

Holding Periods for Institutional Real Estate in the NCREIF Database

by

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The emphasis on 10 years as a forecast or investment horizon for commercial real estate is deeply rooted. With no empirical evidence, some real estate textbooks of the late 1960s and early 1970s suggested that 10 years was about how long investors held properties. Before the advent of large-scale institutional ownership of property by tax-exempt investors, the consequences of Internal Revenue Code real estate provisions figured prominently in popular and academic writing about the "optimal holding period" for real estate. Income tax calculations and the then-existing depreciation schedules favored analysis for 10 to 15 years because that was about the time of the "cross-over" from complete federal income tax shelter to tax liability. Those who remember the common analytical methods of the 1970s might suggest that the ten-year forecast is an accident of computer printer design that limited reports to only 132 characters across a page, just enough for a good-looking 10-year discounted cash flow analysis.

Despite changes in technology and the lessened importance (or disappearance) of tax calculations in much of the real estate business today, real estate analysts, owners, brokers, and appraisers habitually think of commercial property as having a tenure of 10 years. Although it is not necessary to analyze commercial real estate over an investment horizon identical to the expected tenure, there still persists a belief that these two views of a holding period are identical.

This study examines empirically the tenure of institutional-grade commercial property within the database of the National Council of Real Estate Investment Fiduciaries (NCREIF). Because these properties are owned on behalf of tax-exempt domestic pension plans, the impact that tax treatment or depreciation might have on tenure is essentially eliminated. We disaggregate these data by property-type and purchase-year cohorts to isolate differences between disaggregate and aggregate data that imply that tenure may be related to the term of underlying leases, the source of revenue for the properties.

Additionally, because changes in the real estate ownership structures used by public and corporate pension plans have evolved over the last 20 years, we find that tenure has changed as well. While NCREIF's privacy rules preclude tracking of these structural changes with precision, we nonetheless show that the average tenure has been cut by one-third to one-half when contrasting properties purchased after 1990 to properties purchased in the early 1980s. We attribute the bulk of this change to structural changes and less to the desire of portfolio managers to shed underperforming assets or to make alterations in portfolio allocations away from real estate and into stocks or bonds.

Lastly, we comment on the forces affecting commercial property tenure, opine on probable future directions based on current and anticipated institutional ownership structures, and suggest possible changes in the ways that practitioners and researchers might address tenure-related issues. To the extent that investors expect analytical holding periods to match actual experience, the empirical evidence in this study suggests that real estate analytical heuristics may need updating or revision.

Previous Research

Research on property holding periods or tenure has ebbed and flowed over the past 30 years to a large extent commensurate with the changing federal income tax environment. In particular, changes in provisions of the Internal Revenue Code that affect real estate depreciation, recapture, amortization, or tax rates are

followed by waves, albeit small ones, of research on this subject. Since empirical evidence of actual investor behavior is rare, most research uses simulation to suggest how investors might logically react to the changing seascape.

When real estate investment first received relatively favorable federal income tax treatment in the 1967 revisions of the Internal Revenue Code, the mathematics supporting real estate investment decision-making became more complex and interesting to investors and academics alike. In particular, the 1967 revisions allowed accelerated depreciation for some socially or politically favored types of real estate like apartments while retaining the straight-line method for others. Subsequent revisions altered the relative attractiveness of one type of property versus another, and complexities of alternative methods of allowable depreciation, differences in useful life, and recapture of accelerated depreciation or, in the case of historic property, amortization became productive areas of research.

Jaffe [1979], while concluding that for investment planning and analytical purposes computing optimal holding period is largely unimportant and insignificant, provides a useful survey of the opinions and analytical approaches of the 1970s. In the early works, holding periods were assumed to be about 10 years because "real estate changes hands or recasts its financing within ten years of purchase" according to Ellwood. Wiley [1976] lent survey support to this notion, while others used the new-found power of computers to simulate optimal holding period prescriptions. Ricks, Walters, Cooper, Pyhrr, Messner, Findlay, and Friedman all published articles in this vein.

The intricacies of the Internal Revenue Code makes prescriptive simulations possible without the nastiness of dealing with the day-to-day economic environment in which real-world decisions about whether to hold or sell must be made. Brueggeman, Fisher, and Stern [1981] and Fisher and Stern [1982] show how well such complexities as depreciation, recapture, tax rates, regular minimum tax (now called alternative minimum tax), the discount rate, and inflation can be modeled to help investors decide upon which methods of depreciation and holding periods are optimal. In the latter article, the authors provide a series of charts to aid decision-making.

