

Chapter 18:
Commercial Mortgage Analysis
& Underwriting

Section 18.1:

Expected Returns vs Stated Yields

Measuring the Impact of Default Risk

“Expected Returns” versus *“Stated Yields”* . . .

In a bond or mortgage (capital asset with contractual cash flows):

Stated Yield (aka “Contractual Yield”) = YTM based on *contractual obligation*.

Expected Return (aka “Expected Yield” or “Ex Ante Yield”) = $E[r]$ = Mean of probability distribution of future total return on the bond or mortgage investment.

- Quoted yields are always *stated yields*.
- Contract yields are used in mortgage design and evaluation.

- Expected return is more *fundamental* measure for mortgage investors,
- For making investment decisions.

Difference:

Stated Yield – Expected Return

↔ Impact of **Default Risk** in *ex ante* return investor cares about.

18.1.1 Yield Degradation & Conditional Cash Flows...

“Credit Losses” = Shortfalls to the lender (mortgage investor) as a result of *default* and *foreclosure*.

“Realized Yield” = What the lender (investor) actually receives (as an IRR).

“Yield Degradation” = Impact of *credit losses* on the lender’s realized yield as compared to the contractual yield (expressed in IRR units).

Contractual Yield
- Yield Degradation ← Due to *Credit Losses*

= Realized Yield

***Yield Degradation* (“YDEGR”)** = Lender’s losses measured as a multi-period lifetime return on the original investment (IRR impact).

Numerical example of *Yield Degradation*:

- **\$100 loan.**
- **3 years, annual payments in arrears.**
- **10% interest rate.**
- **Interest-only loan.**

Here are the ***contractual*** terms of the loan as an NPV equation:

$$0 = -\$100 + \frac{\$10}{1 + (0.10)} + \frac{\$10}{(1 + (0.10))^2} + \frac{\$110}{(1 + (0.10))^3}$$

Contractual YTM = 10.00%.

Suppose:

- **Loan defaults in 3rd year.**
- **Bank takes property & sells in foreclosure, but**
- **Bank only gets 70% of OLB: \$77.** ←

- **\$33 = “Credit Losses”.**
- **70% = “Recovery Rate”.**
- **30% = “Loss Severity”.**

Here are the ***realized*** cash flows of the loan as an NPV equation:

$$0 = -\$100 + \frac{\$10}{1 + (-0.0112)} + \frac{\$10}{(1 + (-0.0112))^2} + \frac{\$77}{(1 + (-0.0112))^3}$$

Realized IRR = -1.12%

Yield Degradation = 11.12%:

Contract.YTM – Yld Degrad = Realized Yld:

10.00%. – 11.12% = -1.12%.

From an *ex ante* perspective, this 11.12% yield degradation is a **“conditional” yield degradation**.

It is the yield degradation that will occur ***if*** the loan defaults in the third year, and ***if*** the lender gets 70% of the OLB at that time.

(Also, 70% is a **conditional** recovery rate.)

Suppose the default occurred in the 2nd year instead of the 3rd:

$$0 = -\$100 + \frac{\$10}{1 + (-0.0711)} + \frac{\$77}{(1 + (-0.0711))^2}$$

Yield Degradation = -17.11%.

Other things being equal (in particular, the conditional recovery rate), ***the conditional yield degradation is greater, the earlier the default occurs in the loan life.***

From a loan lifetime performance perspective, lenders are hit worse when default occurs early in the life of a mortgage.

Note: “YDEGR” as defined in the previous example was:

- **The reduction in the IRR (yield to maturity) below the contract rate,**
- ***Conditional* on default occurring (in the 3rd year), and**
- **Based on a specified conditional *recovery rate* (or *loss severity*) in the event that default occurs.**

$$YDEGR_t = YTM - YLD|DEF_t = YTM - IRR(loss\ severity_t)|DEF_t$$

For example, if the loss severity were 20% instead of 30%, then the conditional yield degradation would be 7.13% instead of 11.12%:

$$0 = -\$100 + \frac{\$10}{1 + (0.0287)} + \frac{\$10}{(1 + (0.0287))^2} + \frac{\$88}{(1 + (0.0287))^3}$$

$$YDEGR_3 = 10\% - 2.87\% = 7.13\%.$$

Relation between *Contract Yield*, *Conditional Yield Degradation*, & the *Expected Return* on the mortgage...

Expected return is an *ex ante* measure.

To compute it we must specify:

- *Ex ante probability of default*, &
- *Conditional recovery rate* (or the *conditional loss severity*) that will occur in the event of default.

Suppose that at the time the mortgage is issued, there is:

- 10% chance of default in 3rd year.
- 70% conditional recovery rate for such default.
- No chance of any other default event.

Then at the time of mortgage issuance, the *expected return* is:

$$\begin{aligned} E[r] &= 8.89\% = (0.9)10.00\% + (0.1)(-1.12\%) \\ &= (0.9)10.00\% + (0.1)(10.00\% - 11.12\%) \\ &= 10.00\% - (0.1)(11.12\%) = 8.89\%. \end{aligned}$$

In general: *Expected Return* = *Contract Yield* – *Prob. of Default* * *Yield Degradation*.

$$E[r] = \text{YTM} - (\text{PrDEF})(\text{YDEGR})$$

What would be the expected return if the ex ante default probability and conditional credit loss expectations were:

- **80% chance of no default;**
- **10% chance of default in 2nd year with 70% conditional recovery;**
- **10% chance of default in 3rd year with 70% conditional recovery.**

?

Answer:

$$E[r] = \text{YTM} - \sum(\text{PrDEF})(\text{YDEGR})$$

$$E[r] = 10\% - (.1)(11.12\%) - (.1)(17.11\%) = 10\% - 2.82\% = 7.18\%.$$

Note: The probabilities we were working with in the previous example:

- **80% chance of no default;**
- **10% chance of default in 2nd year;**
- **10% chance of default in 3rd year.**

Were “*unconditional probabilities*” as of the time of mortgage issuance:

- **They did not depend on any pre-conditioning event;**
- **They describe an exhaustive and mutually-exclusive set of possible outcomes for the mortgage, i.e.,:**
- **The probabilities sum to 100% across all the eventualities.**

18.1.2 Hazard Functions and the Timing of Default...

More realistic and detailed analysis of mortgage (or bond) default probability (and the resulting impact of credit losses on expected returns) usually works with *conditional probabilities* of default, what is known as a:

Hazard Function

The hazard function tells the *conditional probability* of default at each point in time *given that* default has not already occurred before then.

