Office Property DCF Assumptions: Lessons from Two Decades of Investor Surveys

by Barrett A. Slade, PhD, MAI, and C. F. Sirmans, PhD

ABSTRACT

Real estate analysts and appraisers frequently use discounted cash flow (DCF) analysis in the valuation of multitenant office properties. Important input assumptions determine the reliability of the DCF analysis and the final estimate of value. The purposes of this article are to (1) examine ten DCF assumptions, as published by the Korpacz Real Estate Investor Survey over a 21-year period, and (2) identify important implications for real estate analysts and appraisers.

Whor valuing multitenant office properties, the income capitalization approach generally receives the greatest weight because these properties are bought and sold based on their income-producing potential, i.e., they are typically purchased for investment rather than for owner occupancy. Investors tend to focus on anticipated revenue and yield over the holding period; therefore, these elements are critical in the property valuation. Due to the complexities and timing of different leases in a multitenant property, anticipated revenue varies temporally, i.e., the net operating income (NOI) is not stable. Consequently, discounted cash flow (DCF) analysis, rather than direct capitalization, is often given primary weight in the income capitalization approach to valuation. With the advent of specialized computer software, DCF analysis has grown considerably as a primary method for valuing multitenant properties.

Experienced appraisers and analysts understand that alternative DCF assumptions may significantly influence the final value estimate; therefore, using the proper assumptions is of primary importance.[1] Appraisers strive to mirror the market by using DCF assumptions obtained from market participants, but obtaining this data requires significant expertise as well as time and effort. Investors and analysts are also interested in such data for valuation and acquisition decision-making purposes. Naturally, the demand for data has led third-party entrepreneurs to collect, compile, and publish such data for interested subscribers. One of the first and more prominent third-party data providers is the

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1. The following articles provide a good review of DCF analysis, common abuses, and tests of reasonableness: Vernon Martin III, "Nine Abuses Common in Pro Forma Cash Flow Projections," *Real Estate Review* 18, no. 3 (Fall 1988): 20–25; Gregory J. Accetta, "Testing the Reasonableness of Discounted Cash Flow Analysis," *The Appraisal Journal* (January 1998): 62–67; and MacKenzie S. Bottum, "Discounted Cash Flow Analysis: Tests of Reasonableness," *The Appraisal Journal* (January 1993): 138–143.

Korpacz Real Estate Investor Survey, which began publication in 1988.

The objective of this article is to examine 21 years (84 quarters) of investor surveys, as published by the Korpacz Survey, and to identify important implications for real estate analysts and appraisers.[2] This article proceeds as follows: the second section provides an overview of the data; the third section examines the projection period while the fourth section investigates market rents, vacancy, and tenant retention. The fifth section reviews operating expenses and the Consumer Price Index (CPI), and the sixth section examines capitalization and discount rates. The seventh section concludes the article and identifies important implications for valuation analysis.

Overview of the Data

The data set used in this study consists of 6,718 survey responses of institutional investors of office properties from the first quarter of 1988 through the fourth quarter of 2008 (21 years) as published in the Korpacz Real Estate Investor Survey.[3] The quarterly surveys summarize real estate investors' investment criteria for commercial properties located in various geographic areas of the United States. Within the 21-year study period, the Korpacz organization sponsored the surveys from the first quarter of 1988 through the third quarter of 1999, and PricewaterhouseCoopers sponsored the surveys from the fourth quarter of 1999 through the fourth quarter of 2008.

The Korpacz Survey is conducted through questionnaires mailed to prominent real estate investment market participants in the United States.[4] The survey participants are mostly institutional investors (e.g., pension plans, foundations, endowments, life insurance companies, investment banks, and REITs). The investors involved are not selected randomly. The data cited in the publication pertain to institutional investment-grade properties, including central business district (CBD) and suburban office buildings, major retail properties, urban high-rise and garden apartment buildings, hotels, and industrial properties. Office properties are the mainstay of the survey. For instance, in every quarter since its inception, detailed investor surveys of office properties have been included in the publication unlike the periodic inclusion of the other commercial property types. Because of the temporal inconsistency of the surveys of the other property types, only surveys of office properties are analyzed in this study.

Table 1 provides descriptive statistics of the primary survey responses for ten DCF assumptions (variables) that are frequently employed in the valuation of office properties:

- Projection period
- Rent change
- Months vacant
- Tenant retention
- General vacancy
- Expense change
- CPI change
- Capitalization rate
- Reversion capitalization rate
- Discount rate

Depending on the variable, the number of observations range from 6,067 to 6,718 or approximately 70 to 80 surveys per quarter.

Table 2 provides the descriptive statistics of the means for each quarter for the ten DCF variables. All but three of the variables (months vacant, tenant retention, and general vacancy) have data spanning the entire 84 quarters. Months vacant and tenant retention have data spanning 66 quarters, while general vacancy has data spanning 67 quarters. Data for these three variables began to be published in the third quarter of 1992.

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2. As reviewers of this article pointed out, survey research in general exhibits a number of potential problems, and there are other techniques for appraisers and analysts to get market inputs for their discounted cash flow analysis. Survey research may suffer from a number of shortcomings, such as nonrandomly generated data, bias forecasts, herd behavior, and poor instrument design.

3. Published quarterly by PricewaterhouseCoopers LLP, see http://www.pwcreval.com.

4. The Korpacz Real Estate Investor Survey states the following regarding the survey process: "Survey participants represent a cross section of major institutional equity real estate investors who invest primarily in institutional-grade property. As such, the information presented is not generally applicable to non-institutional-grade investments. In addition, the information represents investors' investment expectations and does not reflect actual property performances. Initially, participants are interviewed regarding their assumptions used in analyzing their U.S. investments. Subsequently, surveys are completed by mail with telephone follow-ups. Although we do not represent that the survey is statistically accurate, its results provide important insight into the thinking of a significant portion of the equity real estate marketplace." It also states the following regarding investor survey responses: "The individual investor responses contained in the large tables in the back of each issue are a representative sample. Due to space constraints, not all responses are included." Based on this comment, it is clear that the current study examines a sample of all the survey responses received by the publisher of the Korpacz Real Estate Investor Survey.

