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How are homeowners associations capitalized into property values?☆

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ABSTRACT

Private homeowners associations (HOAs) levy binding fees and provide local services to members. Both should be capitalized into the value of member properties, but the net effect is ambiguous. We construct the most comprehensive, longitudinal database to date on HOAs for Florida and estimate the impact of HOAs on property values. We find that properties in HOAs sell at a premium just under 5%. The premium is strongest immediately following HOA formation and declines over time, suggesting quick capitalization of HOA benefits. Properties in larger HOAs sell for less, and this is particularly true for properties in the biggest HOAs. Finally, properties located immediately outside of an HOA sell at a premium relative to other non-HOA properties, and this premium marginally decreases (increases) in the size (frequency) of neighboring HOAs.

1. Introduction

Local governments possess the power to tax their citizens, and in return they are expected to provide public goods to residents and businesses within their boundaries. Homeowners associations (HOAs) are institutions increasingly used by municipalities to offload the responsibility of providing local public services onto housing developers. Considerable scholarly attention has been paid towards the effect of the property tax, the local government's most essential taxing tool, on property values, and in the current paper we explore a similar question in the context of HOAs as "private governments." Although not public in nature, and much more limited in their authority and capacity, private HOAs take on similar responsibilities to municipalities and fund them through binding membership fees. Is HOA membership, both the tax it imposes and the benefits it bestows, capitalized into housing values? And if so, does it, on net, depress or inflate housing values?

Membership in HOAs has grown tremendously over the past few decades, with estimates of residents living in an HOA climbing from 2.1 million in 1970 to 62 million in 2010 (Community Associations Institute, 2011). Local municipalities have embraced these associations as a means of downloading certain service and infrastructure responsibilities onto private developers and homeowners. These forms of "private government" have become particularly appealing in times of fiscal stress. Yet, there is very little empirical evidence on their impact on housing markets. The challenge to estimating such an impact is largely driven by lack of data. We construct, using geographic information system (GIS) software, an electronic map of the homeowners associations and the land parcels that are contained within them for the entire state of Florida. This represents, as we far as we know, the most geographically comprehensive database of HOA membership. This diverse and rich pool of data enables us to look at the impact of HOAs on property values for the universe of HOAs in Florida over nearly a fifty-year period. It is timely for us to undertake a dynamic analysis, for in this era of declining house prices, it is useful to see whether or not HOAs can help homes maintain their value.

Results suggest that properties in HOAs sell at a premium compared to non-HOA properties. Specifically, holding other determinants of prices constant, houses that reside in HOAs sell for a five percent premium over houses that do not reside in HOAs. When the price effect is allowed to vary over time, the HOA premium is immediately larger, but then decreases over time. This suggests that the housing market is quick to capitalize the benefits of the HOA into prices. These results are robust to both fine-grained census tract fixed effects and arbitrarily assigned micro-geography fixed effects.

We also find that membership in larger HOAs devalues the price of HOA properties. While HOA size does vary over time, robustness checks

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confirm that the HOA size effect is not confounded by a HOA "vintage" effect: even though properties in newer HOAs do tend to sell at lower prices than older HOAs, they are not driving the size differential.

Finally, properties located immediately outside of HOAs also sell at a premium relative to other non-HOA properties, and it marginally decreases in the size and increases in the frequency of neighboring HOAs. These results indicate that HOA benefits may indeed extend beyond the associations' borders.

The paper proceeds as follows. Section 2 provides the theoretical framework for our analysis, gives a brief overview of homeowners associations and a discussion of the literature looking at their impact on property values. Section 3 explains the empirical strategy, and Section 4 discusses the data and the construction of the GIS map. Section 5 presents preliminary regression results. Section 6 concludes.

2. Overview of private governments and literature review

HOAs, and "private governments" more broadly, provide residents with a housing option where they pay for exclusive services that are above and beyond those provided by the local public sector. HOAs are found in planned developments, condominiums and cooperatives. Theoretically, these associations are formed in response to some underprovision or lack of heterogeneity in public services and/or regulation (Helsley and Strange, 1998).[4]

Membership in these associations has grown tremendously over the past few decades, suggesting that residents are willing, and able, to pay for additional services, amenities and, in general, more control over their neighbors. The question is whether the perceived benefits of HOA membership outweigh the costs of the additional fee and, for some, the additional layers of regulation. To date, this is still an empirical matter.

We draw from theories on property tax capitalization and land use regulation to shed light on our treatment of HOAs and their impact on property values. The traditional view on property tax capitalization tells us that the HOA fee, which is legally binding like the property tax, will lower the present value of the property and underlying land. Since the HOA is governed by covenants and restrictions that run with the land, this capitalization will be irreversible. According to this perspective, we should expect to see a decrease in property and land values in the presence of an HOA. The benefit view of property tax capitalization, however, predicts that the amenities provided using the property tax revenues will increase the value of the home. HOAs, perhaps even more directly than property taxes, create a nexus between the fee and the services provided. This perspective suggests an alternative outcome: any negative capitalization of the HOA fee should be compensated by benefits generated by the supplemental HOA services. Together, the net effect on property values is ambiguous.

Adding yet another layer is the regulatory nature of HOAs. HOAs do not possess the comprehensive authority of a general-purpose government, but they do participate in zoning-like activities that restrict the use and physical appearance of their member properties. In addition, their covenants stipulate voting schemas that delegate power differentially across members of the HOA depending on the size or value of their homes; this voting structure is then the deciding factor in the current and future restrictiveness of the governing use and building regulations. As with the HOA fee, these covenants and restrictions can be viewed as both a tax and a benefit for the homeowner. On the one hand, HOA restrictions impose regulatory obstacles to making improvements to one's home or to engaging in certain activities within the boundaries of the association. In this way, the HOA acts like a regulatory tax by imposing costs that depress the value of the property. Alternatively, HOA regulations can reduce the degree of risk associated with buying into the neighborhood and impose controls over the local community that can even be seen as an amenity. Again, the net effect on property values is ambiguous.