However, in a world free of taxes, the world being examined in this study, Brueggeman, Fisher, and Stern [1981] and Gau and Wang [1994] argue that the present value of a property is independent of the holding period, even if the term structure of interest rates varies over time. Effectively, the marginal rate of return for retaining a property one more year is always equal to the market discount rate.

Even when a property is owned by a tax-exempt investor, it is arguable that the subsequent taxable buyer may derive more or less benefits from ownership. Although selling property to a taxable investor may produce a higher or lower price to the current tax-exempt owner, it is difficult to see how or why the tax consequences of a subsequent owner might affect the tenure decision of a tax-exempt owner.

After the 1970s as a substantial portion of commercial property investment moved from individual and partnership forms where Internal Revenue Code provisions mattered into securitized REIT forms and, more importantly, tax-exempt pension fund investment structures,

research on holding period shifted from prescriptive to descriptive. Rather than suggest what depreciation options or tax-avoidance strategies might be optimal for investors, researchers started to ask institutional investors what they thought the optimal tenure might be. Surveys by Webb [1984] with insurance companies and pension plans and Webb and McIntosh [1996] with REITs found support for the 10-year property tenure for both analytical and investment purposes.

In a more recent survey, Farragher and Kleiman [1996] provide evidence that the expected property tenure gap between institutional and private investors is wide. In response to a question about return forecast horizon, over 70% of insurance company, pension fund, and REIT respondents said they used a 10-year time frame. By contrast, 56% of the private investment company respondents said they used seven or fewer years, 47% used ten years, and 7% used 15 years.

In the literature of real estate tenure, we found only one article based on empirical evidence of actual transactions. Gau and Wang [1994] examine holding period decisions of individual, partnership, and corporate owners of commercial and apartment properties in Vancouver, Canada. In a sample of over 1,000 transactions, the authors determine that investors' consumption and investment preferences and prevailing market interest rates are more important than taxes in determining holding periods.

Data

The data for this study consist of information on 6,587 individual properties owned by or on behalf of tax-exempt institutional investors and compiled by the National Council of Real Estate Investment Fiduciaries (NCREIF). These properties were acquired between 1980 and 1998.

For each property we captured the month and year of acquisition; the property type as either Apartment, Industrial, Office, or Retail and, if sold, the month and year of sale. The database has 2,187 full sales within the 1980 to 1998 period, or about 33% of the data set.

The actual NCREIF property database contains other properties that we choose to exclude. In particular, we excluded hotel properties and land because they are not considered "core" properties for investment purposes and constitute only a small set of properties within the database.

Results

NCREIF property sales transactions are examined for the 1980 to 1998 period and disaggregated by four property types: Apartment, Industrial, Office, and Retail. In total, there are 2,187 full sales in the sample database of 6,587 properties including 341 Apartment sales, 796 Industrial sales, 646 Office sales, and 404 Retail sales.

For each transaction the length of the holding period is calculated by taking the difference between the acquisition date and the sale date. Summary tenure statistics are shown in Exhibit 1 divided into two panels: Panel A shows statistics in months and Panel B shows statistics in years. Mean and median tenure within each property type and within the aggregate set are virtually identical. There are, however, notable differences between the various property types. Retail properties have the longest mean tenure of 103.8 months, followed by Office properties at 92.4 months, Industrial properties at 90.6 months and Apartment properties at 75.1 months.

Exhibit 2 disaggregates transactions data by the year in which the property was purchased. For properties purchased in each year from 1980 to 1986, 50% or more were sold by 1998, and

total of 2,002 properties purchased in this period experienced 866 sales or a sales ratio of 43%. Within the period of our analysis there was no instance where all properties purchased in a particular year were entirely sold by 1998. This complicates the analysis of property tenure, a problem that becomes evident in Exhibit 3.

Exhibits 3 shows the time to sale for properties that were *purchased* during different time periods. It should be noted that the mean and median time to sale is affected by the period covered by our analysis. For example, a property purchased in 1980 has 19 years in which it might be sold within our sample; a property purchased in 1981 has 18 years in which it might be sold; and so forth. Thus, the potential number of years in which a property might be sold decreases as we approach the 1998 ending date of our sample. Similarly, a property sold in 1998 could have been purchased in any of the 19 preceding years; a property sold in 1997 could have been purchased in any of the 18 preceding years; and so forth.

