The Cost of Conformity:

An Empirical Study of Residential Community Associations
in Saint Louis County, Missouri.

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Abstract

Supporters of Residential Community Associations (RCA) argue that one of the advantages of living in an RCA is an increase in property values. While some research has looked at the analytical effects from RCAs, there is no research published on the empirical effects RCAs have on home values. The unique dataset used in this paper is comprised of 124,891 home sale observations from Saint Louis County, Missouri, spanning ten years and is merged with RCA information with the assistance of GIS software. The paper suggests that while there may be a base benefit from residing in an RCA, the conformity of RCA development design results in this being diminished by simple supply and demand effects.

Keywords: Residential Community Associations; Common Interest Developments; Homeowner Associations; Private Governments; Housing Prices; Hedonic Price Functions; Spatial Econometrics; Geographic Information Systems Software;

1. Introduction

Residential Community Associations (RCAs) are becoming increasingly popular among newer residential subdivisions. The Community Associations Institute (CAI) estimates that the number of RCAs has doubled each of the last three decades. As of 2003, it is estimated that over 19.9 million homes (more than 15% of the United States housing stock) are located within some type of RCA development [5] and explanations for this growth vary. Developers argue that RCAs allow them to differentiate their product by varying the rules governing the development and services offered by the RCA [20]. The CAI website cites the increased popularity of RCAs as an increased desire to "…protect home values, provide affordable ownership opportunities, [and] help meet the increased privatization of services as local governments cut back…"[1] A paper by F. Frederic Deng argues that the increase in RCAs is attributed to the existence of a hold-out problem in regards to new development between homeowners and local government created by public zoning laws that is best solved through the private zoning that is the cornerstone of RCAs [7].

A small group of studies, both in the economics and popular literature, have looked at the impact of RCAs on local communities. Foldvary [9] looks at several case studies of the RCA acting as a private provider of public goods. Two articles by Helsley and Strange [13, 15] and a working paper by Groves [11] focus on the potential competition between the RCA and local government in the provision of public goods and its effect on welfare and levels of public good provision. Blakely and Snyder [3] look specifically at gated communities in the urban landscape and find they tend to secede, either literally or figuratively, from the larger community due to a sense of separation created by the gates and walls. A 1999 article by Helsley and Strange looks at a model of gated communities and their role in crime prevention [14]. The model predicts that while crime is diverted to other communities, gated communities do have a negative effect on crime rates as a whole under certain conditions. The only current empirical work focusing specifically on RCAs is a 2004 paper analyzing the effect of RCA assessments,

[1]http://www.caionline.org

involvement, and service provision within six RCAs located in the State of Virginia [19]. The authors find that RCAs governed by members tend to charge higher assessments and provide larger quantities of services than those governed by management agencies. A pair of papers by Hughes and Turnbull [16, 17], while not looking at specifically RCAs, tests the willingness-to-pay for restrictive covenants the enforcement of which makes up a large portion of the role of RCAs. In these papers, the authors find that people are willing to pay a premium for homes that are subject to certain restrictions such as rules limiting signage and parking.

This paper begins to fill the gap in the empirical literature concerning RCAs by testing the assertion that RCAs increase the value of homes located within them. Proponents of RCAs argue that the rules and regulations set forth by RCAs protect residential investments, provide residents with well maintained and planned developments, and services at a lower cost[2]. If this is the case, then these factors should be capitalized into the value of RCA properties resulting in, all else equal, RCA properties commanding a higher price than homes not located within an RCA[3]. A unique dataset merging Geographic Information Systems information with manually collected RCA data is created for Saint Louis County containing 124,891 observations spanning ten years of home sales (1992-2001). This data is used to estimate a hedonic price function for housing including both homes within and outside of RCAs.

The results show that the average home will see either a very small or negative change in value when placed in an RCA development. This result, however, is dependent on the style of home that is placed within the RCA. Allowing the values of housing characteristics to differ by location shows that residing in an RCA can increase the value of a home by about 25% but this base increase in value is quickly diminished by the fact that most RCA homes are very similar in design and type. More specifically, the results show that the most commonly occurring house style in the data sees a net decrease

[2] http://www.caionline.org

[3] For a review of the capitalization literature see Yinger, et. al.[23].

in value of about 8% when placed in an RCA while the least commonly occurring housing style sees a 19% increase in value.

The remainder of this paper is outlined as follows. Section two gives a brief introduction to the institutions of RCAs and section three outlines the statistical techniques for the model estimated and section four reviews the data. Section five reports the results of the empirical analysis and section six concludes with general comments and prospects for future research.

2. Residential Community Associations (RCAs)[4]

Residential Community Associations (RCAs) are a type of Common Interest Development (CID) and are also known as Homeowners Associations (HOAs) or private governments. Residential Community Associations (as they are hereafter referred) are generally governed by a board of trustees made up of residents who own homes within the given residential development. Authority is granted to the board via the Covenants, Conditions, and Restrictions (CC&Rs) that are filed with the local municipality when the development plans are submitted for approval. Covenants, Conditions and Restrictions have been attached to developments for many years and generally contain information regarding the land upon which the development is built and any restrictions or easements[5] on the property. The CC&Rs also create the RCA board of trustees, determine the rights and responsibilities of the board, set up the institutions governing the board, and set the rules regarding the annual membership assessment and provision of services by the RCA. Early RCA public good provision was limited to street maintenance in an attempt to compensate for the poorly maintained streets of the municipality[6]. Over time RCA provision has expanded to include goods such as green spaces, gates and walls, trash collection, water provision, and other common-use amenities [20].

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[4] This is a summary of information from a variety of sources including McKenzie [20], CAI website, information gathered during the data collection stages of this project by the author and the author's own experience with RCAs.

[5] An easement is a right-of-way granted to either the municipality or utility service by the owner of a parcel of land to allow for the construction of infrastructure.

[6] This is common in older RCAs found in St. Louis County. Much of the historic literature cites St. Louis as one of the birthplaces of RCA type developments.

Another public good provided to members of an RCA development is the board's ability to impose monetary penalties for the violation of the CC&Rs. Without a board of directors, it is up to the individual land owners to enforce the CC&Rs via the court system. A primary responsibility of the RCA board is the enforcement of the CC&Rs and the courts have upheld the board's ability to impose monetary penalties for the violation of the CC&Rs. This should increase the likelihood that members of an RCA development will adhere to the CC&Rs and thus limit externalities. To fund this enforcement and the provision of goods and services, the RCA board is granted the ability to collect annual assessments from the property owners. These annual assessments are meant to cover the costs of maintaining any common-use facilities, pay any taxes charged to the RCA by the local government, provide any public goods decided on by the board, and allow the board to seek legal action to enforce the restrictions set forth in the CC&Rs[7].