Example: Suppose this is the *hazard function* for the previous 3-yr loan:

Year:	Hazard:
1	1%
2	2%
3	3%

i.e., There is:

- 1% chance loan will default in the 1st year (i.e., at the time of the first payment);
- 2% chance loan will default in 2nd year if it has not already defaulted in the 1st year; &
- 3% chance loan will default in 3rd year given that it has not already defaulted by then.

Given the hazard function for a mortgage, we can compute the cumulative and unconditional default and survival probabilities.

Example: Suppose this is the *hazard function* for the previous 3-yr loan:

Year:	Hazard:
1	1%
2	2%
3	3%

Then the table below computes the unconditional and cumulative default probabilities for this loan:

Year	Hazard	Conditional Survival	Cumulative Survival	Unconditional PrDEF	Cumulative PrDEF
1	0.01	$1 - .01 = 0.9900$	$0.99 * 1.0000 = 0.9900$	$.01 * 1.0000 = 0.0100$	0.0100
2	0.02	$1 - .02 = 0.9800$	$0.98 * 0.9900 = 0.9702$	$.02 * 0.9900 = 0.0198$	$.0100 + .0198 = 0.0298$
3	0.03	$1 - .03 = 0.9700$	$0.97 * 0.9702 = 0.9411$	$.03 * 0.9702 = 0.0291$	$.0298 + .0291 = 0.0589$

- “*Conditional Survival Probability*” (for year t) = $1 - \text{Hazard}$ for year t .
- “*Cumulative Survival Prob.*” (for year t) = Probability loan survives through that yr.
- “*Unconditional Default Prob.*” (for year t) = Prob.(as of time of loan origination) that loan will default in the given year (t) = $\text{Hazard} * \text{Cumulative Survival}(t-1) = \text{Cumulative Survival}(t) - \text{Cumulative Survival}(t-1)$.
- “*Cumulative Default Prob.*” (yr. t) = Prob.(as of time of loan origination) that loan will default any time up through year t .

In this case: **5.89% unconditional probability (as of time of origination) that this loan will default (at some point in its life). $5.89\% = 1.00\% + 1.98\% + 2.91\% = 1 - 0.9411$.**

For each year in the life of the loan, a conditional yield degradation can be computed, conditional on default occurring in that year, and given an assumption about the conditional recovery rate in that year.

For example, we saw that with previous 3-yr loan the conditional yield degradation was 11.12% if default occurs in year 3, and 17.11% if default occurred in year 2, in both cases assuming a 70% recovery rate.

*Similar calculations reveal that the conditional yield degradation would be 22.00% if default occurs in year 1 with an 80% recovery rate.**

Defaults in each year of a loan's life and no default at all in the life of the loan represent mutually-exclusive events that together exhaust all of the possible default timing occurrences for any loan.

For example, with the three-year loan, Borrower will either default in year 1, year 2, year 3, or never.

Thus, the expected return on the loan can be computed as the contractual yield minus the sum across all the years of the products of the unconditional default probabilities times the conditional yield degradations.

$$E[r] = YTM - \sum_{t=1}^T (\Pr DEF_t)(YDEGR_t)$$

Example:

- Given previous hazard function (1%, 2%, and 3% for the successive years);
- Given conditional recovery rates (80%, 70%, and 70% for the successive years);
- Expected return on the 3-yr 10% mortgage at the time it is issued would be:

$$\begin{aligned} E[r] &= 10.00\% - ((.0100)(22.00\%) + (.0198)(17.11\%) + (.0291)(11.12\%)) \\ &= 10.00\% - 0.88\% \\ &= 9.12\%. \end{aligned}$$

The 88 basis-point shortfall of the expected return below the contractual yield is the “ex ante yield degradation” (aka: “unconditional yield degradation”).

It reflects the ex ante credit loss expectation in the mortgage as of the time of its issuance.

Two alternative ways to compute the *expected return* . . .

“**Method 1**” “Return-based” (as previously described) $E[IRR(CF)]$:

Take the expectation over the conditional returns...

Most commonly used.

$$\begin{aligned} E[r] &= YTM - \sum_{t=1}^T (\Pr DEF_t)(YDEGR_t) \\ &= YTM - \sum_{t=1}^T (\Pr DEF_t)(YTM - YLD|DEF_t) \\ &= (\Pr NODEF)YTM + \sum_{t=1}^T (\Pr DEF_t)(YLD|DEF_t) \\ &= \sum_{i=1}^N (\Pr SCEN_i)(YLD_i) = \sum_{i=1}^N (\Pr SCEN_i)(IRR(CF_i)) \end{aligned}$$

Makes sense if investor preferences are based on the return achieved.

“**Method 2**” “Expected CF-based”, or “Pooled CF-based”, $IRR(E[CF])$:

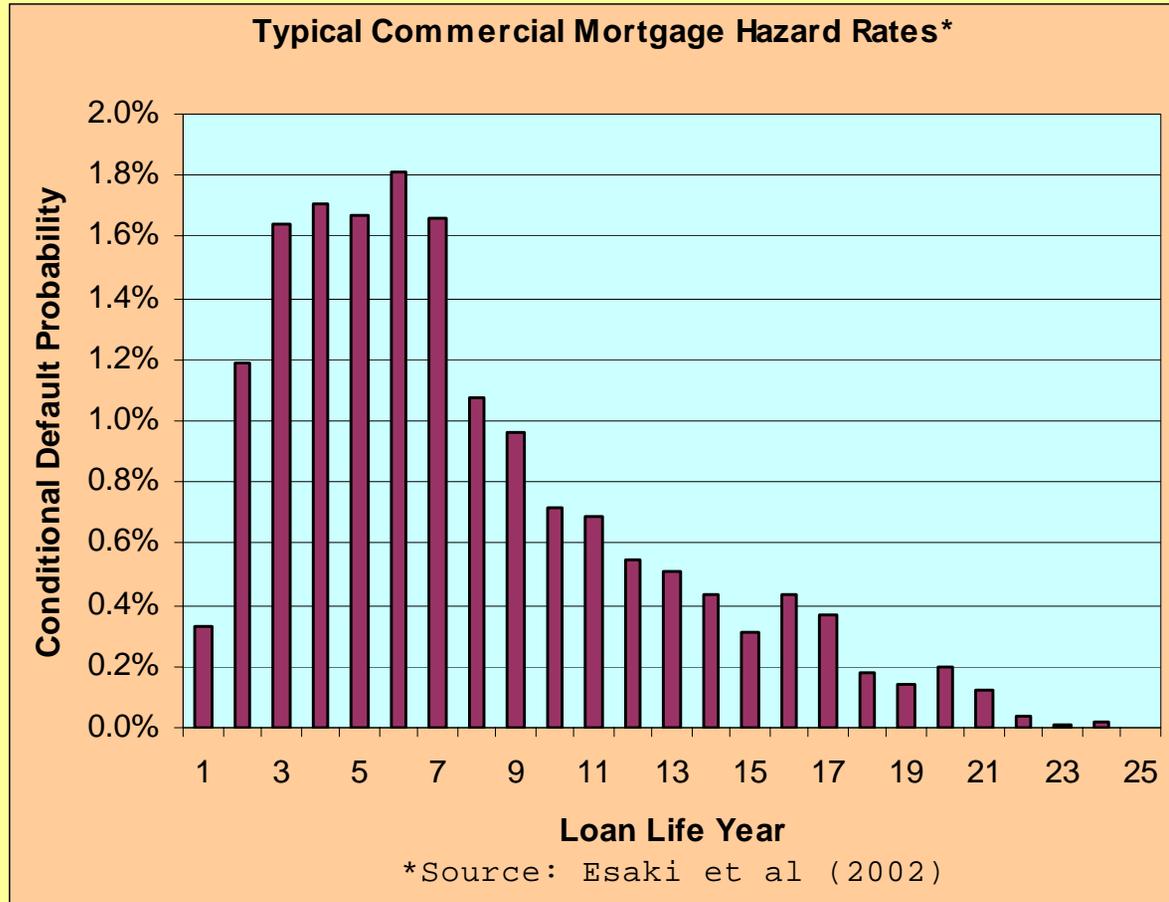
Take the expectation over the conditional cash flows and then compute the return on the expected cash flow stream:

