

Homeowner Association Foreclosures and Property Values in Harris County, 1985–2001*

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SUMMARY

In recent years, homeowner associations (HOAs) in Harris County, Texas have filed thousands of lawsuits threatening foreclosure against residents who owed dues, late fees, or fines. An event count analysis of HOA foreclosures by neighborhood from 1985–2001 shows the bulk of these filings occur in neighborhoods with low median home values. Overall, homeowners in the bottom quartile of home value face more than ten times the risk of HOA foreclosure proceedings as those in the top quartile. Legal changes in 1987 and 1995 also seem to have encouraged HOAs to bring more foreclosures to court: across the spectrum of home values, the annual pace of filing after 1995 is roughly double the previous decade's rate. Although HOA foreclosures are ostensibly motivated by efforts to improve property values, neither foreclosure activity nor HOAs appear linked with above average home price growth.

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1 Introduction

Recently, several lawsuits have drawn attention to foreclosures filed by homeowners associations (HOAs) in Houston, Texas and the Harris County area. In these cases, homeowners faced the loss of their homes over such matters as failure to pay dues, abide by deed restrictions, or pay fines or late fees. The initial debt giving rise to these suits was seldom more than a few hundred dollars.¹ In each case, legal fees related to foreclosure filings can swell the debt by hundreds, or even thousands, of dollars. In an unknown number of cases, foreclosure proceedings led to the auction of homes to pay debts to HOAs—even when those homes were owned outright by their occupants.² Although the number of HOA foreclosure sales is unknown, after 1995, Harris County HOAs filed an average of 1,161 foreclosures per year against residents. It is likely that the legal costs associated with filings imposed substantial hardship on homeowners, if not usually foreclosure itself.

HOA foreclosures have produced considerable controversy. On one side are homeowners who fear that a quasi-public entity might take their homes in an arbitrary and unappealable fashion. To these homeowners, foreclosure constitutes an over-reaction to minor infractions of HOA rules, especially because other legal remedies are available. On the other side are supporters of HOAs who deem the threat of foreclosure necessary to enforce regulations protecting property values. HOA attorneys often advise strict enforcement of fines and foreclosure penalties, on the grounds that making any exceptions will erode the legal power of HOAs to enforce important restrictions³. To date, much of the discussion about HOAs has (rightly) focused on whether they have abused their powers as ‘private governments’ (McKenzie, 1994). But to better answer this question, it is vital to know just what HOAs do. This paper addresses two important unresolved issues: how often do HOAs move to foreclose on members’ homes, and what benefits (in terms of property values) do HOAs bring to neighborhoods to justify these tactics?

This study proceeds in four parts. First, I review changes in Texas law which enabled the recent spate of homeowner association foreclosures. Second, I present a new source of data on HOA activity, a record of foreclosure filings from Harris County over 1985-2001. I then show, using appropriate statistical tools (specifically, a zero-inflated event count model) that foreclosure filings are concentrated in neighborhoods with low home values, and have risen dramatically in recent years. Finally, I assess the key presumed benefit of HOAs, higher property values, showing that property values in HOAs filing foreclosures rise no faster than in other neighborhoods—and may even lag behind.

¹Most cases stem from a failure to pay annual dues, which range from as little as twenty dollars to as much as a few hundred dollars. Deed restriction violations involve no initial debt.

²Recent cases include that of Wenonah Blevins, an 82-year old widow whose \$150,000 home was sold at auction for \$5,000 to cover \$814.50 in delinquent assessments, plus \$2,941.50 in attorneys’ fees; she sued her HOA and won a \$300,000 settlement (see Alan Berstein, 2001, ‘Evicted widow home for holidays: Blevins, homeowners association settle suit,’ *Houston Chronicle*, December 22, A1).

³See, for example, an interview of former Community Associations Institute (CAI) president and attorney F. Scott Jackson in *Common Ground*: ‘Rules must be enforced uniformly, promptly, and firmly by the board. Delays can result in waivers and allow the violator a defense that he or she may otherwise not have had.... If a violation is ignored one time, it could make it more difficult to enforce that rule later on.’ (‘The Buck Stops with the Board,’ November/December, 1992).

