

DCF VALUATION OF COMMERCIAL REAL ESTATE 5 COMMON MISTAKES

Prashant Das, Ph.D.

Associate Professor of Real Estate Finance

Act. Director: Real Estate, Finance & Econ. Institute

EHL Lausanne, Switzerland

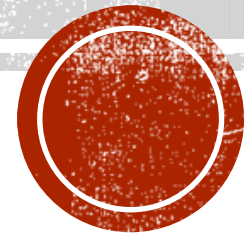
Prashant.pkd@gmail.com | www.prashantdas.com

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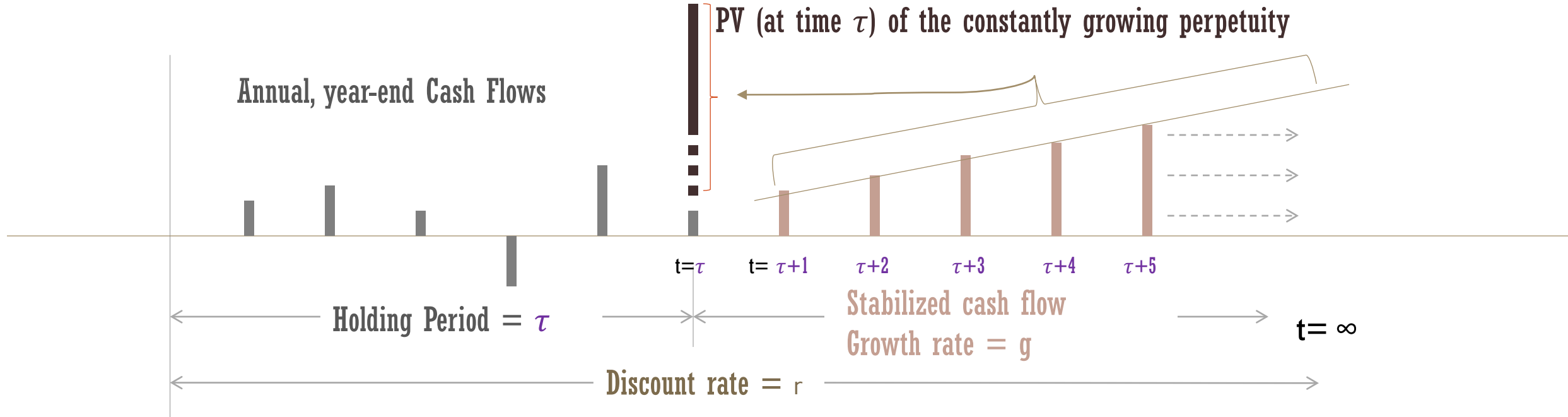


OUTLINE

- Valuation Process
- Common mistakes and recommended solutions



A RECAP OF DCF VALUATION



$$PV_{\tau} = NOI \frac{1}{(1+r)^1} + NOI \frac{(1+g)^1}{(1+r)^2} + NOI \frac{(1+g)^2}{(1+r)^3} + \dots + NOI \frac{(1+g)^{t-1}}{(1+r)^t} + \dots \Rightarrow PV_{\tau} = \lim_{t \rightarrow \infty} NOI \cdot \left[\frac{1 - \left[\frac{1+g}{1+r} \right]^t}{r-g} \right] = \frac{NOI_{\tau+1}}{r-g};$$

Theoretically, $r - g$ is the **Capitalization Rate**

$$\text{and, Value } V_0 = \sum_{i=1}^{\tau} \frac{NOI_i}{(1+r)^i} + \frac{NOI_{\tau+1}}{(r-g)(1+r)^{\tau}}$$



MISTAKE 1

CALCULATING WACC TO ESTIMATE THE VALUATION DISCOUNT RATE

- For estimating the market value, the discount/ capitalization rate should be derived from the market. It is about the asset being valued rather than who is valuing it, or for whom
- The WACC may vary drastically within a market. In principle, the market discount rate is the *before-tax WACC of a typical investor*.
- The market rates are often derived heuristically. But, these rates are what matter.
- **Recommendation: Conduct a market survey for expected unleveraged IRR**
 - In thinly traded markets, a survey of WACC may still be the only practical option. An analyst could use the median WACC (rather than the mean) to avoid outliers