Thus, truncation of the sample holding period for properties sold or purchased in any year and the fact that fewer than 100% of properties purchased in any year of our analysis sold within the 1980 to 1998 period compels us to find another statistic for property tenure. Our choice is to measure the cumulative number of sales across time for properties purchased in each year. This approach gives us the added benefit allowing segmentation of the sample data into three five-year cohorts: properties purchased between 1980 and 1984 inclusively, properties purchased between 1985 and 1989, and properties purchased between 1990 and 1994. Once half the properties have been sold, we have an approximation of the median holding period for that cohort of properties.¹

Because there might be confusion between the median holding period shown in Exhibits 1 and 3, and the time until 50% of properties are sold shown in Exhibit 4 and the five panels of Exhibit 5, we should make this distinction clear. Exhibits 1 and 3 report statistics solely on the 2,187 properties within our sample that *sold* within the 1980 to 1998 period. The median and the means are the simple parametric statistics for this sample of sold properties. The remarks that follow regarding the time until 50% of the properties are sold relate to the entire sample of 6,587 properties including both those sold and those unsold.

Exhibit 4 shows the number of years until the cumulative number of sales of properties purchased in each of the three temporal cohorts reached 50%. The results are further disaggregated by property type. The years to reach 50% for the entire sample and for property-type disaggregations are also shown. For the sample irrespective of property type, it took 11.1 years for 50% of the 6,587 properties to be sold. For the entire sample, there are notable differences among property types. Retail properties showed the longest time to reach the 50% sales level, or 13.7 years. Apartment properties showed the shortest time of just 8.6 years and Industrial and Office properties showed nearly identical times of 11.1 and 10.9 years respectively.

Times to reach 50% of properties sold also vary among the three purchase-year cohorts. In general, the time to reach 50% of properties sold decreases over time. All properties purchased in the 1980-84 cohort reached the 50% sales threshold in 13.4 years, while all properties purchased in the 1985-89 cohort reached the 50% sales threshold in 11.5 years. All properties purchased in

¹ This is an approximation of the median holding period for properties that were purchased at different points in time. E.g., for properties purchased during the 1990-94 time period, once half are sold, as long as this point is after 1994, we know that properties sold at later points in time must have longer holding periods so the time when half are sold is the median holding period. The time until 50% are sold will differ from the true median if this time interval is before all properties in a cohort have been purchased, or if for some reason a property is never sold.

the 1990-94 cohort did not achieve the 50% threshold due to the 1998 cutoff date for our data set, but came close with 48.9% within the potential time frame.

The decreasing time to reach the 50% threshold also held true for most of the property-type disaggregates within temporal cohorts. The lone exception was Industrial property whose 1980-84 cohort took 10.9 years to reach the 50% threshold, but took 12.3 years for the 1985-89 cohort. The Retail property type disaggregation showed the most dramatic decrease in time to the 50% threshold, but this result is skewed by the exceptionally long time to threshold of the 1980-84 cohort of 17.0 years. For each of the two more recent cohorts, Retail is not especially dissimilar to the other types.

Exhibits 5a through 5e graphically depict the cumulative percent of properties sold with various years of purchase for the entire data set (Exhibit 5a) and for property-type disaggregations (Exhibits 5b to 5e). Each graph also shows the three temporal cohorts as well. The horizontal line at the 50% threshold and the arrows dropping from the intersection of the line with the cumulative percent sold line add additional information about the pattern of sales over time and the differences among the cohorts. Here it is quite clear that property tenure has changed over time and that property type differences exist.

Holding periods for Sold Property Sample.

The preceding analysis examined holding periods from the perspective of looking at how long a property was held based on the time from which it was *purchased*. This has the advantage of evaluating the holding period for a sample of properties that includes those that have not yet been sold (as long as 50% have been sold). As a check on the conclusions from this analysis, we also examined the holding period for the subset of properties that have already been sold. To do this, we calculated the average holding period for all properties that were sold during 1999 and the first quarter of 2000. For these *sold* properties, we determined how long it had been since they were purchased. The results are shown in Exhibit 6. Note that the average holding period for each property type based on the sold property sample is very consistent with the totals (all purchase dates) shown in Exhibit 4. The holding period for industrial properties is exactly the same and the others are one to two years shorter. The slightly shorter holding period is consistent with a trend toward shorter holding periods since we are considering properties that were sold during the most recent time period. The shorter holding period might also be due to the bias introduced by only including sold properties in this analysis. In either case, it confirms the differences across property types.

