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Impact of forest-related conservation easements on contiguous and surrounding property values☆

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ABSTRACT

We apply the hedonic pricing method to analyze the effects of conservation easements (CEs) on surrounding vacant land parcel prices within the Metropolitan Atlanta Statistical Area (MASA). First, we collected data on forest related CEs in 30 counties in MASA and randomly sampled 312 land parcels from these same counties for information related to land parcels. The distance between each property and the nearest CE, and between each pair of properties, are calculated and used to find spatial dependence. Results show that the total number of CEs in properties' surrounding areas enhances property values. In addition, the proximity to CE-protected open space after the CEs are established have positive price effects on the surrounding properties, and this effect diminishes with distance.

1. Introduction

The United States has abundant forest resources with one third of the country's land area, or 751 million acres, covered by forestland. Of the total, about 57% of forestland is privately owned (Smith, Miles, Perry, and Pugh, 2009). The ongoing development pressure, however, has increased land values and thus property taxes, which makes it more expensive for forest landowners to keep their land intact. Conservation Easement (CE) is a widely used tool to preserve land for conservation purposes by organizations, such as land trusts, whose missions are to protect natural resources (Fisher, 2015). Protection of working forests is among the top ten priorities for land trusts in the US (Chang, 2016). CEs are a private land conservation mechanism that protects open space from being developed, while helping landowners keep their land (Farmer, Meretsky, Knapp, Chancellor, and Fischer, 2015). A working forest conservation easement is specifically designed to allow operations on forestland, such as harvesting and silvicultural practices, without the risk of losing the forestland due to development pressures (Tesini, 2009). Currently, CEs are protecting more than two million acres of private forestland and the total acreage has been increasing over time, according to the Forest Legacy Program, administered by the US Forest Service (USFS, 2015). All states in the US have passed statutes enabling working forest CEs (Ebers and Newman, 2014).

The impacts of CEs are multi-faceted. CEs' purpose of preserving natural land brings about many environmental and social benefits, including open space for recreational activities and wildlife habitat, that are valued by the public (Geoghegan, Lynch, and Bucholtz, 2003). These benefits may also help increase property values surrounding the CEs. From a different perspective, in addition to keeping their land, CEs benefit landowners from a tax standpoint. Landowners engaged in CEs are considered to have donated a part of their rights for a charitable cause and thus are entitled to enjoy income tax deductions and lower property taxes, to be compensated for public goods provision (Chamblee, Colwell, Dehring, and Depken, 2011; Fava, 2013). Legislatively, many states have passed laws that mandate lower tax valuation for properties with conservation restrictions (Stockford, 1990).

Protecting forests and other open space from increasing development and growing population is challenging. About 6000 acres of open space are lost daily (USFS, 2017). In light of the growing development pressure on forestland and the tax implications of CEs, we investigate the price effects of CEs on surrounding land in the Metropolitan Atlanta Statistical Area (MASA) (Fig. 1). The reason for choosing the MASA region is because of the relationship among land conversion, forestland conservation and increasing developmental pressure observed in this region. Being one of the fastest growing metropolitan areas in the US, Metro Atlanta has seen its population grow significantly over the past decade. In terms of Gross Domestic Product growth, Atlanta has the second fastest economic growth in the US (BEA, 2017). The enormous pressure from the urban sprawl and economic development activities within the region make MASA an appropriate study target. In the state of Georgia, where MASA is located, working forests and private forests are important to the state's economy, as they provide raw materials to

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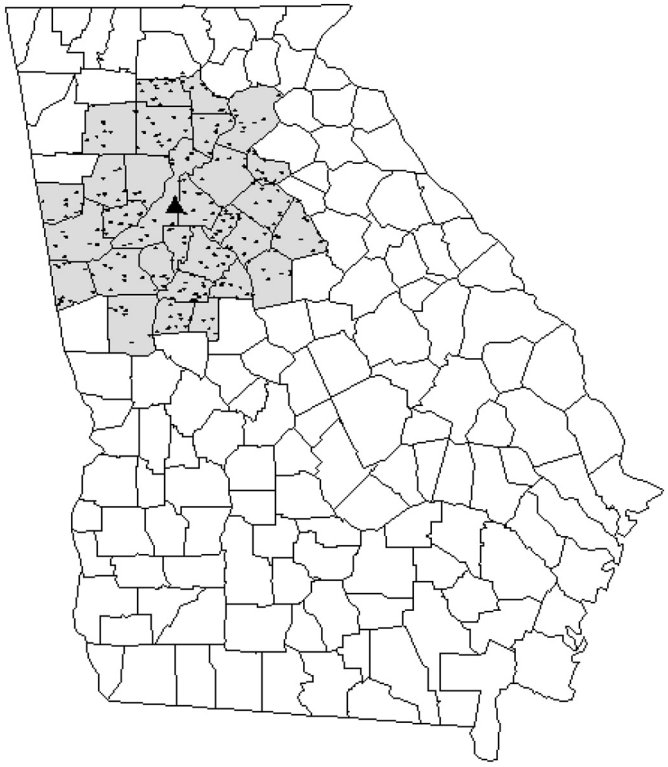

Fig. 1. Map of Georiga.
Note: Shaded areas are MASA counties. The solid triangle is the City of Atlanta. The dots are locations of sampled properties.

the forest industry in the state. Georgia is among the nation's leading forestry states (GFC, 2011). Private forests alone create $37 billion in annual ecosystem services in Georgia (GFA, 2017). In terms of direct economic impacts, in 2015, a total revenue of $32.2 billion and 133,000 jobs were provided by the forest industry in Georgia (Hafer, 2017). CE programs help the industry to protect raw material sources, and more importantly, help private forest landowners keep their forests. The fastest growing metropolitan area coupled with a leading forest industry creates a unique situation and hence makes MASA an interesting target area to study.

