

## Center for Real Estate Examples of Recent Research

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**“Commercial Mortgage Underwriting: How Well Do Lenders Manage the Risks?”** *Journal of Housing Economics*, Vol. 14 No. 4, December 2005, 355-383. **Robert A. Grovenstein, John P. Harding, C.F. Sirmans, Sansanee Thebpanya and Geoffrey K. Turnbull.** Loan-to-value ratio and debt service coverage ratios have long been viewed as the two most important quantitative measures of the default risk of commercial mortgages. Option-based models of default provide strong theoretic support for the importance of original loan-to-value ratio. The same theoretical predictions have found strong empirical support in residential single-family mortgage analyses. However, recent empirical studies of commercial mortgage default have raised questions about the role of loan-to-value ratio in assessing the riskiness of commercial mortgages. These studies generally either find no relationship or a puzzling negative relationship between loan-to-value and default. In this paper, we use a very large data base of commercial loan histories to thoroughly investigate this issue. We find strong evidence that loan-to-value ratio and debt service coverage ratio are endogenous to the underwriting process. Lenders react to other, unmeasured, risk factors by a combination of credit rationing and pricing. As a result, unusually low loan-to-value ratio loans appear to have above average risk in other dimensions and their default probabilities are equal to or higher than average. We find that the pricing spread that lenders establish as part of the underwriting process serves as an excellent summary measure of the riskiness of the loan. We tested the effectiveness of lenders’ ability to appropriately price loan-to-value ratio after controlling for the lender’s pricing.

**“Pricing of Commercial Mortgaged-Backed Securities: Evidence from Modern Conduit Issues,”** *Journal of Fixed Income*, Vol. 14 No. 1, June 2004, 69-87, **John P. Harding, C. F. Sirmans and Sansanee Thebpanya,** The market for commercial mortgage-backed securities (CMBS) has matured. After undergoing explosive growth from 1995 through 1998, the market has survived the liquidity crisis of 1998, the recession of 2001 and the fallout of the 9/11 terrorism. In recent years, issuers worldwide have used the CMBS structure to facilitate the funding of commercial real estate. Global volume averaged close to \$100 billion per year in 2001 and 2002. The CMBS structure has continued to evolve with increased diversification and better prepayment protection for investors. Information about the deals and especially the underlying collateral has increased dramatically since 1997. This paper analyzes the pricing of new CMBS securities from 1997 through 2002. We find that, despite the maturing of the market, CMBS investors still discriminate across deals and price their investments based on an analysis of deal specific factors such as average loan quality, pool diversification, and property type. By utilizing the increased data available for modern CMBS issues and explicitly modeling the joint endogeneity of subordination and pricing, we are able to confirm theoretical predictions that AAA investors should adjust the price they pay based on the level of prepayment protection incorporated into the underlying loans and the diversification of the pool of mortgages, even after controlling for the rating level. In addition to prepayment protection and diversification, we find that loan quality and current economic and market conditions influence pricing.

**The Effect of Agency Reform on Real Estate Service Quality,** *Journal of Housing Research*, Volume 15, Issue 1 (2006), pages 41-53, **Katherine A. Pancak and C.F. Sirmans.** This study examines the impact of recent state real estate agency reforms on real estate service quality. The analysis expands upon prior literature examining licensing law effects on service quality by using state adjudicated disciplinary action decisions as a measure of quality, adding recent state law developments as explanatory variables, and including state licensing board staffing and funding variables to hold licensing administrative efforts constant. Results indicate that certain state real estate agency reform efforts, as well as other licensing laws and the administration of licensing laws, do have an effect on variation in state licensee disciplinary action. These results have policy implications for increasing real estate service quality.

**“How Important is the Board of Directors to REIT Performance?,”** *Journal of Real Estate Portfolio Management*, Vol. 11 No. 3, September-December 2005, 281-293, **Zhilan Feng, Chinmoy Ghosh and C.F. Sirmans.** With the emergence of the “new” REITs over the last decade, the question of corporate governance is of particular interest to investors and managers of REIT portfolios. This paper analyzes the structure of the board of directors for a sample of REITs and examines the relationship between board structure and REIT performance. We construct a board index that assigns higher scores to boards with good governance – small size, majority outside directors, and not chaired by the CEO. We find that while good boards are associated with superior average performance, the effect is significant only for the best and worst boards. For firms where the management appears to have traded off positive board attributes against their power and influence on the board, the net effect on performance is insignificant.

