
# The Effect of Leverage in Real Estate Investment

Leverage is a powerful tool in real estate investment that allows investors to control larger assets with less equity. This presentation explores how debt financing impacts risk and return in real estate investments.

# Understanding Leverage: The Basics

## Definition

Leverage allows equity investors to magnify the amount of underlying physical capital they control.

## Widespread Use

Over $4 trillion in commercial mortgage loans outstanding in the early 2020s in the US.

## Key Metrics

Leverage Ratio (LR) = Total Asset Value/Equity Value

## Industry Standard

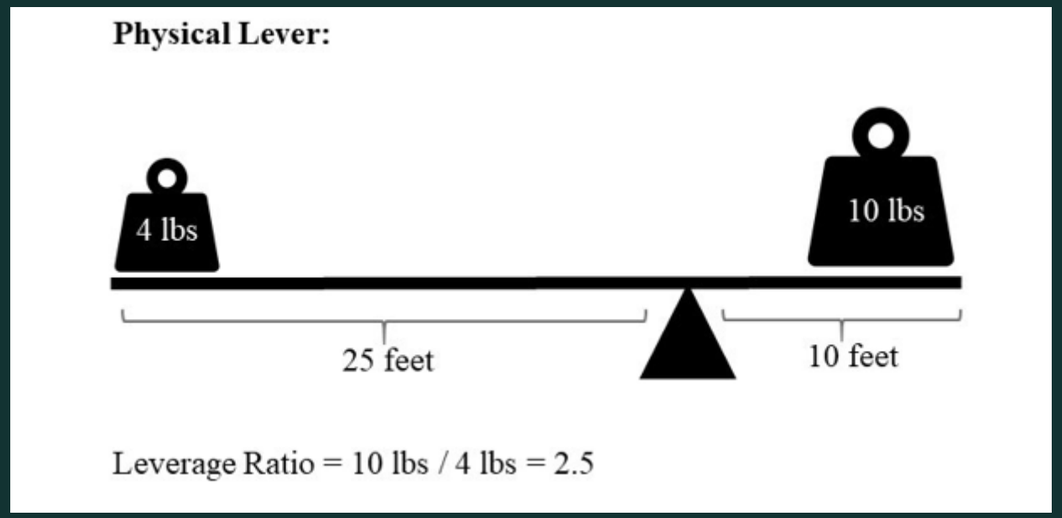
Loan-to-Value (LTV) = Loan Amount/Property Value

# The Physical Lever Analogy

## Physical Leverage

A 4-pound weight can balance a 10-pound weight by standing at the end of an arm 2.5 times longer.

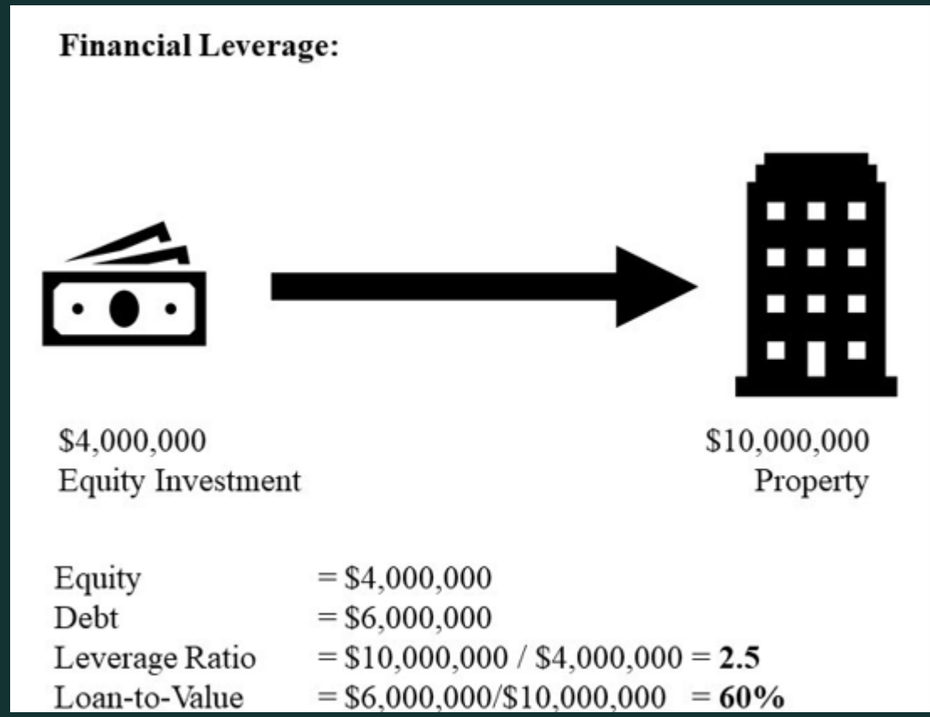
The weight ratio equals the inverse of the arm length ratio.