Because HOAs are now such a popular method for cities and developers to fund local public services, it is important to quantify the impact that HOA membership has on housing prices. Notwithstanding this, however, the economic literature linking HOAs and house prices is nearly non-existent. The primary challenge to this empirical research is data. Because of the private nature of HOAs, there is little, if any, reporting requirement. Generally, most states require that the board of the HOA be incorporated and to file documents of incorporation, but this falls far short of oversight by any regulatory agency. Therefore, little is known on the mere number of HOAs, let alone on their size, yearly budgets and assessments.

To get around the data issue, most studies rely on novel data on HOAs, often collected through manual examination of records, to determine which parcels in a locality belong to an HOA. This is then merged into the sales data (either from real estate listings or property tax records).

The most extensive examination of this type is Groves (2008), who uses a dataset of 124,878 property sales in the St. Louis area in a hedonic analysis. While he finds that homes that belong to an HOA indeed sell for more than homes that do not belong to an HOA, this premium disappears when finer characteristics of the homes are controlled for. Groves argues that this is evidence that the homogeneity of homes within HOAs hides any positive gain from living in an HOA.

In the same vein, LaCour-Little and Malpezzi (2009) and Bible and Hsieh (2001) both look at the impact of being located in a gated community on property values. The results from both studies show that homes located inside gated communities are significantly higher than comparable homes outside the gated communities. Neither of these studies, however, uses longitudinal data that can control for price differentials before the establishment of the homeowners association or gated community.

There are also a handful of studies looking at the relationship between the regulatory role of HOAs and house prices. Most of the studies to date use data on restrictive deeds and covenants for a sample of homes in a single municipality. Rogers (2006) runs cross-sectional hedonic regressions, controlling for spatial autocorrelation, to estimate the impact of Residential Community Associations' (RCAs) regulations on house prices, and produces mixed results. On average, RCAs generally and their use restrictions specifically are associated with higher house prices; building restrictions (covering architecture or easements), on the other hand have no significant effect on house prices. In addition, voting rules of 80% generate the most value and mortgage-holder voting rights dampen values. His results suggest that RCAs do provide some regulatory value that is perhaps underprovided by the local government; that is, residents are willing to pay more for control over current and future neighborhood restrictions.[5]

Similar to Rogers, Hughes and Turnbull (1996) run hedonic regressions to estimate the effect of restrictive deeds and covenants on house prices. They use a sample of 1314 single-family detached house sales from 37 neighborhoods with covenant and deed restrictions in Baton Rouge, Louisiana, and they control for observable house and neighborhood characteristics over a seven-year period. They find that stricter land use control overall increases house prices, suggesting that the reduced uncertainty from these restrictions is capitalized into the house prices. Speyrer (1989) uses a similar estimation approach, but compares the effect of zoning to that of covenants on house prices in Houston. She also finds a positive effect, and specifically a $4800 to $5900 premium (evaluated at the mean).

[4] In turn, studies have shown that the growth of these private providers of public services has had a significant impact on public spending and revenues (Cheung, 2008a,b, 2010).

[5] A complementarity between private and public land use regulation is corroborated by Cheung and Meltzer (2013), who show that cities with a higher prevalence of HOAs tend to have more stringent public land use regulation.

3. Model

3.1. Baseline

In order to test whether HOA membership affects property values, we undertake a hedonic valuation analysis, in the style of Rogers (2006). Our sample, however, is substantially larger than most existing studies, both in number of observations over time and in geographic scope.

The level of observation is the parcel, and we estimate the following baseline regression equation:

$$\ln P_{ijct} = \beta_0 + \beta_1(X_{it}) + \beta_2(HOA_{it}) + d_{tr} + d_{c,t} + \varepsilon_{it},$$

where P_{it} represents the real sales price (2008 dollars) for a property i at time t; $\mathbf{X}_{it}$ is a vector of property characteristics for property i at time t; $\mathbf{HOA}_{it}$ is a vector of HOA variables indicating whether or not the parcel resides in an HOA and when the sale of the parcel took place relative to HOA formation.

For the variables in $\mathbf{HOA}_{it}$, we first include a variable, HOA_ever which takes on the value of 1 if a parcel is ever in an HOA at any point during the study period; the coefficient on this variable can be interpreted as the difference in price between HOA and non-HOA parcels.

Second, we include a continuous linear trend variable, HOA_trendpost, which captures the price trend of HOA parcels after HOA formation, relative to non-HOA properties on average. We also include, in a separate regression, a set of three discrete trend variables that measure non-linearities in price differences over time.

Third, we interact HOA_ever with HOA_size, in order to allow the price effect to vary with the size of the HOA. HOA_size is operationalized as the total number of parcels in the HOA, which will pick up the physical scale of the association and also reasonably proxy for the scale of services and amenities.[6]

We include d_{tr}, census tract fixed effects, in our regression so that the average price of properties inside of HOAs is compared to the average price of properties outside of HOAs, but within the same census tract, both before and after HOA formation. As census tracts can be thought of as proxies for neighborhoods, these fixed effects absorb neighborhood level variation in house prices, which may be mistaken for HOA effects if not included.[7] This would be of particular concern if HOAs tend to locate in a more desirable area of a city — whether that desirability comes from geography, distance to amenities, racial makeup or any fixed factor. The inclusion of census tract fixed effects allays this concern. Finally, we also include in all specifications $d_{c,t}$, a set of county-year dummies to control for unobserved heterogeneity across jurisdictions and in the larger county over time.

3.2. Spillover effects

Even though membership in an HOA is explicitly conditioned on paying the membership fee, the benefits may not be as clearly allocated. For example, properties located immediately outside may benefit from the security and landscaping without paying the price of membership. On the other hand, crime averted inside an HOA may be diverted to houses immediately outside.[8]

We test for these spillover effects by drawing 1- and 2-mile buffers around each non-HOA parcel in our dataset. If the border of an HOA lies within the 1-mile (2-mile) buffer, the parcel gets a 1 in the dummy variable "within 1 mile (2 miles) of an HOA."[9]

In addition, we test for differential spillover effects by interacting this buffer dummy with characteristics of the neighboring HOAs. These include: whether the non-HOA parcel sold after the nearby HOA was constructed; the average distance to neighboring HOAs; the average size of the neighboring HOAs; and the total number of neighboring HOAs. These variables will be explained in more detail in the Regression results section. The amended regression equation, which includes these spillover-related regressors, is thus the following:

$$\ln P_{ijct} = \beta_0 + \beta_1(X_{it}) + \beta_2(HOA_{it}) + \beta_3(HOA * Spillover_{it}) + d_{tr} + d_{c,t} + \varepsilon_{it}.$$

4. Data

4.1. A map of HOAs in Florida

The fundamental obstacle to rigorous empirical work on HOAs is the paucity of reliable, accurate HOA data. Studies have either compromised by using (or building) datasets that are geographically narrow in scope (Groves, 2008), limited in observations over time (Rogers, 2006; LaCour-Little and Malpezzi, 2009; Bible and Hsieh, 2001), or non-spatial (Cheung, 2008a,b).