Table 1   Descriptive Statistics of Survey Responses (Primary Data)

Statistics	Projection Period	Rent Change (%)	Months Vacant	Tenant Retention (%)	General Vacancy (%)	Expense Change (%)	CPI Change (Forecast %)	Cap Rate (%)	Reversion Cap Rate (%)	Discount Rate (%)
Mean	10.08	2.67	7.45	64.51	5.81	3.42	3.32	8.71	9.09	10.84
Std. Dev.	2.12	1.86	2.69	7.05	2.72	0.81	0.70	1.26	1.00	1.64
Skewness	0.62	-0.54	2.10	-0.72	0.46	1.81	1.61	-0.58	-0.61	-0.38
Kurtosis	8.96	8.19	18.66	3.87	3.06	9.37	9.53	3.27	3.32	3.22
Median	10.00	3.00	7.50	65.00	5.00	3.00	3.00	9.00	9.25	11.25
Mode	10.00	3.00	6.00	65.00	5.00	3.00	3.00	9.00	9.50	11.50
Minimum	1.00	-10.00	0.00	35.00	0.00	0.00	0.00	4.50	4.00	6.00
Maximum	20.00	12.50	36.00	95.00	17.50	8.50	10.50	12.50	12.00	16.50
Range	19.00	22.50	36.00	60.00	17.50	8.50	10.50	8.00	8.00	10.50
Count	6718	6448	6114	6124	6067	6650	6445	6641	6656	6674
Percentiles										
1.00%	5.00	-2.50	2.00	50.00	1.00	2.00	2.00	5.50	6.50	7.00
2.50%	5.00	0.00	3.00	50.00	1.25	2.50	2.50	5.75	6.88	7.38
5.00%	7.00	0.00	4.50	50.00	2.00	2.50	2.50	6.25	7.25	8.00
10.00%	8.00	0.00	5.00	55.00	2.00	3.00	3.00	7.00	7.50	8.25
20.00%	10.00	1.50	6.00	60.00	3.50	3.00	3.00	7.63	8.25	9.50
80.00%	10.00	4.00	9.00	70.00	8.00	4.00	4.00	9.75	10.00	12.00
90.00%	12.00	5.00	10.00	72.50	10.00	4.50	4.25	10.00	10.13	12.50
95.00%	15.00	5.25	12.00	75.00	11.00	5.00	5.00	10.50	10.50	13.00
97.50%	15.00	6.50	12.00	75.00	12.00	5.00	5.00	11.00	10.75	13.50
99.00%	15.00	7.50	15.00	77.50	12.50	6.00	5.25	11.50	11.00	15.00

Table 2   Descriptive Statistics of Survey Responses (Quarterly Means)

Statistics	Projection Period	Rent Change (%)	Months Vacant	Tenant Retention (%)	General Vacancy (%)	Expense Change (%)	CPI Change (Forecast %)	Cap Rate (%)	Reversion Cap Rate (%)	Discount Rate (%)
Mean	10.44	2.87	7.61	63.55	5.83	3.75	3.59	8.68	9.10	11.16
Std. Dev.	0.91	1.02	0.91	3.75	0.52	0.82	0.68	0.88	0.64	1.22
Skewness	0.23	-0.31	0.66	-0.74	0.09	0.56	0.40	-0.64	-0.90	-1.20
Kurtosis	1.56	2.59	3.00	2.49	1.89	1.75	1.50	1.87	2.81	3.21
Median	10.32	2.91	7.51	64.61	5.82	3.51	3.39	9.05	9.38	11.52
Mode	9.50	2.48	7.99	65.33	5.17	2.98	4.39	7.67	9.45	11.81
Minimum	9.24	0.82	6.21	55.90	4.88	2.91	2.82	6.99	7.65	8.39
Maximum	12.06	4.98	9.73	68.94	6.81	5.21	4.78	9.74	9.94	12.58
Range	2.83	4.17	3.52	13.05	1.93	2.30	1.95	2.75	2.29	4.19
Count	84	84	66	66	67	84	84	84	84	84
Percentiles										
1.00%	9.24	0.82	6.21	55.90	4.88	2.91	2.82	6.99	7.65	8.39
2.50%	9.34	0.95	6.31	55.92	5.02	2.92	2.84	7.02	7.67	8.45
5.00%	9.43	1.00	6.34	56.10	5.07	2.93	2.87	7.06	7.68	8.50
10.00%	9.44	1.23	6.46	57.11	5.16	2.94	2.89	7.38	8.14	8.82
20.00%	9.50	1.95	6.84	59.74	5.26	2.97	2.93	7.66	8.55	10.12
80.00%	11.40	3.79	8.21	66.33	6.33	4.73	4.44	9.48	9.61	12.09
90.00%	11.56	3.96	9.07	67.93	6.60	5.08	4.60	9.53	9.66	12.35
95.00%	11.97	4.12	9.52	68.52	6.67	5.14	4.65	9.65	9.86	12.44
97.50%	12.06	4.82	9.67	68.92	6.72	5.16	4.67	9.69	9.90	12.52
99.00%	12.06	4.98	9.73	68.94	6.81	5.21	4.78	9.74	9.94	12.58

Table 1 consists of descriptive statistics of the actual survey responses, whereas Table 2 consists of descriptive statistics of the quarterly means; therefore, the variation in Table 1 is much greater compared with Table 2. For instance, in Table 1 the minimum projection period is 1 year and the maximum is 20 years, whereas the minimum and maximum for the projection period variable in Table 2 is 9.24 years and 12.06 years,

respectively. Similar variations can be found for the other variables.

Table 3 provides the correlation coefficients for each variable using the survey responses (primary data). Examination of Table 3, in the context of risk and return, finds the results consistent with expectations. For instance, increasing rent growth and tenant retention leads to a decrease in the discount rate; whereas an increase in general vacancy and operating

Table 3 Correlation Coefficients of Survey Responses (Primary Data)

Correlation Table	Projection Period	Rent Change (%)	Months Vacant	Tenant Retention (%)	General Vacancy (%)	Expense Change (%)	CPI Change (Forecast %)	Cap Rate (%)	Reversion Cap Rate (%)	Discount Rate (%)
Projection Period	1.000	0.154	0.036	-0.100	0.010	0.375	0.368	0.049	-0.009	0.081
Rent Change (%)		1.000	-0.217	0.205	-0.189	0.264	0.209	-0.225	-0.233	-0.098
Months Vacant			1.000	-0.350	0.101	0.062	0.081	0.035	0.031	0.071
Tenant Retention (%)				1.000	-0.253	-0.252	-0.251	-0.207	-0.241	-0.317
General Vacancy (%)					1.000	0.051	0.002	0.130	0.134	0.136
Expense Change (%)						1.000	0.831	0.045	0.009	0.323
CPI Change (%)							1.000	0.038	0.007	0.321
Cap Rate (%)								1.000	0.843	0.744
Reversion Cap Rate (%)									1.000	0.722
Discount Rate (%)										1.000

