

Property Finance: An International Approach

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Effects of Financial Leverage on RE Investments

Chapter 5



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5.1 An illustration of financial leverage (1/4)

Assumptions underlying the analysis

The analysis carried on financial leverage is based on some **simplified assumptions**.

A mono-period model has been used, which assumes the absence of failure costs associated with the investment:

$$K_e = \frac{K_a - K_d LTV}{1 - LTV}$$

with: K_e = (levered) equity return, K_a =(unlevered) total return, K_d =cost of debt, LTV = loan to value ratio

A situation involving financing with no failure costs implies that there is no correlation between the loan and total return. As a consequence:

$$\sigma_e = \frac{\sigma_a}{1 - LTV}$$

with: σ_e = volatility of (levered) equity return, σ_a = volatility of (unlevered) total return





5.1 An illustration of financial leverage (2/4)

Financial leverage reduces the equity contribution, as a consequence it **has a direct influence on the return generated by an investment.**

This evidence may be illustrated through an **example**:

Suppose to analyze a **RE investment with an initial value of €10 mln.**

The investor may choose:

1. an unlevered approach investing without financial leverage
2. a levered approach using borrowed capital to cover 50% of the overall investment

The annual cash flow generated by the investment is € 800,000. Assuming an interest rate on the borrowed capital of 7%, the investor will receive:

1. net cash flows of € 450,000 in the levered scenario
2. € 800,000 in the unlevered case

Two possible scenarios:

1. the value of the property increases by € 100,000
2. the property suffers a fall in value of € 300,000

5.1 An illustration of financial leverage (3/4)

		Positive Leverage		Negative Leverage	
		<i>Unlevered</i>	<i>Levered</i>	<i>Unlevered</i>	<i>Levered</i>
Initial Value		€ 10,000,000	€ 10,000,000	€ 10,000,000	€ 10,000,000
Debt Financing @ 50%	50%	€ 0	€ 5,000,000	€ 0	€ 5,000,000
<i>Initial Equity</i>		€ 10,000,000	€ 5,000,000	€ 10,000,000	€ 5,000,000
Operating free cash flow		€ 800,000	€ 800,000	€ 800,000	€ 800,000
Interest payment @ 7%	7%	€ 0	€ 350,000	€ 0	€ 350,000
Net free cash flow		€ 800,000	€ 450,000	€ 800,000	€ 450,000
Property value variation		€ 100,000	€ 100,000	-€ 300,000	-€ 300,000
Income Return (Net free cash flow/Equity)		8.00%	9.00%	8.00%	9.00%
Appreciation Return (Property value variation)		1.00%	2.00%	-3.00%	-6.00%
Total Return		9.00%	11.00%	5.00%	3.00%



5.1 An illustration of financial leverage (4/4)

How does leverage affect investor returns?

Positive leverage: the return on non-debt funded investment (unlevered) exceeds the cost of financing.

In the first scenario of the previous example, the unlevered return on the investment is equal to 9% while the cost of financing is 7%. With a financial leverage of 50% the return on equity faces a 2% positive increase.

