Apartment Performance in Good Times and Bad

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Abstract

This study estimates and interprets the effects of macroeconomic and local housing market conditions on rents and occupancies in different segments of the multifamily rental housing market. The research uses longitudinal data from a nationally representative sample of apartments drawn from the American Housing Survey to determine whether apartments of different quality grades are differentially affected by income and job growth at the national level as well as in the local metropolitan market. Results indicate that most of the variation in rent change and occupancy status is idiosyncratic and apartment-specific. In addition, the evidence suggests that top-end "Class A" properties outperform others where and when overall housing demand is growing briskly, but that these luxury properties underperform the broader market when the economy is slow. The results are consistent with a theory that demand is more procyclical for top-end apartments than for the overall market, and that this demand differential boosts Class A performance in expansions, especially in the early stages prior to the resulting pickup in luxury construction. In economic downturns, the theory holds that frictions, property image, and resident relations prevent luxury properties from adjusting rents downward quickly and completely to maintain high occupancy by drawing residents from the middle segment of the market. The findings highlight the importance of effective property management, particularly for those properties at the top end of the apartment market, when changing market conditions call for adjustments in asking rents and marketing strategies.

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Introduction/Motivation

The quarterly conference calls during which executives of publicly traded real estate companies discuss their firms' recent and prospective performance are rich sources of information on current market conditions and the issues of concern to management and investors. Among apartment REITs, one recurring question during recent conference calls has been the effect of the weak economy on the performance of different types of apartments. In particular, investors and analysts have been interested in the rent growth and occupancies of "Class A" luxury apartments compared to the performance of the middle market "B" and "C" properties.

There are many anecdotal reports and case studies of property performance in different market conditions. But the anecdotes cannot adequately quantify the effects for the apartment market overall. Nor can the anecdotes distinguish quality segment effects on apartment performance from those associated with location and initial lease-up.

The goal of this project is to provide nationally representative estimates of how macroeconomic conditions affect the rent growth and occupancies of apartments of different quality levels, and a market-based framework for interpreting the empirical results.

Theory

The apartment market is segmented in several dimensions. The most prominent is geography. Apartments in one metropolitan area do not compete directly for residents with apartments in other metropolitan areas. Even within metropolitan areas, submarkets defined down to the neighborhood level are subject to related, yet distinct, demand and supply forces.

Other than geography, apartment market segmentation is probably most pronounced in the dimension of "quality," with rent (relative to the local market average) as a summary indicator. Apartments at different price points in the local market have different physical characteristics, service levels, and customer bases.

Segmentation of housing markets, and the effects of submarket demand and supply shifts on all segments of the market, have been the topics of many studies, with quantitative analysis beginning in earnest in the 1970s.[1] This work emphasized the importance of the relationships (technically, the cross-

[1] One influential early piece was James L. Sweeney, "A Commodity Hierarchy Model of the Rental Housing Market," *Journal of Urban Economics* 1:288-323 (1974).

elasticities) of demand and supply across segments of the market and the frictions and lags in market adjustments to changes in demand and supply.

Applying this theory to a simple model of the apartment market, let us say there are three quality segments to this market -- "luxury" apartments, middle market, and "affordable." We will refer to these (loosely) as "A," "B," and "C" properties respectively. Rents in each segment depend on demand and supply conditions in that segment as well as in the other two segments.

Demand in all three segments would be expected to be procyclical, but the top Class A segment most procyclical of all. Strong economic growth improves the purchasing power of those already in the A segment, and also allows some consumers in the B segment to move up into the A market. Similarly, in a recession, demand in the top segment of the apartment market could drop disproportionately, because this segment is more dependent than the others on demand from job transferees and new hires.[2] (In the slow 2001-2002 period, owners of luxury apartments have noted that their demand has suffered both because they have not been getting job-related in-moves, but also because, unlike the typical situation when the economy is weak, luxury apartments have continued to lose residents to homeownership.)

Supply in the three segments of the apartment market is largely fixed over a short period, and in recent years the pace at which supply has been added has been fairly steady. In each of the past six years, multifamily housing starts have remained close to 300 thousand units annually, adding roughly one percent annually to the multifamily stock.

Of the production that is added, a disproportionate part comes in the luxury segment – often the only segment in which profitable development opportunities exist. The luxury segment may also be the most supply-elastic segment, and respond quickest to increased demand, because luxury apartments typically face fewer regulatory and financing hurdles than affordable and middle-market properties.

