2005), oil and gas facilities (Boxall, Chan and McMillan, 2005), or new urbanism (Song and Knaap, 2003). This study aims to address the topic using a unified framework and consistent methodology to explore the outcome for surrounding residential property values resulting from new retail, office and industrial development for a major U.S. metropolitan market.

Hypothesis 1: *The delivery of new industrial development has no impact on surrounding residential property values.*

Industrial development, by comparison to the other two property types, is typically an unpopular land use, associated with increased pollution and trucking traffic. Industrial development is commonly horizontal on a single-story, rather than vertical, and the number of employees per square foot of building area is the lowest of the three commercial property types discussed in this proposal (e.g., typically 1 to 1.5 employees per 1,000 square feet of building area). Some industrial uses are resource-intensive and can place an excessive burden on the community's access to water and electricity.

Hypothesis 2: *The delivery of new office development has no impact on surrounding residential property values.*

New office development is typically the recipient of the highest property tax assessments (e.g., on both a value per square foot and value per acre basis). As a

consequence, new office buildings generally make positive contributions to a community's resources and infrastructure in excess of the resources absorbed. The disadvantage is that office buildings are highly-densified vertical land uses, increasing traffic flow and parking demand. Office buildings have also been accused of creating dark canyons or solar shadows as negative neighborhood externalities. If parking and traffic are not properly accommodated during the adjustments for development impact, then increased congestion will result as an undesirable consequence of new office construction. The advantage to office development is its ability to attract employers to the community who offer jobs in the business and professional services sectors. Residents seeking to minimize commute times may be attracted to neighborhoods that receive new office development.

Hypothesis 3: *The delivery of new retail development has no impact on surrounding residential property values.*

From a revenue perspective, retail development tends to be a jurisdictional favorite due to higher property tax assessments combined with additional cash flows sourced from local-option retail sales taxes. In the context of the surrounding housing market, whether retail development is net beneficial or detrimental depends on the outcome from competing effects. On the downside, new retail development often increases traffic volume, adds stress to public transportation systems, and attracts retail employees to the community who may seek low-income housing. A political argument is sometimes made to the effect that low-income residents decrease the quality of public education options. On the other hand, the quality and quantity of retail is commonly

ranked as one of the most desirable neighborhood attributes and new shopping and restaurants can attract residents to the community, increasing local housing demand.

If either the favorable or detrimental outcomes associated with any of the property types listed above are offset by the other, then Hypotheses 1, 2 or 3 will be rejected in favor of the alternative that commercial development of that property type *does* have a significant impact on the surrounding residential property values.

Summary of Data & Methods

This study combines market information from two important real estate events: new commercial real estate developments and single-family residential transactions. All empirical estimations in this study consider the values of single-family homes, as proxied by transaction prices. The series of residential transactions are for the metro Atlanta market area, generously provided by Georgia MLS, including a sample of 1,571,479 residential observations during the period 1985Q4-2014Q4. After deleting observations for listing status other than "Sold", transactions occurring under special sale conditions (e.g., foreclosure, short sale), homes under construction at time of sale, reported transaction prices of $0 or $1, homes reported to have zero bedrooms or zero bathrooms, and those with missing information about the date of sale, year built or listing price, the useable sample is reduced to 664,556 observations.

Longitude and latitude coordinates are necessary in order to evaluate the impact of residential transactions that occur in close proximity to new commercial development. However, the Georgia MLS data does not include information about the longitude and latitude of the property sold. To collect this information, the entire residential transaction

series is submitted through the Census Geocoder tool to convert property address to longitude-latitude coordinates. The Geocoder returns unavailable information for 53,971 observations (about 8 percent of the sample), further reducing the final sample to 610,585 observations.

Figure 1 shows the pattern of single-family residential home prices in the Atlanta metro and corresponding transaction volume over the period 1985Q4Q1 thru 2014Q4. During 2006-2007, average home prices in Atlanta peak over $230,000, approaching $250,000. By 2009Q1, the average home price was under $190,000 – down more than 24 percent from the peak. By 2014Q2, those losses had largely been recovered as home prices once again steadied with averages over $250,000. Transaction volume displays a high degree of seasonality, peaking in Q2 of every year. Over 16,000 transactions occurred during 2006Q2, and never more than 9,000 in any quarter during 2008 to 2012. While prices have recovered, transaction volume remains below the height of activity.

The specific focus of this research is to estimate the relative impact on housing values in close proximity to new commercial developments. The list of new commercial development projects includes industrial, office and retail property types, collected from the CoStar Property database – based on year of completion. In total, there were 193 industrial, 273 office and 467 retail projects completed since 2006 in the Atlanta metro area.