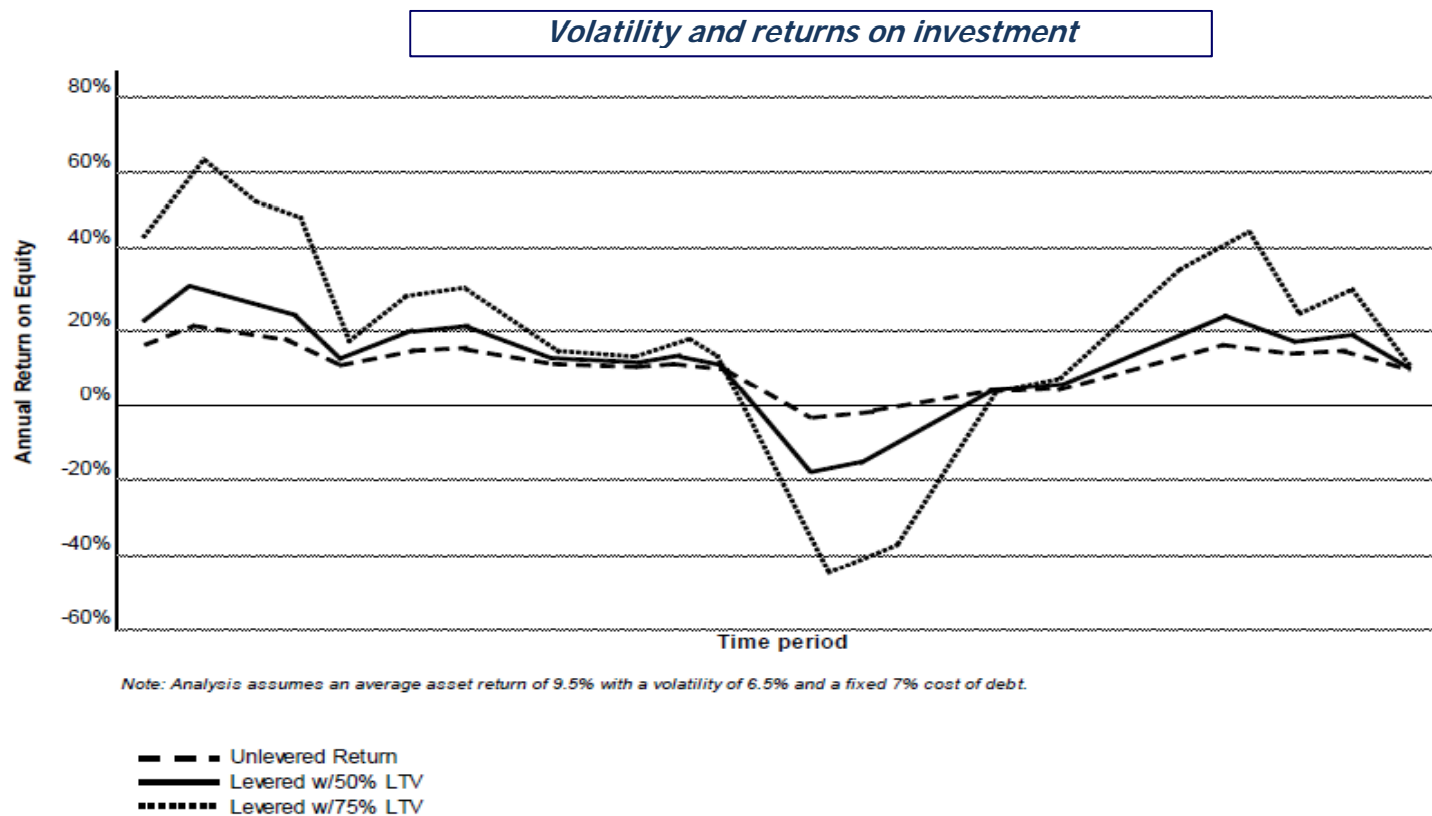
Negative leverage: the cost of debt financing exceeds the unlevered return on the investment.

In the second scenario of the previous example, the unlevered return on the investment is equal to 5% while the cost of financing is still 7%. With a financial leverage of 50% the return on equity drops by 2%.