expenses leads to an increase in the discount rate. The reversion capitalization rate is positively correlated with the going-in capitalization rate, and both are positively correlated with the discount rate.
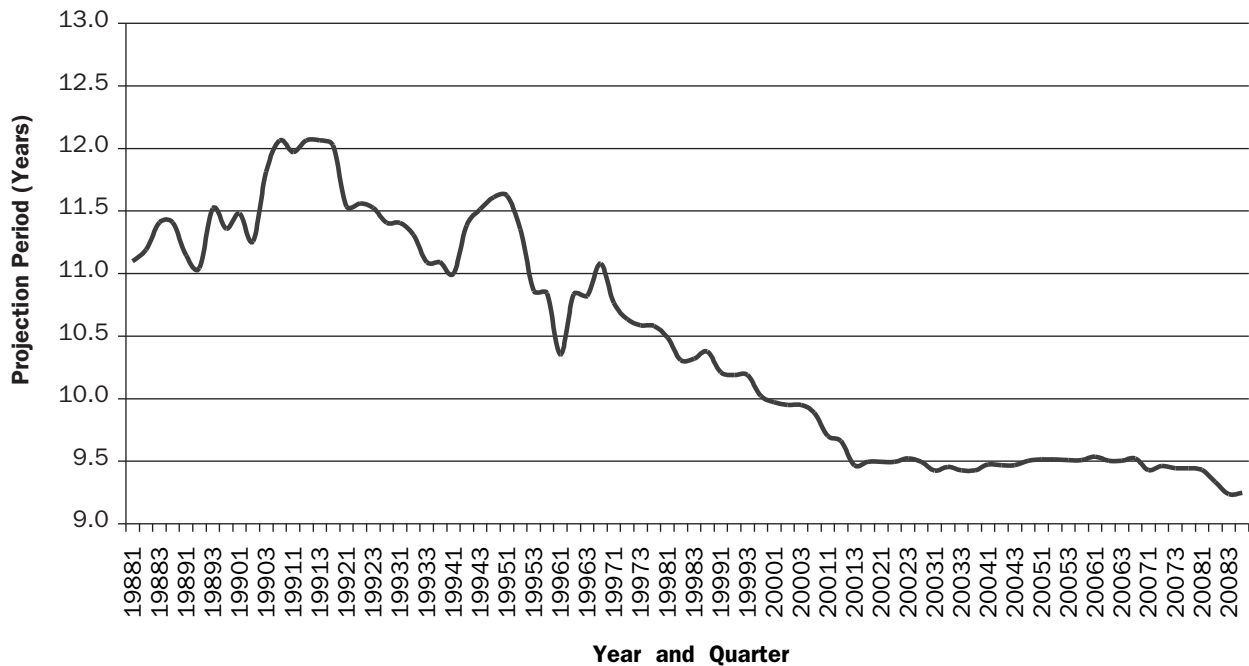
Projection Period

Discounted cash flow analysis requires that the analyst specify the projection period over which the cash flows will be forecast. More formally, *projection period* is defined as "a presumed period of ownership; a period of time over which expected net operating income is projected for purposes of analysis and valuation."[5]

In Table 1, the descriptive statistics of the survey responses show that projection periods over the 21 years range from 1 year to 20 years, with a mean of 10.08 years. In Table 2, the descriptive statistics of the quarterly means provide a range from 9.24 years to 12.06 years, with an overall mean of 10.44 years. From these data, it is clear that a projection period of approximately 10 years is most common

Figure 1 Forecast Projection Period for DCF Analysis (Mean Response by Quarter)

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5. Appraisal Institute, *The Dictionary of Real Estate Appraisal*, 5th ed. (Chicago: Appraisal Institute, 2010), 152.

Figure 1 illustrates the quarterly means for the projection period variable for 1988 through 2008. The first quarter of 1988 shows an average projection period of about 11 years. Over the next three years, the mean projection period ranges from 11 years to 12 years, with a general upward trend. In 1991, all four quarters have a mean projection period of about 12 years, the highest during the 21 years of data. Other than some volatility that occurred in 1994 through 1997, the trend is downward. In late 2001, the forecast projection period stabilized at 9.5 years and remained so through 2006. There was a slight decline at the beginning of 2007 through 2008, with a trough of 9.24 years in the third quarter 2008.

Rent Change, General Vacancy, Months Vacant, and Tenant Retention

Rent Change

Forecasting revenue for the valuation of office properties requires an assumption about the periodic change in rental rates, which may be positive or negative depending on the analyst's expectation of future demand and supply. The primary data in Table 1 shows a mean rent change of 2.67% per year, implying that on average, investors expect rental rates to grow temporally. The minimum annual rent change is -10% and the maximum is 12.5%. In Table 2, the descriptive statistics of the quarterly means show an average annual rent change of 2.87%, with a minimum and maximum of 0.82% and 4.98%, respectively.

Figure 2 illustrates the trends in the expected rent change over the 21 years of investors' forecasts. From the first quarter of 1988 through the first quarter of 1993, a declining trend is observed. For the most part, this time period may be depicted as the savings and loan crisis, where many savings and loans became insolvent as a result of over-aggressive lending during the early to mid-1980s. From 1988 through the first quarter of 1993, investors' expectations of rent growth fell from 5% to 2.3% annually. From the second quarter 1993 through the third quarter 1998, rent growth expectations gradually increased to 4.12%. The roller coaster began again with rent growth expectations declining again from the third quarter 1998 through the second quarter 2003, where they reached a trough at a little under 1% (0.82) annually. During the next four years, rent growth expectation increased and reached a peak at 3.71% annually in the third quarter of 2007. The years 2006 and 2007 experience the steepest increase in expected rent growth; however, 2008 experienced the steepest decline.