Figure 2 shows the commercial development completions over a time series. Industrial development accounts for the largest amount of total space delivered at over 26.6 million square feet, with nearly one-third of that delivered during 2006 alone. Industrial deliveries drop to around 1 million square feet per year during the five year

period from 2009 to 2013; although it appears to have begun a sharp comeback by 2014. By comparison, office and retail development fall to near extinction during 2009 to 2013. All three categories of commercial real estate development display dramatic cyclic behavior.

Figure 3 presents the breakdown of new commercial developments by property type, sub-type and project size. For industrial, warehousing facilities represent the greatest number of new projects (in project count observations). Distribution centers constitute the second largest category, and are generally larger projects (typically over 75,000 square feet). Office buildings are often designed with flexibility to accommodate a variety of possible tenants, and general purpose office buildings represent the largest portion of new product. Medical office buildings are typically smaller (less than 50,000 square feet) and represent the second largest component of new office development. The largest category of new retail development observations is general retail, second is strip centers, and third is neighborhood shopping centers. The number of observations for new retail development types is inversely proportionate to shopping center size.

CoStar data already includes longitude-latitude coordinates for each new delivery. Using these coordinates, the relative distance between each development site and every residential transaction in the sample is calculated in nautical miles (measuring distance "as the crow flies") using the haversine formula and solving for distance:

$$\text{Distance} = 2r \cdot \arcsin\left(\sqrt{\sin^2\left(\frac{\phi_2-\phi_1}{2}\right)+\cos(\phi_1)\cos(\phi_2)\sin^2\left(\frac{\lambda_2-\lambda_1}{2}\right)}\right),$$

where ϕ_1 and ϕ_2 are the latitudes, and λ_1 and λ_2 are the longitudes of points 1 and 2. r is the radius of the earth: 3963.17 miles. The distance measures are used to create the Close

indicator variable, identifying residential transactions that occur within the following radii of a new commercial development: .5 mile, .75 mile, and 1 mile. The objective is to identify relative valuation effects for the surrounding residential area pre- vs. post-completion. Observations located within radius of more than one new development for a commercial property type are removed from the analysis.

Table 1 describes the sample of residential transactions. The average home is 27 years old and sold for over $202,000. The most common home sold has three bedrooms (47 percent of the sample), two bathrooms (65 percent of the sample), and no half-bath (55 percent of the sample). Properties located close to new industrial developments are significantly lower priced (average price of $134,000), as are those close to new retail development (average price of $164,000). By comparison, homes close to new office development are more expensive (average price of $223,000).

To provide a more careful comparison, this study utilizes a matched sample methodology whereby for each Close transaction observation, a matched sample is constructed for transactions of "comparable" properties that are sold in the same calendar quarter, located in the same zip code (but outside the radius), having the same number of bedrooms, same number of bathrooms, and constructed within five years of the Close observation. All properties are single-family detached and sold under normal sale conditions. On average, each observation of a Close transaction corresponds to a matched sample comprised of seven to nine comparables. Observations that do not have at least one comparable transaction are excluded from the analysis.

Observations that are neither identified as Close, nor comparable are omitted from the respective estimation. In doing so, the empirical findings relate the percentage

difference in transactions prices for Close properties relative to comparable properties sold in the same quarter and zip code only – but outside the radius for development impact. The specification is akin to a difference-in-difference approach, attempting to compare effects for the subject group of observations close to a new development to effects for a control group of highly similar observations. The comparison is made at all possible points in time, before and after the development completion. In doing so, the technique attempts to resolve concerns that new commercial developments are neither randomly assigned to submarkets nor evenly distributed over a time series, and instead may respond to locally endogenous conditions such as population and economic growth.

The appropriateness of this method relies on its underlying assumptions. First, it assumes that neighborhood characteristics do not differ significantly between the area depicted by the radius that receives the new development and area in the same zip code that does not. Second, it assumes that the trend in property values beyond the radius but in the same zip code are representative of the trend in property values that would have occurred inside the radius had commercial development activity not taken place. The empirical analysis evaluates both assumptions by measuring the trend within the radius relative to comparable properties in the remaining zip code before development, after development, as well as counterfactually – supposing no development.

A hedonic model is used to specify valuation effects, which assumes that the value of a property is a function of physical, financial, locational, and market timing attributes. The basic model to be estimated is written as:

$$\ln(\text{Sale price}) = \beta_0 + \beta_1 \cdot \ln(\text{Age}) + \beta_2 \cdot 1 \text{ bedroom} + \beta_3 \cdot 2 \text{ bedrooms} + \beta_4 \cdot 4 \text{ bedrooms} + \beta_5 \cdot >4 \text{ bedrooms} + \beta_6 \cdot 1 \text{ bathroom} + \beta_7 \cdot 3 \text{ bathrooms} + \beta_8 \cdot 4 \text{ bathrooms}$$