MISTAKE 2

ESTIMATING CAP RATE USING RISK PREMIA

Capitalization rate, indeed, equals risk free rate plus various risk premia. E.g.

| | |
|----------------------------|-------------|
| Risk-free rate | 2.0% |
| Risk Premia | |
| Asset quality | +0.5% |
| Asset Age | +1.5% |
| Asset Illiquidity | +0.5% |
| Tenant Quality | +1.5% |
| <u>Occupancy Rate</u> | +0.5% |
| Capitalization Rate | 6.5% |

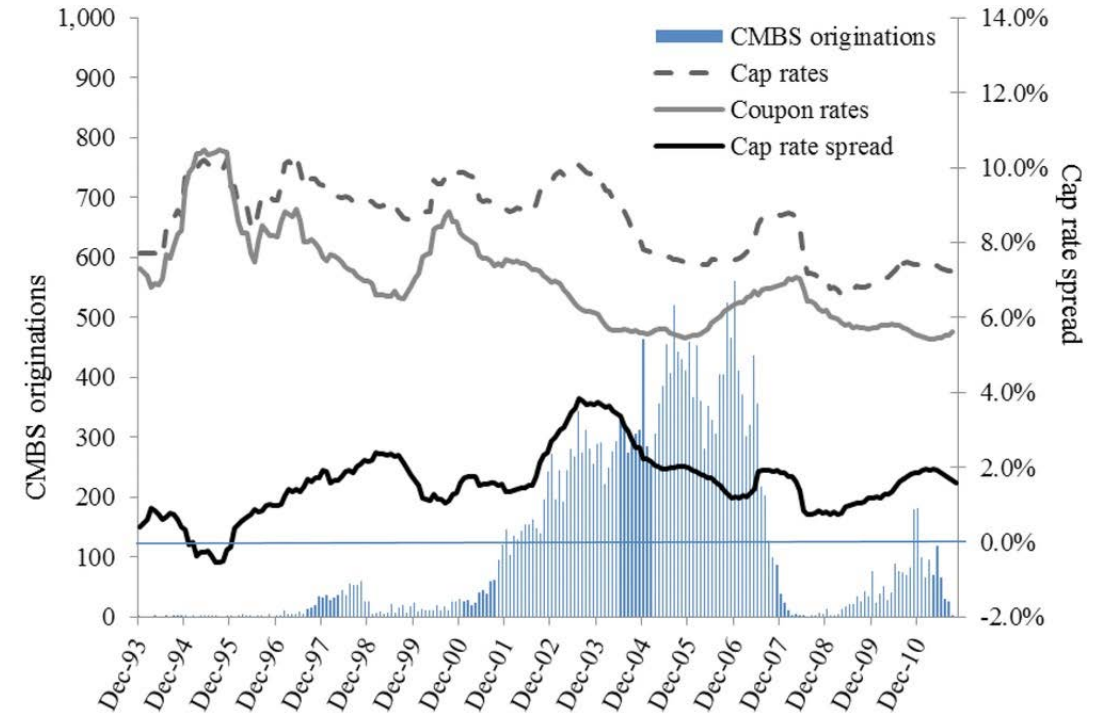


<https://www.thespruceeats.com/>



But, there are practical challenges:

1. Risk Premia are subjective
2. Risk Premia change over time



Seagraves & Wiley (2016). The Cap Rate Spread: A New Metric for Commercial Underwriting (2016). Real Estate Economics 44-2

Recommendation: Avoid this method, unless you are truly an expert



MISTAKE 3

USING MORTGAGE CONSTANT AS THE COST OF DEBT

- Mortgage Constant
 - Assumes loan principal repayment also as a cost of capital
 - May differ across interest-only, fully amortizing, and partially amortizing loans
 - Tends to over-state the cost of debt
 - Tends to systematically undervalue as asset
- The effective borrowing cost depends on various fees, penalties and prepayment decision
- Yet, loan interest rate provides a good proxy for the cost of debt
- **Recommendation: Use interest rate as the cost of debt**



MISTAKE 4

LACK OF STANDARDIZATION IN THE CASH FLOW MEASURE

Other Commercial assets

PGI Potential Gross Income
- VC Vacancy Loss
+ MI Miscellaneous Income
= EGI Effective Gross Income
- OE Operating Expenses
= NOI Net Operating Income
- CAPX Capital Expenditures
= Net Cash Flow