$$E[r] = IRR\left(\sum_{i=1}^N (\Pr SCEN_i)(CF_i)\right)$$

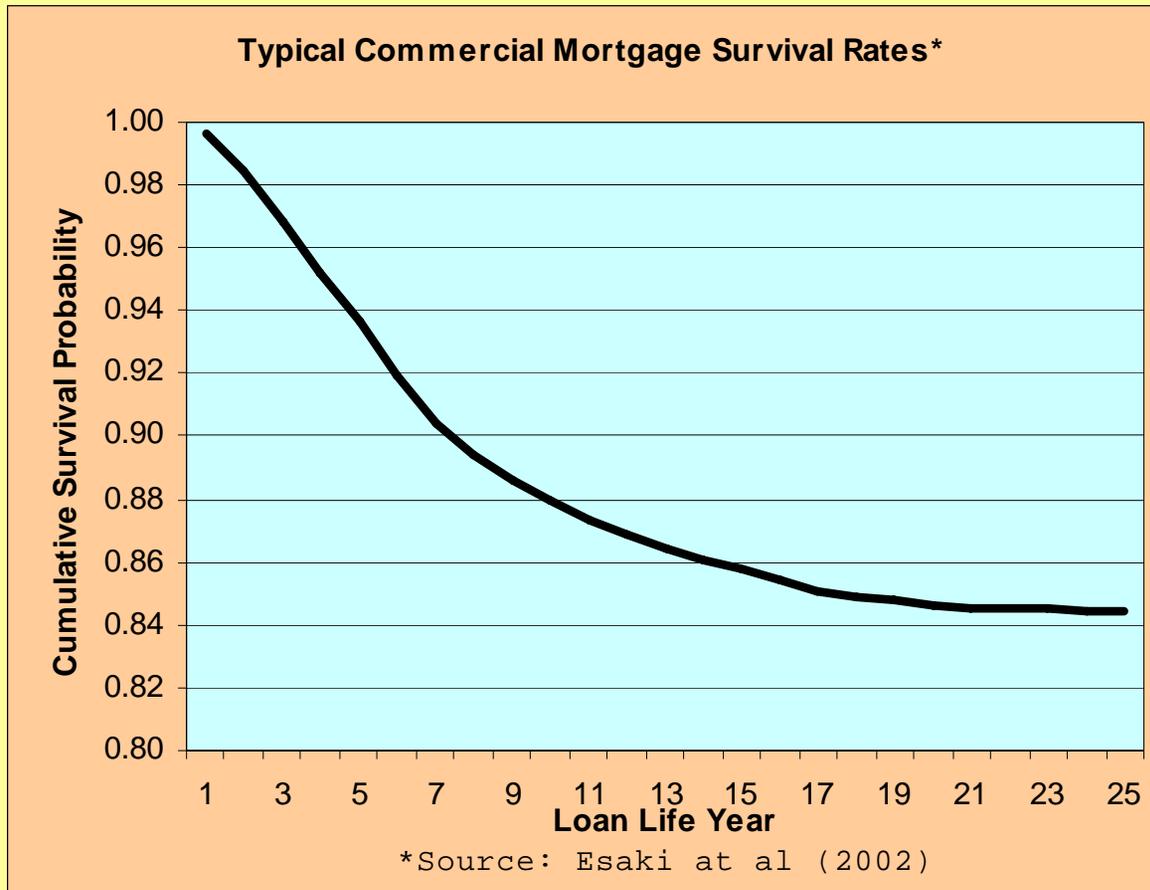
Makes sense if investor preferences are based on the cash flows achieved.

18.1.3 Yield Degradation in Typical Commercial Mortgages...

The most widely used empirical evidence on commercial mortgage hazard rates in the U.S. is that of Snyderman and subsequent studies at Morgan-Stanley.*