We first begin by constructing a dataset of all HOAs in Florida and the land parcels that are contained within them. Florida has obvious advantages for such an analysis: it has one of the highest numbers of HOAs in the United States (over 16,000 as of 2010), and its municipalities are relatively diverse in terms of density and demographic and economic composition.

Information on Florida HOAs was obtained from Sunshine List, a private, Florida-based corporation that has compiled the most comprehensive and up-to-date list of HOAs in the state. This dataset includes information on the location and creation date of every active HOA in Florida as of 2008 (the first HOA was incorporated in 1959).[10] This company compiles a list of all the HOA officers in the state for the purposes of marketing to service providers (lawyers, accountants, landscapers, etc.) Each entry includes information on an officer who sits on the board of the HOA, a unique HOA identification number, the officer's address and the incorporation date of the HOA. We geocode, using geographic information system (GIS) software, the reported addresses of the officers onto an electronic parcel map of the state obtained from the Florida Department of Revenue.

The next step is to define the HOA boundaries. Unfortunately, the dataset does not indicate how many residential parcels are in each HOA, and so there is no way to identify the exact size of the HOA. However, since HOA officers generally live in the HOA they serve, we make the following strong working assumption: if we know that a parcel of land belongs in an HOA because an officer lives there, then all parcels in the same subdivision belong to the same HOA. We believe that this assumption is reasonable because of the fact that housing developers who plat subdivisions are, by and large, the creators of HOAs (Rogers, 2006; Hughes and Turnbull, 1996; Roland, 1998). We contacted each county's property assessor or GIS department and requested the electronic map of all the platted subdivisions in the state. All but a few counties responded. We then overlaid the subdivision map on top of the parcel map and located the subdivisions that intersected with the address of an officer. Each of these is considered an HOA, and by counting the number of residential parcels that intersect the subdivision, we can obtain the number of housing units in the HOA.

[6] Ideally we would like to have information on the budget, services or amenities offered in the HOAs, but this data is unavailable.

[7] There is potential concern that the census tract fixed effects may absorb too much variation, as all identification would be based on comparing non-HOA and HOA within the same, geographically-small area. To address this, we have also run regressions in which we include a set of jurisdiction fixed effects instead. The qualitative results are very similar, and so we do not believe that our tract controls are overly restrictive. These additional specifications are available upon request.

[8] This hypothesis is examined in Helsley and Strange (1999).

[9] We have also examined defining a continuous variable that is the distance between a non-HOA parcel and its nearest HOA, as long as that distance does not exceed 2 miles. This variable does not generate very different results and so is not reported here.

[10] HOAs are rarely, if ever, dissolved.

We note a caveat to our approach. The address of an officer in our dataset is self-reported, and there are two potential reasons why the address might not be the actual residence of the officer. First, the officer may have put the HOA's management office as his or her address. Second, the officer uses the HOA unit as a second or vacation home or rents it out. We have devised an algorithm to identify these suspect HOAs, and we are forced to drop them from our sample.[11] We are confident that our assumptions are reasonable and, if anything, err on being conservative in terms of determining the scope of HOAs in the state. The result is the most comprehensive electronic map of HOA activity, covering virtually the entire state of Florida.

4.2. Property characteristics data

We supplement our HOA map with data for property sales and property characteristics, which come from the Florida Department of Revenue's electronic parcel map. This map is compiled annually by each of the county's property assessors. Every parcel is identified uniquely within the county by parcel ID. For each parcel, we observe some physical characteristics such as size of lot, number of units, number of buildings, building classification (in this case, single-family or condominium), age of structure, square footage of the structure and livable area and vacant status. We also observe the last two sale dates of the property and the corresponding sales prices.

4.3. Description of data

Our data covers 49 of 67 counties in Florida. We dropped counties from the analysis either due to incomplete data (primarily from missing subdivision and/or GIS parcel files) or due to lack of variation in HOA membership. Ultimately, our data covers over 80% of the state population. Thus, we still retain the most populous parts of the state, which does not cause us much concern for the validity of our dataset.

We use only single-family, residential parcels that are part of subdivisions, and drop all properties that were constructed prior to 1960 (which corresponds with the establishment of the first HOA) in order to ensure comparability in the style of development and property vintage across the sample.[12] We also eliminate any repeat sales that take place within one year of one another (to assure arms-length sales and avoid those with unusually quick turnover) and all sales valued at less than $10,000 and more than $1,000,000 (to remove outliers at the top and bottom percentiles). In addition, we drop any parcels in HOAs with fewer than ten units. Finally, we restrict our analysis to parcels within incorporated cities, towns and villages only. This is motivated both by the aim to minimize the burden of computation and also by the fact that smaller jurisdictions and larger counties have different regulatory and taxing powers that could differentially influence the likelihood of HOA formation and the capitalization of their amenities into property values.[13]

Our entire working dataset consists of 583,133 (parcel-year) observations total, with sales dates extending from 1960 to 2008. All of these parcel-year observations are located in incorporated jurisdictions, and the average incorporated jurisdiction in the sample has 1893 parcel-years.