Two primary concerns regarding RCAs are the chance the RCA will dissolve or the secession of the RCA from the local municipality[8]. On the one hand, some RCAs may attempt to dissolve due to an inability to collect necessary revenues or a lack of involvement from the residents. Dissolving, however, can be quite difficult if the RCA provides services such as common land or road maintenance. In these cases local governments tend to require the RCA to bring the common space or roadways up to or beyond current construction standards before they are willing to take over the responsibility of providing the services in place of the RCA. As a result, the RCA does not dissolve officially but rather decreases the quality of the good or service being provided. On the other hand, some RCA members become so frustrated by local government that they vote to secede from the local government and form their own municipality as has been in the case in states such as California and Florida.

3. Empirical Model: The Hedonic Price Function and the Role of Geographic Space

[7] In many cases the maximum amount the board can assess a member in any given year is explicitly stated in the CC&Rs and generally requires the approval of a super-majority of the residents to increase that maximum. It is, however, becoming more common (especially during the late 1990s) for CC&Rs to tie the maximum assessment to a measure of inflation such as the CPI.

[8] For more information on these topics see Blakely and Snyder [3] and Gordon [10].

If one wishes to determine the price, demand parameters, or supply parameters of a good, one need only look at the market for that good. This becomes difficult, however, if the good in question is a component of a larger good and has no explicit market in and of itself. Such is the nature of housing. If one is interested in the price of an additional bedroom, for example, one can not look at the market for bedrooms given that the market does not exist. One method to determine the equilibrium price of a bedroom implicitly is to estimate the hedonic price function. Rosen [22] shows that the hedonic price function estimates the locus of all of the price-quantity pairs where the consumer's bid function is tangent to the producer's offer function. The coefficients from the empirical estimation of the hedonic price function yields the equilibrium price of the given attribute or component.[9] If there is a positive, non-zero price for the attribute (in this case, living in an RCA), then a homeowner searches for that attribute when purchasing a home. If, however, the value is zero or negative, the homeowner either does not consider that attribute in their housing decision or considers the attribute to be a "bad". The resulting base model used to estimate the effect of RCA control on a home is[10]

$$\ln P = \alpha + \sum \beta_j C_j + \sum \delta_j Year_j + \sum \phi_j L_j + \gamma \; RCA + \varepsilon \qquad (1)$$

where

P =	a vector of observed home sale prices adjusted to 1982-1984 dollars
C_j =	a vector of home characteristics
$Year_j$ =	a vector denoting the year the home was sold
L_j =	a vector of location characteristics measured by either the school district or the city the home is located in
RCA =	a vector with the element equal to one if the home is within an RCA

A problem faced when estimating the hedonic price function for the housing market is that the location of a given observation in space must be addressed or the results will suffer from spatial autocorrelation. When using OLS estimation it is assumed that the error terms are independent of each other yielding zeros on the off-diagonal of the covariance matrix. In the housing market, however, the

[9] These coefficients can then be used to determine the parameters of the demand or supply function for that particular attribution in which case a series of identification issues are noted by Bartik [2] and Epple [8]. Given that only the marginal price of the good is of interest, the identification concerns are not addressed in this paper.

sale price of a home is not only a function of the characteristics of the home itself, its neighborhood, and the preferences of the potential homeowner, but is also a function of the attributes of nearby homes as measured by their sale price. Failure to account for this role of space in the hedonic price function results in the dependency of the error terms across observations and thus autocorrelation caused by "space". The resulting coefficient estimates of the hedonic price function are biased and the standard errors are incorrect.

The general solution to this problem is to include a spatially lagged value of the regressor, just as a temporally lagged value of the dependent variable is included in time series analysis. Several methods of spatially lagging the dependent variable are discussed in Anselin [1]. For the purpose of this paper the spatial weight matrix is used and denotes an observation's 15 nearest neighbors based on Euclidean distance. The hedonic function now predicts price as a function of a home's own characteristics, its neighborhood, and a weighted average of the sale price of its 15 nearest neighbors.

If the data covers more than just one year, the creation of the weight matrix is complicated slightly. If the weight matrix is created using typical methodology, it is possible that a price from an observation sold in 2001 will help to determine the price of a home sold in 1979. Clearly this temporal inconsistency is unacceptable and must be controlled for[11]. In an article by Pace, et. al. [24] the authors use the STAR (spatiotemporal autoregressive) class of models. An attractive element of the STAR model is that the spatial weight matrix is created by first sorting the observations by date of sale from oldest to most recent. The distance between the current observation and all previous observations is calculated and used to create the weight matrix. This new matrix is used in place of the typical weight matrix and denotes an observation's 15 nearest neighbors sold in the current or previous years.

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[10] One of the major concerns when estimating the hedonic price function is the choice of functional form. While there is no theoretical motivation for the functional form used, simulations by Cropper, et. al. [6] show that in the presence of missing variable bias, the semi-log functional form is just as accurate as other methods.

[11] Anselin [1] surveys several space-time models, however, these methods are only suited for data that is a panel across time or space. Obtaining a panel with home sales can severely limit the number of usable observations.

In addition to the autocorrelation among the error terms, most spatial data also exhibit heteroskedasticity. For this paper the GMM estimation technique proposed by Kelejian and Prucha [18] is used[12]. This methodology calls for the hedonic price function to be estimated using a two-stage least squares process with a set of instruments comprising the characteristics of an observation and a spatial lag of those characteristics.

One complication with using this method is that the weight matrix is not a typical spatial weight matrix. By using the STAR methodology, homes that were sold early in the data set may have neighbors that are not very close due to the limited number of previously sold properties available to be neighbors. The STAR methodology calls for multiplying the spatial weight matrix (*S*) by the variable to be spatially lagged and then remove the first *m* observations, where *m* is determined exogenously, to ensure that the observations listed as neighbors are, in fact, located close to the current observation[13]. Fortunately this can easily be included into the Kelejian and Prucha GMM estimation technique by first spatially lagging the necessary variables, removing the first *m* observations, and then estimating the hedonic equation. After considering these econometric issues, the base model defined in (1) is re-written to that shown in equation (2).

$$\ln P = \rho SP + \alpha + \sum \beta_j C_j + \sum \delta_j Year_j + \sum \phi_j L_j + \gamma RCA + \varepsilon \qquad (2)$$

where

ρ = the spatial autocorrelation coefficient
S = a lower triangular weight matrix denoting the 15 nearest neighbors[14]

A final spatial concern is that of spatial heterogeneity or the case where the coefficients of some variables differ by location. In a 1990 paper by Can [3], the author shows that the value of certain housing characteristics differ across space based on the quality of the neighborhood within which that home is

[12] Several estimators exist to produce consistent estimates in the presence of heteroskedasticity; however, the size of the data set used for this research would require the inverting of a matrix with over 100,000 columns and rows.

[13] For the purpose of this paper, *m*=2,499. Altering this value does not change the final results.