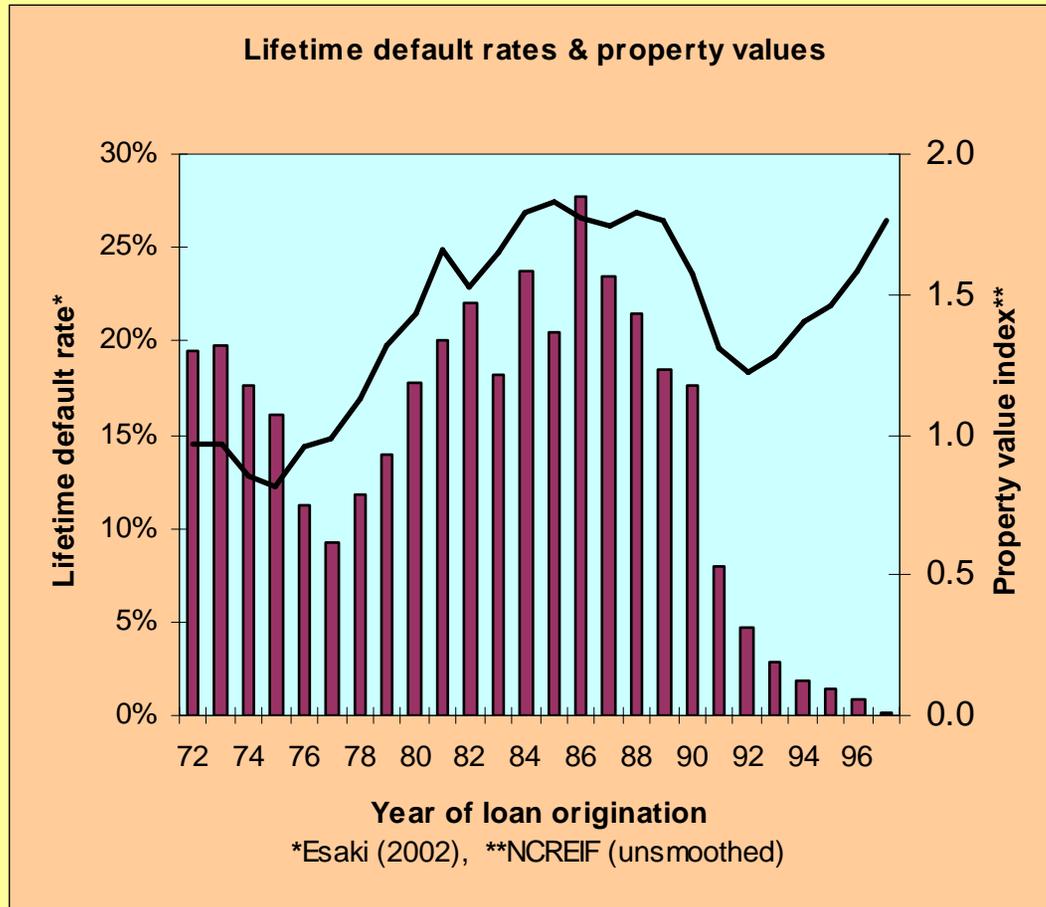
The implied survival function and cumulative default probability is shown here:



Overall Average Default Probability = 16%.

1 out of 6 commercial mortgages in the U.S. default at some point in their lives.

Loan lifetime default probabilities are strongly influenced by the time (phase of the real estate market cycle) at which the loan was originated:



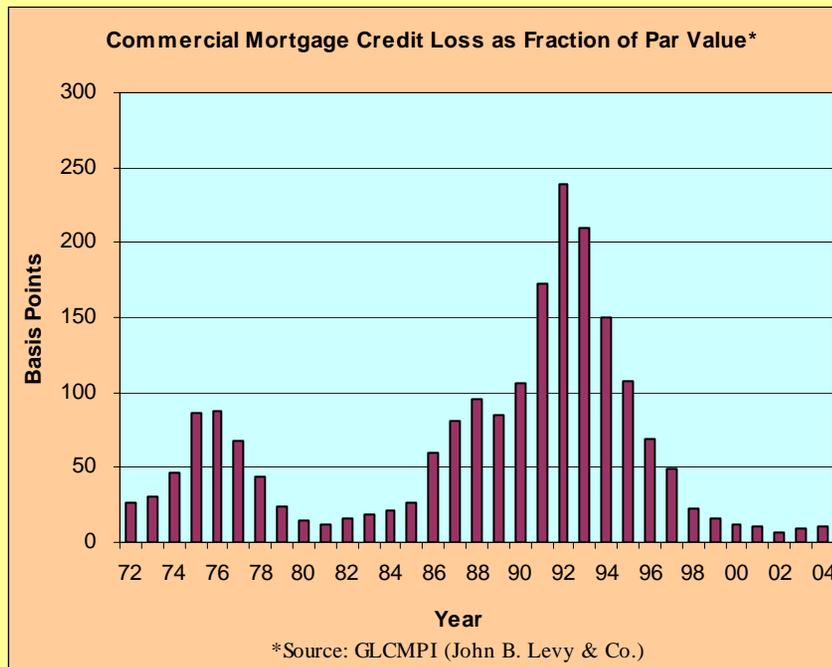
*Why do you suppose this is so?
And what do you think about it?*

Combining empirical data on conditional recovery rates (typically assumed to be between 60% and 70%), we can estimate the typical ex ante yield degradation in U.S. commercial mortgages...

→ Typical Yield Degradation:

60 to 120 basis points.

Similar results are observed in the *Giliberto-Levy Commercial Mortgage Index (GLCMI)*, the major index of commercial mortgage (“whole loan”) periodic ex post returns (HPRs).



1972-2004 Avg =

62 basis points*

Is 16% avg lifetime default probability surprisingly high? . . .

Consider relation between: *A simplified example...*

- LTV,
- Property Risk (volatility),
- Loan Default Probability.

(Text box p. 447)

Suppose...

- Initial Prop. Val = \$100, $E[g] = 2\%/yr.$
- 75% LTV (No amort \rightarrow OLB = \$75 constant).
- Average loan default occurs in year 7 of loan life (*Esaki*).
- Individ. Prop. Ann. Volatility (Std.Dev[g]) = 15%.
- Prop. Val follows *random walk* (effic. mkt.).
- $\rightarrow T \text{ yr Volatility} = \sqrt{T} (\text{Ann.Volatility})$

A simplified example...

Thus, After 7 years:

- $E[\text{Val}] = 1.02^7(100) = 115$

- $\text{Std.Dev}[\text{Val}] =$

$$\begin{aligned} & \sqrt{7} (15\%)(100) \\ & = 2.6 * 15\% (100) \\ & = \pm 40\% (100) = \pm 40. \end{aligned}$$