Returns for Different Holding Periods.

Exhibit 7 shows a scatterplot of the internal rates of return generated by each of the 2,187 properties in our sample that sold against their holding period. The most notable feature is the trumpet-shaped pattern suggesting some asymptotic return between perhaps 10% and 12%, right in line with pro-forma expectations commonly expressed by investment managers and their pension plan clients. The mean and median internal rates of return are 7.7% and 8.0%. By inspection we observe that the cross-sectional distribution does not change much after a five-year holding period and that there is considerable skewing toward low or negative returns for properties with short holding periods.

This trumpet-shaped graph also demonstrates how the volatility of returns due to unsystematic property specific factors tends to be reduced by the averaging of returns over a longer holding period. Non-systematic factors are most apparent in the early years when the distribution of returns is the widest and diminish over time as the returns tend to reflect longer-

term systematic factors affecting real estate markets. Returns over short holding periods may also be influenced by sales of properties purchased as part of a package. Typically, buyers of packages accept some properties they would rather not hold long-term. These properties are often culled from the investor's portfolio early and may account for the negative skewing observed among properties held for just a few years. Unfortunately, NCREIF masking criteria make proof of this conjecture impossible.

Conclusions

This study provides empirical evidence of the property tenure (holding period) for a group of U.S.-based tax-exempt institutional owners and their managers derived from the NCREIF property database. Because our data set is limited to the 1980 to 1998 time period and because not every property in the database has been sold, we could not simply compute the average or median time to sale. Properties purchased recently simply have not had time to complete the acquisition/disposition cycle. Thus, to create a way of analyzing tenure, we measured the cumulative time to sell properties from their purchase date. We graph the results for the entire data set, for property-type disaggregations, for three purchase-year cohorts, and for combinations of property-type and purchase year cohorts.

In the aggregate, the time to sell 50% of properties in our data set was 11.1 years. Differences among property types might be influenced to some extent by the relative length of leases underlying these property types; e.g., retail has the longest holding period and tends to have the longest lease terms whereas apartments have the shortest holding period and tend to have very short-term leases.

While we have good evidence of sales history, we know very little about the impetus for a sale. By examining a database of properties owned by tax-exempt institutional owners, we have removed what has been regarded as a key determinant of a property's holding period or tenure, namely the tax consequences of property ownership. Although tax-exempt owners need not worry about the income taxes attendant with their ownership of property, perhaps some consideration should enter the buy/sell analysis insofar as the subsequent owner might be subject to taxation.

What motivates tax-exempt institutional investors to sell real estate is an open question or, perhaps more accurately, an open series of questions worthy of further study. Should NCREIF members be willing to divulge their individual ownership of properties within the NCREIF database, then it might be possible to get answers to these questions. For example, are property sales triggered by portfolio considerations within the real estate asset allocation or by factors in the larger mixed-asset portfolio of the institution? From other recent research we know that substantially all of the risk of commercial real estate is non-systematic, asset-specific risk. Therefore, sales might be more dependent upon property-specific factors than broader local or regional market influences. Since income-producing real estate tends to be purchased at prices that reflect current capitalization rates in the 8% to 10% range while investors ultimately expect to receive total returns about 3% higher, investors may be more inclined to sell when those investment objectives have been met. Conversely, properties that have poor prospects of achieving their original return expectations may be sold and the capital redeployed to other, more attractive assets.

Properties financed with third-party debt may be more or less easy to sell depending upon specific mortgage conditions and the interest rate environment at the time of sale. We did not segment the NCREIF data into leveraged and unleveraged sets, but even if we had, there are

questions about the underlying mortgage terms that could not have been answered owing to privacy policies of NCREIF. Nonetheless, future research should split the set to see whether there is reason to investigate tenure differences that might arise from debt characteristics.