It is interesting to note that annual rent growth expectations during the 21 years of data have never returned to the 5% level observed at the beginning of 1988 and have generally fluctuated between 2% and 4%.
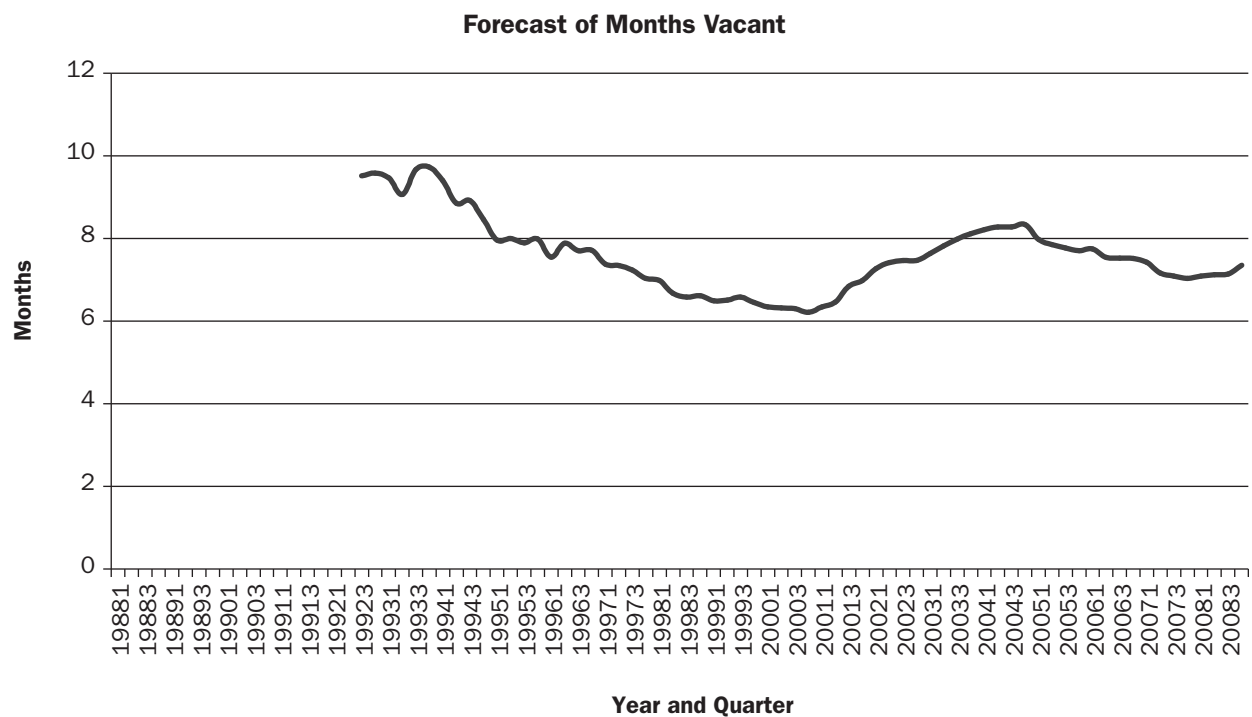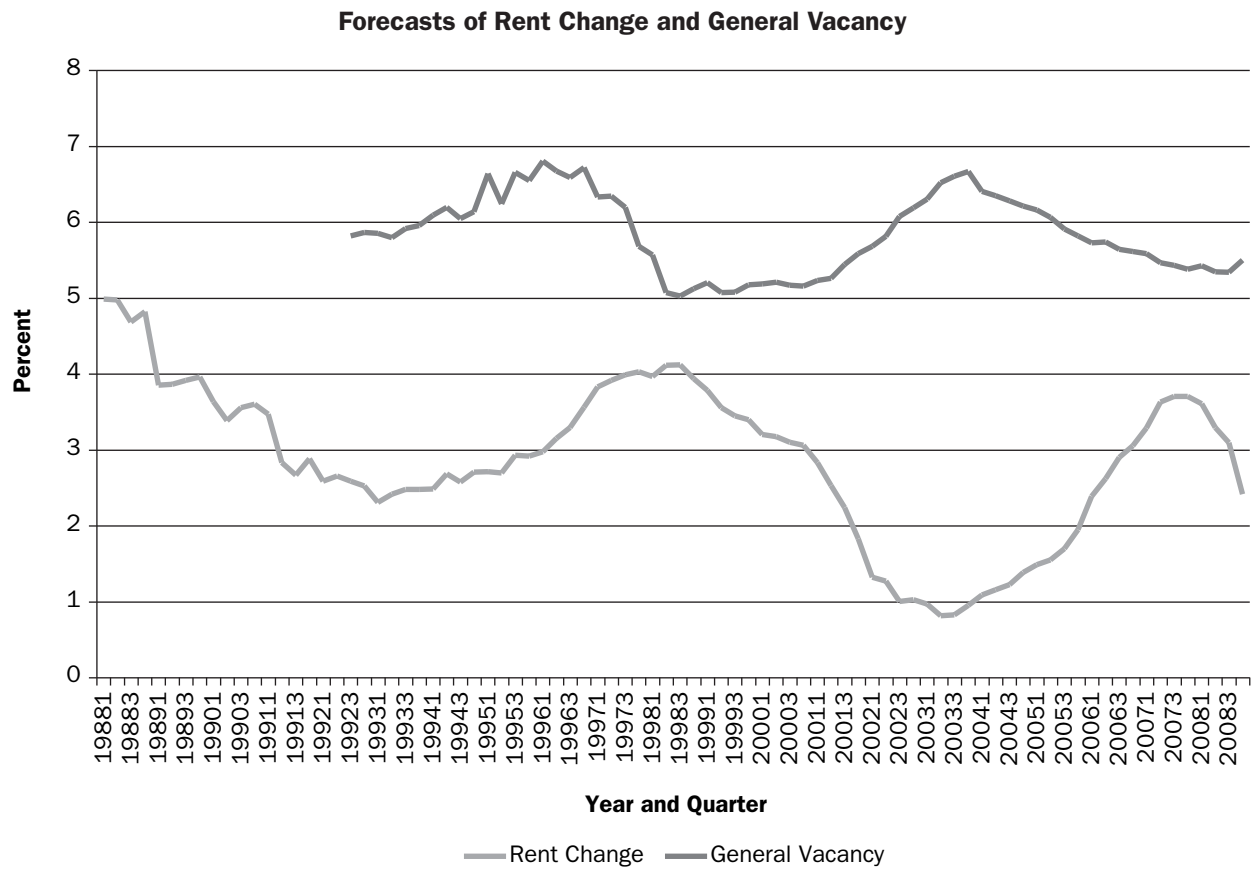
General Vacancy

Table 1, descriptive statistics of the primary survey data, shows that, on average, investors forecast a general vacancy of 5.81%, with a minimum and maximum of 0% and 17.5%, respectively. Table 2, descriptive statistics of the quarterly means, provides a range of forecasts from the minimum of 4.88% to the maximum of 6.81%, with an overall mean of 5.83%.