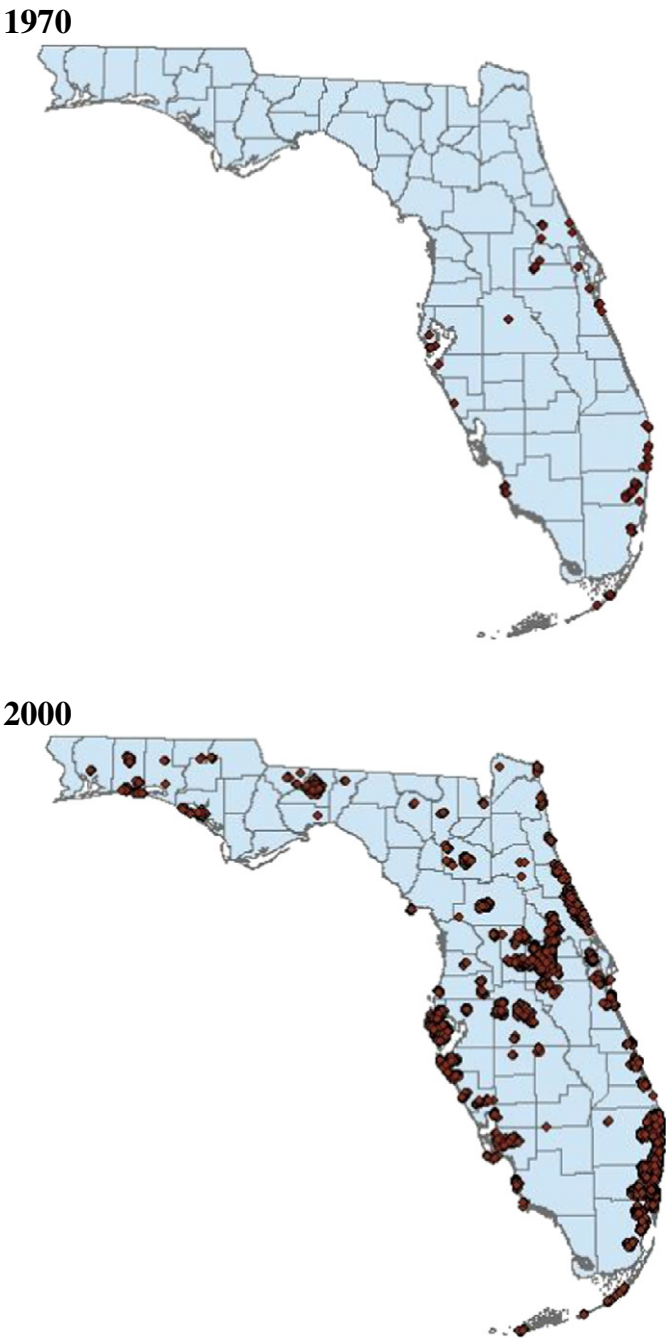


Fig. 1. Spread of HOAs across Florida.

4.4. HOAs in Florida

Like trends for the rest of the country, HOAs in Florida have proliferated over the past thirty years and during the past decade in particular. Chart 1 provides evidence of this.[14] The first recorded HOA was established in 1959, and since 1990, the number of HOAs in Florida has increased by nearly 140%. To put this in context, the number of new housing units in Florida has increased by 14% during the same

[11] We will not elaborate on the algorithm here, but briefly here is a non-exhaustive list of reasons that would cause us to reject an address as being the actual location of an HOA: (1) address reported is zoned commercial; (2) identical addresses are reported for more than one HOA (this is likely an office building); and (3) address belongs to a different city from the other officers in the same HOA.

[12] We also run all models excluding properties built prior to 1980 (in order to narrow the vintage range even more), and excluding sales of parcels transacting after 2006 (in order to avoid complications from recent housing market volatility). The results from these regressions are substantively identical to those presented in the paper and are available from the authors upon request.

[13] All the regressions are replicated for unincorporated county areas and are available from the authors upon request. The results are substantively similar.

[14] Chart 1 and Fig. 1 represent the universe of HOAs in Florida; the sample for the current analysis is smaller, due to the data filters we put in place, as described in the previous section.

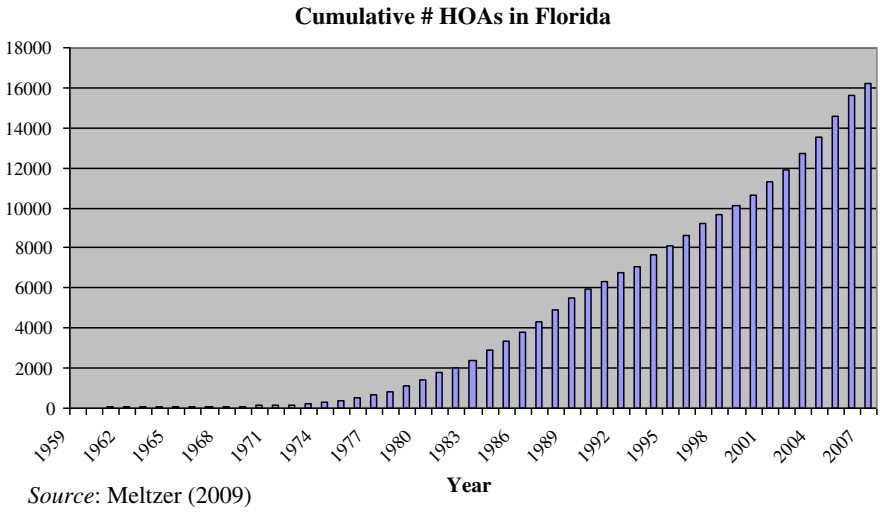


Chart 1. Number of HOAs in Florida over time.
Source: Meltzer (2009).

period, and the number of units in HOAs nationwide has increased by about 50% (Community Associations Institute, 2011).

The maps in Fig. 1 also illustrate that the growth of HOAs has been unevenly distributed throughout the state. They have primarily emerged along the coasts, and increasingly in the central peninsula and pockets of the northern panhandle. As expected, they are most prevalent in the central and suburban parts of the state, where developable land is abundant. The number of HOAs in a particular jurisdiction varies considerably; as of 2008, some places had only one HOA while others had 300 or more.