The vehicles in which pension plan real estate investments have been held has changed significantly since institutional real estate ownership began in the mid-1970s. In the early days, almost all pension fund real estate assets were in commingled fund form divided into two types: open-end funds of the type promoted most often by insurance companies and commercial banks, and closed-end funds of the type promoted by real-estate-only firms and offshoots of syndicators. For purposes of this tenure discussion, open-end and closed-end funds differed in terms of their defined holding periods. Open-end funds are typically perpetual life vehicles, while closed-end funds have a finite investment life, 10 years in the case of RREEF, which pioneered the closed-end form for real estate, and 15 years in competing products that followed.

Open-end funds were free to sell whenever they wished while closed-end funds seldom sold properties before the scheduled fund termination dates and, in many cases, not until several years after scheduled termination. Thus, the earliest closed-end fund sales began as a trickle in the mid-1980s and did not reach appreciable levels until much later.

As institutional investors demanded other vehicle structures in part as a reaction to the lack of investor control available in commingled vehicles and in part as a reaction to the decline in property performance in the late 1980s, investment managers formed other vehicles to client specifications. Most importantly, the larger pension plans preferred the separate account structure beginning in the late 1980s. In a separate account, all the properties are owned by a single pension plan that typically exerts a strong influence on the decisions to buy and sell. The separate account structure had the effect of causing investment managers to become more active managers, buyers, and sellers, a pattern that was clearly less apparent in the commingled fund heyday.

Thus, the overall shortening of property tenure across temporal cohorts shown in Exhibit 4 and depicted graphically in the panels of Exhibit 5 is, we believe, due in large measure to the structures in which properties have been owned over time and to the increasing emphasis on active portfolio and property management that accompanied this structural shift.

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Exhibit 1

Summary Statistics on Tenure, NCREIF Property Data, 1980 to 1998

Panel A: Tenure in months

	Total	Apartment	Industrial	Office	Retail
Sales	2,187	341	796	646	404
Mean tenure	91.2	75.1	90.6	92.4	103.8
Std dev	46.2	38.7	44.9	47.3	48.6
Minimum	2	3	2	6	13
Maximum	220	194	217	206	220
80th Pctle	132	107	129	134	152
Median	91	76	91	95	101
20th Pctle	45	36	46	43	56

Panel B: Tenure in years

	Total	Apartment	Industrial	Office	Retail
Sales	2,187	341	796	646	404
Mean tenure	7.6	6.3	7.5	7.7	8.6
Std dev	3.8	3.2	3.7	3.9	4.1
Minimum	0.2	0.3	0.2	0.5	1.1
Maximum	18.3	16.2	18.1	17.2	18.3
80th Pctle	11.0	8.9	10.8	11.2	12.7
Median	7.6	6.3	7.6	7.9	8.4
20th Pctle	3.8	3.0	3.8	3.6	4.6

Exhibit 2

Percent of NCREIF Properties Sold Based on Year Purchased

Year Purchased	Count	Number Unsold	Number Sold	Percent Sold
1980	221	64	157	71
1981	364	123	241	66
1982	276	133	143	52
1983	208	101	107	51
1984	281	127	154	55
1985	292	137	155	53
1986	360	181	179	50
1987	348	206	142	41
1988	454	283	171	38
1989	483	308	175	36
1990	396	261	135	34
1991	246	170	76	31
1992	174	108	66	38
1993	189	146	43	23
1994	360	285	75	21
1995	486	408	78	16
1996	525	456	69	13
1997	451	432	19	4
1998	473	471	2	0
	6,587	4,400	2,187	

Exhibit 3

Time to Sale Based on Year Purchased

Year Purchased	Number Sold	Maximum Number of Years of Data	Time to Sale in Years			
			Min.	Max.	Median	Mean
1980	157	19	2.83	18.33	8.42	9.18
1981	241	18	0.58	17.33	8.33	8.83
1982	143	17	1.00	16.58	10.33	9.91
1983	107	16	1.42	15.75	11.25	10.54
1984	154	15	1.42	14.92	11.08	10.20
1985	155	14	1.17	13.75	10.25	9.49
1986	179	13	1.67	12.50	10.00	8.58
1987	142	12	1.00	11.67	9.17	8.15
1988	171	11	0.50	10.92	8.33	7.66
1989	175	10	1.50	9.75	7.67	6.98
1990	135	9	0.50	8.92	6.92	5.99
1991	76	8	0.42	7.75	5.08	4.89
1992	66	7	1.33	6.83	4.92	4.48
1993	43	6	1.00	5.92	4.04	3.85
1994	75	5	0.83	4.92	3.25	3.27
1995	78	4	0.25	3.83	2.58	2.51
1996	69	3	0.25	2.75	1.83	1.75
1997	19	2	0.42	1.92	1.33	1.19
1998	2	1	0.17	0.42	0.29	0.29