2 The Homeowner Association Controversy

Two events heralded the surge in HOA foreclosure filings. The first was a 1987 Texas Supreme Court ruling (*Inwood North Homeowners' Association, Inc. v. Harris*)⁴ holding that HOAs could foreclose to collect assessments despite constitutional homestead protections. Under the Texas constitution, debts cannot generally be collected through foreclosure on an owner-occupied home⁵; however, the court ruled that when HOA covenants pre-date homeowners' deeds, they comprise an exception to homestead protection.⁶ HOA advocates consider *Inwood* vital to their efforts to protect property values. If *Inwood* were overturned, one HOA manager argued that property owners will shirk dues and regulations indefinitely, turning less affluent neighborhoods into 'automatic slums'.⁷

A second turning point came in 1995, with the passage of Chapter 204 of the Texas Property Code. Written by Houston HOA attorney Michael Gainer,⁸ and applied only to Harris County,⁹ this law makes it easier for Harris County HOAs to adopt and enforce new deed restrictions, and allowed the creation of HOAs in existing subdivisions over the objections of a minority of property owners.¹⁰ This law overrides any prior agreements within subdivisions prohibiting HOAs or requiring unanimous consent in their formation. The law also permits the appointed or elected boards of HOAs to impose late fees, interest charges, and legal fees on members behind on their assessments. These measures apply to all residents, even those who did not consent to the provisions, or even the HOA itself, when their deeds were signed.

In the wake of these legal changes, some Harris County residents have raised concerns that private organizations are usurping the tax and regulation powers of governments without adopting adequate safeguards of residents rights or the democratic process. Others defend the practices of HOAs as vital to the upkeep of neighborhoods and protection of property values. In many respects, the Harris County controversy over HOAs' growing numbers and power mirrors a national discussion over the proper role of homeowner associations.¹¹ What both sides lack, however, is hard evidence of the benefits and costs of homeowner associations. To fill this gap and inform the national debate, I turn now to a new dataset of foreclosures and property values in Harris County subdivisions.

⁴736 S.W.2d 632 (Tex. 1987).

⁵Tex. Const. art. XVI, §50, cl. (a).

⁶It remains to be seen whether *Inwood* allows HOAs formed after the signing of deeds to foreclose.

⁷Stella Wallack of Consolidated Management, quoted in Jim Barlow, 1997, 'Homestead bill spurs nasty fight,' *Houston Chronicle* April 6, B1.

⁸According to HOAdata, Gainer has represented HOAs in 918 Harris County foreclosure filings since 1985.

⁹If writing property law for one county in a state seems unusual, consider Section 206 of the Texas Property Code, which applies to exactly one subdivision, Oak Forest of Harris County. Passed in 1997, Section 206 allows the imposition of mandatory assessments by a majority of those property owners *voting*, rather than a majority of all deedholders. After a 'majority' of 500 homeowners voted to establish mandatory assessments on their 5100 fellow homeowners, three-quarters of the neighborhood rose in protest, ultimately restoring voluntary payment of dues (See Matt Schwartz, 1998, 'Residents are opposed to deed-restriction revise,' *Houston Chronicle* August 11, A19.).

¹⁰Specifically, chapter 204 permits a vote of 60 percent of homeowners to establish a homeowners association with mandatory dues whose actions are binding even on those deedholders who opposed forming an HOA.

¹¹See, for example, Benjamin (2000), Conte (2001), and McKenzie's (1994) reviews of homeowner complaints of heavy-handed, capricious, and secretive regulation by homeowner's associations across the country.