## Financial Leverage

An investor purchases a $10 million property using $4 million equity and $6 million borrowed money.

The leverage ratio is 2.5, allowing control of an asset 2.5 times greater than the equity invested.



# Impact on Expected Returns

## Unlevered Property

10% total return: 8% income return + 2% appreciation return

## Levered Equity (60% LTV)

13% total return: 8% income return + 5% appreciation return

## Key Insight

Leverage increases expected return when borrowing at an interest rate lower than the property's expected return.

# The Risk Trade-off

## Unlevered Property

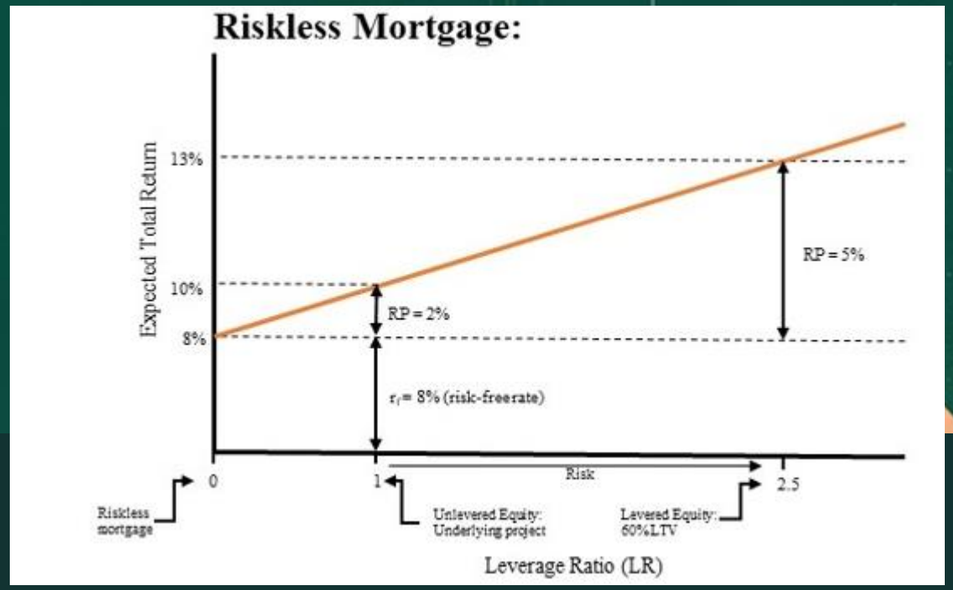
±11% range in total return between optimistic and pessimistic scenarios

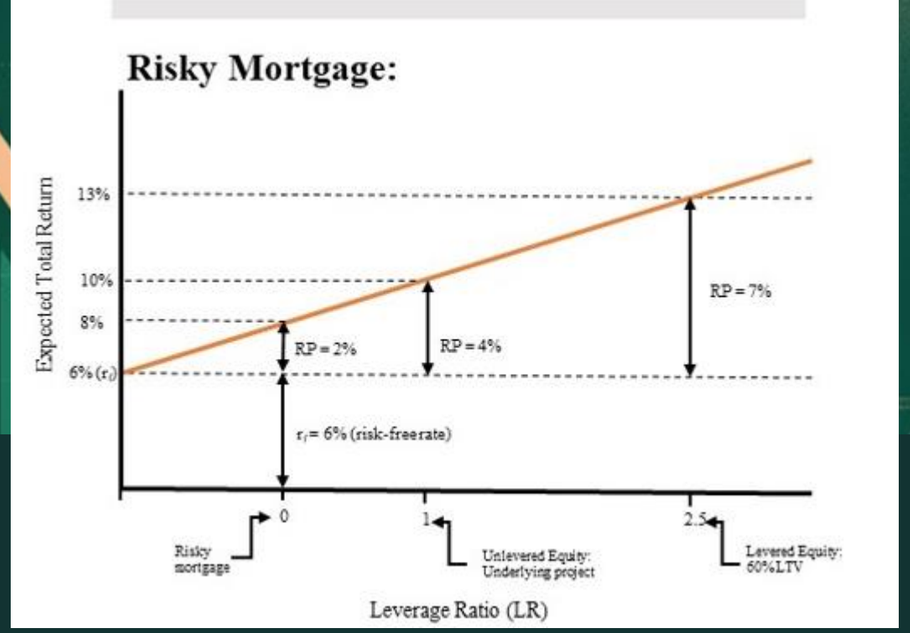
## Levered Equity (60% LTV)