For the most part, investors' expectations for general vacancy are negatively correlated with expectations for rent growth rates. This is particularly the case from 1996 through 2008. There is, however, an anomaly from the second quarter 1993 through the first quarter of 1996 when positive rent growth expectations were accompanied by positive vacancy rate growth expectations. There does appear to be more volatility in the vacancy forecasts, which may account for some of the ambiguity, but the overall results are still puzzling. This period is considered the height of the savings and loan crisis, where the Resolution Trust Corporation (RTC) was disposing of many properties. This process may have resulted in greater uncertainty in the market, which was then manifest in the survey respondents' forecasts.

Months Vacant

The puzzle becomes more perplexing when the months vacant forecasts are examined. This variable is the investor's forecast of how many months available space will be vacant between leases. The correlation between months vacant and general vacancy is positive during the later periods, which is as expected. However, from the third quarter 1993 through the fourth quarter 1996 the correlation is negative. It is hard to explain how general vacancy would be expected to increase while the expectation of months vacant between leases is declining. In any regard, the months vacant between leases ranges, on average, from about 6 months to 10 months during the entire period that this variable has been tracked.

Figure 2 Comparison of Forecasts of Rent Change, General Vacancy, and Months Vacant (Mean Response by Quarter)

Forecasts of Rent Change and General Vacancy

Legend: Rent Change — General Vacancy

Forecast of Months Vacant

Year and Quarter

Tenant Retention

Figure 3 compares the forecasts of rent change, general vacancy, and tenant retention. Multitenant office properties typically have tenants with alternative lease terms. When leases expire, some tenants elect to stay in the building and renew or renegotiate the lease while some elect to vacate. The probability of retaining a tenant or tenants is an important assumption that impacts the forecast of cash flows.

Data pertaining to tenant retention began to be collected in the third quarter of 1992 and is shown through the fourth quarter of 2008. During this 16-year period, the average tenant retention ranged from approximately 55% to 69%. Other than a slight decline that occurred in 2001 and 2002, the overall trend is upward, reaching a pinnacle of about 69% at the end of 2008. This result is another interesting piece of the puzzle. Why would tenant retention be improving during pronounced periods of increasing vacancy? One reviewer hypothesized that investors may be concluding that institutional-grade tenants are more likely to stay in a property rather than relocate due to the greater stability of their business and the higher pecuniary costs of moving. Future research on the percent of tenant retention between various office-property types may shed light on this piece of the puzzle.

Operating Expenses and CPI

Operating expenses are anticipated to change as the costs of operating an office building fluctuate through time. Any forecast of the cash flows for an office property must include a forecast of these operating costs. The Table 1 descriptive statistics of the primary survey data show that, on average, investors forecast a positive annual change in operating expenses of 3.42%, with a minimum and maximum of 0% to 8.5%, respectively. The CPI change forecast on Table 1 provides a mean of 3.32% with a minimum and maximum of 0% to 10.5%, respectively. These statistics suggest that investors believe that the expected change in operating expenses and in the CPI (an economic measure for inflation) are highly correlated. In fact, the correlation coefficient between these two variables shown in Table 3 is 83%, confirming that expectations on operating expenses and inflation (CPI) are highly correlated.

Figure 4 charts the quarterly means for both variables. During the early periods of the survey,

1988–1991, differences of approximately 50 basis points exist; however, the measures later converge. The two variables are almost indistinguishable from 1992 through 2008. The expense forecast is at its highest level at the beginning of the survey (1988) at slightly above 5%, and then experiences a pronounced decline through 2000. From 2001 through 2008, the forecast percent change in operating expenses and in the CPI are very stable at approximately 3%.
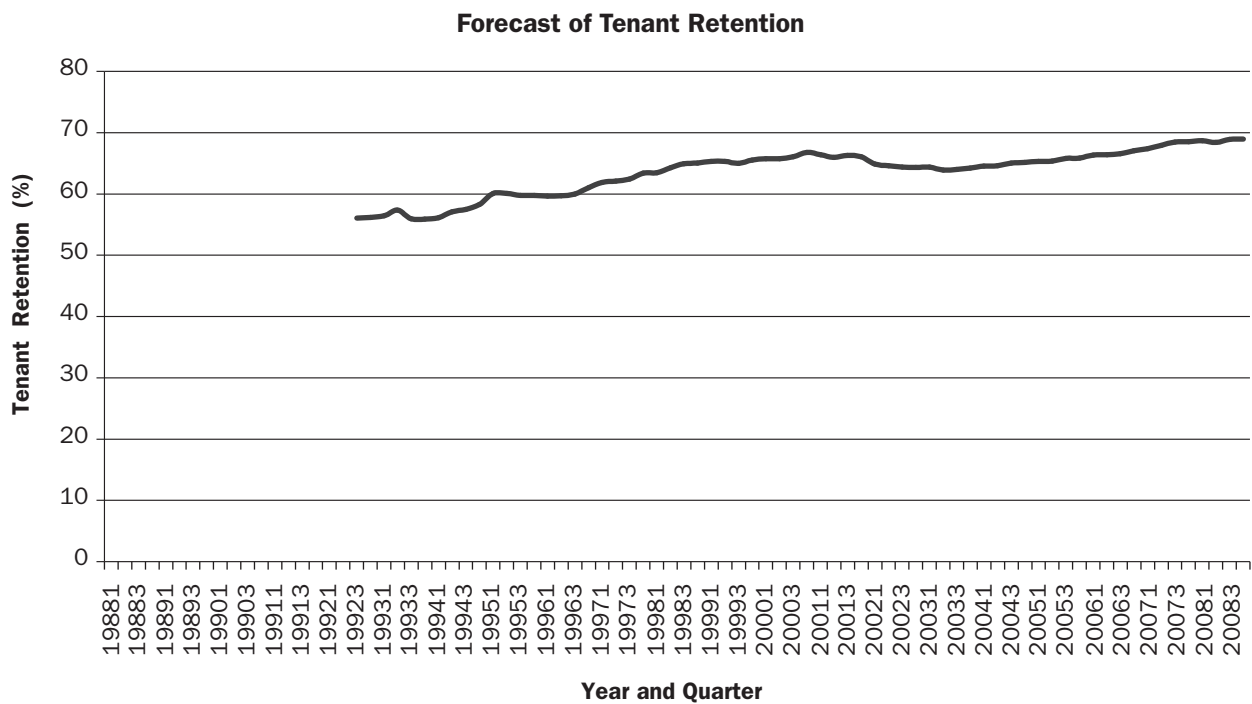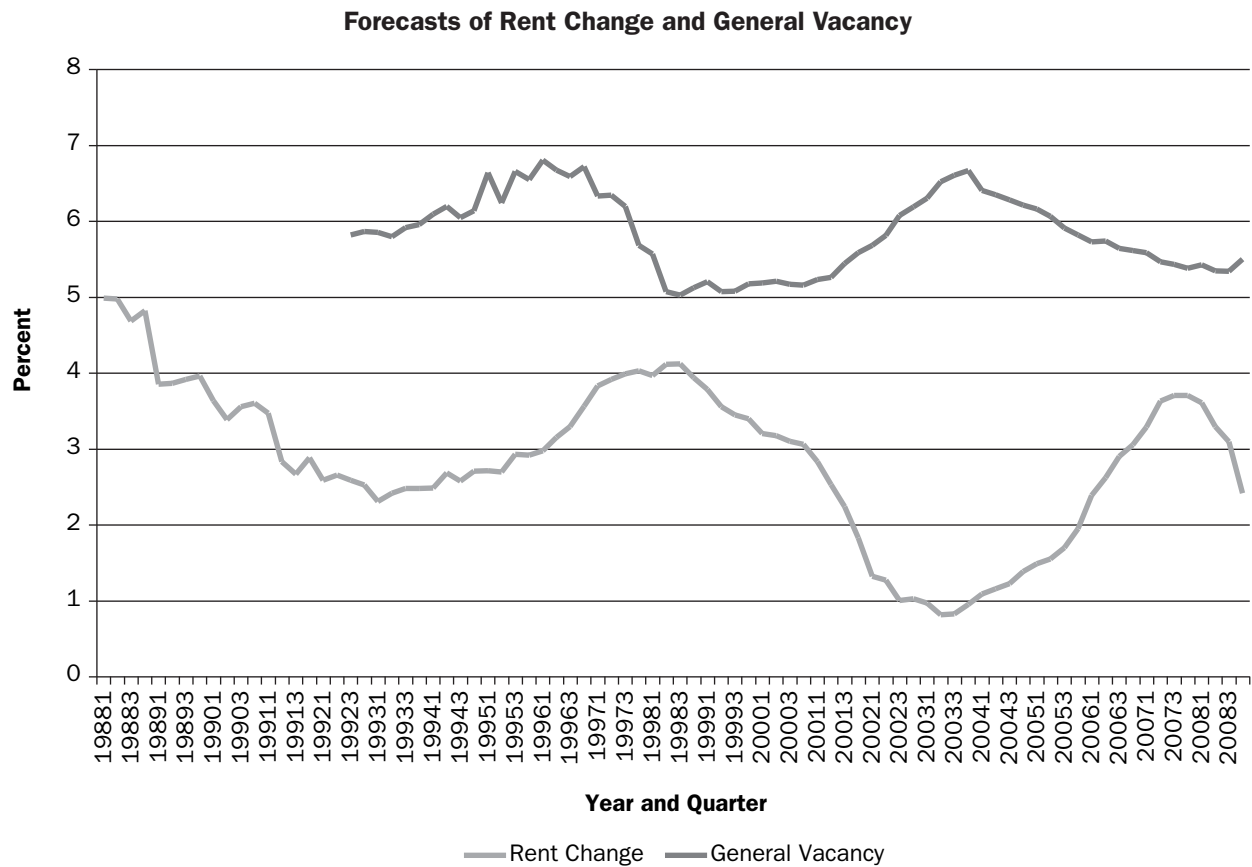
Capitalization and Discount Rates