[14] Other specifications for the values of the non-zero elements of *S* were also tried including 1/10, 1/5 and a decreasing value as the ‘neighbor’ was further away. The results of model did not significantly differ from those presented here.

located in; this phenomenon is called spatial drift. When estimating an equation with spatial drift there is a direct and an indirect effect from each characteristic. The direct effect is the base increase in the value of a home from that characteristic and then the indirect effect corrects for any increase or decrease in the value of that characteristic in a given location. For example, one would expect that a large yard may be more valued in a neighborhood with more children than in a neighborhood with more seniors.

This method can also be applied to the case of RCAs which, by their very nature, collect rather homogenous populations into a single geographic area. This is done both through the rules and restrictions of the RCA and the fact that many RCAs are developed as large tracts by a single developer with little variation of housing style (so as to limit the developer's costs). As a result there may be a supply effect from certain characteristics that are being incorporated in the results from equations (1) and (2) thus depressing the RCA effect. To control for this, equations (1) and (2) are estimated again by incorporating an expansion equation into the model allowing the spatial drift of housing characteristics. The new model is shown in equations (3) and (4) below

$$\ln P = \alpha + \sum (\beta_{j0} + \beta_{j1} RCA) C_j + \sum \delta_j Year_j + \sum \phi_j L_j + \gamma \; RCA + \varepsilon \qquad (3)$$

$$\ln P = \rho SP + \alpha + \sum (\beta_{j0} + \beta_{j1} RCA) C_j + \sum \delta_j Year_j + \sum \phi_j L_j + \gamma RCA + \varepsilon \qquad (4)$$

where

β_{j0} = Estimate of the direct effect from the home characteristics

β_{j1} = Estimate of the indirect effect from the home characteristics when located within an RCA.

4. Housing Observations from Saint Louis County, Missouri

4.1 The Integrated Assessment System (IAS) Database

The data used in this study includes all single family, detached homes sold in Saint Louis County, Missouri, between 1992 and 2001. The house characteristics and sales data are taken from the Saint Louis County Department of Revenue's 2002 Integrated Assessment System (IAS) database. This database includes the assessment information for all properties located within the county and also includes the sales data from the sample period. The public use database also includes several characteristic variables and uniquely identifies each home by use of a parcel identification number. The initial IAS database includes about 330,000 properties. Once the database is limited to single family, detached housing units, the database contains 267,806 observations. The data is limited further to include only homes with a reported valid sale in the IAS database[15] during the 1992 – 2001 timeframe bringing the final observation count to 124,889.

4.2 The RCA Database

To determine if a home is located within a Residential Community Association it was necessary to undertake an original data gathering effort to construct a database of RCAs. Formally, a subdivision is defined as having an RCA if a board of trustees is created by the CC&Rs and if there is an annual assessment charged to residents of the subdivision[16]. Using the IAS database, a list of subdivisions containing 10 or more homes was compiled and investigated to determine if a CC&R was on file and, if so, whether it created an RCA as defined previously.[17]

There are a few possible sources of measurement error inherent in this process. First, a subdivision may have been excluded due to the 'ten units or less' criteria. It is not impossible for a subdivision to be both an RCA and have fewer than ten units. If one believes that these smaller RCAs are easier to control due to their small membership, then not including these observations in the sample will result in the RCA coefficient being understated. Secondly, if there was an error on the part of the Recorder of Deeds office in maintaining their catalog, then subdivisions with RCAs may not be included as RCA developments or subdivisions that have dissolved their RCA may be included in the sample as RCA developments. Given the conflicting effect that this type of error may have on the coefficient

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[15] The sales database includes information on who reported the price (i.e. buyer, seller, agent, ect.) and whether the price and sale has been validated. Only those observations that were recorded as having been validated are included in this paper.

[16] This is to differentiate an RCA from a subdivision with either CC&Rs and an architectural control committee or subdivisions with CC&Rs and no enforcement group. In the case of an architectural control committee, the committee is used to approve floor plans and designs for homes during a new construction phase. For many of these committees, the developer or their appointees serve as the members and no institutions are in place for the continuation of the committee once the developer vacates. The case of a subdivision with CC&Rs and no formal enforcement groups is discussed in the literature on restrictive covenants.

[17] There are approximately 3,520 subdivisions with ten or more units in Saint Louis County and it took approximately eight months to complete the investigation.

estimates it is impossible to determine whether this error overstates or understates the RCA effect. Unfortunately due to the massive number of subdivisions in the IAS dataset and the lack of official record keeping regarding RCA status or board membership, there is no effective way to control for these sources of error and they must therefore be kept in mind when interpreting the results.

4.3 Saint Louis County Preliminary Data Analysis

Table 1 shows the summary statistics for the housing characteristics[18] used in the estimation of the hedonic price function. The first set of columns shows the summary statistics for the full sample. The average home is about 28 years old when it is sold and has a full basement with no attic and is one story with 3 bedrooms and almost 2 full bathrooms. Twenty-eight percent of the homes are aluminum construction while about 25% of the homes are brick and 20% of the homes are wood frame construction. Just over 40% of the homes are ranch style while another 32% are classified as “other.” The average sale price for a home in St. Louis County over the period 1992 - 2001 was $96,339. The second and third columns break the full sample into RCA and non-RCA only sub-samples. Residential Community Association homes are shown to sell, on average, for about $114,483 over the ten year period covered by the data while non-RCA homes only sold for an average price of $77,810. A difference of means test shows that this difference is statistically significant at the one percent level. Table 2 shows the average sale price for each of the sub-samples in each of the years included in the data. In each year RCA homes sold for a significant premium over non-RCA homes. Another interesting observation from table 2 is that the RCA sub-sample accounts for about 50% of the observations in each year of the data.

[Insert Table 1 and 2]

Looking at the characteristic means between the two sub-samples yields a first glimpse into a possible explanation for the large difference in the sale price of the two types of homes. One possible explanation is that RCA homes tended to be younger at the time of sale with an average age of 18 years

[18] A complete list of summary statistics including school district and city variables is available from the author upon request.

whereas non-RCA homes were twice that age at 39 years old when they sold[19]. Since age has a negative effect on the price of a home, it is no surprise that non-RCA homes should sell for a lower price, on average than an RCA home. A second important observation is that RCA homes tended to be larger than non-RCA homes along several measures. There tended to be fewer one-story homes in the RCA sub-sample and those homes tended to have more bedrooms, more full and half bathrooms, and have a family room. Residential Community Association homes also tended to have a fireplace more frequently then homes not located within an RCA. These differences in the attributes included in the home will also result in differences in the final sale price of the homes[20].