Some analysts include, but others exclude capital reserves / expenditure from the cash flow measure used for valuation

or

?

or

Hotels

Revenue
-Department Expenses (DE)
=Gross Operating Income (GOI)
-Undistributed Operating Expenses (UOE)
=Gross Operating Profit (GOP)
-Fixed Expenses (FE)
= Earnings Before Int., Dep. & Amort. (EBITDA)
-Capital Reserves
= Net Operating Income (NOI)



On the other hand, “80% of the investors (Institutional in particular) calculate the NOI before capital reserves”
- a PwC Survey

Suppose,

Cap Rate based on NOI before CapRes = y_b

Cap Rate based on NOI after CapRes = y_a

NOI_b before CapRes = EBITDA

NOI_a after CapRes = EBITDA(1 - x%)

$$V = \frac{NOI_b}{y_b} = \frac{NOI_a}{y_a} \mid y_a = (1-x\%)y_b$$

From market surveys

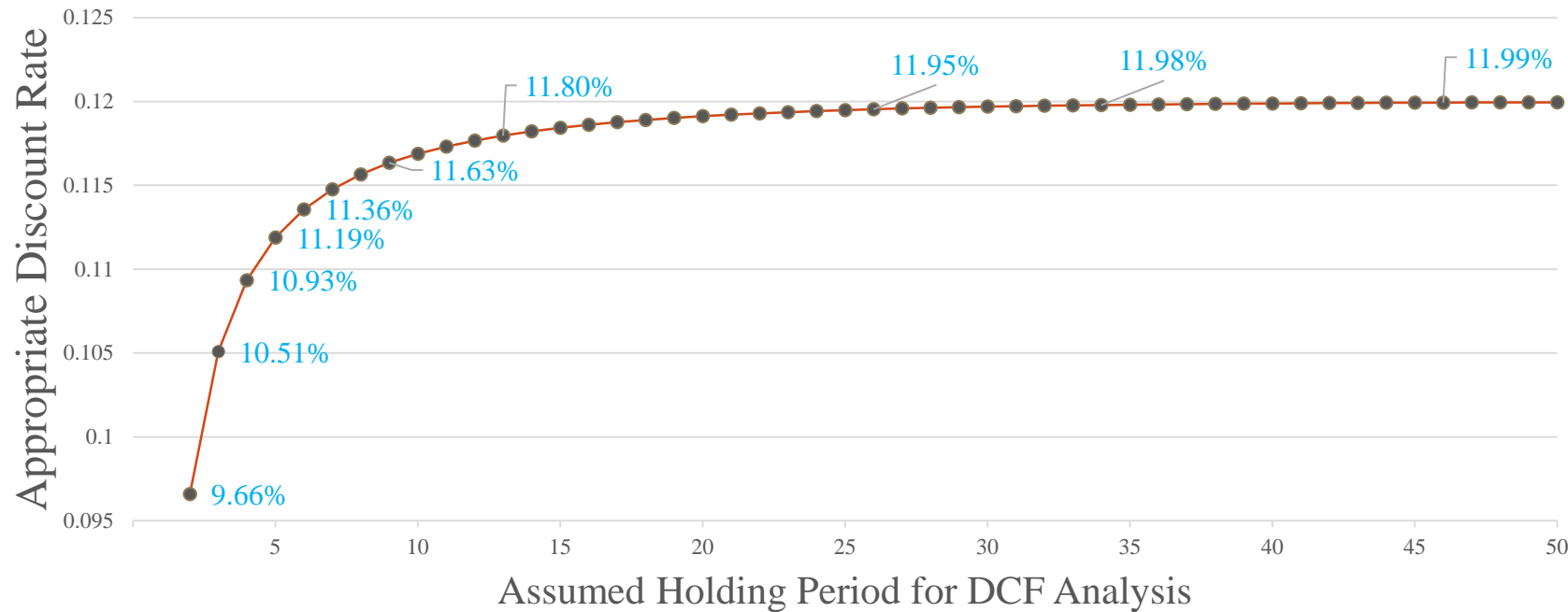
For pro-forma analysis

- Capital reserve / expenditure may vary across assets, but are mostly inevitable
- Such expense budgets, therefore, must be accounted for in the cash flow measure, to keep it realistic
- As such, market reports may over-estimate the cap rates
- **Recommendation: Adjust the cap rate accordingly per asset**