±27.5% range in total return between scenarios

## Risk Magnification

Risk is magnified by a factor equal to the leverage ratio (2.5x)




# The Security Market Line

1

## Risk-Free Rate

Base return with zero risk (e.g., 6% T-bills)

2

## Mortgage Return

Includes risk premium (e.g., 8% return = 6% risk-free + 2% premium)

3

## Unlevered Property

Higher risk premium (e.g., 10% return = 6% risk-free + 4% premium)

4

## Levered Equity

Highest risk premium (e.g., 13% return = 6% risk-free + 7% premium)

# The Weighted Average Cost of Capital

$$r_P = (LTV)r_D + (1 - LTV)r_E$$

Where:

- rP is the return on the underlying property
- rD is the return to the property's debt
- rE is the return to the levered equity
- LTV is the loan-to-value ratio

# Solving for Equity Return

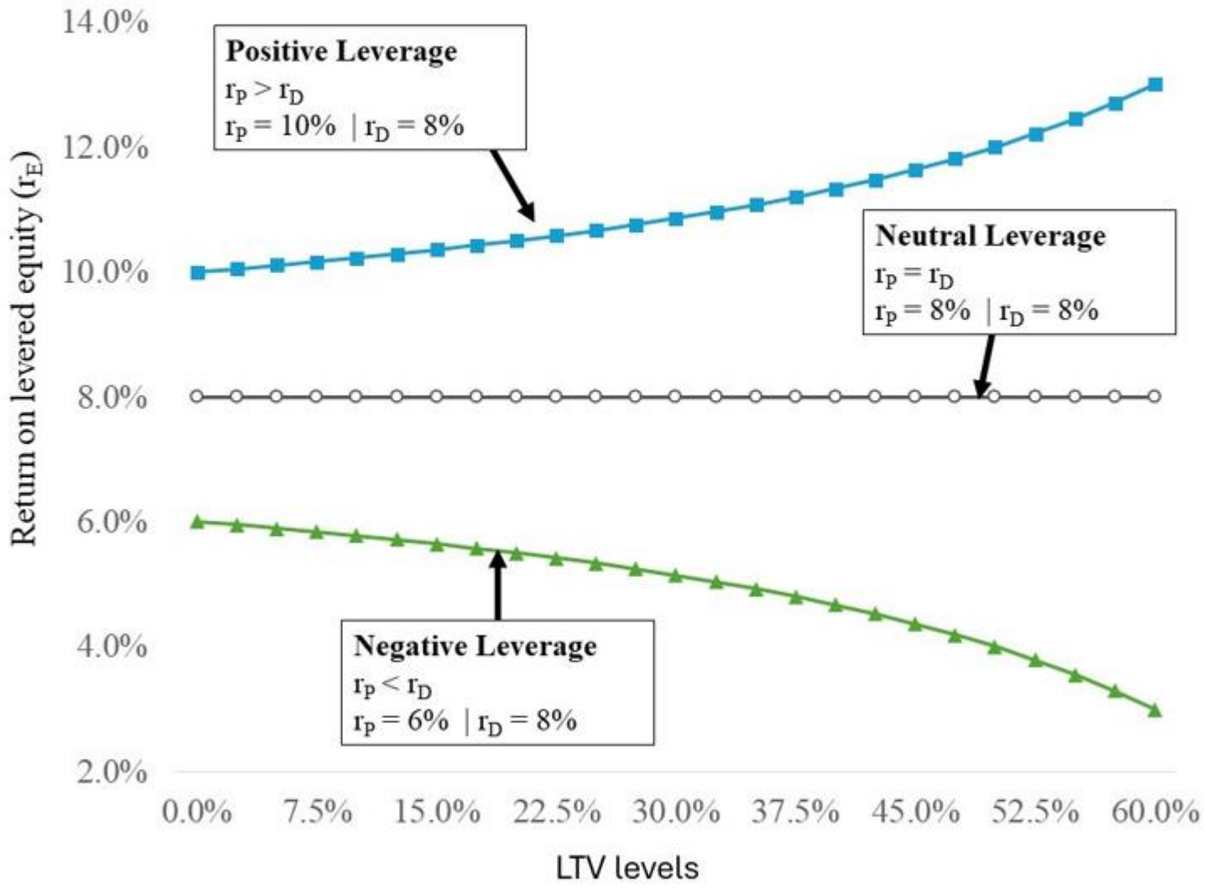
$$r_E = \frac{r_P - LTV \times r_D}{1 - LTV}$$