The procyclicality of luxury demand, together with the comparative elasticity of luxury supply, suggests that the upper end of the apartment market might be the most volatile as measured by changes in rent growth and occupancies. In the early stages of economic expansion, occupancies and rents should rise most rapidly in the Class A segment of the market, reflecting the increased demand. Construction responds, especially in the luxury segment, to the improved occupancies and rents. As supply increases, rent growth moderates, most notably in the Class A segment.

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[2] This statement is based on the author's analysis of responses to the "reasons for move" questions in the American Housing Survey.

At the beginning of economic downturns, demand should fall the most at the top end of the market, for the same reasons that this segment grows the most in good times. By presumption, then, rents should grow proportionally more in the middle market and, if rents are not constrained by regulation, in the affordable market.

However, even in bad times, the properties serving the top-end market still should be able to outperform others, as measured by percentage growth in total revenue. The reason is that these properties – as the most desirable in the local market – should always be able to lure residents from other properties. By this reasoning, the Class A apartments should be the last to be unoccupied. Even if a 25 percent reduction in rents is required to fill an apartment, the resulting revenue is much better than zero.

Yet this inherent advantage of Class A properties has not been realized in the experience of the past two years, according to anecdotes that surfaced early on and now some harder evidence coming from market surveys and studies. Research using both the REIS database and that from M/PF Research show clear outperformance of Class B properties over Class A's in recent quarters.[3] The REIS data show a widening occupancy rate gap between A's and B/C's, and the M/PF indicate that property revenue (average rent times occupancy rate) growth of A's has fallen short of growth of B's during the past two years of weak economic growth, reversing the pattern of the previous several years.

Why haven't Class A apartment properties outperformed B's and C's? Reaction lags likely contribute. First property managers must recognize the falloff in demand and reduce asking rents accordingly. Second, consumers must learn of and respond to the rent incentive. In addition to the reaction lags, rent adjustments to reduced demand can be constrained by concerns of property image and of relations with current residents who might not appreciate being bound by leases at rents 25 percent above those of new move-ins.

It is an empirical question whether these frictions from reaction lags and other constraints on rent reductions should dominate the inherent advantage on occupancy that Class A properties possess. For an answer the analysis now turns to the data.

[3] Presentations by Jeanette Rice of LendLease Real Estate Investments, David Kleinerman of Security Capital, and John Christie of AvalonBay, all at the National Multi Housing Council Research Forum, Dallas, November 5, 2002.

Data Analysis

The primary data source for this research is the American Housing Survey (AHS). The AHS is a biannual probability sample of the nation's housing stock, with sample sizes of roughly 58,000 to 67,000 occupied and vacant housing units, depending on survey year. The AHS is a longitudinal survey of the housing stock: The same housing units are surveyed every two years, and detailed information is collected on the characteristics of the units and, for occupied units, the occupants.

The research focuses on rental housing units in structures with at least five units, which will be referred to in this paper as "apartments." This is the segment of the rental housing market of most interest to institutional investors. The AHS sample includes approximately 17,000 to 20,000 apartment records, depending on year.

This analysis exploits the longitudinal feature of the AHS. Housing units can be linked over time to develop time series information on changes in those units and their occupants. The project links the apartment records during two distinct macroeconomic periods. First, records from the 1997 and 1999 AHS files are linked and analyzed. This was a period of strong growth in the economy and generally above-average rent growth and occupancies. Second, records from the 1989 and 1991 AHS files are linked and analyzed. This was a period of macroeconomic recession and, in the apartment industry, above-average vacancies and declining real rents.

For both of the 1997-99 growth period and the 1989-91 recession period, the project measures apartment performance by two indicators: the change in occupancy rates between the first and second surveys, and the change in rent for those apartments occupied by cash-paying renters on both survey dates.[4] The analysis is "same store": That is, only apartments that were in the sample in both the first and second survey bracketing the two-year period are analyzed. The sample does, however, change between the 1989-91 period and the 1997-99 period to accommodate new construction and losses from the stock during the intervening six years.

The results presented below are representative of a much larger set of tabulations which included some more complex specifications than those shown.