5.2 The effects of an increase in volatility

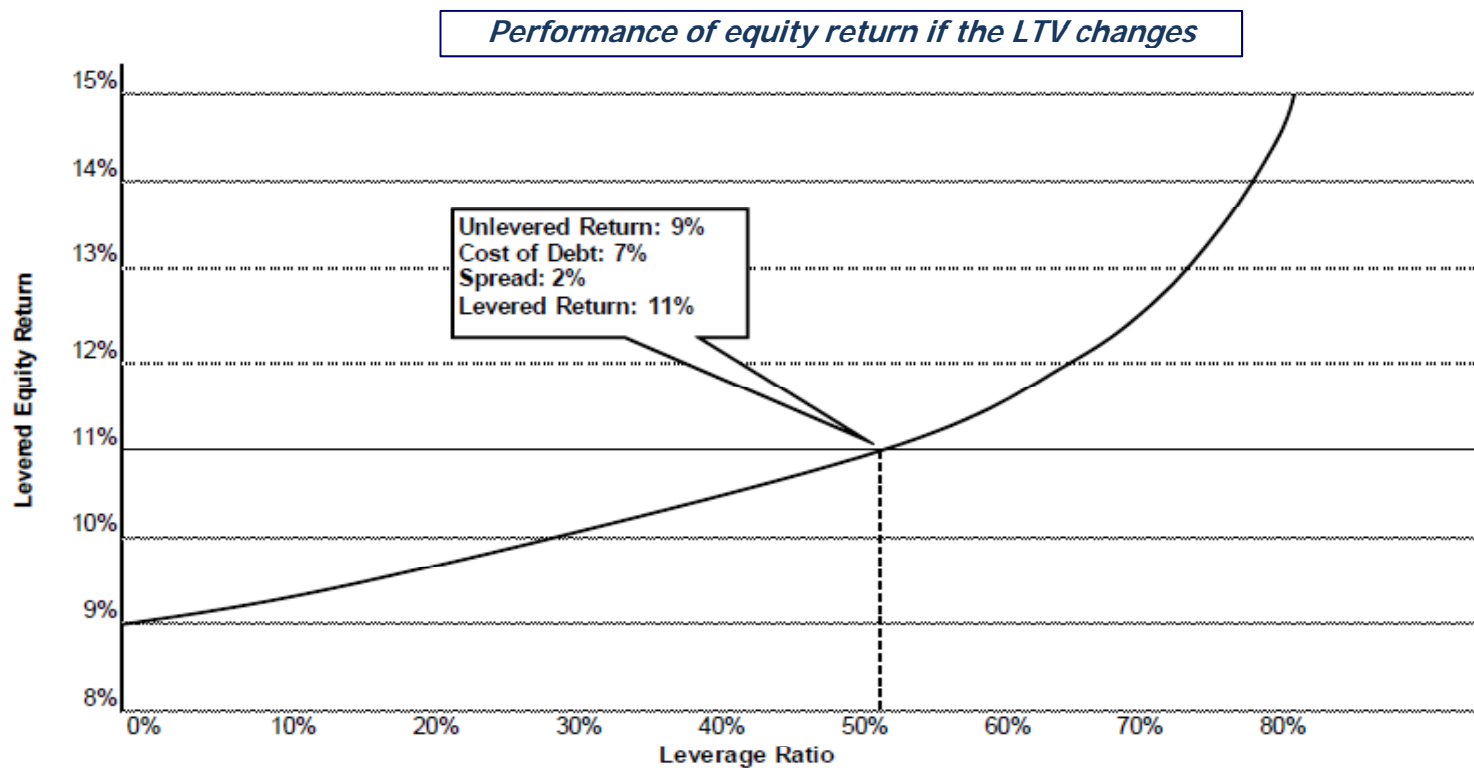
The return of an investment with an unlevered approach is more stable over time. By contrast, **the higher the degree of leverage of an investment, the higher the volatility of its return.**



5.3 The effect of financial leverage on returns

The **return on equity** is a function of:

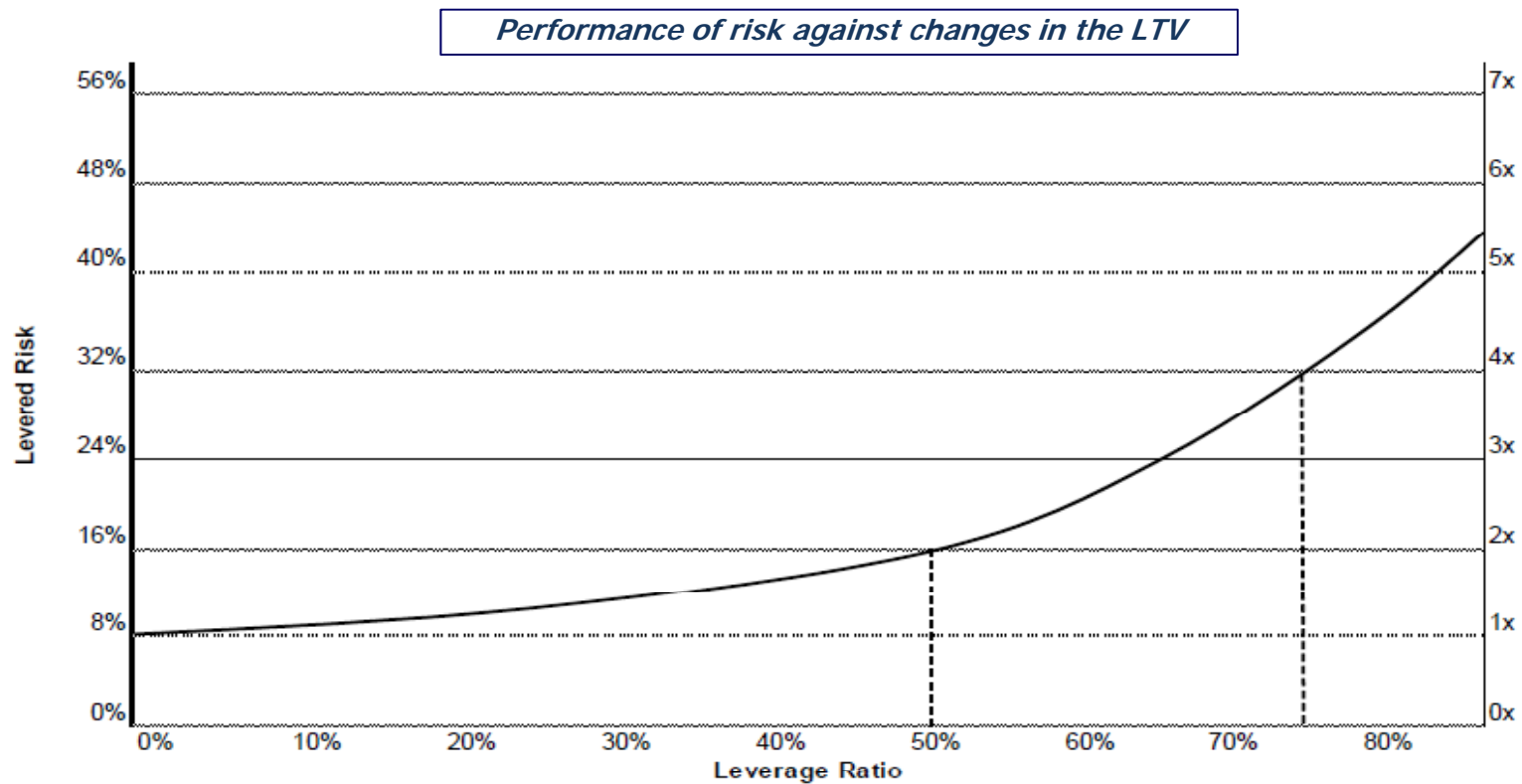
- the LTV
- the spread between total return and debt servicing costs



Note: Analysis assumes a 9% unlevered return and a 7% cost of debt.

5.4 The effect of financial leverage on risk

The risk of an investment, measured in terms of volatility of returns, increases as the leverage of an investment increases.



Note: Analysis assumes an 8% unlevered risk and a 7% cost of debt.