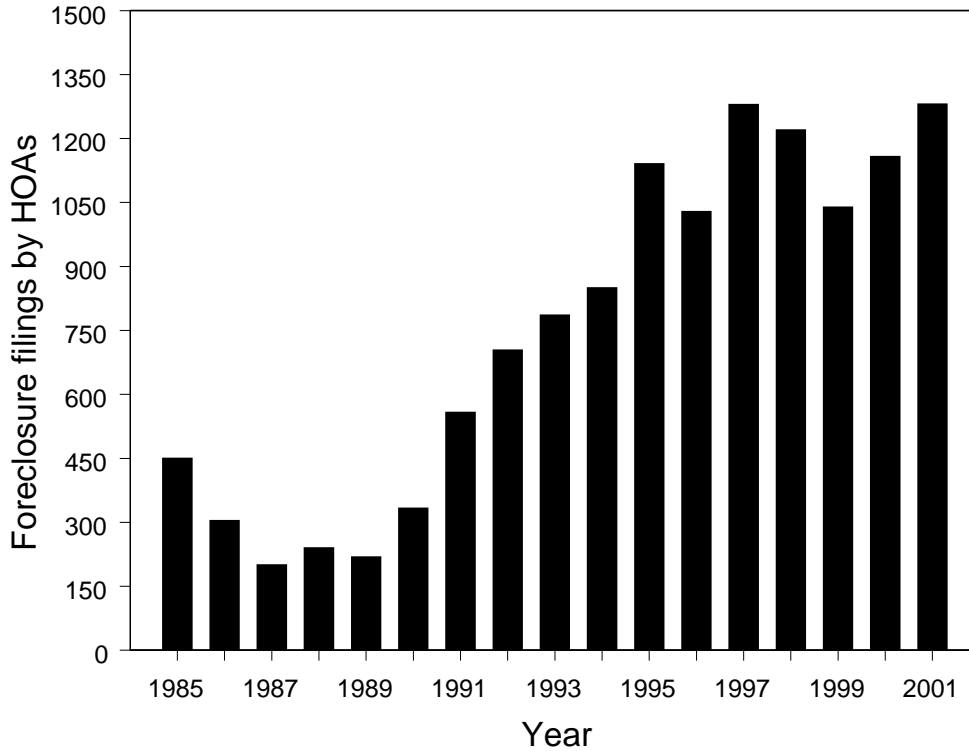


Figure 1: *Total HOA foreclosure filings in Harris County.* Source: HOAdata.

3 Harris County Foreclosure Filings, 1985–2001

Data on foreclosure filings were drawn from Harris County court records by the HOAdata researchers.¹² These data pertain to foreclosure filings rather than foreclosure sales because the final disposition of homes can be difficult to determine from the record.¹³ All filings carry the legal threat of foreclosure and the likelihood that the homeowner will bear all legal costs for both sides. In all, 12,759 filings from 670 Harris County HOAs were recorded over a 17 year period (1985-2001). Despite efforts to ensure a complete count of all filings, the data may represent undercounts, though there is no reason to suspect any undercounting introduces bias.

Filing counts were matched to subdivision data—counts of total homes, median home prices, the median year homes were built, and price trends—obtained from the Houston Association of Realtors (HAR).¹⁴ Altogether, 80 percent of filings were successfully matched to subdivisions. The unmatched names are likely due to errors or idiosyncracies in the recording of subdivision names and the possibility that some subdivisions are missing from HAR’s data.

Several patterns emerge from the data, even without formal statistical analysis. First, filing rates surged over the 1990s, as Figure 1 shows. In 1985, only 449 homeowners faced foreclosure by their HOAs; by 2001, this number rose to 1,280. The growth in HOA foreclosure filings suggests that legal

¹²The data used here are current as of January 13, 2002. For the latest data, see <http://HOAdata.org>.

¹³Foreclosure filings are defined as lawsuits by HOAs against homeowners which carry the threat of foreclosure.

¹⁴The data are available from HAR on the web at <http://www.har.com/indexpricetrends.htm>.

changes in 1987 and 1995 have made it easier for HOAs to foreclose on members. I will put this impression to a formal statistical test in the next section.

Second, filings are far more common in neighborhoods with low home values, which is likely a strong proxy for income and class. The simple correlation between the total filings in a subdivision and the (natural log of the) median home value is a hefty 0.93. Were this a study of bank foreclosures, such a correlation might be unremarkable. However, the dollar amounts in dispute in HOA cases are much smaller than in bank foreclosures: fines or delinquent dues provoking foreclosure typically amount to a few hundred dollars. Moreover, the HOA ostensibly represents the neighborhood itself. Thus poorer neighborhoods—or their agents, the HOAs—seem to have *chosen* to impose higher rates of foreclosure on themselves.