[4] A small proportion of rental units are occupied by people who pay no rent because they work for the property owner, are a related to the owner, or for some other reason. These "non-cash renter" units are excluded from the analysis of rent change. Also excluded from all tabulations are apartments with very low rents of below $100 in 1989 or $150 in 1997. These low rent units are likely to be heavily subsidized, below investment-grade quality, or have mis-reported rents. In addition, apartments reporting a two-year rent increase of more than 100 percent, or rent decline of more than 50 percent, were dropped as likely data errors or fully renovated units. Lastly, to reduce the influence of newly built apartments still in initial lease-up, apartments had to be built more than one year before the first survey year (1989 or 1997) to be retained in the sample.

However, the more complicated specifications shed no additional light on the issues so I emphasize the more straightforward results.

Descriptive Statistics

Overall, the vacancy rates and rent increases recorded in the AHS are consistent with those from other sources for those same time periods (Table 1), once allowance is made for definitional differences. Vacancies are lower in the AHS than in the Census Bureau's quarterly Housing Vacancy Survey (HVS). Much of the difference likely arises from the composition of the AHS subsample used in this analysis. To be retained in the subsample, an apartment must appear in the sample in both periods and have been built more than a year prior to the first year of the two-year observation period. These restrictions exclude many very new and very old units from the AHS subsample, and both of these age groups have above-average vacancy rates. (Very old units are the most likely to be removed from the housing stock between the first and second survey years, and therefore ineligible for retention in the "same store" sample.) Very new properties may still be in their initial leasing periods and not yet stabilized.

The comparison of rent increases across surveys is less straightforward, because the CPI rent measure is implicitly a mean, whereas the AHS measure we use is the percentage change in *median* rent.[5] In addition, our AHS-based rent change is only for apartments, whereas the CPI covers all rental housing. Nonetheless, the AHS and CPI estimates of rent growth are similar, and they indicate about the same deceleration in rents between 1989-91 and 1997-99.

[5] Because of errors in survey responses, the median is a better measure of central tendency of AHS rents than is the mean.

Table 1:
AHS and Other Estimates of Rent Growth and Vacancies

	AHS	CPI
Rent Increase (annualized)		
1989-91	3.4	3.9
1997-99	2.5	3.2
	AHS	**HVS**
Vacancy Rates		
1989	7.2	10.6
1991	7.4	10.7
1997	7.0	9.4
1999	7.0	9.0

Notes:
rent increase: AHS estimate is the annualized percentage change in median rent for apartments occupied at the beginning and end of the two-year period. CPI refers to all rental housing, not just apartments, and is the annualized percentage change in the residential rent index for July of the years shown.
vacancy rates: refer in both the AHS and the Census Bureau's Housing Vacancy Survey to rental units in structures with 5+ units; AHS estimates are for units completed at least a year prior to the Survey year. HVS estimates are for the second quarter of the year shown.

Like all sample surveys, the AHS is subject to both sampling error and non-sampling error, although the large sample size of the AHS reduces the magnitude of the sampling errors. The rent change sample overall exceeds 4,000 observations, and almost all subgroups exceed 1000 observations. The vacancy rate calculations are based on over 6,000 observations, with most subgroups above 1,500. While exact computation of confidence intervals is not possible, tests I have done based on the AHS technical documentation, suggest that the 90 % interval for both vacancy rates and percentage rent increases is approximately +/- one half percent for full sample and no more than +/- one percentage point for subsamples shown in Table 2.[6]

Bivariate results reveal few large or systematic differences in apartment performance by property characteristics (Table 2). Differences in median rent increases across categories were generally less than a percentage point in both

[6] More background on the American Housing Survey, including a discussion of the accuracy of the estimates, can be found at www.census.gov/hhes/www/ahs.html.