Example: If property return is 10%, debt costs 8%, and LTV is 60%:

$$r_E = \frac{10\% - 0.6 \times 8\%}{1 - 0.6} = \frac{10\% - 4.8\%}{0.4} = 13\%$$

# Positive vs. Negative Leverage

**EXHIBIT 12-5** Positive, Neutral, and Negative Leverage for varying LTV levels (x-axis). The return on debt $r_D$ is always 8%.



# Impact on Return Components

## Property Return

8% income + 2% growth = 10% total

## Debt Return

8% interest - 1% amortization = 7% total

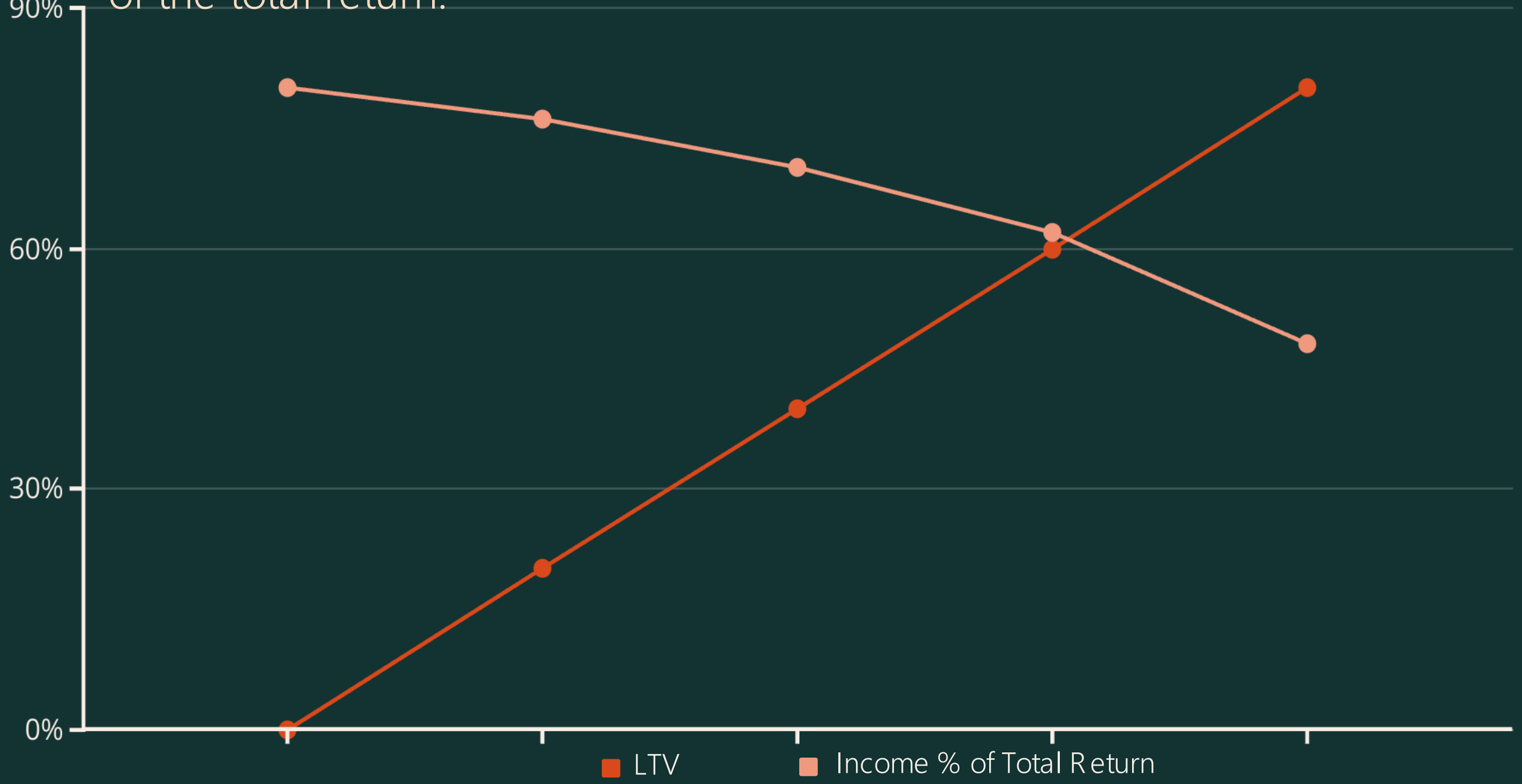
## Key Insight

Leverage shifts return from income toward appreciation