Since an avowed purpose of HOAs is raising property values, perhaps HOAs are simply more aggressive enforcers of deed restrictions where property values are low. Alternatively, HOAs may be acting without the knowledge or support of residents, finding it easier to foreclose in poorer neighborhoods where residents lack legal and financial resources. Since foreclosure is potentially lucrative for HOAs and their attorneys, this possibility raises concerns for all members of homeowner associations, particularly those in lower-priced subdivisions.¹⁵ With the available data, it is not possible to determine the causal mechanism underlying the correlation of home price and HOA foreclosure filings. As a first step to understanding this process, this paper will develop a statistical model to confirm and quantify the relationship between filings and neighborhood home values.

4 Measuring the Cost of HOAs: Foreclosures

4.1 Methodology

Analysis of foreclosure filings presents several methodological challenges. First, the data are counts of events, and thus take on only positive integer values. Least squares regression is inappropriate in the presence of this heteroskedasticity, and specialized event count models must be used. However, simple count models based on the Poisson distribution are also inadequate. Foreclosures are likely to be overdispersed, with the variance in filing rates rising faster than the mean. In the Poisson model, this overdispersion will lead to overconfidence. Fortunately, overdispersion can be captured with negative binomial models, which modify the Poisson to allow the variance of the count to be larger than the expected value.

A second complication is that zero filing counts in neighborhoods with and without HOAs arguably arise from different probability distributions: the count process producing filings and the binary process producing HOAs, respectively. The overdispersion of the negative binomial cannot account for the excess zeros that correspond to neighborhoods that have no HOA and hence no HOA foreclosure filings (non-filing HOAs are unobserved). Fortunately, a zero-inflated count model can obtain better estimates of the rate of filing by homeowner associations by estimating the probability that zero counts

¹⁵In the median foreclosure case for which data on fees are available, HOA attorneys fees charged to defendants amounted to \$1,490, to which a median judgment of \$1,020 was added. Some attorneys appear to specialize in HOA foreclosure cases. Just 10 attorneys account for half of the 12,759 foreclosure filings in Harris County (1985 to 2001). See <http://HOAdata.org> for more information.

reflect the absence of an HOA, rather than a non-filing (i.e., unobserved) HOA.

To account for both sources of dispersion, I employ a zero-inflated negative binomial (ZINB) model.¹⁶ In the ZINB model, a binary stage determines whether the count is produced by the negative binomial or is simply zero. The binary or 'inflation' stage is modeled by a logit link, as follows:

$$\begin{aligned}
 y_i &= 0 \text{ with probability } \phi_i \\
 y_i &\sim \text{NB}(\mu_i, \alpha) \text{ with probability } 1 - \phi_i \\
 \phi_i &= \frac{\exp(z_i \gamma)}{1 + \exp(z_i \gamma)} \\
 \mu_i &= \exp(x_i \beta)
 \end{aligned} \tag{1}$$

The specific form of the negative binomial used here corresponds to Cameron and Trivedi's (1998) NB2 model, in which $E(y_i) = \mu_i$ and $\text{Var}(y_i) = \mu_i(1 + \alpha\mu_i)$. The model was estimated by maximum likelihood.¹⁷

The negative binomial component of the model is conditioned on two variables: the median value of homes in the subdivision and a measure of 'opportunity' for foreclosure, the number of homes in the neighborhood times the years of the current period in which the subdivision existed. Hence

$$\mu_i = \exp(\beta_0 + \beta_1 \ln(\text{Value}_i) + \beta_2 \ln(\text{Years}_i \times \text{Homes}_i)) \tag{2}$$

The inclusion of $\text{Year}_i \times \text{Homes}_i$ is strongly justified by the count framework—more opportunities to foreclose should imply more foreclosures.

The excess zeros are modeled using the same variables:

$$\phi_i = \text{Logit}(\gamma_0 + \gamma_1 \ln(\text{Value}_i) + \gamma_2 \ln(\text{Years}_i \times \text{Homes}_i)) \tag{3}$$

The opportunity variable plays an important role here as well. For example, larger neighborhoods may be more likely to form HOAs, since any fixed costs of HOA creation and operation would be spread among more residents. Property values could be associated with HOA presence through a variety of channels: on one hand, HOAs may be a 'luxury' indulged mostly by more affluent neighborhoods; alternatively, they may be more common in lower-value neighborhoods motivated to raise property values. Either way, it is worth controlling for property values in the inflation stage as well as the count model.