Within the income capitalization approach, final valuation of office properties occur with the application of appropriate capitalization and discount (yield) rates to the forecast cash flows.

Capitalization Rate

The Table 1 descriptive statistics of the primary survey response data show an average going-in capitalization rate of 8.71%. The minimum and maximum during the 21-year period is 4.5% and 12.5%, respectively. The average reversion or going-out capitalization rate is 9.09%, with a minimum and maximum of 4.0% and 12.0%, respectively. The difference between the means is 38 basis points. In Table 2, the descriptive statistics of the quarterly means provide average going-in and going-out capitalization rates of 8.68% and 9.10%, respectively or a difference of 42 basis points. During the entire 21-year period, the range between the quarterly means for the going-in capitalization rate is 2.75%. The range between the reversion or going-out capitalization rate is even narrower at 2.29%.

Figure 5 illustrates the going-in and reversion capitalization rate forecasts over the 21-year period. Initially, during 1988, the spread between the going-in and reversion capitalization rates ranged from 1% to 1.5%; however, the chart illustrates that convergence began almost immediately and peaked in the third quarter of 1993 when the two rates are virtually indistinguishable. The two rates paralleled quite closely from 1995 through the second quarter of 2002, averaging between 9% and 10%, and then both begin a rapid descent through 2007. The spread between the two rates becomes more pronounced during this period of decline. The trough occurred in the first quarter 2008. The last two quarters of 2008 experience a clear increase in the two rates.

Figure 3 Comparison of Forecasts of Rent Change, General Vacancy, and Tenant Retention (Mean Response by Quarter)

Forecasts of Rent Change and General Vacancy

Year and Quarter

— Rent Change   — General Vacancy

Forecast of Tenant Retention

Year and Quarter

Figure 4 Comparison of Forecasts of Operating Expenses and CPI (Mean Response by Quarter)