## Equity Return

9.5% income + 6.5% growth = 16% total

# Income vs. Growth Component: More leverage means less income return of the total return.




# Real-World Commercial Mortgages

## Common Terms

1/7, 2/8, or 3/10 structures with 25-year amortization

## Adjustable Rates

Interest rates may adjust based on indexes like LIBOR

## Balloon Payments

Large final payment when loan matures before full amortization

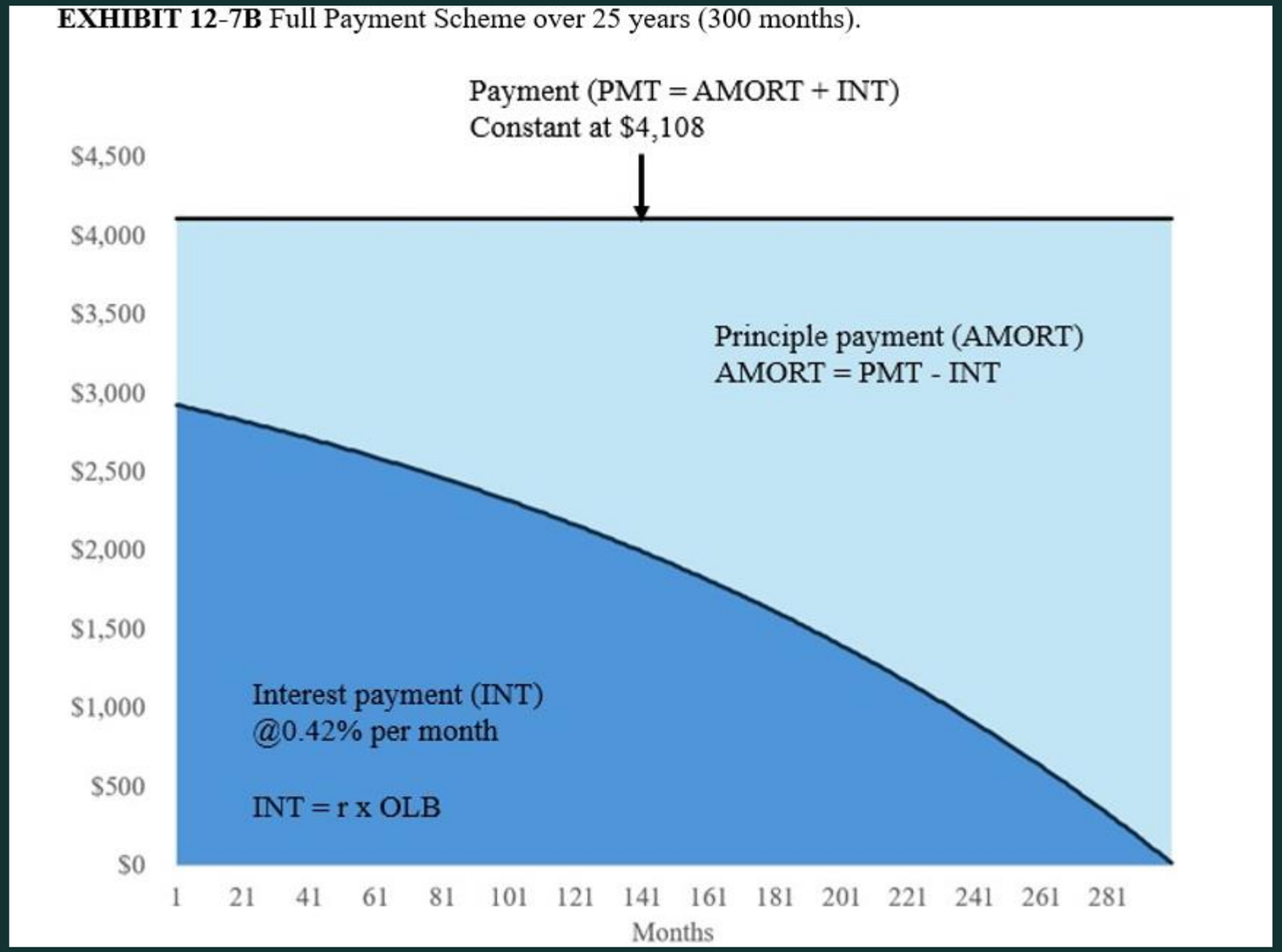
# Calculating Mortgage Payments

$$PMT = OLB_{t-1} \times r_t \times \frac{(1 + r_t)^{N_t}}{(1 + r_t)^{N_t} - 1}$$