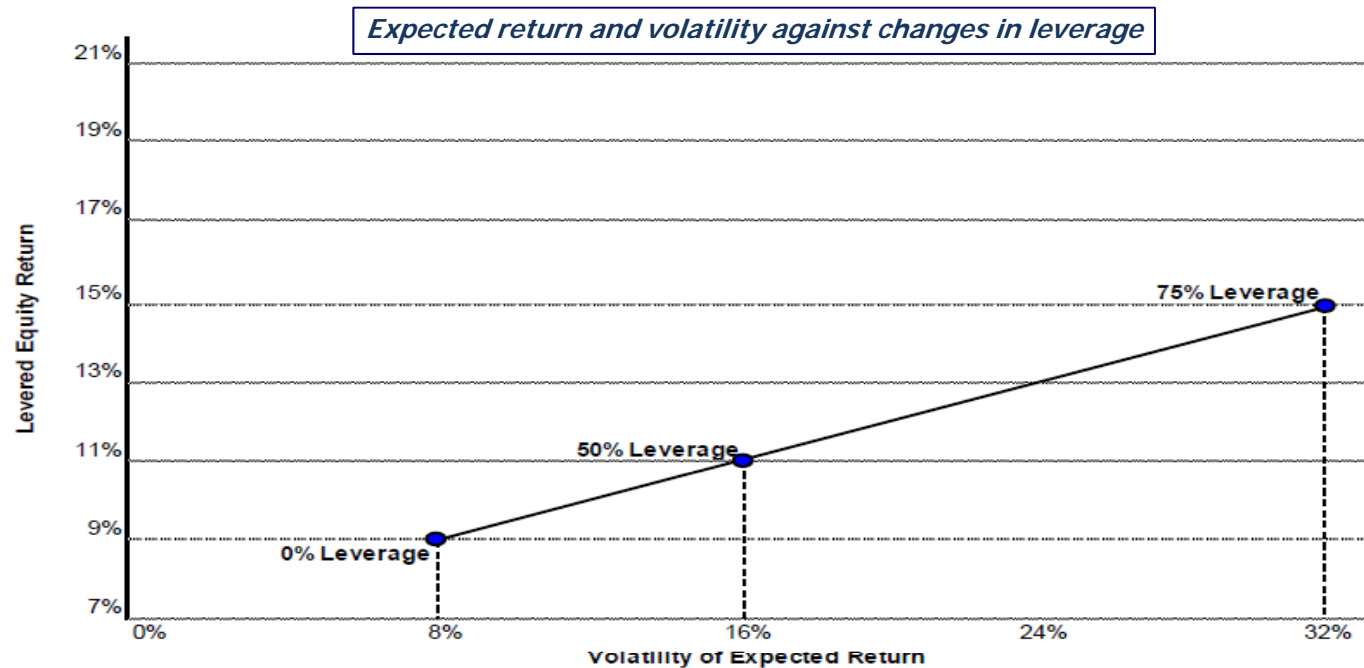




5.5 The theorem of “No Free Lunch”

There exists a **trade-off** between risk and return, known as “No Free Lunch theorem”.

It implies that, in absence of market imperfections, **the returns generated through financial leverage will be completely offset by a related increase in risk**, this means the risk premium being constant at any level of financial leverage.