Some differences between HOA properties and non-HOA properties can already be seen in Table 1. This table presents summary statistics for parcels in our sample, which, to reiterate, lie within subdivisions and within incorporated cities. Out of about 583,000 observations, about 20% of our parcels lie within an HOA. The mean sales price (in 2008 dollars) of an HOA parcel was $226,443, compared to $196,079 for a non-HOA parcel. HOA properties also exhibit more variation in sales price than non-HOA properties. HOA houses tend to be newer and have larger living area than non-HOA houses, but interestingly they lie on smaller lots and are of lower assessor-determined quality. This observation is consistent with the popular trend of constructing dense, affordable HOA developments in suburban areas.

Turning to the HOA characteristics, the average HOA in our sample was formed in 1991. The average HOA has 408 residential parcels, but that number ranges considerably, with the largest HOA having nearly 3000 parcels.

5. Regression results

5.1. Baseline

First we summarize the baseline results for the hedonic model, all displayed in Table 2. All models include census tract fixed effects and county-year dummy variables. The first column displays the model with only property covariates on the right-hand side in order to verify the validity of our base hedonic model. These all have generally accepted signs. The sales price of a house is positively associated with more livable square footage and better improvement quality (controlling for livable area, the lot size is negatively correlated with price). More recently built houses have higher sales prices, and vacant lots sell for substantially less than improved lots.

In the second column, we add in HOA_ever to measure the impact of HOA membership on sales price. We see that there is a positive and highly significant association between HOA membership and property value. Specifically, properties in HOAs sell at prices about 4.9% higher than those not in HOAs. Based on the mean sales price in the sample, the price premium for HOA membership amounts to about $9852 on average per parcel; not an exorbitant premium, but also not a minuscule amount.

In the third column we allow the price effect to vary over time. The coefficient on HOA_ever is still significant and increases up to about .09; the coefficient on HOA_trendpost is also highly significant, but negative. This suggests that although HOA properties do sell at a premium relative to non-HOA properties, this differential decreases over time (and specifically at about 0.4% per year). This particular model will serve as our "baseline" regression moving forward.

In column 4, we test for non-linearities in the effect of HOA membership over time, by replacing the continuous HOA_trendpost with two discrete time-since-formation dummies: HOA formed 0 to 5 years ago and HOA formed 5 to 15 years ago. The omitted category captures a parcel in an HOA that is 15 or more years old. The declining pattern of the coefficients corresponds to the negative continuous trend, and suggests that it takes more than 15 years after HOA formation for the premium to dissipate.

We rely on census tract fixed effects for their small geography; this should mitigate any bias due to selection or reverse causality. Specifically, since we are comparing HOA- and non-HOA properties within the same micro neighborhood (i.e. the census tract), it is unlikely that any localized conditions, other than the HOA designation, are driving meaningful differences in prices. In order to test this assumption and to assess the strength of the census tract controls, we also run baseline specifications using fixed effects based off of arbitrarily sized, but uniformly applied, grid squares.[15] We essentially overlay a grid over our HOA-parcel map and assign parcels to their respective squares. We run this specification for three different grid sizes (approximately .5, 1.75 and 3.75 square miles,[16]) and the results are substantively consistent with the specifications that rely on census tract fixed effects. The coefficient on HOA_ever is still highly significant, and essentially the same (.085); the coefficient on HOA_tpost is nearly identical. We include in Appendix Table A results for the fully specified baseline model, using .5 square mile grid sizes.[17]

[15] We thank an anonymous referee for suggesting this alternative specification.
[16] These correspond to squares with sides of 0.01, 0.02 and 0.03 degrees of latitude and longitude, respectively.
[17] We also replicate these models using jurisdiction fixed effects; the results are substantively the same and we opt for a finer geographic control to sharpen the identification of the HOA effect. These results are available from the authors upon request.

Table 1
Summary statistics of key variables.

	Non-HOA property	HOA property	Non-HOA property	HOA property	Non-HOA property	HOA property	Non-HOA property	HOA property
Variable	Mean		Std. dev.		Min		Max	
Characteristics of HOA where parcel resides								
HOA formation yr		1991		9		1961		2008
HOA size (# parcels)		408		692		10		2969
Characteristics of parcel								
Sales price ($2008)	196,079	226,443	148,652	156,149	10,000	10,002	1,000,000	1,000,000
Year built	1987	1994	13	10	1960	1960	2009	2009
# buildings	1.09	1.04	0.40	0.26	1.00	1.00	17.00	7.00
Total sq. feet of lot (1000s)	11.35	10.04	14.74	11.88	0.001	0.001	1095	488
Total sq. feet of living area (1000s)	1.99	2.18	1	1	0.224	0.270	22	19
Vacant	0.07	0.09	–	–	0.00	0.00	1.00	1.00
Improved quality	0.76	0.48	1.35	1.15	0.00	0.00	6.00	6.00
N	487,587	95,546						

Notes: all difference in means significant at $p < .01$; improved quality measured on 1–6 scale, ranging from minimum to superior. The sample consists of parcels within subdivisions and within incorporated jurisdictions.

5.2. Testing for HOA size effects

In the next two tables, we return to our baseline specification and explore the differential effect of HOA size on home values. The first column of Table 3 replicates the baseline specification. In the second column, we interact HOA_size with HOA_ever. The coefficient on the interaction is negative and highly significant (albeit very small in magnitude), suggesting that properties in relatively larger HOAs (as measured by the number of member parcels) sell at lower prices. Based on the mean sales price of an HOA property, $226,443, an additional parcel in an HOA decreases that value by about $22. In order for a homeowner to suffer a loss of $10,000 or more, the HOA would have to include at least 450 parcels, which is just over the mean size for the sample. This is quite negligible for that homeowner; however, when aggregated across many HOA properties, this could be economically meaningful for the municipality overall. Although larger HOAs most likely have more amenities and services (which would theoretically demand a price premium), they could potentially be less exclusive and/or intimate, both of which might be disincentives for homebuyers. Larger HOAs might also offer less control over internal rules and services and more onerous administration to navigate for the individual homeowner, which again could devalue the property relative to other HOA properties.[18]

We look for a non-linear effect in column 3, where we divide up the HOAs according to their number of housing units: small (below the 30th percentile in number of units); medium (30th to 60th percentile); and large (above the 60th percentile). These are interacted with HOA_ever. The omitted category includes the small HOAs. The results show that there is a clear difference between small and large HOAs. Large HOAs have a depressing effect on the capitalization of HOA benefits into house values — although the effect is not large enough to reverse the positive capitalization.