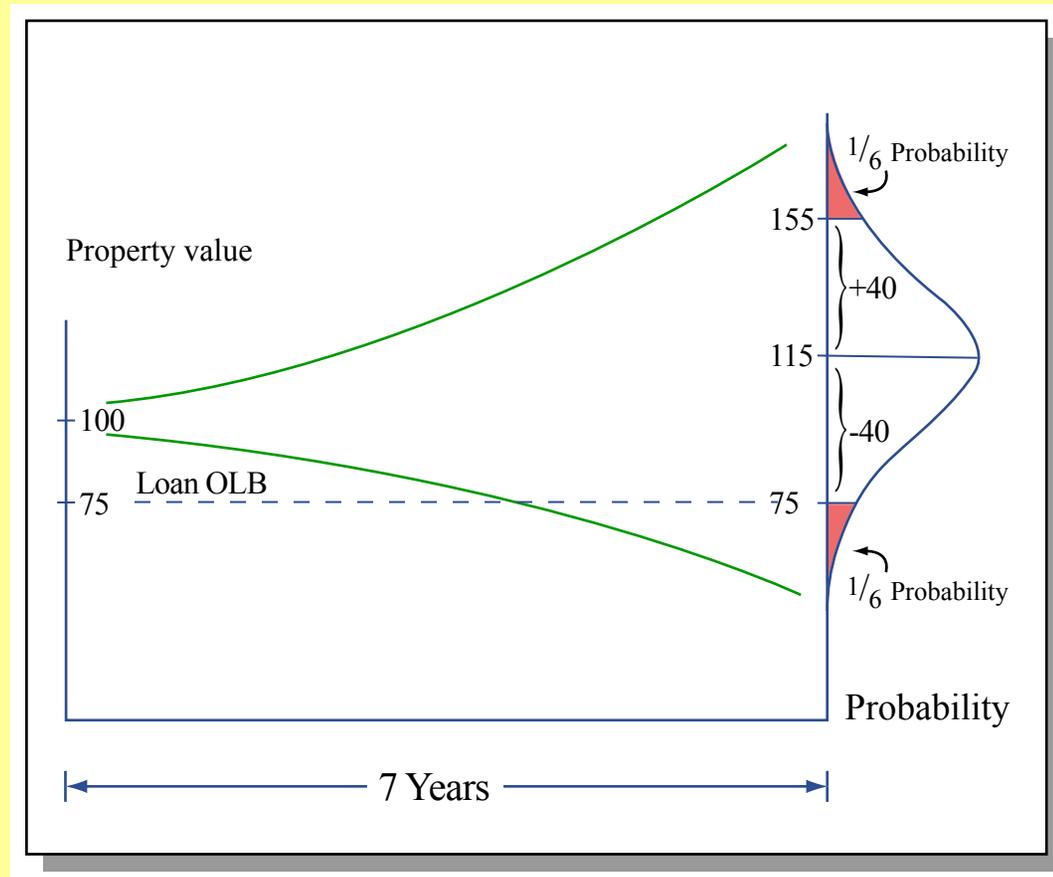


Image by MIT OCW.

- $1 \text{ Std.Dev below } E[\text{Val}] = \$115 - \$40 = \$75.$

- If $\text{Prob}[\text{Val}] \sim \text{Normal}$, $\rightarrow 1/6 \text{ chance Val} < \text{OLB}$, \rightarrow Loan “under water” (large chance of default in that case).

Section 18.2:

Commercial Mortgage Underwriting

“Underwriting”

= Process lenders go through to decide to issue a commercial mortgage, and the terms of the loan:

Loan Origination (“primary” market).

- Often a negotiation type process (esp. for large loans): Commercial Mortgage business is a “custom” shop.
- Standard criteria may sometimes be “bent” (esp. for large borrowers, or when the market is “hot”), but provide the basic guidelines.

Basic Purpose of Underwriting:

→ To make *default a rare event*.

But no one can operate “outside the market”...

Supply & Demand:

- Most borrowers cannot (or do not want to) conform to underwriting standards so tight as to eliminate default risk (even if that would get them T-Bond interest rates).
- Lenders must conform to the market in order to “play the game”: Modify loan terms so that $E[r]$ is sufficient to compensate for default risk.

Two Foci of Underwriting:

Borrower & Property

1) Borrower:

On the *downtside*:

- i) Can “bleed” healthy property as “cash cow”.
- ii) Can use Ch.11 if they get in trouble (“cramdown”).
- iii) Financial health of borrower is important.
- iv) Check “parent” company.

On the *upside*:

- i) Potential “repeat customer”.
- ii) Consider size, track record, future potential.

Two Foci of Underwriting: Borrower & Property

2) Property:

Generally more important than borrower:

- i) Main source of CF to service loan.
- ii) Comm.Mtgs effectively “non-recourse”.
- iii) Careful lender w well-crafted loan: strong property counts more than strong borrower.

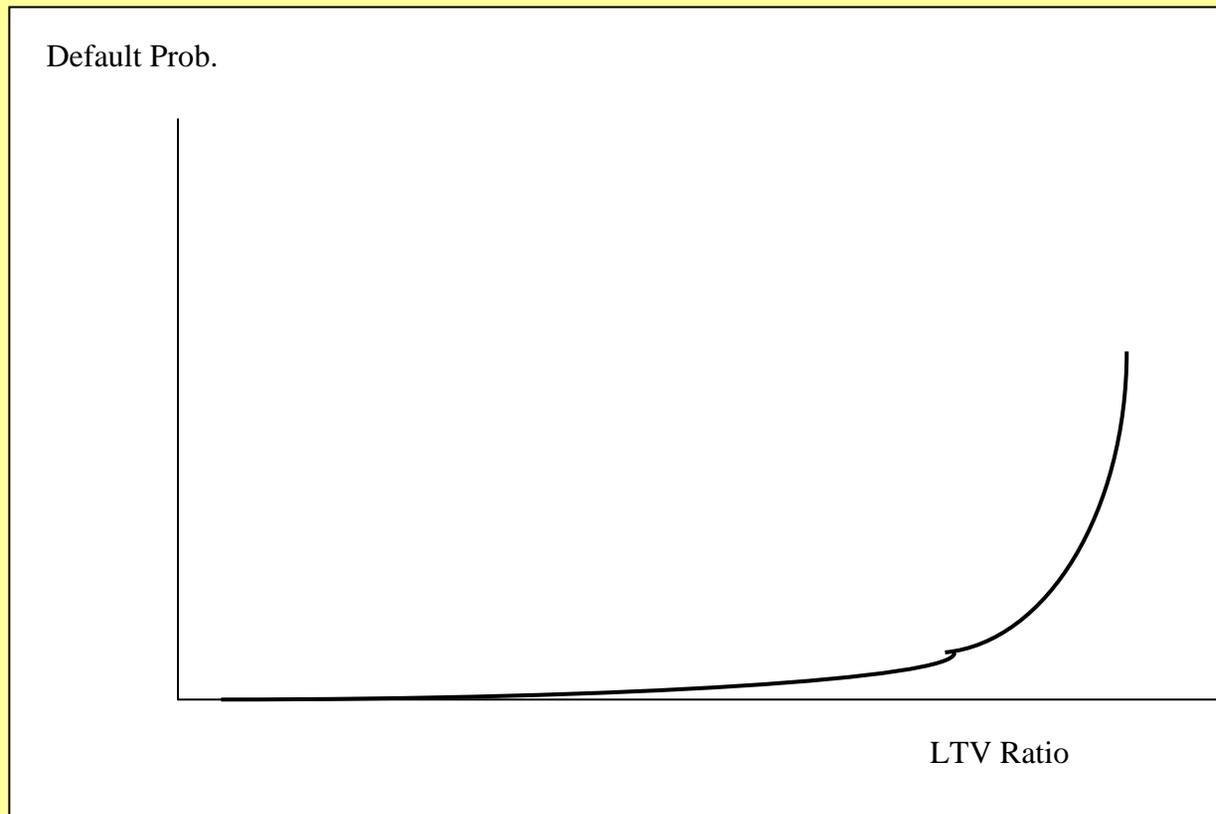
Standard Property-level Underwriting Criteria:

- i) Asset value criteria...
- ii) Property income criteria...

Asset Value Criterion: Initial Loan-to-Value Ratio (LTV)

$$LTV = L/V$$

Exh. 18-5: Typical relationship between initial LTV ratio and the ex ante lifetime default probability on a commercial property mortgage:



Relation between:

- LTV,
- Property Risk (volatility),
- Loan Default Probability.

A simplified example...

(Text box p. 447)

Suppose...

- Initial Prop. Val = \$100, $E[g] = 2\%/yr.$
- 75% LTV (No amort \rightarrow OLB = \$75 constant).
- Average loan default occurs in year 7 of loan life.
- Individ. Prop. Ann. Volatility (Std.Dev[g]) = 15%.
- Prop. Val follows *random walk* (effic. mkt.).
- $\rightarrow T \text{ yr Volatility} = \sqrt{T} (\text{Ann.Volatility})$

Relation between:

- LTV,
- Property Volatility, &
- Loan Default Probability.

Thus, After 7 years:

- $E[\text{Val}] = 1.02^7(100) = 115$

- $\text{Std.Dev}[\text{Val}] =$

$$\begin{aligned} & \sqrt{7} (15\%)(100) \\ & = 2.6 * 15\% (100) \\ & = \pm 40\% (100) = \pm 40. \end{aligned}$$

- $1 \text{ Std.Dev below } E[\text{Val}] = \$115 - \$40 = \$75.$

- If $\text{Prob}[\text{Val}] \sim \text{Normal}$, \rightarrow 1/6 chance $\text{Val} < \text{OLB}$, \rightarrow Loan “under water” (large chance of default in that case).

A simplified example...

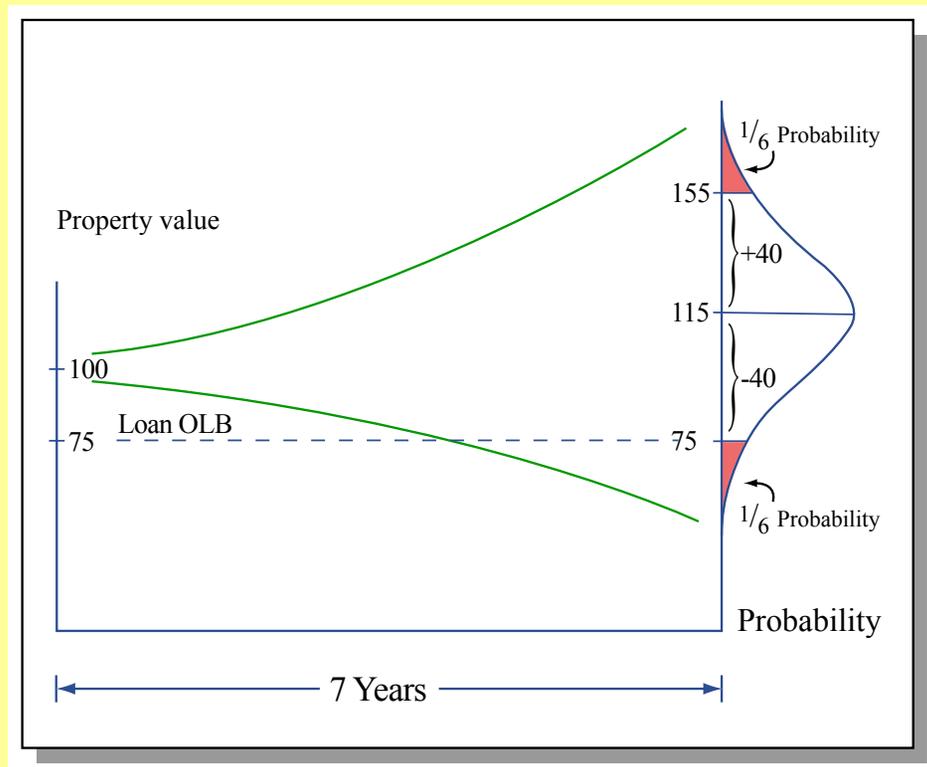


Image by MIT OCW.

The point is . . .

Greater Property Volatility (Risk)

- Lower LTV corresponds to a given lifetime default probability.**
- Lower Max LTV Limit in underwriting criteria.**

Typical **LTV limit in commercial mortgages on good quality stabilized properties is **75%**.**

- Based on lower of appraisal or purchase price.**
- Based on lower of DCF or Direct Cap.**
- Sometimes “bent”, or fudged in appraisal, due to market pressure.**

Property Income Criteria...

1) Debt Service Coverage Ratio (DCR):

$$DCR = NOI / DS$$

Typical: DCR \geq 120%

2) Break-even Ratio (BER):

$$\text{BER} = (\text{DS} + \text{OE}) / \text{PGI}$$

→ Occupancy ratio required for $\text{EBTCF} > 0$ (exclu CI)

→ Lender usually requires $\text{BER} < (100\% - \text{Mkt Vac})$

Typical: $\text{BER} \leq 85\%$, or less than mkt avg occupancy minus some buffer (typically 5%).

3) Equity Before-Tax Cash Flow (EBTCF):

$$\text{EBTCF} = \text{NOI} - \text{DS} - \text{CI}$$

Similar to DCR, only includes effect of CI.

Projection of **EBTCF < 0** any year of loan

→ **“Red Flag”**.

4) Multi-year Pro-Forma Projection:

In principle, lenders project income ratios for all years of loan life.