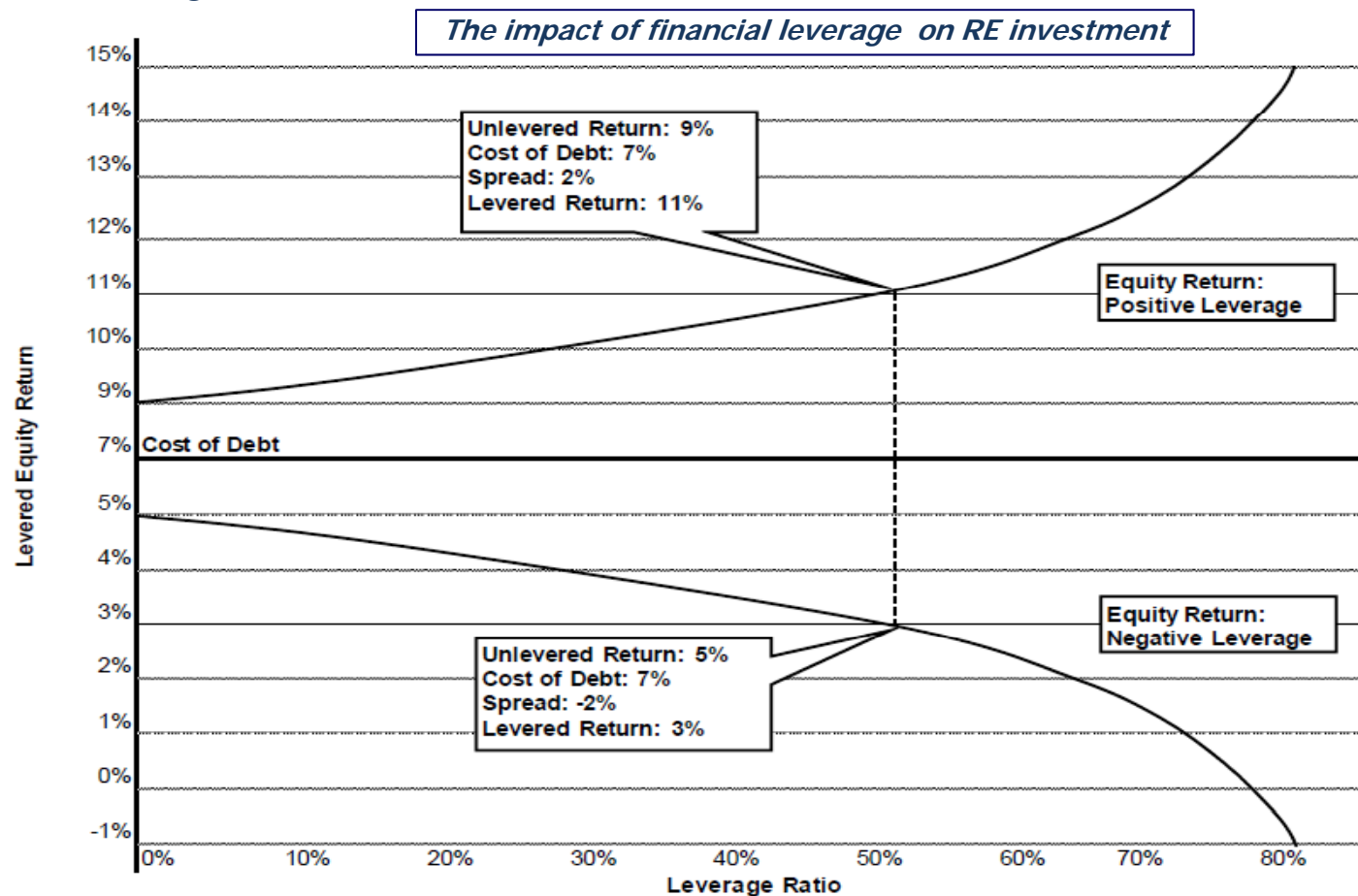


*Note: Analysis assumes a 9% unlevered return, 8% unlevered risk and a 7% cost of debt.
Risk-adjusted returns are equal to: (levered return - risk free rate) / return volatility.*