The analysis was run separately on counts from two periods: 1985-1994 and 1995-2001. Differences in the filing rate across these periods may capture the cumulative effect of *Inwood* (1987) and changes to Chapter 204 (1995). In each period, small subdivisions (those with less than 100 homes) are excluded from the analysis, which nonetheless leaves as many as 1400 neighborhoods, depending on the period.

¹⁶See Greene (2000) and Zorn (1996) on zero-inflated models in a Poisson context; the negative binomial is analogous.

¹⁷The following likelihood function was maximized using GAUSS:

$$L = \sum_{y_i=0} \ln \left[\phi_i + (1 - \phi_i) \left(\frac{1}{1 + \alpha\mu_i} \right)^{\frac{1}{\alpha}} \right] + \sum_{y_i>0} \left[\ln(1 - \phi_i) + \ln \Gamma \left(\frac{1}{\alpha} + y_i \right) \right]$$

Parameter	Zero-inflated Negative Binomial			
	1995-2001		1985-1994	
	Count	Inflate	Count	Inflate
Value	-2.28 (0.22)	-6.33 (1.02)	-2.32 (0.26)	-7.37 (1.43)
Years \times Home	1.15 (0.11)	-1.02 (0.20)	0.90 (0.10)	-1.46 (0.28)
Constant	18.7 (2.95)	79.2 (11.7)	20.4 (3.20)	94.4 (16.4)
α	4.42 (0.52)		5.40 (0.67)	
N	1417		1290	
Vuong	10.22 ($p < 0.0001$)		9.70 ($p < 0.0001$)	
LR test ($\alpha = 0$)	4198.5 ($p < 0.0001$)		1887.5 ($p < 0.0001$)	

Table 1: *HOA Foreclosure Filings in Harris County*. Entries are zero-inflated negative binomial regression coefficients, with standard errors in parentheses. $p < 0.0001$ for all parameters. 'Count' estimates correspond to the NB2 portion of the ZINB model; 'Inflate' estimates refer to the Logit model of excess zeros within ZINB.

4.2 Results

Table 1 shows the estimated parameters of the ZINB model of foreclosure filings. For both periods, neighborhoods with lower home values have more foreclosure filings, as do neighborhoods with more homes. According to the inflation stage estimates, the presence of HOAs is positively related to property values and *Years \times Homes* (note that the inflation parameters are positively related to excess zeros, and thus negatively related to HOA presence). All estimated coefficients are highly statistically significant ($p < 0.0001$ in all cases). Moreover, Vuong (1989) tests of non-nested hypotheses strongly support the zero-inflated model versus the simpler NB2 model ($p < 0.0001$), and likelihood ratio (LR) tests favor the zero-inflated negative binomial over the zero-inflated Poisson ($p < 0.0001$).

Since few of us can interpret the substantive significance of negative binomial coefficients, the best way to understand the model is to compare expected filing rates under different scenarios. This could be accomplished by simply plugging a hypothetical scenario x_c into the regression model, to obtain $E(y_i|x_c) = \exp(x_c\hat{\beta})$. However, analytically obtaining the uncertainty of this estimate is not as straightforward. Fortunately, statistical simulation techniques produce exactly the same expected

$$\left[-\Gamma(y_i + 1) - \ln \Gamma\left(\frac{1}{\alpha}\right) + \frac{1}{\alpha} \ln\left(\frac{1}{1 + \alpha\mu_i}\right) + y_i \ln\left(1 - \frac{1}{1 + \alpha\mu_i}\right) \right]$$

A GAUSS package to implement the ZINB model is available online at <http://chris.adolph.name>.