Variables and loan terms to negotiate:

- **Loan Amount**
- **Loan Term (maturity)**
- **Contract Interest Rate**
- **Amortization rate**
- **Up-front fees and points**
- **Prepayment option and back-end penalties**
- **Recourse vs. Non-recourse debt**
- **Collateral (e.g., cross-collateralization)**
- **Lender participation in property equity**
- **Cramdown insurance**
- **Etc. . . .**

Underwriting Example

The Problem:

- Buyer (borrower) & seller claim property worth \$12,222,000;
- Buyer wants to borrow 75% (\$9.167 Million, or \$91.67/SF) from you (mortgage lender), for purchase-money 1st mortgage;
- Wants non-recourse, 10-yr interest-only loan, monthly pmts;
- Willing to accept “lock-out”.
- ***Should you do the deal?***

Underwriting Example (cont.)

Current Capital Market Information:

- In Bond Mkt: 10-yr US Govt Bonds yielding 6.00%.
- In Mortg Mkt: 10-yr balloon lock-out commercial mortgages require risk premium in contract total yield typically 200bp (CEY) spread over TBonds for good properties, non-recourse.
- → Loan YTM = 6% + 2% = 8% CEY,
- → *What EAY & MAY?*
- → EAY = 8.16%, → **7.87% MEY required YTM.**

Underwriting Example (cont.)

Underwriting Criteria (from capital provider):

1. Max Initial LTV = 75%.
2. Max projected terminal LTV = 65%.
3. In computing LTV, normally: (i) Apply direct capitalization with going-in cap rate $\geq 9\%$, terminal cap rate $\geq 10\%$; (ii) Apply multi-yr DCF with Disc. Rate $\geq 10\%$; (iii) Use lower of (i) & (ii) to compute Initial LTV.
4. Min DCR = 120%.
5. Max BER = 85%, or 5% less than mkt vac (whichever is less).
6. Consider need for CI, and avoid EBTCF < 0 .

Loan must conform to these criteria, given capital market (yield requirement) and property markets (space & asset mkts → value & income criteria).

Underwriting Example (cont.)

Property & R.E. Market Information (from broker):

- **100,000SF, fully occupied, single-tenant, off.bldg.**
- **10-yr lease signed 3 yrs ago.**
- **\$11/SF net (suppose EOY ann. pmts).**
- **"Step-ups" of \$0.50 in lease yr.5 & 8 (yrs 2 & 5).**
- **Current mkt rents on new 10-yr leases are \$12/SF net.**
- **Expect mkt rents to grow @ 3%/yr. (same age).**

Solution, General Procedure . . .

Step 1: Construct 10-yr "Proforma":

- 1) Forecast Property Cash Flows
- 2) Calculate Loan Debt Service Cash Flows for Requested Loan

Step 2: Examine DCR, BER, EBTCF, @ Requested Loan:

Is there Compliance with Income Underwriting Criteria?...

Step 3: Estimate Property Value (Use Direct Capitalization &/or DCF):

Is there Compliance with Value Underwriting Criterion?...

Step 4: If Compliance Fails in either Step 2 or 3:

How can loan be modified to meet underwriting criteria?...

How much (and why) is lender willing to "bend" underwriting criteria to make loan?...

--> What "yield enhancements" (e.g., "origination fee") would temp lender?

--> What security enhancements (e.g., "recourse", "multi-collateral", "cramdown" insur) would assuage lender?

Underwriting Example (cont.)

Broker's pro-forma submitted with loan request. . .

Assumes: *75% renewal probability*

3 mo. Vacancy if non-renewal

No provision for CI (inclu leasing expenses).

Yr.10 cap rate = 9%.

Year:	1	2	3	4	5	6	7	8	9	10	Year 11
Mkt Rent (net) /SF	\$12.36	\$12.73	\$13.11	\$13.51	\$13.91	\$14.33	\$14.76	\$15.20	\$15.66	\$16.13	\$16.61
Property Rent(net)	\$11.00	\$11.50	\$11.50	\$11.50	\$12.00	\$12.00	\$12.00	\$15.20	\$15.20	\$15.20	\$15.20
Vacancy Allow	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
NOI/SF	\$11.00	\$11.50	\$11.50	\$11.50	\$12.00	\$12.00	\$12.00	\$15.20	\$15.20	\$15.20	\$15.20
NOI	\$1,100,000	\$1,150,000	\$1,150,000	\$1,150,000	\$1,200,000	\$1,200,000	\$1,200,000	\$1,520,124	\$1,520,124	\$1,520,124	\$1,520,124
Reversion@9%Cap										\$16,890,268	

So, you need to deal with the usual . . .

You make following modified assumptions:

- *1% Market rental growth for existing bldg (3%-2%depr).*

- *Yr.8 Leasing expenses: \$2/SF if renew, \$5/SF not renew.*

- *Yr.8 TI: \$10/SF if renew, \$20/SF if not renew.*

- *Yr.10 cap rate = 10%.*

Underwriting Example (cont.)

Your adjusted pro-forma (based on research):

Assumes: *1% Market rental growth for existing bldg (3%-2%depr).*

Yr.8 Leasing expenses: \$2/SF if renew, \$5/SF not renew.

Yr.8 TI: \$10/SF if renew, \$20/SF if not renew.

Yr.10 cap rate = 10%.

Year:	1	2	3	4	5	6	7	8	9	10	Year 11
Mkt Rent (net) /SF	\$12.12	\$12.24	\$12.36	\$12.49	\$12.61	\$12.74	\$12.87	\$12.99	\$13.12	\$13.26	\$13.39
Property Rent(net)	\$11.00	\$11.50	\$11.50	\$11.50	\$12.00	\$12.00	\$12.00	\$12.99	\$12.99	\$12.99	\$12.99
Vacancy Allow	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.81	\$0.00	\$0.00	\$0.00
NOI/SF	\$11.00	\$11.50	\$11.50	\$11.50	\$12.00	\$12.00	\$12.00	\$12.18	\$12.99	\$12.99	\$12.99
NOI	\$1,100,000	\$1,150,000	\$1,150,000	\$1,150,000	\$1,200,000	\$1,200,000	\$1,200,000	\$1,218,214	\$1,299,428	\$1,299,428	\$1,299,428
Lease Comm	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$275,000	\$0	\$0	
Ten.Imprv	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$1,250,000	\$0	\$0	
Reversion@10%Cap										\$12,994,280	
Less OLB										\$9,167,000	
PBTCF	\$1,100,000	\$1,150,000	\$1,150,000	\$1,150,000	\$1,200,000	\$1,200,000	\$1,200,000	-\$306,786	\$1,299,428	\$14,293,709	
Debt Svc	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$9,888,443	
EBTCF	\$378,557	\$428,557	\$428,557	\$428,557	\$478,557	\$478,557	\$478,557	(\$1,028,229)	\$577,985	\$4,405,266	
DCR	152%	159%	159%	159%	166%	166%	166%	169%	180%	180%	
BER @ Mkt	60%	59%	58%	58%	57%	57%	56%	56%	55%	54%	

Note income underwriting criteria for \$9,167,000, 7.87% loan.