The HOA size effect may also be due to different development behavior over time; that is, HOA size may vary over time, and therefore what we are (partially) picking up is an HOA "vintage" effect (rather than an isolated size effect). Indeed, Chart 2 indicates a time-varying pattern of HOA development. While the number of HOAs grew through 2000, the size of the typical HOA declined; these patterns have reversed since 2000.

To further disentangle this difference, we run a few additional specifications, all displayed in Appendix Table B. First, we incorporate into the baseline model a variable to control for HOA formation year, HOA_year. The first column displays the model with only HOA_size, the second column adds in HOA_year alongside HOA_size, and the third column adds in an interaction term for HOA_size and HOA_year. Adding in the HOA formation year does not dramatically detract from the size variable (the magnitude of the coefficient is marginally smaller) and HOA_year is also negative and highly significant. This suggests that, controlling for HOA size, newer HOAs actually pull prices down. This could be due to some loss in HOA novelty over time, or perhaps a decline in the quality/nature of HOA construction over time. When HOA_size is interacted with HOA_year, however, we see a very small, positive effect.

Table 2
Baseline regression results.

Dep. var. = log sales price	(1)	(2)	(3)	(4)
HOA_ever		0.049***	0.085***	−0.009
		(0.001)	(0.002)	(0.002)
HOA_trendpost			−0.004***	
			(0.0002)	
HOA_trendpost_5 yrs				0.084***
				(0.0031)
HOA_trendpost_5 to 15 yrs				0.072***
				(0.003)
Total sq. feet of lot (1000s)	−0.0002*	−0.0001	−0.0001	−0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Improved quality	0.036***	0.036***	0.036***	0.036***
	(0.002)	(0.002)	(0.002)	(0.002)
Year built	0.001***	0.001***	0.001***	0.001***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Total living area (1000s sq. ft.)	0.422***	0.421***	0.421***	0.421***
	(0.002)	(0.002)	(0.002)	(0.002)
# Buildings	−0.039***	−0.038***	−0.038***	−0.038***
	(0.002)	(0.002)	(0.002)	(0.002)
Vacant	−1.344***	−1.342***	−1.342***	−1.342***
	(0.004)	(0.004)	(0.004)	(0.004)
Intercept	7.846***	8.357***	8.736***	8.756***
	(0.126)	(0.128)	(0.130)	(0.130)
Census tract F.E.?	Y	Y	Y	Y
County * yr dummies?	Y	Y	Y	Y
N	581,906	581,906	581,906	581,906
Log-likelihood	604,378	603,359	602,916	602,734

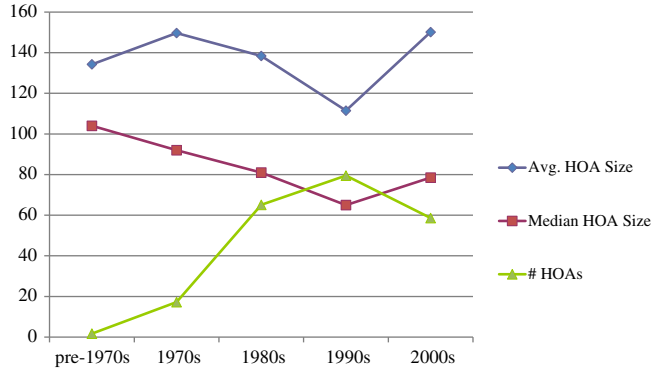
Notes: Robust standard errors shown; *, ** and *** denote significance at the 10, 5 and 1% levels, respectively.

[18] We run similar models also controlling for HOA square footage to check for any density effects absorbed in the HOA size measure; the main results are unchanged and so we present the more parsimonious model.

Table 3
HOA size.

Dep. var. = log real sales price	(1)	(2)	(3)
HOA_ever	0.085***	0.112***	0.113***
	(0.002)	(0.002)	(0.003)
HOA_trendpost	−0.004***	−0.003***	−0.003***
	(0.0002)	(0.0002)	(0.0002)
HOA ever * HOA size		−0.0001***	
		(0.000002)	
HOA_ever * 30–60 percentile in size			−0.040***
			(0.003)
HOA_ever * above 60th percentile in size			−0.069***
			(0.003)
Total sq. feet of lot (1000s)	−0.0001	−0.0001	−0.0001
	(0.0001)	(0.0001)	(0.0001)
Improved quality	0.036***	0.036***	0.036***
	(0.002)	(0.002)	(0.002)
Year built	0.001***	0.001***	0.001***
	(0.0001)	(0.0001)	(0.0001)
Total living area (1000s sq. ft.)	0.421***	0.420***	0.420***
	(0.002)	(0.002)	(0.002)
# Buildings	−0.038***	−0.038***	−0.039***
	(0.002)	(0.002)	(0.002)
Vacant	−1.342***	−1.341***	−1.343***
	(0.004)	(0.004)	(0.004)
Intercept	8.736***	8.805***	8.780***
	(0.130)	(0.130)	(0.130)
Census tract F.E.?	Y	Y	Y
County * yr dummies?	Y	Y	Y
N	581,906	581,906	581,906
Log-likelihood	602,916	602,916	602,490

Notes: Robust standard errors shown; *, ** and *** denote significance at the 10, 5 and 1% levels, respectively.



Source: Author's calculations.

Chart 2. HOA size by HOA vintage.
Source: author's calculations.

This indicates that properties in newer, but bigger, HOAs actually have a slight price premium.

As a final check, we categorize HOA formation into four vintages: those built prior to 1980, during the 1980s, during the 1990s, and post-2000. We then interact these categorical variables with HOA_size to discern any non-linear temporal variation in the size effect. The results, shown in the fourth column of Appendix Table B, indicate that the effect is generally negative and small; moreover, the coefficients are all insignificant. Regardless, the magnitude of the negative effect from the size-vintage interaction appears to be relatively consistent over time (i.e. post-2000 HOAs are no more price-demeaning than pre-1990 HOAs). The patterns displayed in Chart 2 would have predicted opposing price effect for post-2000 and pre-1990 HOAs, but the regression results display consistently negative coefficients. Overall, we take this evidence to suggest that vintage will not bias the size coefficient in any uniform direction.