Exhibit 4

Years for Cumulative Number of Sales to Reach 50% of Total Number of Properties Purchased within Cohort

Cohort	All				
	Properties	Apartment	Industrial	Office	Retail
1990-94	*	*	*	8.9	8.7
1985-89	11.5	8.8	12.3	11.5	11.5
1980-84	13.4	11.4	10.9	12.4	17.0
<hr/>					
Totals					
1980-98	11.1	8.6	11.1	10.9	13.7

* Cumulative number of sales did not reach 50% of properties purchased in cohort. By 1998 the cumulative number of sales as a percent of those purchased in the 1990-94 cohort were 48.9% for All Properties, 46.3% for Apartment properties, and 45.3% for Industrial properties.

Exhibit 5a

All Properties
Average Cumulative Percent of Properties Sold within Years of Purchase
1980 to 1998 and Three Five-Year Cohorts

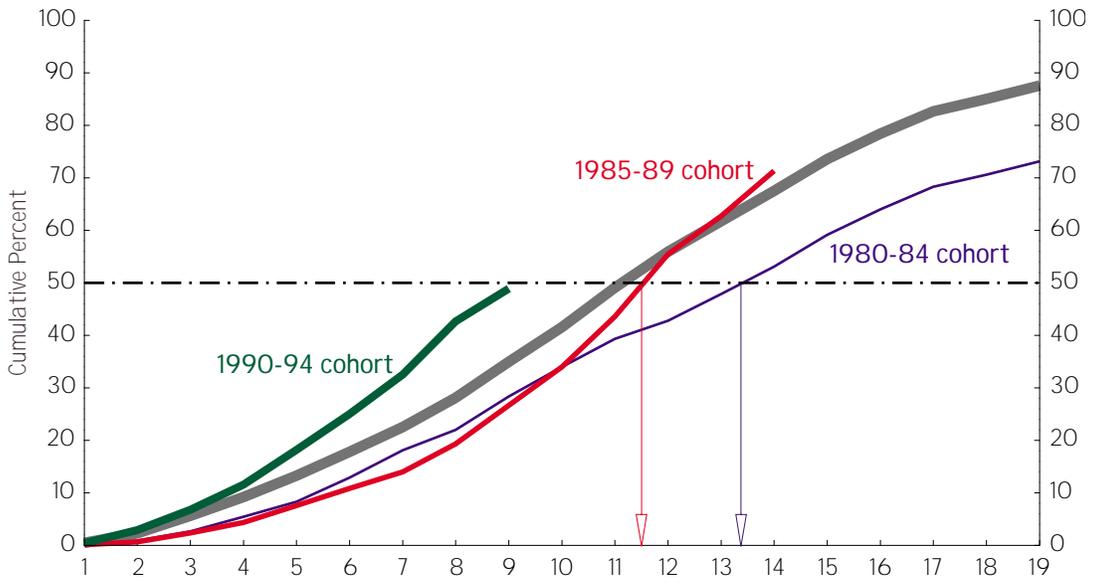


Exhibit 5b

Apartment Properties
Average Cumulative Percent of Properties Sold within Years of Purchase
1980 to 1998 and Three Five-Year Cohorts