Table 2: Descriptive Statistics

	1997-1999			1989-1991		
	Rent Growth	Vacancy Rate		Rent Growth	Vacancy Rate	
		1999	chg from 1997		1991	chg from 1989
	(annual %)	(%)	(pct. pts)	(annual %)	(%)	(pct. pts)
U.S. Total	2.5%	7.0	0	3.4%	7.4	0.2
Region						
Northeast	2.0%	4.3	-0.8	3.7%	6.2	2
Midwest	2.4%	8.4	0.8	3.1%	7.6	1.2
South	2.6%	9.3	0.3	3.5%	8.7	-1.2
West	3.0%	6.0	0.1	3.4%	6.8	-1
Metro Location						
central city	2.2%	6.9	0.3	3.9%	7.6	0
suburb	2.8%	6.3	-1.0	2.8%	7.6	0.5
non-metro	2.1%	11.2	3.1	3.4%	5.1	0
Year Structure Built						
pre-1960	2.0%	6.4	0.4	3.9%	7.5	0.6
1960s	2.6%	7.4	-0.1	3.1%	8.1	0.8
1970s	2.7%	6.9	-0.4	3.2%	6.6	-0.5
1980s	2.9%	7.7	0.6	3.5%	7.8	0
1990s	1.7%	7.5	-0.5		n/a	n/a
Structure Size						
5 to 9 units	2.1%	7.3	-0.5	3.3%	7.7	1.1
10 to 24	2.6%	7.9	0.4	3.3%	8.1	0
25 plus	2.6%	5.3	-0.3	3.8%	6.4	-0.4
Bedrooms in Unit						
one	2.7%	6.8	0.3	3.5%	7.6	0.5
two	2.2%	6.9	-0.7	3.2%	7.1	0
three+	2.1%	5.5	-0.3	4.0%	4.0	-1.8
Rent Group						
low	1.9%	9.3	n/a	4.0%	7.8	n/a
medium	2.3%	7.8	n/a	3.1%	8.3	n/a
high	3.1%	6.9	n/a	2.6%	6.7	n/a

Source: author's tabulations from the American Housing Survey
Notes: all statistics refer to rental units in structures with five or more units;
rent growth estimates are for units occupied in both survey years;
vacancy rates by rent group apply only to units that were occupied in the first year of the period shown;
rent groups: 1989-91: $100-299, 300-599, 600+; 1997-99: $150-449, 450-649, 650+

time periods. As for vacancy rates, while the levels differ considerably from category to category, changes in vacancy rates over time show less variation.

Looking first at the geographic descriptors, the regional rank orderings and range of variation in rent growth are generally corroborated by the CPI rent growth estimates for those regions and time periods. The West, dominated by California, had the greatest rent increase of any region in 1997-99, whereas in the earlier 1989-1991 period, the Midwest lagged the other regions. The relative rent performance of central cities and suburbs switched between the two periods.

Among the structural characteristics in Table 2, property age – which is hard to interpret because of its correlation with location – has no clear relationship to rent growth or vacancy change in either period. In contrast, large properties performed best in both periods. Small (that is, one-bedroom) units did best in growth period, worst in recession. It may be that marginal household formations are predominantly single-person households, who are most likely to seek single-bedroom apartments.

The last property characteristic in the table is rent, used here as an indicator of apartment quality. No consensus exists on the quality ratings of apartments. Whether a property is an "A" or a "B" seems often to depend on whether the rater is the seller or the buyer.[7] However, rent is the single best composite measure of the physical, service, and locational attributes of a unit and its property. Table 2 groups apartments in each of the time periods into three approximately equal size groups based on rent, with the break points specified in the notes to the table. A unit's rent depends on both the quality of that apartment and on housing costs in the local market. I examined more complicated rent measures than the one in Table 2, including some that measure rent relative to local market averages. Results were very similar to those shown in Table 2.[8] They do indicate that in the strong growth period of the late 1990s higher rent apartments posted slightly greater rent increases than did lower rent units, whereas in the recessionary time of 1989-1991, they fared less well than did units in the middle and lower rent groups.

Property revenue depends both on rent growth at occupied units and on changes in the occupancy rate. Because of market segmentation by geography and property type, and because natural vacancy rates differ by market segment, it is

[7] Jack Goodman and Brook Scott, "Rating the Quality of Multifamily Rental Housing," *Real Estate Finance*, 1997

[8] The rent group allocations in Table 2 and thereafter are based on the average rent of the unit in the two survey years, to avoid the spurious correlation between rent at the beginning of the period and subsequent change. For example, units with rent of $1 in the first survey year cannot show a lower rent in the second year, and apartments at the top allowed rent in year one cannot (absent an increase in the top code) post an increase in year two.

not surprising that the levels of vacancies vary by market segment, as shown in Table 2. But changes over time in vacancies should indicate tightening or loosening in those segments. As shown in the table, the changes in vacancy rates differ by structural characteristics, geography, and time period. But there are few consistent results. The estimates by year built, for example, do not indicate any clear relationship between property age and change in vacancy rate. However, the rent group statistics, at the bottom, suggest that upper-end units maintained occupancy better than other apartments in both time periods.