5.3. Spillover effects

Finally, we turn to the regression results for the specifications that control for parcels located immediately outside the HOA borders. Table 4 displays the results with the baseline regression in the first column for reference. The coefficients for the properties' physical characteristics are not reported to save space. We take every non-HOA parcel and draw a one-mile buffer around it. We assign a dummy for whether or not the parcel lies within 1 mile of the border of any HOA. As shown in column 2, the coefficient on this variable is positive and significant at the 5% level. However, it is possible that the positive effect is attributable to unobserved characteristics about the area that make HOAs more likely to be found there, and so we also include an interaction term between being within 1 mile of an HOA and the sale being observed after the neighboring HOA was built. The coefficient on this is positive, which is consistent with the HOA generating a positive spillover effect on nearby properties.

In columns 3 and 4, we explore larger distance buffers around non-HOA parcels.[19] We retain the 1-mile buffer and then add another 1 mile ring outside of that zone (specified as between 1 and 2 miles of HOA). The goal is to capture changes in price premiums as we gradually increase the parcel's distance from the HOA border. Column 3 shows that in contrast to the above result, parcels located between 1 and 2 miles of an HOA, but not closer, are generally not as expensive as HOA properties, but still experience a price premium relative to other non-HOA parcels that are farther from the HOA. This price increase, however, is not as large as those in the HOA or those relatively closer to the HOA. This suggests that the beneficial spillovers from being near an HOA (better security, landscaping, prestige of locating near exclusive neighborhoods) are stronger the closer one is to the HOA, but that those benefits attenuate as one moves away. Overall, column 4 shows that the net effect of being within 2 miles of an HOA is positive (about an 8.5% premium over non-HOA parcels that are beyond the 2-mile buffer).[20]

We want to be sure that any spillover effect is not just a product of imprecisely designating the HOA boundary. To test this, we construct a variable that takes on the value of "1" if the parcel is in an HOA and immediately inside its borders. We identify the distance from the center of the HOA and then classify "immediately" as being located less than one-third of this distance from the HOA border. Presumably, misclassification of a parcel as an HOA would more likely happen if the parcel's address was near the subdivision's boundary as opposed to deep inside the subdivision. If our classification is robust, then we should see no significant price difference between these marginal HOA members and more internal HOA members; but we should still see a price difference with the non-HOA parcels. Appendix Table C displays the results from this regression, and the results confirm this expectation: the coefficients on the variables, marginal HOA and marginal HOA * sold post-HOA, are negative and positive, respectively, but both insignificant. Together, these findings allay concerns over misclassification of HOA membership.

In the last three columns of the table we explore finer interactions of having an HOA as a neighbor and characteristics of the neighboring HOA(s). We use the broadest definition of neighbor, being within a 2 mile distance from an HOA border. As the average straight-line

[19] We do this in part to alleviate concerns that measurement error in the subdivision shapefiles may lead us to misclassify parcels that are actually in an HOA to being simply neighbors of HOAs.

[20] The net effect of within 2 miles of HOA and within 2 miles of HOA * sold post-HOA is also significant at the 1% level.

Table 4
Spillover regressions.

Dep. var. = log real sales price	(1)	(2)	(3)	(4)	(5)	(6)	(7)
HOA_ever	0.085***	0.128***	0.136***	0.056***	0.064***	0.134***	0.126***
	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
HOA_trendpost	−0.004***	−0.004***	−0.004***	−0.004***	−0.004***	−0.004***	−0.004***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Non-HOA parcel							
Within 1 mile of HOA		0.009**	−0.004				
		(0.004)	(0.0050)				
Within 1 mile of HOA * sold post-HOA		0.074***	0.081***				
		(0.004)	(0.0040)				
Between 1 and 2 miles of HOA			−0.044***				
			(0.005)				
Between 1 and 2 miles of HOA * sold post-HOA			0.045***				
			(0.005)				
Within 2 miles of HOA				−0.024***			
				(0.004)			
Within 2 miles of HOA * sold post-HOA				0.085***			
				(0.003)			
Within 2 miles of HOA * avg dist. to HOA					−0.00002***		
					(0.000)		
Within 2 miles of HOA * no. HOAs						0.005***	
						(0.000)	
Within 2 miles of HOA * avg HOA size							−0.0002***
							(0.000)
Census tract F.E.?	Y	Y	Y	Y	Y	Y	Y
County * yr dummies?	Y	Y	Y	Y	Y	Y	Y
N	581,906	581,906	581,906	581,906	456,796	581,906	581,906
Log-likelihood	602,916	599,913	599,776	601,427	618,549	600,428	599,593

Notes: Robust standard errors shown; *, ** and *** denote significance at the 10, 5 and 1% levels, respectively. All specifications also include property characteristics, not reported here.

distance between the non-HOA parcel and the adjacent HOAs increases, home values decrease, consistent with the attenuation of spillover benefits. We observe in our data that many parcels are close to more than one HOA subdivision, and column 6 suggests that more HOA neighbors lead to greater home values. Finally, the larger the average size of neighboring HOAs, the smaller the spillover. This result corroborates the hypothesis in the baseline analysis that larger HOAs do not confer as great a degree of capitalization as do smaller HOAs. For non-HOA parcels, perhaps larger neighboring HOAs end up being more of a nuisance or segregated space rather than a source of security or esthetic. All of these interacted coefficients are significant, although they are small in magnitude. These findings indicate that it is not simply a crude HOA effect, but that the characteristics of the neighboring HOA(s) matter as well.

6. Conclusion

As more and more local jurisdictions struggle with strained budgets and limited revenues, the appeal of offloading public service provision onto private housing developers is growing. In return for fees, homeowners associations provide residents with supplemental public services and tighter land-use control. While anecdotal evidence and popular perception suggest that HOAs protect property values by maintaining uniformity and guaranteeing a minimum level of targeted services and amenities, there is little empirical evidence on the capitalization of HOA benefits into property values.