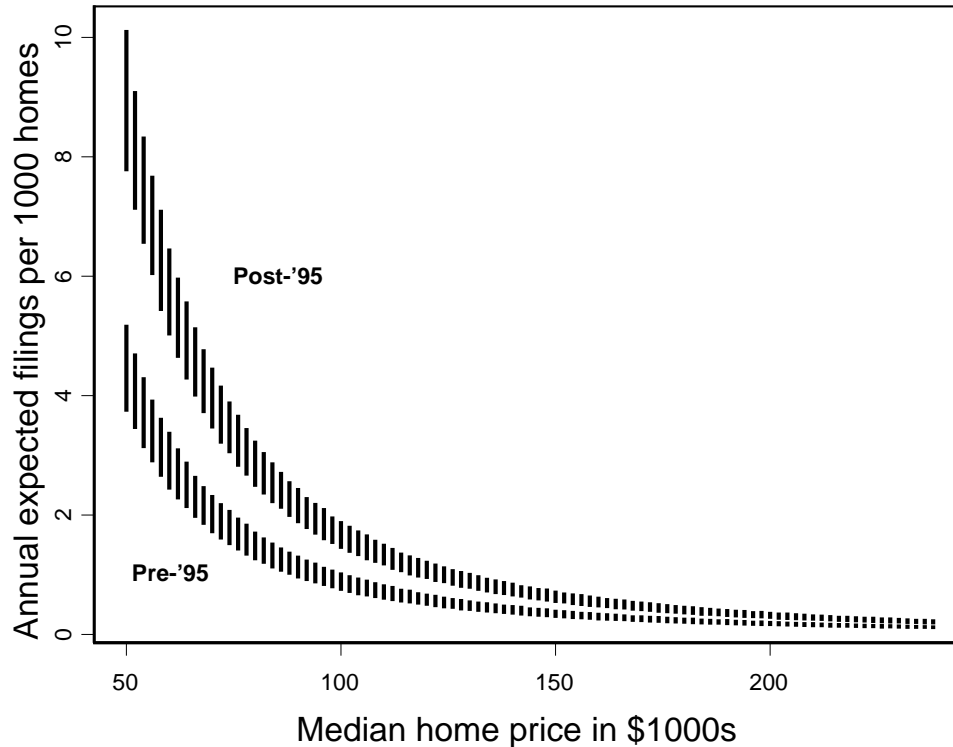


Figure 2: *Foreclosure filings in subdivisions with HOAs.* The higher curve illustrates HOA behavior from 1995-2001; the bottom curve 1985-1994. Expected foreclosure filing rates are drawn from simulations of the count models in Table 1. Bars indicate 95 percent confidence intervals for each level of median home value. In all simulations, neighborhood size is set to the mean for subdivisions with HOAs (about 600).

values (and, in fact, any desired quantity of interest calculable from the estimated model) along with a confidence interval (King, Tomz, and Wittenberg, 2000).

For each hypothetical neighborhood, I drew 1,000 simulated expected values from the estimated model, yielding an expected filing rate and its 95 percent confidence interval. Since we are interested in the behavior of HOAs, I explicitly assume the existence of an HOA by drawing directly from the NB2 component of the model. Throughout the simulation runs, I held the number of homes at 600 (the mean for known HOA neighborhoods) and varied the median home value. I then converted all simulation results to rates per 1000 homes for ease of comparison.

Focusing first on the results for 1995-2001 (the higher curve in Figure 2), I note that the average HOA homeowner (who lived in a \$84,000 subdivision) faced a 2.5 in 1000 annual risk of foreclosure filing. Filings are dramatically higher for HOA neighborhoods with low property values. In a \$60,000 neighborhood, 5.7 in 1000 homeowners face foreclosure filings by their HOA each year, compared with only 0.32 in 1000 homeowners in a \$200,000 subdivision—a difference of almost 18 times. Put a different way, owners of homes worth \$50,000 face an almost one percent chance of foreclosure proceedings every year in an HOA neighborhood. These differences are not just evident at the extremes. Overall, homeowners in the bottom 25 percent of neighborhoods by value faced 10.7 times the risk of

foreclosure filing as those in the top 25 percent.

With confidence intervals as tight as those in Figure 2, there is little doubt that the less affluent face far greater risk of foreclosure by their own HOAs. Given that 7 percent of HOA homes and 31 percent of all Harris County homes were worth \$60,000 or less in 2000, one concludes that HOA foreclosure filings in modest neighborhoods are a significant phenomenon with the potential to grow even larger as HOAs become more prevalent.

Comparing the two curves in Figure 1 shows that foreclosure filings became much more common in the late 1990s, perhaps the result of changes in Texas law. After 1995, the average homeowner faced nearly twice the risk of foreclosure filing by his HOA as in the previous ten years. The rise in foreclosure filings hit modest neighborhoods hardest: for the resident of a \$50,000 home, the risk of HOA foreclosure filing doubled, from 4.4 in 1000 homes to 8.9 in 1000. Even for the affluent owners of \$200,000 homes, the chance of HOA foreclosure filing rose by 76 percent, though filing rates in such expensive neighborhoods remained well below one home in 1000.