MISTAKE 5

PICKING AN ARBITRARY HOLDING PERIOD

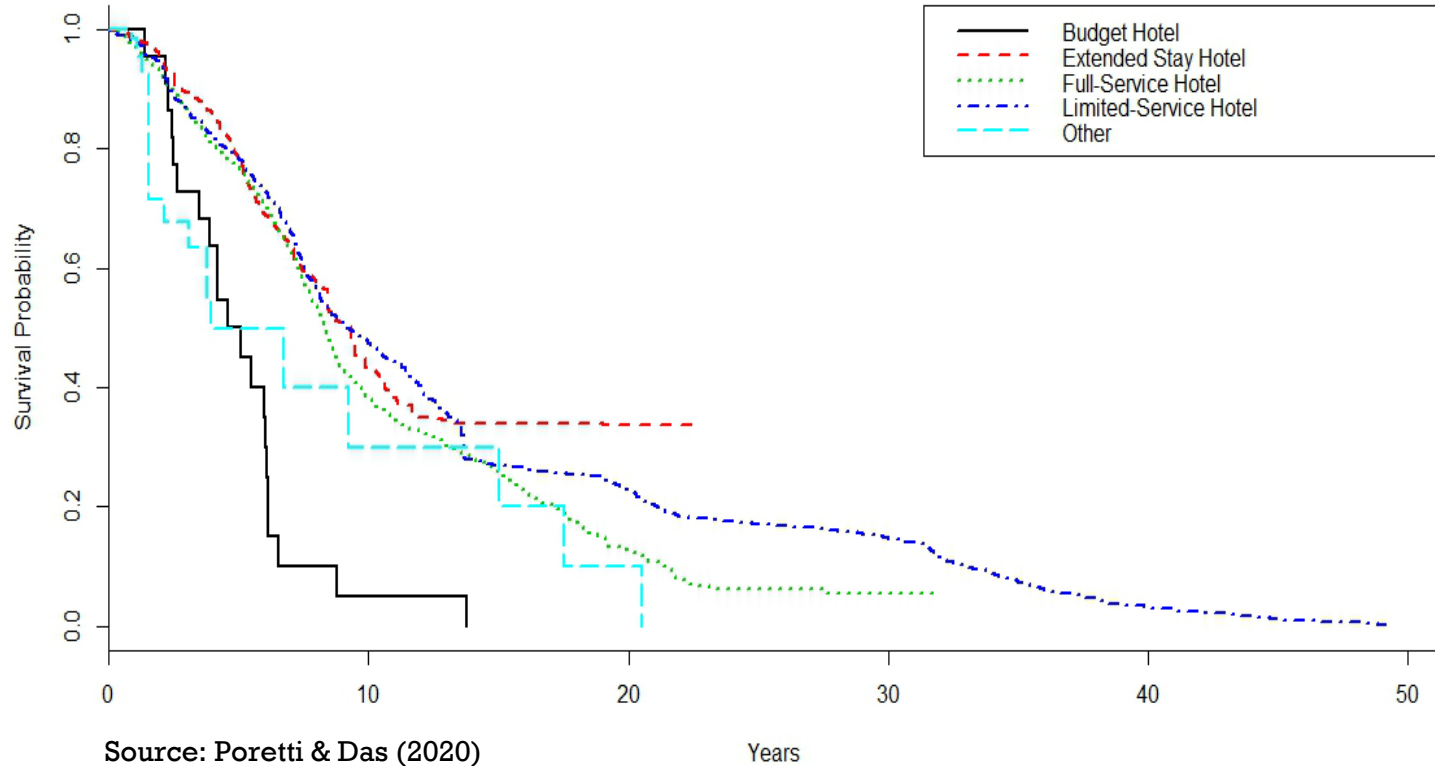


Notes. This hypothetical example shows variations in equivalent discount rates in a DCF valuation exercise which **keep the valuation at Year-0 unaltered** for a given property across differently assumed holding periods. The stabilized asset acquired at \$100 mi generates \$10 mi cash flows in its first year of operation which grows 2% annually rendering the going-in capitalization rate as 10%. The going-out capitalization rate is fixed at 10.5% across all assumed holding periods.