DCR & BER look good.

How were these computed?...

Underwriting Example (cont.)

Year:	1	2	3	4	5	6	7	8	9	10	Year 11
Mkt Rent (net) /SF	\$12.12	\$12.24	\$12.36	\$12.49	\$12.61	\$12.74	\$12.87	\$12.99	\$13.12	\$13.26	\$13.39
Property Rent(net)	\$11.00	\$11.50	\$11.50	\$11.50	\$12.00	\$12.00	\$12.00	\$12.99	\$12.99	\$12.99	\$12.99
Vacancy Allow	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.81	\$0.00	\$0.00	\$0.00
NOI/SF	\$11.00	\$11.50	\$11.50	\$11.50	\$12.00	\$12.00	\$12.00	\$12.18	\$12.99	\$12.99	\$12.99
NOI	\$1,100,000	\$1,150,000	\$1,150,000	\$1,150,000	\$1,200,000	\$1,200,000	\$1,200,000	\$1,218,214	\$1,299,428	\$1,299,428	\$1,299,428
Lease Comm	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$275,000	\$0	\$0	\$0
Ten.Imprv	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$1,250,000	\$0	\$0	\$0
Reversion@10%Cap										\$12,994,280	
Less OLB										\$9,167,000	
PBTCF	\$1,100,000	\$1,150,000	\$1,150,000	\$1,150,000	\$1,200,000	\$1,200,000	\$1,200,000	-\$306,786	\$1,299,428	\$14,293,709	
Debt Svc	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$9,888,443	
EBTCF	\$378,557	\$428,557	\$428,557	\$428,557	\$478,557	\$478,557	\$478,557	(\$1,028,229)	\$577,985	\$4,405,266	
DCR	152%	159%	159%	159%	166%	166%	166%	169%	180%	180%	
BER @ Mkt	60%	59%	58%	58%	57%	57%	56%	56%	55%	54%	

$$\text{DCR (Yr.1)} = \text{NOI} / \text{DS} = \$1,100,000 / \$721,443 = 1.52$$

$$\text{BER (Yr.1)} = (\text{OE} + \text{DS}) / \text{PGI} = (\$0 + \$7.214) / \$12.12 = 0.60$$

(Note use of current mkt rent in BER: Consistent with intent of that ratio.)

DS from: \$9,167,000 X 7.87% = \$721,443, in Interest-Only Loan.

Although standard income ratios look good, this loan does have some problems.

One problem is in the income criteria. Can you spot it in the proforma?...

Year:	1	2	3	4	5	6	7	8	9	10	Year 11
Mkt Rent (net) /SF	\$12.12	\$12.24	\$12.36	\$12.49	\$12.61	\$12.74	\$12.87	\$12.99	\$13.12	\$13.26	\$13.39
Property Rent(net)	\$11.00	\$11.50	\$11.50	\$11.50	\$12.00	\$12.00	\$12.00	\$12.99	\$12.99	\$12.99	\$12.99
Vacancy Allow	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.81	\$0.00	\$0.00	\$0.00
NOI/SF	\$11.00	\$11.50	\$11.50	\$11.50	\$12.00	\$12.00	\$12.00	\$12.18	\$12.99	\$12.99	\$12.99
NOI	\$1,100,000	\$1,150,000	\$1,150,000	\$1,150,000	\$1,200,000	\$1,200,000	\$1,200,000	\$1,218,214	\$1,299,428	\$1,299,428	\$1,299,428
Lease Comm	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$275,000	\$0	\$0	\$0
Ten.Imprv	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$1,250,000	\$0	\$0	\$0
Reversion@10%Cap										\$12,994,280	
Less OLB										\$9,167,000	
PBTCF	\$1,100,000	\$1,150,000	\$1,150,000	\$1,150,000	\$1,200,000	\$1,200,000	\$1,200,000	-\$306,786	\$1,299,428	\$14,293,709	
Debt Svc	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$721,443	-\$9,888,443	
EBTCF	\$378,557	\$428,557	\$428,557	\$428,557	\$478,557	\$478,557	\$478,557	(\$1,028,229)	\$577,985	\$4,405,266	
DCR	152%	159%	159%	159%	166%	166%	166%	169%	180%	180%	
BER @ Mkt	60%	59%	58%	58%	57%	57%	56%	56%	55%	54%	

Negative EBTCF in Yr. 8

Another problem is in the initial LTV:

- Based on direct capitalization, loan passes OK:
 - $\$1,100,000 / 9\% = \12.22 M , $\rightarrow \text{LTV} = 9.167 / 12.22 = 75\%$.
- But the DCF @ 10% gives $\text{PV}(\text{PBTCF}) = \$11,557,000$.
 - $\rightarrow 9.167 / 11.557 = 79\%$.

A similar problem is in the Terminal LTV:

- $\$9,167,000 / \$12,994,280 = 71\%$, which is $>$ the 65% limit.

Underwriting Example (cont.)

Problems in the loan proposal:

Income: Projected EBTCF (Yr.8) = $-\$1,028,229 < 0$.

Value: Initial LTV Ratio = 79% > 75% (in DCF @ 10%, OK in dir.cap)

Terminal LTV Ratio = 71% > 65% (@ 10% cap rate).

But EBTCF < 0 is:

Due mostly to cap impr (financing possible?).

Far in future (when inflation will have improved default risk).

After much previous positive cash flow.

Not untypical in single-tenant bldg.

And Value criteria are missed only slightly.

So loan is “close” to passing criteria.

How good a future potential “customer” is this borrower?

How much pressure is there in the loan market?

Try to negotiate a similar loan? . . .

Underwriting Example (cont.)

**Consider a \$8,700,000 loan with 40-yr Amort. 10-yr balloon
(instead of \$9,167,000, Interest-Only):**

	\$9,167,000 Int-Only	\$8,700,000 40-yr Amort
PMT	\$721,443	\$715,740
Initial OLB	\$9,167,000	\$8,700,000
Initial LTV Ratio	79%	75%
Terminal OLB	\$9,167,000	\$8,230,047
Terminal LTV Ratio	71%	63%