Regarding the style of home in each of the sub-samples, there is not much of a difference. The ranch and other styles are the most common across both sub-samples with there being slightly more ranch style homes in the non-RCA sample and slightly more homes classified as other in the RCA sub-sample. Of interest is that the third most common non-RCA home style, the Bungalow, appears less than one-sixth as often in the RCA sample than in the non-RCA sample. Other than these differences, the remaining housing styles are about equally represented across the sub-samples. The most glaring difference in housing construction across the sub-samples is the fact that 50% of the homes in the RCA sub-sample are of either frame or masonry construction whereas only 30% of the non-RCA sub-sample are of these types. Another 37% of the non-RCA homes are of block construction compared to only 15% of the RCA homes.

5. Results

5.1 Estimation without Characteristic Drift

The results from the estimation of equations (1) and (2) with a matrix denoting the school district the home is located within as the location control variable is shown in table 3. Table 3 shows that most of

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[19] This shows that RCA homes tend to be newer; however, if one looks at the range of ages, RCA homes range from zero to 175 years old and non-RCA homes range from zero to 169 years old.

[20] While not shown, a difference of means test is performed on the RCA and non-RCA sub-sample means and all of the means are significantly different at the five percent level.

the coefficient estimates are significant at the 10% level while many are significant at the 1% level[21]. The values and signs of the coefficients follow expectations within the housing market literature. Homes with split foyer, split level, bungalow or other style see lower sale values while homes of the remaining styles see an increase in their sale value compared to those of the ranch style.

[Insert Table 3]

The coefficients for the type of attic and basement do seem to suffer from some inconsistencies in the estimates of equations (1) that may be due to a correlation with the style variable or the lack of information concerning the surrounding topography[22]. The relative size of the coefficients is more in line with expectations in column two corresponding to the estimation of equation (2) with spatial effects being estimated. The coefficient estimates also shows the expected result that as the age of a home increases, the value of the home decreases by about 1% per year and this rate increases over time. An added bedroom raises the value of the home by about 6 to 8%, an additional story adds about 5% and an extra bathroom adds between 12 and 18% depending on the model specification. Brick homes are valued between 8 and 12% higher than a wood frame home while concrete homes are valued 15 to 24% higher and a stone home commands a premium between 16 and 19%. Homes constructed from block or asbestos see a decrease in value of about 8% and 3% respectively.

The results do tend to support the need to correct for spatial autocorrelation given the increase in the R^2 and the quite large and significant coefficient on the spatially lagged variable. This is supported further by the fact that, aside from the corrections in the relative size of the some of the coefficient estimates mentioned above, both the magnitude and relative sizes of the school district effects (not shown) are improved when using the spatial model rather than the simple OLS estimate.

Of primary interest is the value added to a home if it is located within an RCA. Column one in table 3 shows that residing in an RCA increases the value of a home by about 1.6%, all else equal. This

[21] This is a direct result of the large number of observations and independent variables in the estimation.

[22] This is an example of the possibility of spatial autocorrelation, especially concerning the existence and type of basement given that certain topographies are not ideal for the basements of various types. Topography is clearly a location specific variable that, in this analysis, is unobserved.

equates to about a $1,500 increase in the sale price of the average home. Estimating the same effect while controlling for possible spatial autocorrelation shows that the value of a home actually falls by about 0.5% if the home is located within an RCA. While the former result is smaller than one would expect, the latter estimate does not even have the expected sign given the supposed role of the RCA within a community and the anecdotal evidence on the effect living in an RCA has on the value of a home. These results also seem to conflict with the results from previous research on the willingness of people to pay for restrictive covenants.

A possible critique of the results in columns one and two is that using school district as a measure of locational characteristic is too coarse. An alternative is to use city as a measure of locational characteristic, especially if one views the RCA as a solution to a public goods provision or hold-out problem. In Saint Louis County there are ninety-two incorporated municipalities in addition to the un-incorporated areas of the county. The results from estimating equations (1) and (2) replacing the school district matrix with a matrix denoting the municipality within which the home is located is reported in columns three and four[23]. Column three of table 3 shows that many of the direct characteristic effects vary in size compared to the results from column one and the R^2 for the estimation of equation (1) is smaller than its counterpart in column one, however there are no changes in the signs of characteristics and most are significant at the 1% level.

The results on the city variables (not shown) are also consistent with expectations regarding the effect city has on home values in Saint Louis County. The prime real estate in Saint Louis County is found in the cities of Ladue and Clayton and the results show that homes within these cities, all else equal, see large increases in value. Areas in the northern part of the county are expected to be less desirable and this is also seen in the results. Again when the equation is estimated using the control for spatial autocorrelation the relative size of many of the coefficients falls and are relatively more consistent with expectations, more are significant, and there are no sign changes. The coefficient on the spatially

[23] It should be noted that to avoid multicollinearity, unincorporated St. Louis County is withheld from the matrix.

lagged variable is about the same size as in column two showing the presence of spatial autocorrelation in the model when city is used as the location control variable.

The effect of living in an RCA when using the city as a locational characteristic proxy increases to 3.1% or about $3,000. This larger result, compared to its counterpart in column one, is likely due to the fact that RCAs do tend to resolve failures of the local government in terms of building controls and public good provision more than they are related to school districts. When spatial autocorrelation is controlled for in the GMM estimate of equation (2), the increase from living in an RCA is about zero. While not negative as its counterpart in column two, this result still seems to be at odds with the expectations regarding the impact residing within an RCA should have on the value of a home.

5.2 Estimation with Characteristic Drift

The results from estimating the model that adds spatial drift are shown in tables 4-A and 4-B with the direct results (estimates of β_{j0}) shown in table 4-A and the indirect effects (estimates of β_{j1}) shown in table 4-B. As in table 3, the first two columns use school district as a measure of location control while columns three and four use city. When looking at the direct effects and comparing them to their counterparts in table 3, there is little change. Some the coefficients change in relative size but there are no sign changes or changes in relative values between mutually exclusive characteristics (such as attic type). The estimates incorporating spatial drift do have higher R^2 values across all model specifications and the estimations that also include the spatial autocorrelation control have similar coefficients on the spatially lagged variable to those in table 3. This shows that the estimates are rather robust across the different specifications used in the estimation process.

[Insert Table 4-A and Table 4-B]

In all of the estimates of the spatial drift model, the direct RCA effect is extremely high. Residing within an RCA should increase the value of a home by about 44% before controlling for spatial autocorrelation and about 24% after including the spatial lag. These numbers correspond to an increase in the sale price of a home of between $42,000 and $23,000 respectively. These estimates seem to be consistent with the expectations regarding the role of RCA controls and provision on the value of a home.

This is, however, before the values of housing characteristics are considered. Basic supply and demand analysis implies that as the supply of a given good increases, the price (or willingness-to-pay) for that good will fall. This is exactly what is seen in the market for housing characteristics within RCAs. Table 4-B shows the estimates of the coefficients from the interaction of the characteristics with the RCA variable found in the estimation of equations (3) and (4). As in the estimation of the direct effects, many of the indirect effect coefficient estimates are significant and the significance and the signs are consistent across the estimates of equations (3) and (4). To interpret these results the expected change in the value of a home located within an RCA must be determined by evaluating the sum of the direct RCA effect and the indirect effects from the characteristics evaluated at their respective means. Using the model from equation (3) the expected increase in value is less than one percent increase while the estimates from the spatial model given by equation (4) yield a one and a half percent decrease in value due to being within an RCA. These values are consistent with the estimates of equations (1) and (2) shown in table 3.