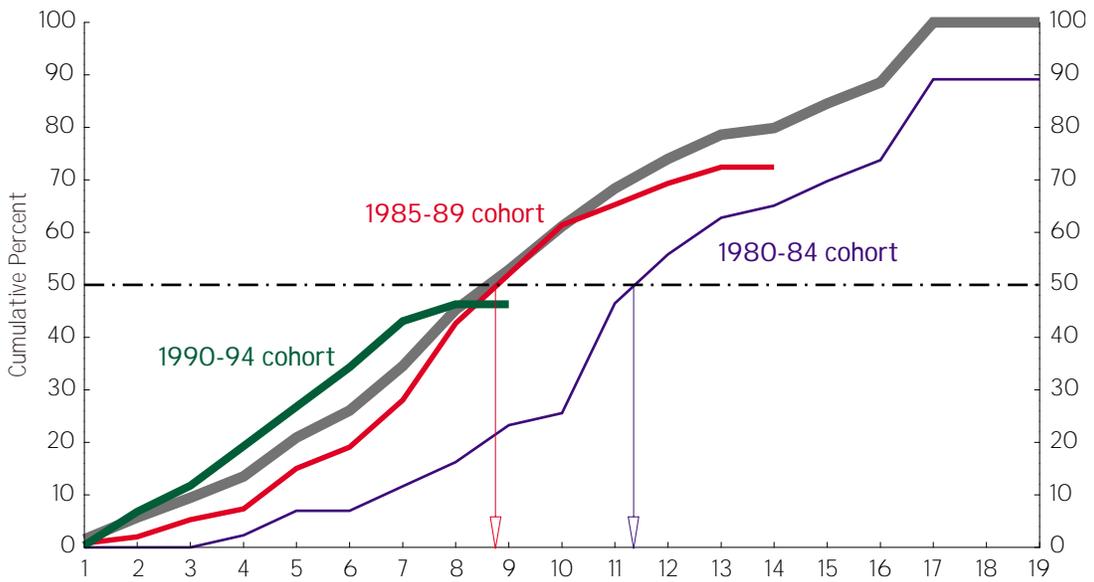


Exhibit 5c

Industrial Properties
Average Cumulative Percent of Properties Sold within Years of Purchase
1980 to 1998 and Three Five-Year Cohorts

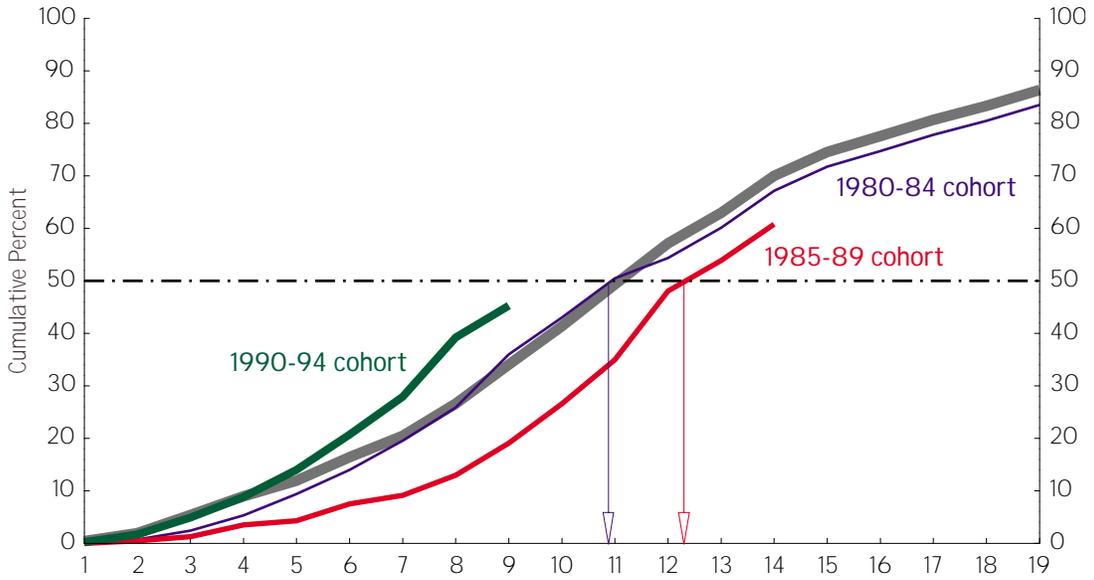


Exhibit 5d

Office Properties
Average Cumulative Percent of Properties Sold within Years of Purchase
1980 to 1998 and Three Five-Year Cohorts