Operating Expense Forecast % Change ···· CPI Forecast % Change
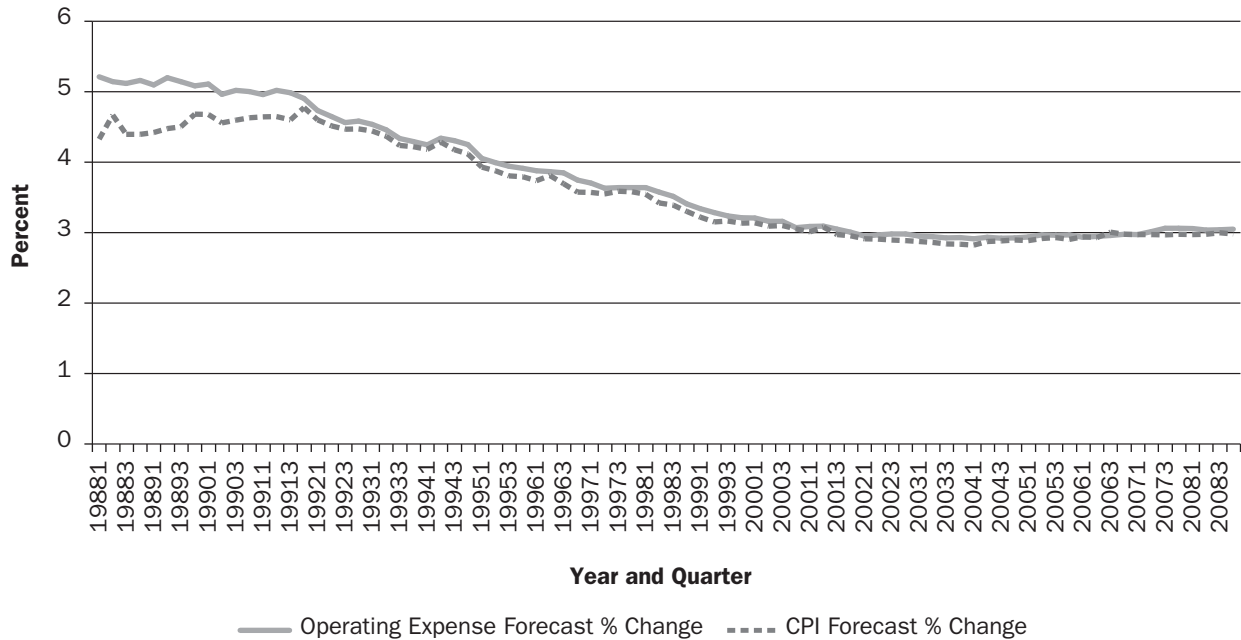
Figure 5 Comparison of Forecasts of Discount (Yield) Rate, Going-in Capitalization Rate, and Reversion Capitalization Rate (Mean Response by Quarter)


···· Reversion Capitalization Rate ─ ─ Discount (Yield) Rate ── Going-in Capitalization Rate
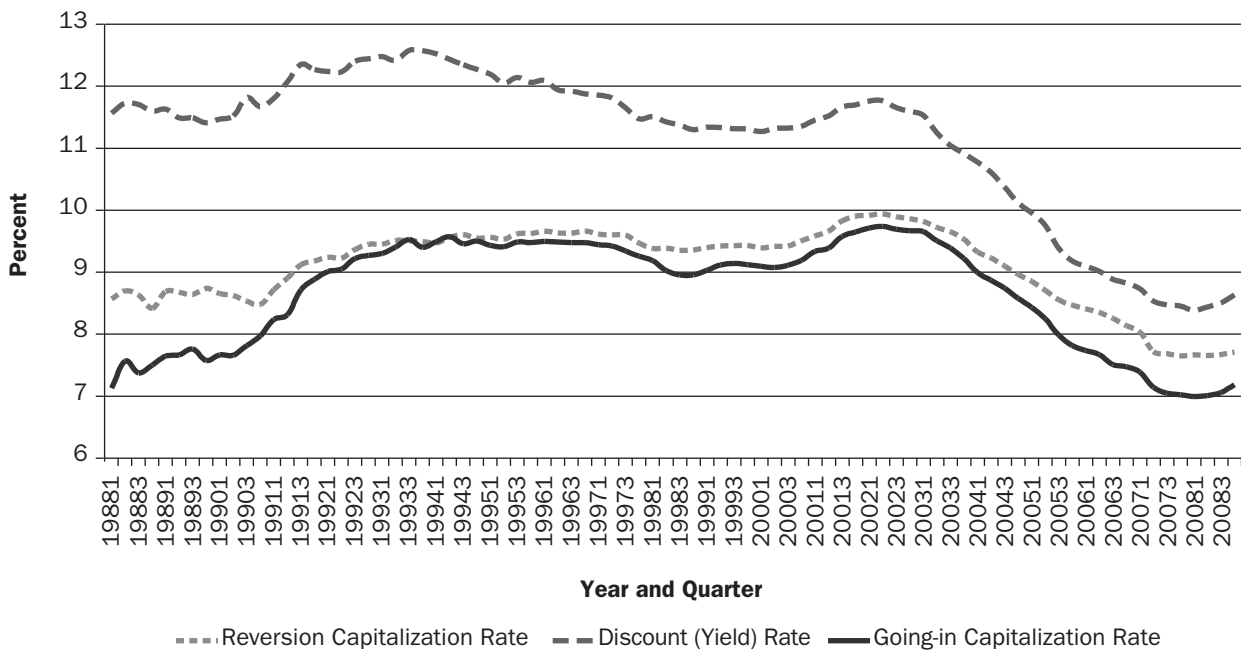
Discount (Yield) Rate

In Table 1, the descriptive statistics of the primary survey data provide an average discount rate of 10.84%, with a minimum and maximum of 6% and 16.5%, respectively. In Table 2, the descriptive statistics of the quarterly means provide an average discount rate of 11.16%, with a minimum and maximum of 8.39% and 12.58%, respectively, or a range of 4.19% over the 21-year study period.

Figure 6 Comparison of Forecasts of Discount (Yield) Rate, Going-in Capitalization Rate, and Reversion Capitalization Rate (Quarterly Means) with Actual Ten-Year Treasury Rate and Thirty-Year Mortgage Interest Rate