Where:

- PMT is the monthly payment
- OLBt-1 is the outstanding loan balance
- rt is the monthly interest rate
- Nt is the remaining months to maturity

# Mortgage Payment Components




Over time, the composition of mortgage payments shifts from mostly interest to mostly principal, while the total payment remains constant.

# Calculating Equity Cash Flow

### Property Before-Tax Cash Flow (PBTCF)

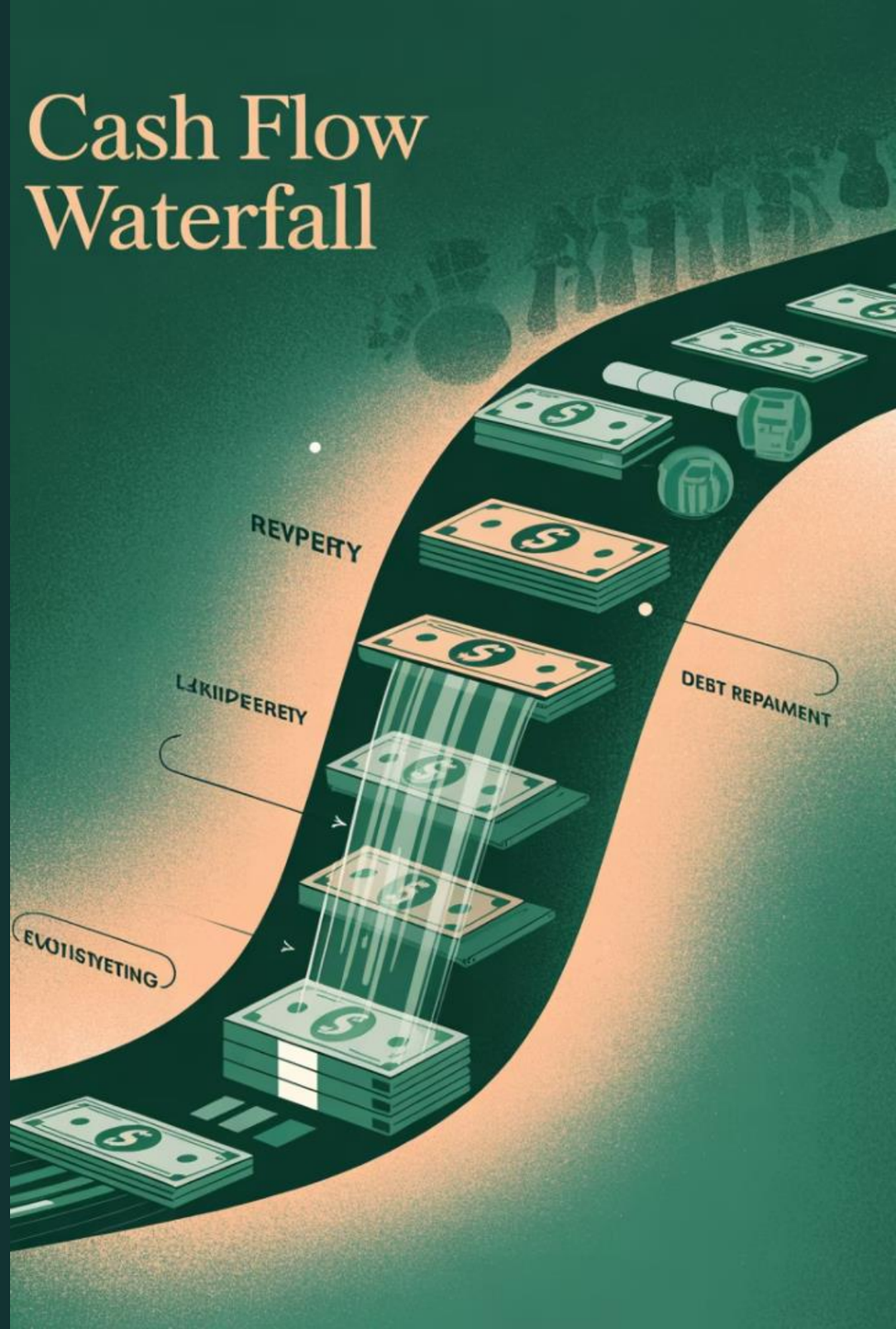
Net operating income minus capital expenditures