Does this mean that RCA owners have been fooled into believing that living within an RCA should raise their property values or that RCAs are not performing as they are intended? While not conclusive, the answer appears to be that it depends. It may be the fact that RCA are working exactly as they are meant that is being shown in these results. The fact that the direct RCA effect is so large implies that there is likely some base advantage from residing within an RCA due to the enforcement of covenants and other positive amenities. The indirect effects seem to be evidence that some, if not all, of this increase is eaten away by the fact that RCAs do their job too well and result in a residential development of “cookie cutter” homes. Consider the following example. If one was to place a wood-frame constructed ranch style home with no attic, no basement and other characteristics matching those of the average RCA home into an RCA, that home would loose about 8.5% in value than if it remained outside the RCA. Conversely, if one was to take a block home of the Cape Cod style with an unfinished attic, a crawl space, and all other characteristics matching the average RCA home and place it in an RCA, that home would see an increase in value equal to about 19%. This drastic change is simply the result of the fact that the Cape Cod style of home is the most uncommon example of an RCA home while the ranch is the most common.

6. Conclusions

During the past three decades, the number of residential developments including some type of Residential Community Association (RCA) has grown dramatically. One of the primary reasons given by supporters of RCAs for living in an RCA development is that the institutions of the RCA increase the value of a home over a home not within an RCA. In a survey sponsored by the Community Associations Institute[24], 85% of the respondents believed that property values were rising in their community. Residential Community Associations are generally created *ex-ante* the development of the subdivision and the institutions that govern the RCA and the rules protecting the homeowners are laid out as part of the Covenants, Conditions, and Restrictions (CC&Rs) filed by the developer when the subdivision is approved by the local municipality. While some research has analytically looked at the impact of RCAs and walled communities on crime, no work has empirically estimated the effect on home values from locating within an RCA.

The research reported in this paper uses a unique dataset comprising data from Saint Louis County, Missouri, and a hedonic price function for homes sold from 1992 – 2001 to estimate the effect on housing values from locating in an RCA. The data includes characteristics, location, appraisal information, and sale prices for all homes located within Saint Louis County between the years 1992 and 2001. Whether a home is located within an RCA is determined by researching the individual CC&Rs of all subdivisions containing at least 10 units. Using a statistical method similar to that used in Pace, et. al. [21] and GMM methodology similar to that outlined in Kelejian and Prucha [18], a hedonic price function is estimated correcting for the presence of spatial autocorrelation.

Initial results show that locating in an RCA increases the value of a home by about 1.5 – 3.0% before spatial autocorrelation is controlled for depending on whether city or school district is used as a

[24] http://www.caionline.org

location control variable. Once the spatially lagged dependent variable is added to the model, locating in an RCA *decreases* the value of a home between 0.04% and 1.70%. While these coefficient estimates are statistically significant, the average effect is not economically significant. An expansion model is estimated to better identify the effect of RCA location on housing prices. These estimates indicate that the benefit received or cost paid for residing in an RCA is dependent on the style and size of home located within the RCA. Estimates show that the most frequently occurring housing style sees a decrease of about 8% from being located within an RCA while the least frequently occurring housing style sees an increase in value of about 19%. This indicates that, while there may be a base benefit from RCAs, most of this is mitigated because all of one's neighbors have the same type of home.

While this research does present several interesting results it should be noted that this study does lack the ability to distinguish between types of RCAs. Gated and walled RCAs may actually increase value while RCAs providing only common ground or street maintenance have little or no effect on home values because they offer little advantage or may be indistinguishable from non-RCA developments. Further distinguishing between types of RCAs may actually allow for higher coefficients on the direct and marginal effects from residing in an RCA. Additionally it is possible that the institutions governing most RCAs in the Saint Louis County area may be so rigid that RCAs loose their effectiveness over time and some may actually lower the value of the homes located within[25]. While collecting the data to adequately address these questions is costly, the results of the research reported here indicate the benefit to the literature from addressing these issues clearly outweigh those costs.

[25] Many of the CC&Rs limit the maximum amount a board can charge for an annual assessment and this maximum is not tied to any measure of inflation and at least a super-majority of residents is needed to approve an increase in the maximum. As a result the real amount of the assessment decreases over time resulting in a lower real operating budget for the board. For example a $100 maximum for an association built in 1980 is only worth $33 annually in 2005. This may then result in the quality of public goods such as street maintenance falling below that of even the local municipality's provision.