**“A Semiparametric Method for Estimating Local House Price Indices,”** *Real Estate Economics*, Vol. 32 No. 1, Spring 2004, 127-169. **John M. Clapp.** Spatial autoregressive hedonic models utilize house prices lagged in space and time (Pace, 1997; Pace *et al.*, 1998). These models are capable of producing local house price indices: I.e., a family of different but related indices, one for each point in space. This paper develops an alternative semiparametric approach, the Local Regression Model (LRM) designed to use large databases to produce neighborhood price indices: I.e., the LRM estimates a surface of constant-quality-house values as a function of time. From another perspective, the LRM estimates a price index, and a confidence interval, at each point on a grid covering the geographical area of interest. The LRM is fitted to 49,511 sales from 1972Q1 - 1991Q2 in Fairfax County, Virginia. The local price indices display plausible and significant variations over space and time. On average, LRM indices are the same as a standard hedonic price index for the entire county. The LRM price indices in selected neighborhoods are shown to differ significantly from those in some other neighborhoods. A new method for estimating standard errors addresses an overlooked problem common to all local price indices: How to evaluate the amount of noise in the estimates. Out-of-sample prediction errors demonstrate that LRM adds significant information to the hedonic model. Moran’s I-statistics suggest that future research could usefully add a model of spatial autocorrelation to the LRM.

**“Pricing Cutting Behavior in Residential Markets,”** *Journal of Housing Economics*, Vol. 13 No. 3, September 2004, 195-207. **William E. Herrin, John R. Knight and C.F. Sirmans.** Changing reservation prices during the marketing of a heterogeneous asset is a basic result of search theory and the theory of pricing under demand uncertainty. Empirical evidence is sparse though, because data regarding price changes are not usually available. Using a unique housing data set that includes the number of list price changes that occur over the listing period, we provide, in this paper, a test of the implications of these theories. Consistent with the theory of pricing behavior under demand uncertainty, we find that owners whose homes trade in thin markets and owners who have better information about the value of their homes are less likely to change price. On the other hand, owners who have relatively high costs of continuing a search for a buyer are willing to change price more readily, a finding consistent with search theory.

**“Apartment Rent Prediction Using Spatial Modeling,”** *Journal of Real Estate Research*, Vol. 27 No. 1, 2005, 105-126. **James Valente, Shan Shan Wu, Alan Gelfand, and C.F. Sirmans.** This paper provides a new model to explain local variation in apartment rents by introducing the notion of a spatial process. The background section defines the difference between global trend and local variation, and explains why proximity variables and sub-market variables should be modeled in the mean portion of the model, and that the inclusion of such variables does not constitute a spatial model. Additionally, the background section provides an example of a simple model that incorporates both proximity and zonal (sub-market) association variables. A plot of the residuals illustrates the significant level of spatial association that remains even after controlling for spatial effects in the traditional manner. The paper also provides a review of the use of both proximity and zonal association variables, and discusses early attempts at spatial modeling, including conditional spatial autoregressive, simultaneous spatial autoregressive models, and kriging. A review of the data for the eight markets included in this study is followed by a detailed description of the spatial process model. The final section presents the results, which indicate significant prediction improvement over traditional hedonic rent models that only include indicator variables to capture spatial effects. A number of maps illustrate both continuous residual and rent surfaces, clearly illustrating the spatial patterns that exist in apartment rents.

**“Modeling Spatial and Temporal House Price Patterns: A Comparison of Four Models,”** *Journal of Real Estate Finance and Economics*, Vol. 29 No. 2, September 2004, 167-192. **Bradford Case, John M. Clapp, Robin Dubin, and Mauricio Rodriguez.** This research reports results from a competition on modeling spatial and temporal components of house prices. A large, well-documented database was prepared and made available to anyone wishing to join the competition. To prevent data snooping, out-of-sample observations were withheld; they were deposited with one individual who did not enter the competition, but had the responsibility of calculating out-of-sample statistics for results submitted by the others. The competition turned into a cooperative effort, resulting in enhancements to previous methods including: a localized version of Dubin’s kriging model, a kriging version of Clapp’s local regression model, and a local application of Case’s earlier work on dividing a geographic housing market into districts. The results indicate the importance of nearest neighbor transactions for out-of-sample predictions: spatial trend analysis and census tract variables do not perform nearly as well as neighboring residuals.