This study investigates factors that contribute to the valuation of properties in the surrounding areas of existing CEs. We use CE records and property sales data obtained from public sources to examine the price effects of CEs across different counties in MASA. A hedonic pricing model is used to explore the effects of characteristics of properties and CEs in determining property values.

2. Literature review

A number of studies have been conducted to identify the effects on property values brought by the proximity to open spaces, such as agricultural land and forests. Geoghegan et al. (2003) use parcel-level data of residential properties to construct a pricing model for three counties (Calvert, Carroll and Howard) in Maryland. They find that in two of the three counties, residents living next to preserved open spaces value the environmental benefits, e.g., better air and water quality, brought by open spaces. On top of the environmental benefits, natural amenities such as better views and the access to nature are also factors that help increase surrounding residential property values. It is also noted that residents in Carroll County value open spaces less because they have more of them in the county. Sander and Polasky (2009) estimate the value of views and open space in Ramsey County, Minnesota and similarly conclude that the access to and the view of natural open spaces, such as water and grassy areas, have positive effects on home sale prices in the study area. Other open spaces, such as parks and trails, are also highly valued by home buyers. In a study focusing on undeveloped land, Zygmunt and Gluszak (2015) find similar effects on undeveloped real estate values near Las Wolski Forest in Poland. They collect data from 355 real estate development transactions in this area during 2002–2011, and use three estimation models. Their results indicate positive price effects of the proximity to this forest, with land values decreasing by 3% every one-hundred-meter further away from the forest.

The effects of conservation programs on surrounding land values have also been studied widely, and in most cases, are found to be positive. Geoghegan (2002) studies the relationship between two types of conserved open space and their effects on land prices in Howard County, Maryland. She defines these two types of conservation activities as “permanent open space” and “developable open space”, whose difference primarily lies in the expected future land use. The “permanent open space” category is congruent with the mechanism of CE programs. Results indicate that “permanent open space”, such as CE-protected land, has a statistically significant positive association with land prices, reflected through the higher housing prices in the surrounding area. Anderson and Weinhold (2008) investigate the effects of CEs and attempt to value development rights. They collect sales data and characteristics information on 131 properties with and without CE-restriction in South Central Wisconsin and compare their prices. Their results suggest that there is a significantly negative effect of CE restrictions on prices of undeveloped land, but not on prices of developed land. In addition, they are unable to conclusively establish a significant relationship between CEs and values of surrounding properties. In a later study on the relationship between conservation activities and land prices in North Carolina, Chamblee et al. (2011) collect data on vacant land transactions in a 12-year time span and information on conservation programs in Buncombe County, North Carolina. They distinguish conservation programs into two main mechanisms, namely fee-simple conservations and CE programs. Their study finds that fee-simple conservation programs increase surrounding land values by 46%. CE programs' positive effects are less substantial, at 11%. They attribute this difference to land trusts' inclination to use CEs to protect only properties with lower development prospects. In addition, they find that there exist non-capitalized benefits enjoyed by the residents who live close to, but not adjacent to the conserved land. A similar study done in Florida uses data on nine open space projects, called the Florida Forever, sales records of surrounding homes, and the hedonic model to investigate the effects of land conservation on nearby property values (Beal-Hodges, 2012). She finds that when land is placed on the conservation acquisition list and considered undevelopable, the surrounding property values increase, in some of the study areas.

On the tax aspect of CE programs, several studies have been conducted to find the impacts of conservation activities on property value assessments, since taxes are assessed based on values. Stockford (1990) slices through laws and court cases on federal, state and local levels, to reveal the challenging factors that complicate the valuation assessment of properties encumbered with CEs. He finds that uncertainties exist in various aspects of the valuation system, and that easements can increase the market values of nearby properties and thus increase tax revenues from the surrounding area accordingly. King and Anderson (2004) sample 29 towns in Vermont using the stratified random sampling plan and study the effects on property taxes brought by CEs in Vermont. They use data on local communities' budgets, demographics and policies to examine the marginal effects of CEs. An interesting finding of their study is that the tax effects on the encumbered properties are positive only in the short-run. Over the long term, CEs have either no impact or a diminishing impact on property tax rates in Vermont towns. They also find increased appraised values of surrounding properties for governments to have sufficient tax revenues to cover essential service expenses. In a study to explore economic models that maximize net social benefits of CEs, Gustanski and Wright (2011)