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Table 1

Summary Statistics

	Full Sample N=124891				**RCA Subsample** N=63102				**Non-RCA Subsample** N=61789			
	Mean	**Std. Dev.**	**Min**	**Max**	**Mean**	**Std. Dev.**	**Min**	**Max**	**Mean**	**Std. Dev.**	**Min**	**Max**
Price (adjusted)	96339.26	79679.79	1571.84	2043143.00	114483.10	77653.97	8266.78	1591201.00	77809.84	77426.93	1571.84	2043143.00
RCA	0.51	0.50	0	1	1.00	0.00	1	1	0.00	0.00	0	0
Split Foyer	0.03	0.18	0	1	0.05	0.21	0	1	0.02	0.15	0	1
Split Level	0.01	0.11	0	1	0.01	0.10	0	1	0.01	0.11	0	1
Ranch	0.42	0.49	0	1	0.40	0.49	0	1	0.44	0.50	0	1
Contemp	0.01	0.10	0	1	0.01	0.11	0	1	0.01	0.08	0	1
Old Style	0.05	0.21	0	1	0.02	0.13	0	1	0.08	0.27	0	1
Bungilow	0.09	0.28	0	1	0.02	0.15	0	1	0.16	0.36	0	1
Colonial	0.02	0.12	0	1	0.02	0.13	0	1	0.01	0.12	0	1
Cape Cod	0.01	0.08	0	1	0.00	0.05	0	1	0.01	0.10	0	1
Other	0.32	0.47	0	1	0.40	0.49	0	1	0.24	0.43	0	1
PUD	0.03	0.17	0	1	0.05	0.21	0	1	0.01	0.10	0	1
Conventional	0.02	0.13	0	1	0.02	0.16	0	1	0.01	0.10	0	1
No Attic	0.93	0.25	0	1	0.96	0.19	0	1	0.90	0.29	0	1
Unfin. Attic	0.01	0.11	0	1	0.00	0.07	0	1	0.02	0.14	0	1
Partly Fin. Attic	0.02	0.12	0	1	0.01	0.08	0	1	0.02	0.15	0	1
Full Fin. Attic	0.02	0.15	0	1	0.01	0.11	0	1	0.03	0.18	0	1
Wall Ht Attic	0.01	0.12	0	1	0.01	0.11	0	1	0.02	0.13	0	1
No Basement	0.05	0.21	0	1	0.03	0.16	0	1	0.06	0.25	0	1
Crawl Space	0.00	0.05	0	1	0.00	0.03	0	1	0.00	0.06	0	1
Partial Basement	0.02	0.15	0	1	0.01	0.12	0	1	0.03	0.17	0	1
Full Basement	0.93	0.25	0	1	0.96	0.20	0	1	0.90	0.30	0	1
Age At Sale	28.40	21.50	0	175	18.06	16.40	0	175	38.96	20.96	0	169
(Age At Sale)^2	1268.85	1601.12	0	30625	595.00	920.42	0	30625	1957.03	1838.25	0	28561
# Stories	1.29	0.46	1	3	1.40	0.49	1	3	1.19	0.39	1	3
# Bedrooms	3.14	0.79	0	9	3.38	0.71	1	9	2.89	0.79	0	9
# Family Rooms	0.55	0.51	0	3	0.70	0.47	0	3	0.41	0.50	0	2
# Full Bath	1.75	0.69	0	8	1.99	0.63	0	7	1.50	0.67	0	8
# Half Bath	0.47	0.55	0	6	0.57	0.56	0	4	0.36	0.53	0	6
Add Fixtures	0.64	1.12	0	11	0.92	1.25	0	11	0.36	0.90	0	9
# Fireplace Openings	0.38	0.63	0	8	0.39	0.65	0	8	0.36	0.62	0	8
# Fireplace Stacks	0.33	0.53	0	5	0.34	0.53	0	4	0.33	0.52	0	5
# Fireplaces	0.35	0.52	0	7	0.49	0.55	0	5	0.20	0.43	0	7
Frame	0.20	0.40	0	1	0.26	0.44	0	1	0.15	0.35	0	1
Brick	0.26	0.44	0	1	0.15	0.36	0	1	0.37	0.48	0	1
Masonary	0.18	0.39	0	1	0.24	0.43	0	1	0.12	0.33	0	1
Block	0.00	0.03	0	1	0.00	0.01	0	1	0.00	0.04	0	1
Stucco	0.01	0.08	0	1	0.00	0.05	0	1	0.01	0.10	0	1
Aluminum	0.29	0.45	0	1	0.31	0.46	0	1	0.27	0.44	0	1
Stone	0.00	0.05	0	1	0.00	0.02	0	1	0.00	0.06	0	1
Asbestose	0.06	0.24	0	1	0.04	0.19	0	1	0.08	0.27	0	1
Concrete	0.00	0.01	0	1	0.00	0.01	0	1	0.00	0.01	0	1

Italics denotes a dichotomous variable

Sale price in terms of 1982-84 dollars

Table 2

Average Sale Price and Difference of Means Tests

Sale Price (By Year)

Year	Sample	Mean	Std. Dev.	N	p-Value	% RCA
1992	RCA Only	$141,825	$ 82,495	7058	0%	53%
	Non-RCA Only	$104,457	$ 88,663	6305		
1993	RCA Only	$149,485	$ 89,614	6733	0%	51%
	Non-RCA Only	$112,045	$114,120	6389		
1994	RCA Only	$159,209	$101,944	7409	0%	51%
	Non-RCA Only	$109,554	$103,171	7111		
1995	RCA Only	$165,571	$116,476	6079	0%	51%
	Non-RCA Only	$110,106	$108,164	5944		
1996	RCA Only	$171,320	$114,967	6951	0%	51%
	Non-RCA Only	$117,343	$119,421	6574		
1997	RCA Only	$180,860	$116,592	6819	0%	52%
	Non-RCA Only	$123,121	$ 74,285	6389		
1998	RCA Only	$186,904	$130,136	7866	0%	49%
	Non-RCA Only	$124,499	$124,112	8257		
1999	RCA Only	$199,093	$142,202	7408	0%	48%
	Non-RCA Only	$126,698	$121,284	8061		
2000	RCA Only	$220,800	$155,722	5691	0%	50%
	Non-RCA Only	$139,657	$163,655	5764		
2001	RCA Only	$277,107	$171,845	1088	0%	52%
	Non-RCA Only	$177,215	$193,120	995		
Full	RCA Only	$176,240	$123,230	63102	0%	51%
Sample	Non-RCA Only	$119,710	$121,030	61789		