**“The Impact of a State Mandated Expenditure Floor on Aggregate Property Values,”** *Journal of Urban Economics*, Vol. 53, 2003, 531-540, Laurie J. Bates and Rexford E. Santerre. Using a test of allocative efficiency in the local public sector developed by Brueckner (3), this study empirically examines the impact of a state minimum education expenditure requirement on aggregate property values in Connecticut communities. The empirical results reveal that the typical community in Connecticut spends less on education and municipal services than the level that maximizes aggregate property values. The results further indicate that spending on education fall further below the property maximization level in those communities constrained by the state expenditure floor. It follows from the analysis that some state expenditure floors can raise aggregate property values and promote efficiency.

**“The Public Demand for Open Space: The Case of Connecticut Communities,”** *Journal of Urban Economics*, Vol. 50, 2001, 97-111, Laurie J. Bates and Rexford E. Santerre. At both the state and national levels, public policies are being designed to stimulate the demand for locally owned open space. Yet very little is known about the factors that influence the demand for open space and the sensitivity of demand to price and income. To fill the void, this study uses data for Connecticut cities and towns to estimate the public demand for open space. The empirical results suggest that the demand for open space is relatively insensitive to changes in price but highly responsive to changes in income. The findings also show that federal and state open space may tend to crowd out locally owned open space and that locally open space represents a highly congestable good. Finally, the analysis indicates that privately owned open space is not a good substitute for locally owned public open space

**“An Empirical Investigation of Federal Wetlands Regulation and Flood Delineation: Implications for Residential Property Owners,”** *Journal of Real Estate Research*, Vol. 26 No. 3, 2004, 299-315, Randall S. Guttery, Stephen L. Poe, and C.F. Sirmans. The purpose of this article is to present an empirical study of economic consequences for residential property owners that arise upon implementation of federal wetlands regulations. Specifically, this study examines the effect of federal wetlands regulations on sale prices of residential properties in East Baton Rouge Parish, Louisiana. The costs of compliance with the wetlands permit process can be significant, due primarily to lengthy time-delays, expenses of preparing development impact studies and satisfying other requirements, and burdens associated with satisfying regulatory mitigation requirements. Given these costs, the hypothesis of this study is that sale prices of residential properties where compliance with the wetlands permit process is highly probable are significantly different than those for comparable properties in otherwise similar locations where such compliance is not probable, *even after controlling for having a flood delineation*. To measure the impact of such compliance, sales prices of residential properties prior to and after the Supreme Court’s December 1985 ruling in *Riverside* are compared.

**“Schools and Housing Markets: An Examination of School Segregation and Performance in Connecticut,”** *The Economic Journal*, Vol. 114 No. 499, 2005, F425-F440. John M. Clapp and Stephen L. Ross. This paper examines the relationship between house price levels, school performance, and the racial and ethnic composition of Connecticut school districts between 1995 and 2000. A panel of Connecticut school districts over both time and labor market areas are used to estimate a simultaneous equations model describing the determinants of these variables. Specifically, school district changes in price level, school performance, and racial and ethnic compositions depend upon each other, labor market wide changes in these variables, and the deviation of each school district from the overall metropolitan area. The specification is based on the differencing of dependent variables, as opposed to the use of level or fixed effects models and lagging level variables beyond the period over which change is considered; as a result the model is robust to persistence in the sample. Identification of the simultaneous system arises from the presence of multiple labor market areas in the sample, and the assumption that labor markets changes in a variable due not directly influence the allocation of households across towns within a labor market area. We find that towns in labor markets that experience an inflow of minority households have greater increases in percent minority if those towns already have a substantial minority population. We find evidence that this sorting process is reflected in housing price changes in the low priced segment of the housing market, not in the middle and upper segments.