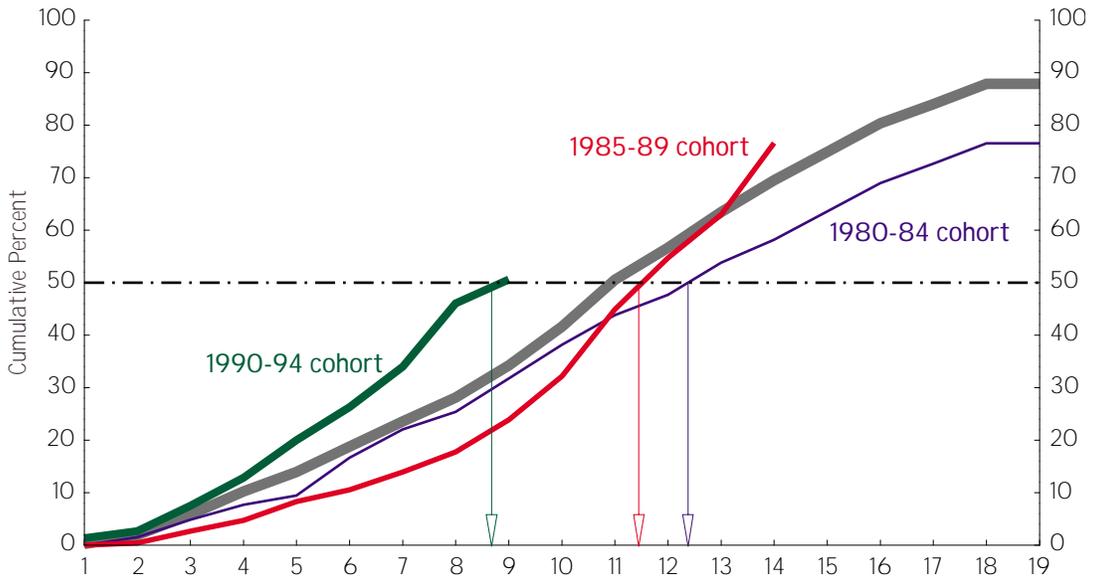


Exhibit 5e

Retail Properties
Average Cumulative Percent of Properties Sold within Years of Purchase
1980 to 1998 and Three Five-Year Cohorts

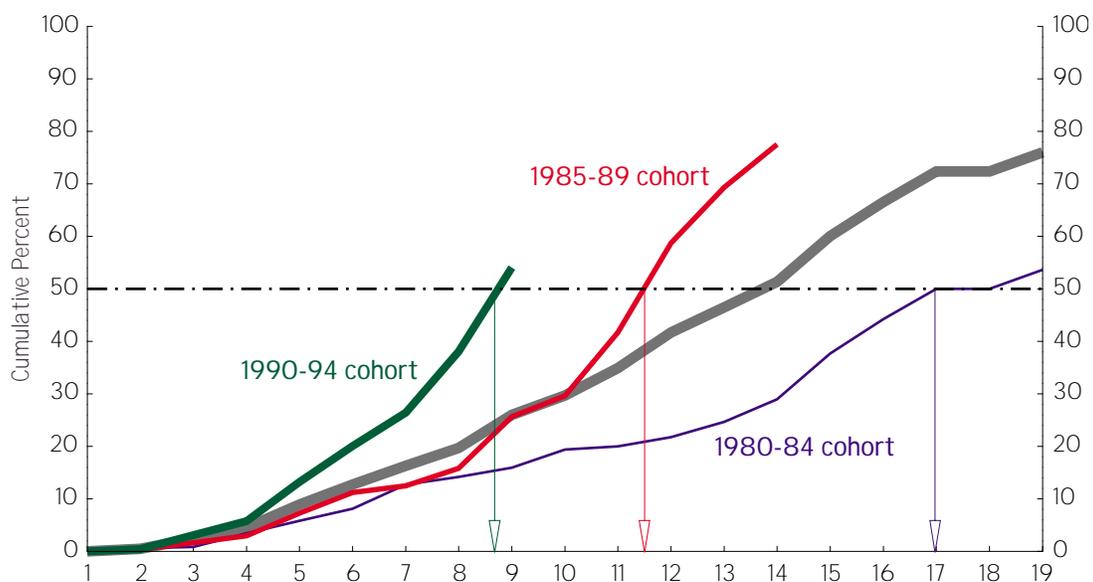


Exhibit 6

Holding Period for Properties Sold in 1999 and 2000

Property Type	Average Holding Period	Properties Sold
Apartment	6.2	65
Industrial	11.1	102
Office	8.7	111
Retail	12.1	94
All properties	9.8	372

Exhibit 7

Internal Rate of Return versus Holding Period for Sold Properties