Assuming unequal variances

Table 3

OLS and GMM Estimation												
	Column One			Column Two			Column Three			Column Four		
	No Spatial - OLS			Spatial - GMM			No Spatial - OLS			Spatial - GMM		
R^2	0.8783			0.9266			0.8763			0.9249		
N = 124889												
Variable	**Coefficient**	**t-statistic**		**Coefficient**	**t-statistic**		**Coefficient**	**t-statistic**		**Coefficient**	**t-statistic**	
RCA	0.02	10.09	***	0.00	-3.95	***	0.03	19.07	***	0.00	2.23	**
S15*Y				0.49	206.67	***				0.47	189.30	***
Constant	10.58	1548.77	***	5.23	198.19	***	10.46	1581.60	***	5.42	199.67	***
Split Foyer	-0.15	-41.58	***	-0.08	-28.65	***	-0.10	-27.40	***	-0.07	-22.86	***
Split Level	-0.05	-7.82	***	-0.03	-5.06	***	-0.02	-2.71	***	-0.01	-1.78	*
Contemporary	0.02	3.52	***	0.03	5.49	***	0.01	1.96	**	0.03	5.09	***
Old Style	0.10	23.27	***	0.06	16.06	***	0.07	16.26	***	0.05	13.09	***
Bungalow	-0.09	-32.76	***	-0.05	-24.26	***	-0.11	-39.93	***	-0.06	-26.97	***
Colonial	0.12	19.88	***	0.06	13.81	***	0.07	11.80	***	0.05	9.47	***
Cape Cod	0.08	9.50	***	0.04	6.34	***	0.06	6.62	***	0.03	4.94	***
Other	-0.05	-22.39	***	-0.04	-23.24	***	-0.04	-19.01	***	-0.04	-19.98	***
PUD	-0.01	-1.44		0.00	0.99		-0.04	-9.33	***	-0.01	-2.46	***
Conventional	0.00	0.12		0.03	6.56	***	0.00	-0.10		0.03	7.94	***
Unfin. Attic	0.06	10.45	***	0.05	11.19	***	0.08	12.73	***	0.06	12.44	***
Partly Fin. Attic	0.04	7.18	***	0.04	9.61	***	0.05	9.00	***	0.05	10.88	***
Full Fin. Attic	0.04	8.29	***	0.04	12.11	***	0.03	7.28	***	0.04	11.67	***
Wall Ht Attic	0.01	1.10		0.04	7.87	***	0.02	2.68	***	0.04	9.29	***
Crawl Space	-0.04	-3.20	***	-0.04	-3.79	***	-0.04	-2.57	***	-0.04	-3.78	***
Partial Basement	0.16	29.79	***	0.11	24.40	***	0.16	28.09	***	0.11	24.46	***
Full Basement	0.16	48.52	***	0.12	47.04	***	0.15	45.35	***	0.12	46.65	***
Age	-0.01	-85.06	***	-0.01	-65.81	***	-0.01	-102.79	***	-0.01	-76.50	***
Age^2	0.00	46.79	***	0.00	37.41	***	0.00	58.61	***	0.00	46.94	***
# Stories	0.05	17.81	***	0.04	17.79	***	0.05	18.82	***	0.04	18.90	***
# Bedrooms	0.07	55.85	***	0.06	59.25	***	0.07	52.67	***	0.06	55.72	***
# Family Rooms	0.07	43.46	***	0.04	32.91	***	0.07	41.07	***	0.04	32.84	***
# Full Bath	0.18	117.54	***	0.11	93.94	***	0.16	102.23	***	0.11	88.46	***
# Half Bath	0.10	66.10	***	0.07	56.31	***	0.09	59.03	***	0.07	53.17	***
Add Fixtures	0.08	87.89	***	0.04	61.01	***	0.07	74.69	***	0.04	58.31	***
# Fireplace Openings	0.13	39.05	***	0.09	33.02	***	0.10	30.35	***	0.08	28.97	***
# Fireplace Stacks	0.10	25.20	***	0.05	17.52	***	0.11	27.32	***	0.06	19.93	***
# Fireplaces	0.07	41.19	***	0.06	41.28	***	0.09	53.10	***	0.06	45.46	***
Brick	0.12	54.22	***	0.08	44.27	***	0.11	50.13	***	0.08	44.86	***
Masonry	0.06	27.97	***	0.04	22.00	***	0.06	25.86	***	0.04	20.94	***
Block	-0.08	-3.25	***	-0.09	-4.67	***	-0.09	-3.40	***	-0.09	-4.48	***
Stucco	0.14	17.38	***	0.08	12.53	***	0.12	14.83	***	0.07	11.27	***
Aluminum	0.00	1.12		0.01	6.08	***	0.00	-0.84		0.01	4.77	***
Stone	0.19	14.01	***	0.16	14.62	***	0.20	13.65	***	0.15	13.46	***
Asbestos	-0.03	-9.33	***	-0.01	-4.48	***	-0.05	-15.18	***	-0.03	-10.01	***
Concrete	0.24	3.35	***	0.15	2.62	***	0.20	2.69	***	0.15	2.63	***
School District Controls	Yes			Yes			No			No		
City Fixed Effects	No			No			Yes			Yes		
Year Fixed Effects	Yes			Yes			Yes			Yes		

*Significance Levels: *** denotes 1%, ** denotes 5%, * denotes 10%*

t-statistics are asymptotic

Table 4-A

OLS and GMM Estimation

	Column One			Column Two			Column Three			Column Four		
	No Spatial - Interaction (OLS)			Spatial - Interaction (GMM)			No Spatial - Interaction (OLS)			Spatial - Interaction (GMM)		
R^2	0.8816			0.9280			0.8816			0.9264		
N = 124889												
Variable	**Coefficient**	**t-statistic**		**Coefficient**	**t-statistic**		**Coefficient**	**t-statistic**		**Coefficient**	**t-statistic**	
RCA	0.36	28.90	***	0.22	21.70	***	0.35	27.65	***	0.20	19.71	***
S15*Y				0.49	207.51	***				0.47	192.07	***
Constant	10.42	1160.04	***	5.14	194.93	***	10.32	1145.38	***	5.31	196.82	***
Split Foyer	-0.15	-23.65	***	-0.08	-16.62	***	-0.09	-14.33	***	-0.06	-11.83	***
Split Level	-0.04	-4.42	***	-0.01	-1.96	*	-0.01	-1.14		0.00	0.21	
Contemporary	0.08	6.81	***	0.07	7.10	***	0.06	4.94	***	0.06	6.09	***
Old Style	0.04	7.20	***	0.02	5.18	***	0.01	2.07	**	0.01	3.58	***
Bungalow	-0.10	-33.22	***	-0.06	-22.64	***	-0.12	-39.34	***	-0.06	-25.01	***
Colonial	0.08	8.78	***	0.05	6.97	***	0.05	6.09	***	0.04	5.52	***
Cape Cod	0.02	1.64		0.00	0.65		0.01	0.75		0.00	0.63	
Other	-0.08	-27.22	***	-0.06	-24.96	***	-0.07	-22.16	***	-0.05	-21.25	***
PUD	0.00	-0.21		-0.02	-3.18	***	-0.01	-1.19		-0.02	-3.06	***
Conventional	-0.05	-5.84	***	0.03	4.13	***	-0.08	-8.49	***	0.02	2.97	***
Unfin. Attic	0.06	9.48	***	0.05	9.97	***	0.08	11.32	***	0.06	11.06	***
Partly Fin. Attic	0.07	10.88	***	0.06	11.99	***	0.09	13.86	***	0.07	14.25	***
Full Fin. Attic	0.06	10.62	***	0.06	13.14	***	0.05	9.65	***	0.06	13.16	***
Wall Ht Attic	0.04	5.34	***	0.06	9.79	***	0.05	6.42	***	0.06	10.92	***
Crawl Space	-0.05	-3.18	***	-0.05	-4.21	***	-0.04	-2.48	***	-0.05	-3.94	***
Partial Basement	0.16	24.38	***	0.10	18.86	***	0.16	23.64	***	0.10	19.41	***
Full Basement	0.16	42.74	***	0.12	40.93	***	0.16	39.74	***	0.13	40.10	***
Age	-0.01	-47.64	***	-0.01	-42.75	***	-0.01	-66.05	***	-0.01	-54.46	***
Age^2	0.00	23.51	***	0.00	23.73	***	0.00	38.19	***	0.00	34.67	***
# Stories	0.15	36.99	***	0.10	30.98	***	0.16	36.96	***	0.11	31.54	***
# Bedrooms	0.08	47.71	***	0.07	51.96	***	0.08	45.43	***	0.06	48.18	***
# Family Rooms	0.08	33.86	***	0.05	26.47	***	0.07	31.17	***	0.05	25.36	***
# Full Bath	0.17	80.21	***	0.11	64.78	***	0.15	68.00	***	0.10	59.57	***
# Half Bath	0.10	47.05	***	0.07	39.21	***	0.09	40.86	***	0.06	36.12	***
Add Fixtures	0.07	46.46	***	0.04	32.86	***	0.06	40.03	***	0.04	32.12	***
# Fireplace Openings	0.14	28.40	***	0.09	24.44	***	0.12	23.43	***	0.09	22.11	***
# Fireplace Stacks	0.07	12.60	***	0.04	8.68	***	0.09	15.51	***	0.05	10.56	***
# Fireplaces	0.07	25.76	***	0.05	24.38	***	0.09	32.95	***	0.06	27.21	***
Brick	0.11	35.64	***	0.08	31.38	***	0.12	37.17	***	0.09	34.26	***
Masonry	0.07	18.62	***	0.04	12.50	***	0.05	14.69	***	0.03	10.84	***
Block	-0.08	-3.19	***	-0.08	-4.21	***	-0.08	-2.93	***	-0.08	-3.77	***
Stucco	0.12	13.00	***	0.07	9.60	***	0.12	12.54	***	0.07	9.47	***
Aluminum	0.00	-0.36		0.01	4.95	***	0.00	-0.76		0.01	4.16	***
Stone	0.18	12.35	***	0.15	12.47	***	0.18	11.45	***	0.13	10.88	***
Asbestos	-0.04	-8.85	***	-0.02	-6.09	***	-0.05	-11.86	***	-0.03	-8.92	***
Concrete	0.35	3.74	***	0.24	3.26	***	0.30	3.23	***	0.25	3.47	***
School District Controls	Yes			Yes			No			No		
City Fixed Effects	No			No			Yes			Yes		
Year Fixed Effects	Yes			Yes			Yes			Yes		