- Typical Holding Period depends on
 - Asset characteristics
 - Market Cycle
 - Market
 - Owner, etc.

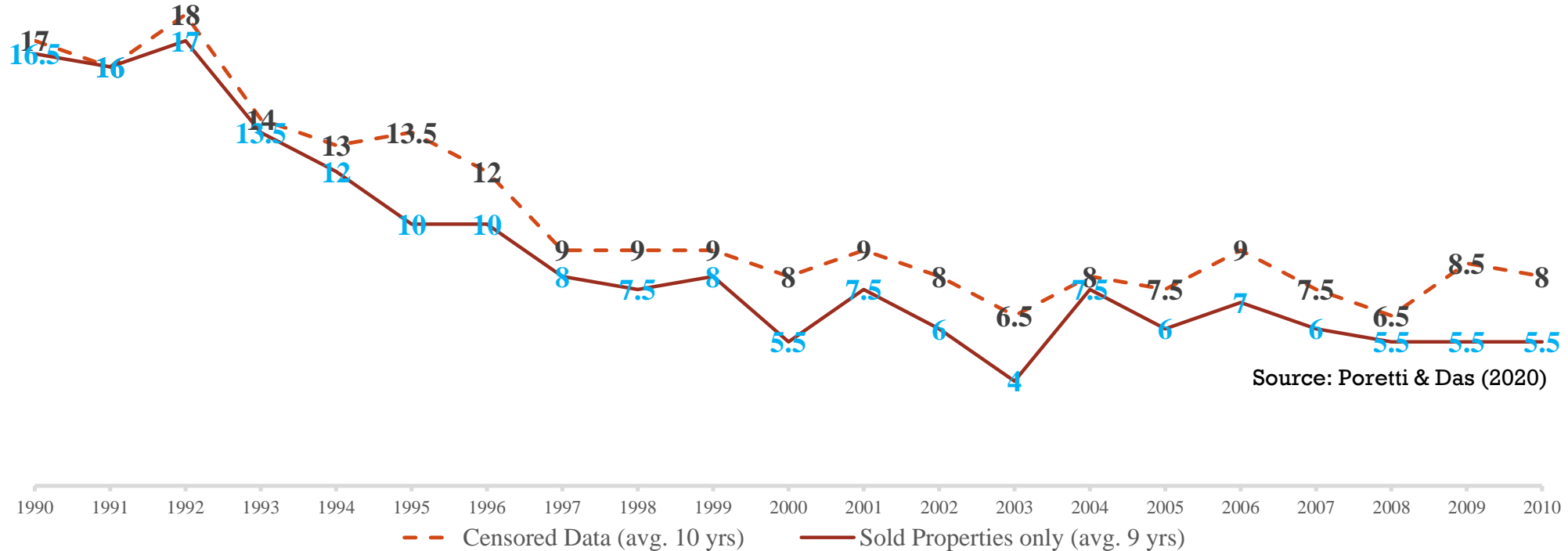
Survival Curve for Hotels Considering Asset Disposition as a 'Hazard'



Source: Poretti & Das (2020)



Variation in Hotel Holding Period over time



Notes: Y-axis signifies observed holding period. X-axis denotes the year of acquisition. The dotted line (Censored data) includes hotels which were not sold until their most recent observation in the sample. The solid line summarizes the holding period of This method is based on Atkins & Dyl (1997) and Collett, Lizieri, & Ward (2003). The analysis is based on 3,239 hotels owned by 290 REITs and REOCs covered by S&P SNL database. REIT and Listed sub-samples are Non-exclusive and Non-exhaustive with respect to the Overall sample.



- Market surveys report going-in (acquisition) and going-out (disposition) capitalization rates in the same breath
- However, the going-out capitalization rate depends on the holding period
- Fixing the going-out cap rate at the outset necessitates discount rate adjustment
 - Else, the valuation will be sensitive to the selection of holding period (years)
- **Recommendation: For the assumed ('valuation') holding period, adjust the discount rate. The adjustment depends on an asset's estimated holding period.**



THANK YOU