Multivariate Analysis

Correlations among the descriptor variables in Table 2 can mask the independent association of apartment characteristics with rent growth and vacancy performance and may contribute to the generally small and inconsistent differences observed. The next step in the analysis is to determine which, if any, of the property characteristics are correlated with performance independent of their correlations with other property characteristics, and how those relationships vary with macroeconomic conditions and with the local economy and housing market. In addition to parsing out the influences of individual predictors, regression results, specifically the goodness of fit of the models, give a better feel than the bivariates for the diversity across individual apartments. This section summarizes results from regressions of rent growth and logit analysis of changes in occupancy status.

Because the regression and logit results generally indicate an absence of effects, as explained later in this section, they are presented only in summary form. Also, the models described here are representative of a much larger set varying in complexity that I have estimated, including modifications to the list and definitions of variables included in the analysis and to the functional forms of the models tested. The conclusions reached below are robust to all those specification changes.

-- rent change

Look first at the results from the multivariate analysis of rent growth, summarized in Table 3.[9] Although several of the independent variables have coefficients significantly different from zero by standard statistical tests, the estimates are generally unstable or too small to be of economic significance. The structural and locational attributes had inconsistent effects, with fewer of statistical significance in 1997-99 than in 1989-91. This lack of influence is found despite

[9] The regressions are run only on units occupied at the time of both surveys (but not necessarily by the same people) in the two-year period, in order to get more accurate responses on unit rent. In addition, units with very big rent changes were excluded, as discussed earlier.

the exclusion of outlier observations with implausibly large rent changes (discussed previously) and despite the flexible, non-linear relationships that are estimatable with the independent variables in categorical ("dummy variable") form, as most are in the models tested. Consistent with this weak influence of most of the independent variables, less than 5 percent of the variance in rent change can be explained by the models summarized in Table 3.

The rent group results are of particular interest because of their association with quality submarkets. This independent variable yielded some of the more coherent estimates. The results for 1997-1999 indicate that in a strong economic period the upper end of the apartment market posted the biggest rent increases. The regression summarized in the table indicates that the highest rent group had rent increases averaging about 4 percentage points annually above those of the lowest rent group and about 3 percentage points annually above the middle rent group. By contrast, in the recessionary period 1989-1991, the middle market did best, although only about 1 percentage point annually above the other two rent groups.[10] These results, which control for the effects of all the other independent variables within a regression framework, held up under a variety of specifications.

The macroeconomy influences local apartment performance mostly through its effects on local apartment demand and supply. Note that these models include among the predictors not only the property characteristics from Table 2, but also two local area variables that would be expected to influence rent growth.[11] Local economies are not all in recession and growth mode at the same time and to the same degree. Housing markets too are local, and rents and occupancies depend on the local economy.

[10] In the regressions, dummy variables identified the three rent groups, and the lowest rent group was the omitted category. In 1997-99, the coefficient and standard error for the high rent dummy were .075 and .014, and for the middle rent dummy were .017 and .013. In 1989-1991, the coefficient and standard error for the high rent dummy were -.002 and .013, and for the middle rent dummy were .023 and .011

[11] The SMSA is identified for many of the AHS observations. For these records, rental vacancy rates as estimated by the Census Bureau for the 75 largest markets were added to the set of independent variables, and job growth (specifically, the two-year percentage change in total nonfarm employment) as estimated by the Bureau of Labor Statistics for each SMSA in the country was added as well.

Table 3:
Regression Results: Influence of Independent Variables on Percentage Change in Rent

	1989-1991	1997-1999
Independent Variable		
region	Northeast higher than other regions	insignificant
city/suburb	central city higher than suburbs	insignificant
decade of construction	old apartments higher than new	insignificant
number of bedrooms	bigger units higher	insignificant
units in structure	small buildings higher	large buildings higher
unit rent group	middle rent units higher than extremes	most rent growth in high rent segment
metro vacancy rate in start year relative to long-run average	insignificant	more rent growth in low vacancy markets
metro area job growth during period	positive	insignificant
Adjusted R-square	0.02	0.03
sample size	2413	2176

notes: coefficients of variables mentioned above are significantly different from zero at 95% conf level;
most of the independent variables are specified as categorical (rather than continuous), and in some instances only selected categories are significantly different from zero.

sample restricted to 5+ units occupied by cash renters in both years of two-year interval, rents of $100+ in 1989 or $150+ in 1997, and with changes over two years of between -50% and +100%
sample size are lower than in the bivariate tabulations because observations needed non-missing data for each of the predictor variables to be included in the regression estimation.