5.6 The mechanics of financial leverage

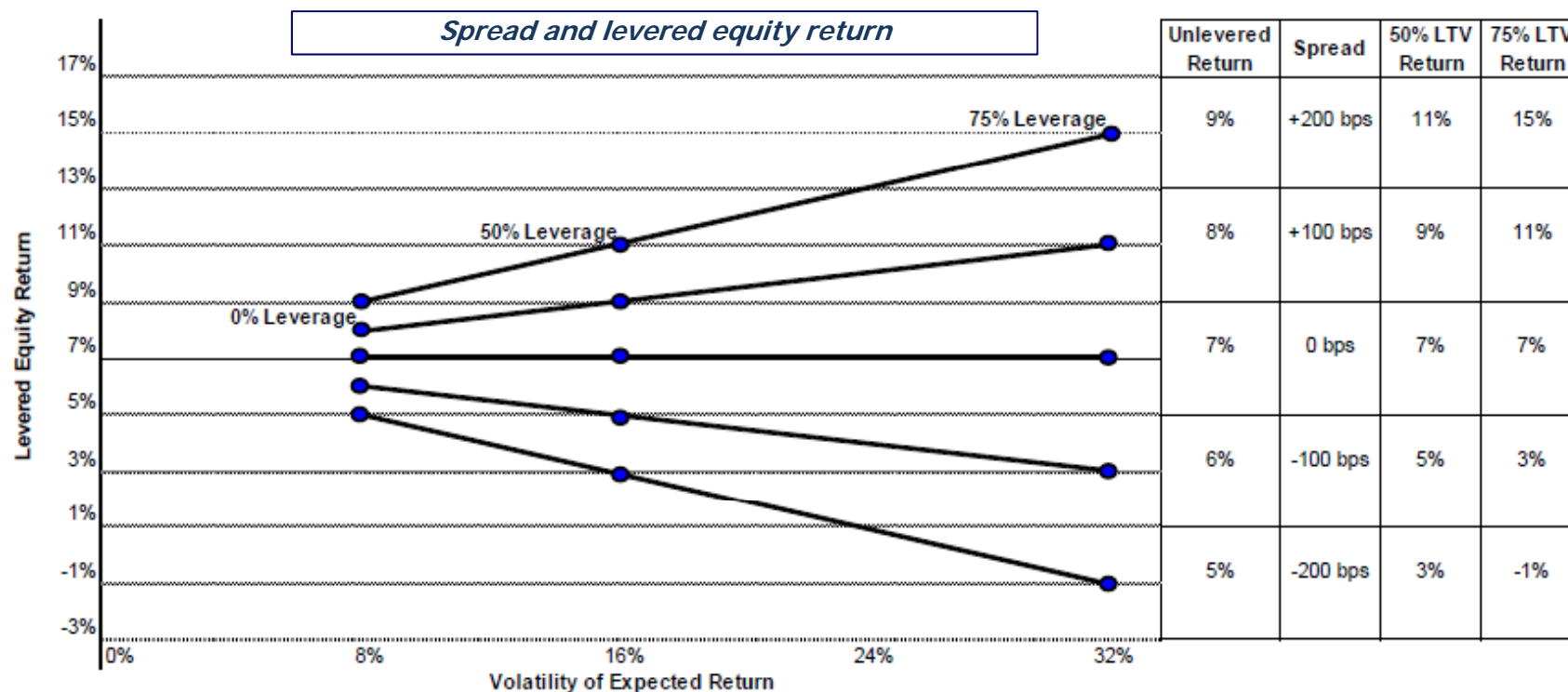
Returns are by definition uncertain, as a consequence the decision to use financial leverage could lead to a result for investors which may be either positive or negative.



5.7 The effect of the spread

The element which determines the effect of the use of financial leverage is the **spread between the unlevered total return and debt servicing costs**.

As a consequence a clear identification of the spread within a RE investment is of primarily importance.



Note: Analysis assumes a 7% cost of debt and a 8% unlevered risk.



5.8 When to use financial leverage

The effective use of financial leverage is based on the answer to the following questions:

- *What is the spread between expected unlevered total return and debt servicing costs?*
- *Is the spread sufficiently broad in order to offset the greater risks which financial leverage requires the borrower to take on?*
- *Are there satisfactory alternative investments for equity capital not used in the project?*
- *Are cash flows expected to be sufficiently stable and will they increase sufficiently?*
- *What is the degree of certainty for the assumptions underlying the investment plan?*

Contacts

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