In this paper, we construct the most comprehensive, statewide electronic map and database of homeowners associations to date. By tying in accurate assessor and property tax information, we can see how membership in an HOA affects property prices, and ultimately, the public fisc. These findings are particularly relevant in times of fiscal stress, when municipalities might be eager to raise local revenues (and defer local expenses).

Our findings suggest that properties in HOAs sell at a premium compared to non-HOA properties, and this is persistent across various specifications for incorporated jurisdictions. Specifically, houses that belong to HOAs sell for, on average, a 5% premium over houses that do not reside in HOAs. In addition, HOA properties in larger associations tend to sell for less. When the price effect is allowed to vary over time, the premium is immediately larger, but then decreases over time. This suggests that the housing market is quick to capitalize the benefits of the HOA into prices.

Finally, properties located immediately outside of the HOAs seem to benefit as well: they too sell at a premium relative to other non-HOA properties, although the magnitude is much smaller. This premium marginally increases in the number and decreases in the size of the neighboring HOAs. In sum, HOAs appear to be a boon to the local fisc, both in the tax revenues they can bring in and the service responsibilities they can assume. And while members exclusively benefit from HOA services and amenities, the non-HOA neighbors also see returns in the form of price premiums (and without paying an HOA fee). HOAs can thus presumably confer benefits beyond their borders.

However, what still remains unclear is why homebuyers will pay such a premium to live in these associations. Is it primarily about the services and amenities they provide? The results showing that HOA size can actually cut into the price premium suggest that this might not be the case. To the extent that the nature and quality of services is correlated with HOA size, then our findings suggest that homebuyers are actually willing to pay higher prices for more intimate communities. Is the premium then more about retaining close control over rules and regulations or maintaining more close-knit (perhaps more homogeneous) communities? Our analysis demonstrates that HOA membership is valued in the marketplace, but future research and more detailed data will help uncover the mechanisms behind this premium.

Appendix A

Appendix Table A
Arbitrary micro-geography fixed effects.

Dep. var. = log real sales price	(1)	(2)
HOA_ever	0.085***	0..085***
	(0.002)	(0.002)
HOA_trendpost	−0.004***	−0.003***
	(0.0002)	(0.0002)
Total sq. feet of lot (1000s)	−0.0001	−0.0001
	(0.0001)	(0.0001)
Improved quality	0.036***	0.036***
	(0.002)	(0.002)
Year built	0.001***	0.001***
	(0.0001)	(0.0001)
Total living area (1000 s sq. ft.)	0.421***	0.420***
	(0.002)	(0.002)
# buildings	−0.038***	−0.038***
	(0.002)	(0.002)
Vacant	−1.342***	−1.341***
	(0.004)	(0.004)
Intercept	8.736***	8.772***
	(0.130)	(0.130)
Census tract F.E.?	Y	N
0.5-mile grid F.E.?	N	Y
County * yr dummies?	Y	Y
N	581,906	583,133
Log-likelihood	602,916	607,683

Notes: Robust standard errors shown; *, ** and *** denote significance at the 10, 5 and 1% levels, respectively.

Appendix Table C
HOA boundary test for misclassification.

Dep. var. = log real sales price	(1)	(2)	(3)
HOA_ever	0.085***		0.128***
	(0.002)		(0.003)
HOA_trendpost	−0.004***		−0.004***
	(0.0002)		(0.0000)
HOA parcel			
Marginal HOA			−0.072
			(0.625)
Marginal HOA * sold post-HOA			0.068
			(0.647)
Non-HOA parcel			
Within 2 miles of HOA		−0.024***	−.025***
		(0.004)	(0.0000)
Within 2 miles of HOA * sold post-HOA		0.085***	.085***
		(0.003)	(0.0000)
Census tract F.E.?	Y	Y	Y
County * yr dummies?	Y	Y	Y
N	581,906	581,906	581,906
Log-likelihood	602,916	601,427	602,899

Notes: Robust standard errors shown; *, ** and *** denote significance at the 10, 5 and 1% levels, respectively.

Appendix Table B
HOA size and vintage.

Dep. var. = log real sales price	(1)	(2)	(3)	(4)
HOA_ever	0.112***	8.127***	8.325***	0.113***
	(0.002)	(0.5270)	(0.5582)	(0.0024)
HOA_trendpost	−0.003***	−0.006***	−0.006***	−0.003***
	(0.0002)	(0.0003)	(0.0003)	(0.0002)
HOA ever * HOA size	−0.0001***	−0.00008***	−0.0006***	−0.00007***
	(0.000002)	(0.000002)	(0.0005)	(0.000007)
HOA year		−0.004***	−0.004***	
		(0.0003)	(0.0003)	
HOA size * HOA year			0.0000002***	
			(0.0000)	
HOA vintage 1980s				−0.000005
				(0.000007)
HOA Vintage 1990s				−0.0000004
				(0.000008)
HOA vintage post-2000				−0.00001
				(0.000008)
Total sq. feet of lot (1000s)	−0.0001	−0.0001	−0.0001	−0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Improved quality	0.036***	0.036***	0.036***	0.036***
	(0.002)	(0.002)	(0.002)	(0.002)
Year Built	0.001***	0.001***	0.001***	0.001***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Total living area (1000s sq. ft.)	0.420***	0.420***	0.420***	0.420***
	(0.002)	(0.002)	(0.002)	(0.002)
# buildings	−0.038***	−0.038***	−0.038***	−0.038***
	(0.002)	(0.002)	(0.002)	(0.002)
Vacant	−1.341***	−1.341***	−1.341***	−1.341***
	(0.004)	(0.004)	(0.004)	(0.004)
Intercept	8.805***	8.711***	8.707142956	8.81092151
	(0.130)	(0.1301)	(0.1302)	(0.1302)
Census tract F.E.?	Y	Y	Y	Y
County * yr dummies?	Y	Y	Y	Y
N	581,906	581,906	581,906	581,906
Log-likelihood	602,916	601,095	601,123	601,421

Notes: Robust standard errors shown; *, ** and *** denote significance at the 10, 5 and 1% levels, respectively.

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