5 Measuring the Benefit of HOAs: Property Values

Proponents of homeowner associations often cite higher property values as the key benefit of HOAs. According to the Community Association Institute (CAI), the leading national organization of HOAs, foreclosure powers are simply a necessary tool to keep HOAs running, rules enforced, and property values high¹⁸. And in disputes across the country over deed restrictions, dues, and foreclosures, HOA boards routinely defend their organizations as indispensable guardians of property values (cite***). According to this logic, an expansion of foreclosure powers should produce higher home values in neighborhoods with HOAs, particularly those which use this power to enforce dues-collection and deed restrictions.

The raw numbers do not support the HOA's case: property values in neighborhoods with HOA filings grew at an 4.9 percent annual rate from 1994 to 2000, versus 7.1 percent in all other neighborhoods (unweighted averages of neighborhoods with at least 100 homes). But to provide a better test to the argument that HOAs benefit property values, we should distinguish three categories of subdivisions: those without HOAs, those with HOAs but no foreclosures, and those with HOAs that filed for foreclosure. The goal is to show whether the latter two categories are positively associated with growth in property values from 1994 to 2000 ($\Delta Price_i$), over which period HOA powers expanded.

First, we must distinguish filing from non-filing HOAs. HOAs that have filed foreclosures in court are easily identified from court records. Thus let $Filed_i$ be a binary indicator of whether an HOA filed any foreclosures between 1995 and 2000. However, without a database of all HOAs, disinguis

¹⁸In an article in CAI's magazine, attorney James L. Strichartz argues uncollected assessments cause 'property values to decline.' To avert this threat, he recommends HOAs adopt a policy threatening lawsuits or foreclosure against delinquent homeowners. He cautions that 'courts are often reluctant to ... deprive[s] an owner of his or her home for minimal defaults', and that the costs of foreclosure are difficult to justify where delinquencies are small. Nevertheless, Strichartz recommends HOAs ensure homeowners are liable for all attorney's fees in foreclosure cases, and urges HOAs 'to band together to lobby their state legislature' for non-judicial foreclosure powers where they are lacking (see James L. Strichartz, 1992, 'Getting Tough with Assessment Collections', *Common Ground*, July/August). More recently, CAI has pressed states to allow non-judicial foreclosure proceedings (*Capitol Connection*, August/September, 2000).

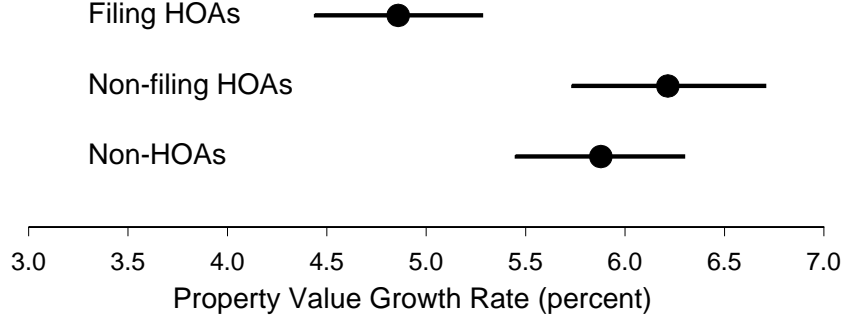


Figure 3: *Estimated property value growth rates, Harris County.* Expected annual growth rates by category of subdivision, with 95 percent confidence bars. Simulated from Eq. 5.

between non-HOAs and non-filing HOAs poses difficulties. In the absence of hard data, the inflation stage of the ZINB model can be interpreted as providing estimates of which neighborhoods have no HOAs (the excess zeros). Using these estimates, I construct an indicator, ϕ_i , of *non-filing* HOAs:

$$\phi_i = \begin{cases} 0 & \text{if } Filed_i = 1 \\ \text{Bernoulli}(1 - \phi_i) & \text{otherwise} \end{cases} \quad (4)$$

Undoubtedly, this measure is only as good as the ZINB model and estimates, and could be improved; ideally, it will be replaced with a definitive list of all HOAs. In the meantime, however, the ZINB estimates are the best data available.