- - - Reversion Capitalization Rate   − − Discount (Yield Rate)   ▬▬ Going-in Capitalization Rate
     · · · · Ten-Year Treasury Rate   − − Mortgage Interest Rate (30 Year)
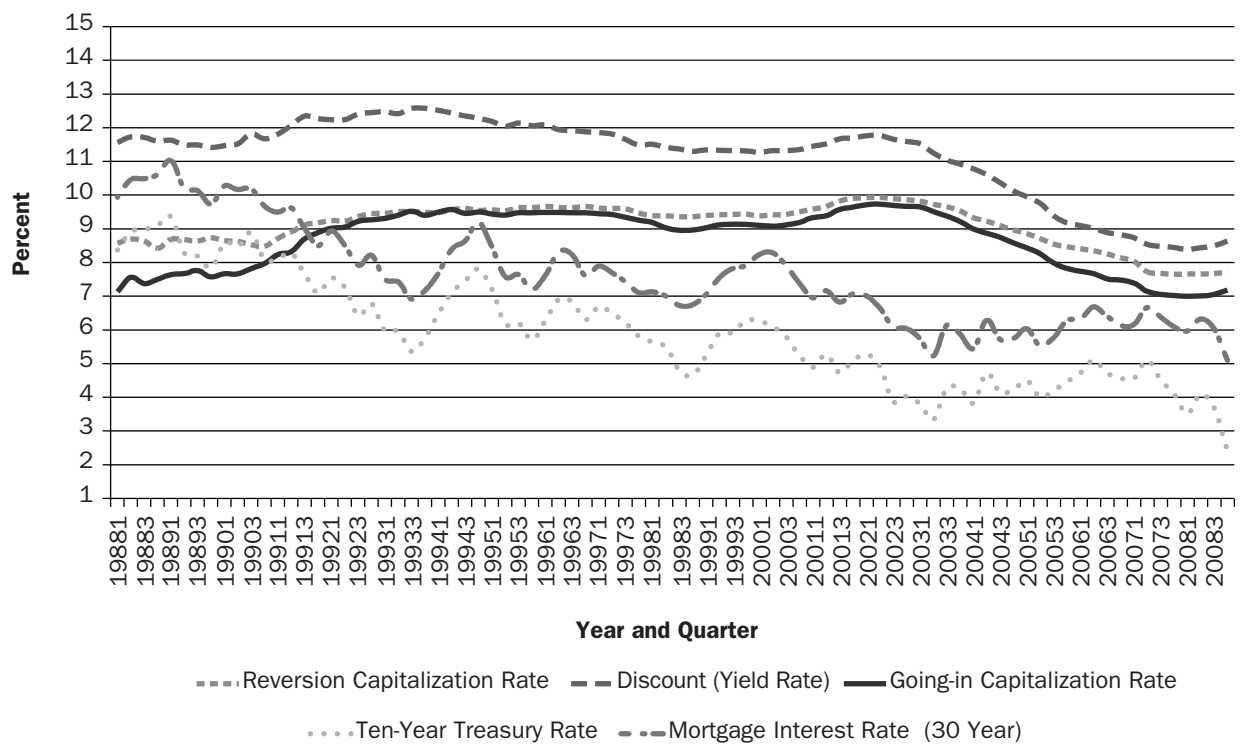
In Figure 5, the discount rate reached a peak during the third quarter of 1993 and a trough during the first quarter of 2008. Other than a brief period in 2001 and 2002, the discount rate was generally declining from the third quarter 1993 through the first quarter 2007. A comparison of the discount rate and the going-in capitalization rate suggests that the two follow a similar pattern with the going-in capitalization rate exhibiting a slightly more humped pattern and the discount rate a slightly more declining pattern. Overall, the spread between the two measures narrowed considerably over the 21-year period.

Figure 6 provides a comparison of the discount and capitalization rates with the ten-year Treasury and thirty-year residential mortgage interest rates. These rates are not forecasts provided by the Korpacz Survey, but actual rates provided in the financial markets. The ten-year Treasury and thirty-year residential mortgage interest rate are observably highly correlated; however, a comparison with the forecast discount and capitalization rates suggests a much lower correlation. The forecast discount and capitalization rates exhibit much less volatility than the ten-year Treasury or thirty-year mortgage interest rates. The average difference between the discount rate and the ten-year Treasury rate, also known as the equity premium, is 5.24% over the 21-year study period, and the standard deviation is 1.34%. The equity premium exhibits a minimum of 2.27% and a maximum of 7.97% over the 21-year period; the median is 5.34%.

Conclusion and Implications for Valuation Analysis

Discounted cash flow analysis and associated survey data are clearly important tools in real estate valuation. The Korpacz Real Estate Investor Survey is one of the most-widely used and consistently produced surveys of institutional investor forecasts. For over two decades, these quarterly surveys have provided important data pertaining to discounted cash flow assumptions. For instance, some of the important variables in the survey include holding period, rent growth rate, capitalization rate, and discount rate. Examination of the survey data over the 21-year study period allows some general

conclusions about how a discounted cash flow model is being implemented in the valuation of institutional-grade properties.

First, it appears that a ten-year forecast projection period has become the standard. Although not shown in the tables, the minimum and maximum projection periods provided in the Korpacz Real Estate Investor Survey have been declining over time. For instance, from the first quarter of 1988 through the second quarter of 2001, the minimum and maximum projection periods range from 5 years to 20 years. From the third quarter of 2001 through the fourth quarter of 2008, the range declines considerably from 1 year to 12 years.

Second, investors are forecasting operating expense growth rates at essentially the CPI. This may be driven by the fact that lease rates and expense reimbursements are frequently tied to the CPI. The overall reliability of this approach is not known, however, since the literature does not report on any detailed examination of actual operating expense growth rates.

Third, data pertaining to tenant retention was not originally collected when the survey began; however, it is clear that this is an important variable in the contemporary environment. This addition may have resulted from the increased capacity of DCF software to address tenant retention affects in the valuation analysis. There does not appear to be a detailed study in the valuation literature that documents actual tenant retention rates. For example, the Building Owners and Managers Association International (BOMA) office report does not report these data. It is likely, however, that some respondents have in-house data on tenant retention rates and respond accordingly.

Fourth, it is obvious that going-out capitalization rates are consistently higher than going-in capitalization rates; however, the differential is not constant. As shown in Figure 5, the spread varies considerably during the 21-year study period. In the very early years (1988 and 1989), the spread approximated 100 to 150 basis points, but in 1993 and 1994 the spread was almost indistinguishable. In later periods (2007 and 2008), the spread increased again to about 75 basis points.

Fifth, the spread between the required discount rate and the risk-free discount rate, as measured by the ten-year Treasury, narrowed over the study period. One reason why the spread has narrowed could be that there are more institutional investors pursuing institutional-grade real estate. At least over the last decade, risk premiums in all financial assets narrowed until the recent financial crisis.

Sixth, it could not be determined whether there is herding behavior among the investors in the reporting process, but in general, the data seem to be internally consistent and valuable in understanding overall market trends. Keep in mind that these data and results are macro in orientation, and specific inputs for a local market may vary.

Barrett A. Slade, PhD, MAI, is an associate professor of finance and a J. Cyril Johnson Fellow in the Marriott School at Brigham Young University in Provo, Utah. **Contact: bslade@byu.edu**

C. F. Sirmans, PhD, is the J. Harold and Barbara M. Chastain Eminent Scholar in Real Estate in the Department of Risk Management/Insurance, Real Estate & Business Law at Florida State University in Tallahassee, Florida. **Contact: cfsirmans@cob.fsu.edu**

Web Connections

Internet resources suggested by the Y. T. and Louise Lee Lum Library

Commercial Real Estate Cap Rate Data (Cap Rates.net)
  http://www.caprates.net/

Discounted Cash Flow (Investopedia)
  http://www.investopedia.com/terms/d/dcf.asp

IRR Viewpoint (Free Download)
  http://www.irr.com/Index.asp?x=010|010&~=

Capital Markets Update (Urban Land Institute)
  http://www.uli.org/ResearchAndPublications/CapitalMarketsUpdate.aspx