The first local variable included in the models is the metropolitan area's rental vacancy rate in the first year of the two-year observation period. Because the "natural" or equilibrium vacancy rate varies from market to market, the rate in the equation is scaled as the rate in the first year minus its long-run (1986-91) average for that market. Results using the unadjusted vacancy rate are similar. The expectation is that apartments in high vacancy markets will post less rent growth than low vacancy markets. As shown in Table 3, that was the finding for 1997-1999, but not for 1989-1991.

The second metro area variable expected to influence rent growth is job growth. More jobs imply more households which implies more demand for housing of all types, including apartments. Some of this demand pressure should get reflected

in rent increases. That is the finding for the recessionary period 1989-1991, but not for 1997-1999.

These results on local market effects indicate that when the economy is weak overall (1989-1991), demand growth is relatively important in generating rent increases, but when jobs are growing everywhere (1997-1999), the supply situation (as indicated by the vacancy rate) is more important in distinguishing between markets with rent growth and those without. To date, however, I have not come up with a plausible economic theory to support this interpretation.

A last set of specifications was intended to further explore the rent group effects. To determine if high-end units post the biggest rent increases not only in strong macroeconomic times but also in strong local markets, the sample was subselected to include apartments only in markets with above-average job growth in each period. In a similar test, additional regressions were run only on apartments in markets with below-average vacancy rates. The expectation was that high-end units would perform even better (as measured by rent growth) relative to other apartments in both of these subselected samples than in the full samples for those two time periods. One of these tests did produce the expected results: In 1997-1999 high-end apartments in markets with above average job growth did even better relative to other apartments than was the case in other local markets during that period. The other three tests[12] found rent growth differentials by quality segment to be very similar to those of the full sample results summarized in Table 3.

In summary, the results from the rent growth regressions were surprisingly weak. I experimented with a number of alternative specifications. Two in particular that I thought would boost the explanatory power were:

- inclusion of a "recent mover" dummy variable to identify units that had a change in resident between the first and second survey, to control for the effect of tenure discounts and rent adjustments at turnover; and

- inclusion of dummy variables for each of the 45 metro areas from which observations are included in the regressions, to control for idiosyncratic local market effects on rent growth not captured by the local vacancy and job growth variables.

Nonetheless, in no specification did the adjusted R-square statistic rise above 0.05. In other words, no more than 5 percent of the variance in rent growth

[12] High job growth markets in 1989-1999, low vacancy markets in 1989-1991, and low vacancy markets in 1997-1999.

across individual apartments can be explained by a number of geographic, structural, and local economic variables.[13]

-- occupancy status

The rent regressions were run only on units occupied in both periods. Another dimension of performance is occupancy. Changes in vacancies are especially important for measuring financial performance at the property level, since property revenue change is determined by change in rents of occupied units and by changes in occupancy rates.

Results from multivariate logit analysis of changes in occupancy were weak and inconclusive. Given the low explanatory power of the models for rent change and the ambiguous bivariate results on vacancy changes, it is little surprise that the vacancy logits were largely unable to "predict" the units that would change their occupancy status.

The models tested first stratified the sample by occupancy status – occupied or vacant -- in the first year of the two-year period (that is, 1989 or 1997). The dependent variable was dichotomous, indicating whether the unit changed occupancy status by the second interview (in 1991 or 1999). The dependent variable in these logit runs typically showed little variation: Of those units occupied in the first year, only 8 percent were vacant two years later. This percentage held both for 1989-1991 and for 1997-1999. Of those units vacant in the first year, only 24 percent (20 percent in 1997-1999) were vacant in the second.