To account for the uncertainty of ϕ_i , I imputed multiple sets of $\tilde{\phi}_i$'s from the fitted Eq. 1, and ran each imputation through the following model¹⁹:

$$\Delta Price_i = \lambda_0 + \lambda_1 Filed_i + \lambda_2 \tilde{\phi}_i + \lambda_3 Price_{94,i} + \varepsilon_i \quad (5)$$

which I estimated by least squares.²⁰ Filing HOAs are associated with higher property value growth than non-HOA neighborhoods if $\lambda_1 > 0$. Likewise, non-filing HOAs' property values grew faster than non-HOAs' if $\lambda_2 > 0$. Finally, filing HOAs have higher growth than non-filing HOAs if $\lambda_1 > \lambda_2$.

As neither condition holds, the estimated model does not support the claims that HOAs or HOA foreclosures benefit home values:²¹

¹⁹Multiple imputation of 100 datasets proved sufficient to obtain stable estimates of the quantities of interest.

²⁰Although weighted least squares would seem appropriate, using the number of homes as weights made no noticeable difference in the least squares estimates.

²¹Results and standard errors have been combined across the imputed datasets. With m imputed datasets, the point estimate of parameter λ is simply the average across the imputed datasets, or $\bar{\lambda} = \frac{1}{m} \sum_{j=1}^m \hat{\lambda}_j$. The standard error of $\bar{\lambda}$ takes into account both the estimated variance within each imputed dataset plus the sampling variance across datasets. Hence, $SE(\lambda)^2 = \frac{1}{m} \sum_{j=1}^m \hat{V}_{\lambda_j} + S_{\lambda}^2(1 + 1/m)$, where the sampling variance is $S_{\lambda}^2 = \sum_{j=1}^m (\lambda_j - \bar{\lambda})^2 / (m - 1)$. See King *et al* (2001) for further details on combining multiple imputation regression estimates.

$$\Delta Price_i = \begin{matrix} 0.066 & -0.010 \times Filed_i & -0.003 \times \tilde{\varphi}_i & -0.153 \times Price_{94,i} \\ (0.005) & (0.003) & (0.004) & (0.068) \end{matrix}$$

$N = 1039$, s.e.r. = 0.036

Overall, the change in non-filing HOA property values from 1994-2000 is statistically indistinguishable from non-HOA neighborhoods (Figure 2). However, property values grew significantly slower—by about one percent per year—in neighborhoods with filing HOAs. Notably, this result does not depend on multiple imputation or including $\tilde{\varphi}_i$ in the model—in this case, filing HOAs still significantly underperform all other subdivisions.²²

It would be inappropriate to conclude on this evidence that HOAs or HOA foreclosures are actually *bad* for property values, since we do not know what would have happened to property values in HOA subdivisions had the HOA not been present. Moreover, the model of property values can also be improved in further work by controlling for other causes of changing property values (location, for example). Still, it is troubling that the costs of foreclosure do not seem to be offset by clear benefits in property values.

6 Conclusions

The findings presented here should help ordinary homeowners and housing scholars better understand the risks and rewards involved in belonging to homeowner associations. Harris County HOA foreclosure rates have risen dramatically in the wake of *Inwood* and the passage of Chapter 204. For the average homeowner, the annual risk of HOA foreclosure from 1995-2001 was almost double that of the previous decade. This increase in foreclosure threat does not seem to be balanced by higher property value growth; if anything, property values grew more slowly in HOAs that filed foreclosures than in other neighborhoods. Finally, less expensive neighborhoods had vastly higher foreclosure rates than more expensive subdivisions, suggesting that poorer homeowners bear the brunt of foreclosures. Understanding why should be a key question in future research.

²²If $\tilde{\varphi}_i$ is dropped from Eq. 5, the resulting model yields a comparison of filing HOAs versus all other neighborhoods. In this specification, the expected annual property value growth for filing HOAs is 4.8 percent (with a 95 percent confidence interval of 4.4 to 5.2), and the expected growth of all other subdivisions is 6.0 percent (with a 95 percent confidence interval from 5.8 to 6.3), for a difference of 1.2 percent.

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