*Significance Levels: *** denotes 1%, ** denotes 5%, * denotes 10%*

t-statistics are asymptotic

Table 4-B

OLS and GMM Estimation	Column One			Column Two			Column Three			Column Four		
	No Spatial - Interaction (OLS)			Spatial - Interaction (GMM)			No Spatial - Interaction (OLS)			Spatial - Interaction (GMM)		
R^2	0.8816			0.9280			0.8816			0.9264		
N = 124889												
Variable	**Coefficient**	**t-statistic**		**Coefficient**	**t-statistic**		**Coefficient**	**t-statistic**		**Coefficient**	**t-statistic**	
Total RCA Effect	**0.0024**			**-0.0168**			**0.0160**			**-0.0105**		
RCA (From 4-A)	0.36	28.90	***	0.22	21.70	***	0.35	27.65	***	0.20	19.71	***
Split Foyer	0.01	1.03		0.00	0.71		-0.01	-1.04		-0.01	-1.19	
Split Level	-0.03	-2.40	***	-0.03	-3.00	***	-0.02	-1.49		-0.03	-2.50	***
Contemporary	-0.05	-3.12	***	-0.03	-2.96	***	-0.04	-2.72	***	-0.03	-2.57	***
Old Style	0.20	17.46	***	0.10	11.00	***	0.21	18.20	***	0.09	10.32	***
Bungalow	0.04	6.15	***	0.02	3.38	***	0.08	11.39	***	0.04	6.85	***
Colonial	0.10	8.82	***	0.05	5.52	***	0.06	5.10	***	0.03	3.33	***
Cape Cod	0.16	8.19	***	0.10	6.22	***	0.11	5.70	***	0.07	4.31	***
Other	0.09	20.43	***	0.06	16.38	***	0.08	16.65	***	0.05	14.08	***
PUD	-0.01	-0.87		0.03	3.51	***	-0.05	-4.09	***	0.01	1.63	
Conventional	0.13	11.11	***	0.03	3.27	***	0.16	13.41	***	0.05	5.02	***
Unfin. Attic	0.05	3.05	***	0.04	3.05	***	0.05	3.16	***	0.04	2.87	***
Partly Fin. Attic	-0.07	-5.53	***	-0.05	-4.64	***	-0.11	-8.68	***	-0.07	-6.96	***
Full Fin. Attic	-0.04	-3.92	***	-0.03	-3.90	***	-0.03	-3.06	***	-0.03	-3.69	***
Wall Ht Attic	-0.07	-5.93	***	-0.05	-5.24	***	-0.06	-5.45	***	-0.04	-4.83	***
Crawl Space	0.05	1.61		0.07	2.77	***	0.05	1.66	*	0.07	2.51	***
Partial Basement	0.02	2.12	**	0.03	3.41	***	0.00	-0.05		0.02	1.85	*
Full Basement	-0.01	-1.68	*	-0.01	-1.73	*	-0.03	-3.73	***	-0.02	-2.82	***
Age	-0.01	-25.49	***	0.00	-13.01	***	0.00	-15.60	***	0.00	-6.89	***
Age^2	0.00	27.80	***	0.00	17.56	***	0.00	20.50	***	0.00	13.33	***
# Stories	-0.19	-32.97	***	-0.11	-25.01	***	-0.18	-31.52	***	-0.11	-24.30	***
# Bedrooms	-0.03	-11.25	***	-0.03	-13.83	***	-0.03	-11.70	***	-0.03	-12.54	***
# Family Rooms	-0.01	-2.24	**	-0.01	-2.83	***	0.00	-0.96		0.00	-1.73	*
# Full Bath	0.01	1.84	*	0.00	1.88	*	0.01	4.69	***	0.01	3.51	***
# Half Bath	0.00	1.60		0.01	2.43	***	0.01	3.44	***	0.01	3.45	***
Add Fixtures	0.01	4.63	***	0.01	4.15	***	0.01	3.08	***	0.00	2.49	***
# Fireplace Openings	-0.02	-3.36	***	-0.02	-3.46	***	-0.03	-4.69	***	-0.02	-4.20	***
# Fireplace Stacks	0.05	6.68	***	0.03	4.60	***	0.03	4.29	***	0.03	4.25	***
# Fireplaces	0.00	0.82		0.01	2.34	***	0.00	0.92		0.01	2.65	***
Brick	0.02	5.17	***	0.00	0.81		-0.02	-3.48	***	-0.01	-4.00	***
Masonry	-0.01	-2.22	**	0.00	0.76		0.00	0.79		0.01	1.96	**
Block	0.01	0.16		-0.01	-0.12		-0.06	-0.66		-0.05	-0.68	
Stucco	0.07	3.74	***	0.04	2.75	***	0.02	0.83		0.02	1.19	
Aluminum	0.00	-0.58		-0.01	-2.54	***	0.00	-0.48		-0.01	-1.70	*
Stone	0.07	1.72	*	0.13	4.14	***	0.13	3.26	***	0.16	5.02	***
Asbestos	0.01	1.97	**	0.02	4.77	***	0.00	-0.05		0.01	2.59	***
Concrete	-0.27	-1.88	*	-0.24	-2.10	**	-0.27	-1.83	*	-0.27	-2.33	***
School District Controls	Yes			Yes			No			No		
City Fixed Effects	No			No			Yes			Yes		
Year Fixed Effects	Yes			Yes			Yes			Yes		

Significance Levels: *** denotes 1%, ** denotes 5%, * denotes 10%

t-statistics are asymptotic