By various measures of goodness of fit, maximum likelihood logit models with independent variable sets similar to that of Table 3 fit the data poorly. "Pseudo" R-square statistics were below .05 in all instances, and in several of the models the null hypothesis of no explanatory power for the entire set of independent variables could not be rejected. Perhaps most telling, not one of the models was able to discriminate between those apartments that switched occupancy status and those that did not. The predicted probabilities of switching status for each time period and initial status group were all on the same side of 0.50. In other

[13] Only a few other studies have analyzed longitudinally linked rental housing units in the AHS data sets. While not directly comparable to my approach and results, those studies also hint at low explanatory power in predicting rent change of individual apartments over time. In addition, the first cited study below presents evidence that the rent variable in the AHS does not suffer from extreme misreporting. James Follain, David Kogut, and Michael Marshoun, “Analysis of the Times Series Behavior of Rents of Multifamily Housing Units,” paper presented at the annual meeting of the American Real Estate and urban Economics Association, January 2000; and C. Tsuriel Somerville and Cynthia Holmes, “Dynamics of the Affordable Housing Stock: Microdata Analysis of Filtering,” Journal of Housing Research V. 12, no. 1 (2001).

words, the models predicted the same occupancy outcome for every apartment, regardless of its characteristics or location.

Conclusions

The first conclusion is that apartment performance is very idiosyncratic. Despite a variety of flexible specifications, the models could not explain more than 5 percent of the variation in rent growth across individual apartments, and the predictive power for changes in occupancy were comparably weak. Structural and locational traits had little effect. Granted, it would be much easier to explain rent *levels* than *changes*, but the utter lack of meaningful explanatory power came as a surprise. Error in measurement could perhaps account for some of the weak findings, but experiments with alternative specifications suggest that data error is not the main reason for the lack of relationship.

That said, the results do provide support for some of the theoretical expectations. Upscale apartments appear to do the best (as measured by rent growth) relative to the overall apartment market in times and places of strong demand growth and low rental vacancies. This finding is consistent with other recent evidence on this issue, although the inconclusive results on vacancies make it difficult to aggregate our results on unit revenue to equivalents for properties. The results are consistent with a theory that demand is more procyclical for top-end apartments than for the overall market, and that this demand differential boosts Class A performance in expansions, especially in the early stages prior to the resulting pickup in luxury construction. In economic downturns, the theory holds that frictions, property image, and resident relations prevent luxury properties from adjusting rents downward quickly and completely to maintain high occupancy by drawing residents from the middle segment of the market.

Much can be done to improve upon the analysis presented here. The theoretical framework can be refined and formalized by drawing on existing research on housing market segmentation and the dynamics of demand and supply. At the property level, holding rents above "market-clearing" levels may be an optimizing strategy for managers of Class A properties confronting property image and resident relations issues, or if the interests of property managers and property owners are not perfectly aligned, but the arguments need to be formalized. More generally, rent optimization strategies akin to airline and hotel "load management" practices are now being implemented by apartment companies,[14] but the formal economics of property-level rent-setting optimization has yet to be developed.

[14] Donald Davidoff and Steven Small, "Automated Revenue Management: Opportunities and Challenges for Apartment Firms," paper presented at the National Multi Housing Council Technology Forum, Dallas, TX., November, 2002.

Regarding the empirical work, one advantage of the AHS is its wealth of housing unit-specific information. But a weakness for purposes of this study is the absence of property-level performance measures. Managers presumably seek to maximize property-level net operating income, which implies maximization of property revenue. The analysis here looks separately at changes in rent and changes in occupancies, but managers try to maximize the product of these two. Property level financial information of the type provided by various proprietary apartment surveys and the Census Bureau's soon-to-be-released 2001 Residential Finance Survey can address the questions posed in this paper, and tapping these sources should be on the research agenda.

At the outset of this project, I thought the implications of the findings would be for investment strategy – acquisition timing and pricing – but they turn out to be more for property management. The results show that where you are and what you have does not pre-determine apartment performance. But the results also show that Class A properties in particular have some control over their fate and that property management is no less important than property selection in determining apartment investment performance over the business cycle.

About the Author

Jack Goodman provides economic and demographic research to the real estate industry through his firm, Hartrey Advisors. He previously was Chief Economist at the National Multi Housing Council and has served on the research staffs of the Federal Reserve Board and Urban Institute and on the economics faculty at the University of Virginia. He has consulted overseas for the World Bank and USAID and has chaired the Planning and Housing Commissions of Arlington County, Virginia. He has a Ph.D. in Economics from the University of Michigan.