### Debt Service

Annual mortgage payments (principal + interest)

### Equity Before-Tax Cash Flow (EBTCF)

PBTCF minus debt service

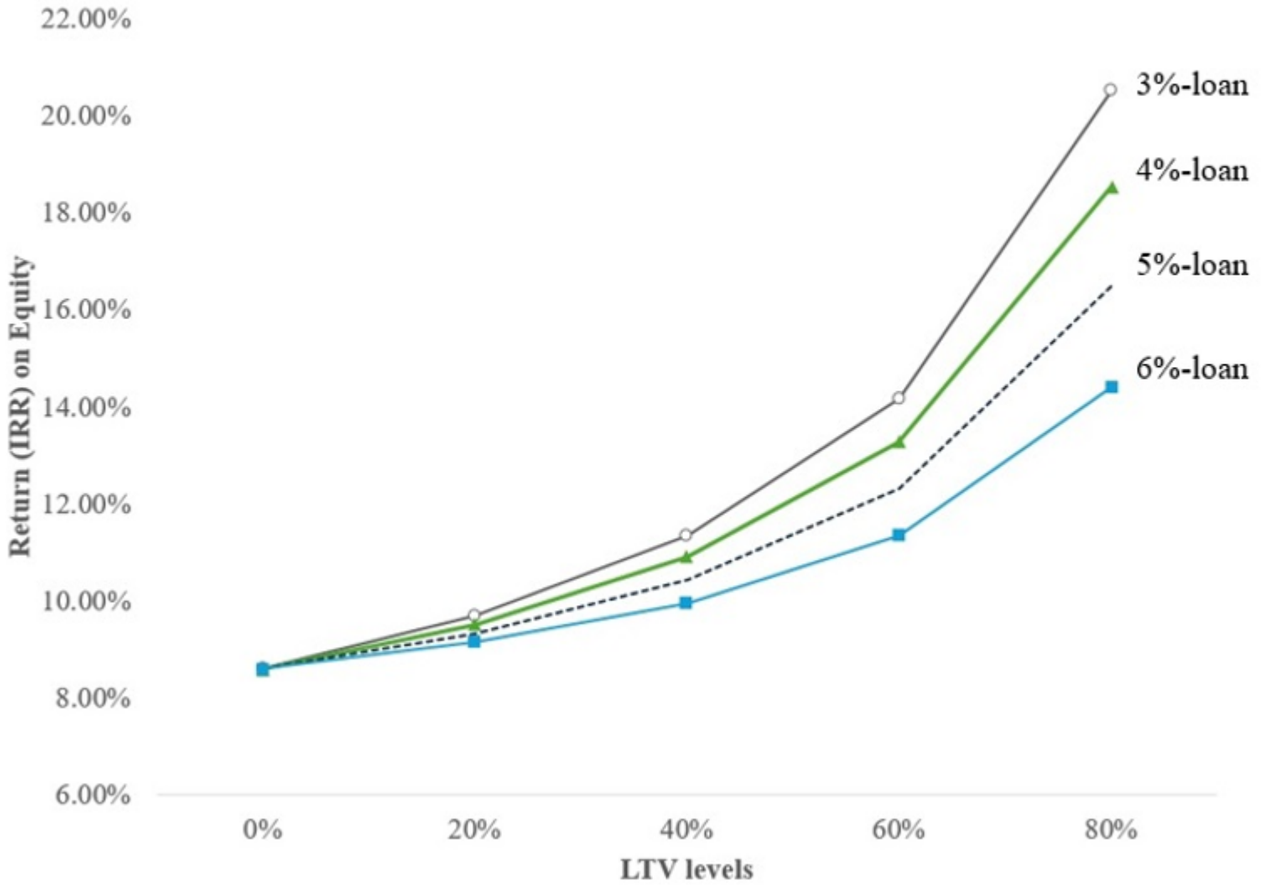


# Impact on Equity IRR

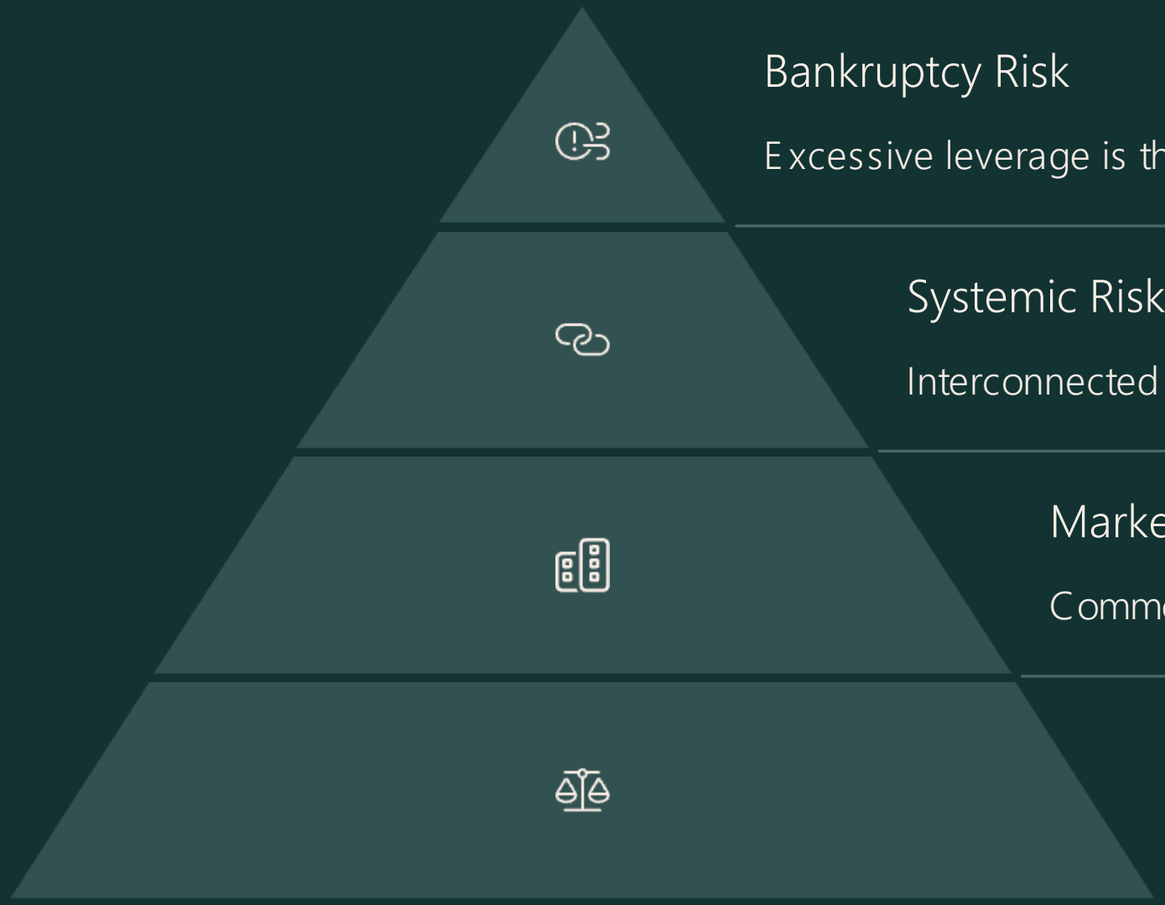
| 8.60% | 15.03% | 6.43% |
| --- | --- | --- |
| Unlevered IRR | Levered IRR | IRR Increase |
| Return on property with no debt | Return on equity with 75% LTV | Difference due to leverage effect |

# Leverage and Interest Rate Impact

**EXHIBIT 12-9** Expected Return on Equity for different LTV levels and Interest Rates using the proforma example of Exhibit 12-8.



# The Temptation and Danger of Leverage



### Bankruptcy Risk

Excessive leverage is the leading cause of investment failure

### Systemic Risk

Interconnected debt can propagate failures through the system

### Market Crashes

Commercial property markets crash every few decades

### Prudent Use

Moderate leverage can enhance returns while managing risk

# Key Takeaways

## Risk-Return Tradeoff

Leverage increases both expected return and risk, typically in proportion.

## Return Composition

Leverage shifts returns from current income toward appreciation.

## Careful Analysis

Proper debt structuring requires understanding payment mechanics and cash flow impacts.

## Prudent Management

Successful investors balance leverage benefits against increased vulnerability.