ProMS®

How much risk does leverage add to commercial property portfolios?

Radley & Associate

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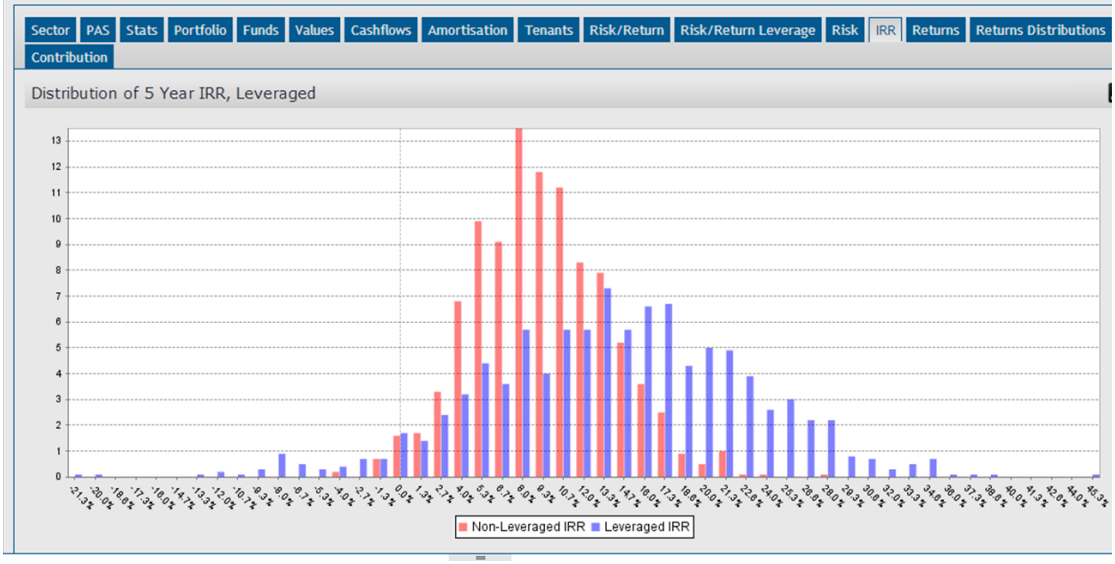
Summary findings

Although leverage may enhance investment returns it is likely to increase risk. In this exercise we model a representative IPRE portfolio to act as a case study for a discussion about leverage and risk.

In our example portfolio, adding fixed rate leverage of about 56% (loan-to-value) to a sample mixed portfolio of investment assets valued at £89 million, increased the expected gross 5-year IRR from 9.9% to 14.6%. However the volatility of the expected returns (measures by the standard deviation of the 5-year IRR) also increased from 4.4% to 8.7%

5-year IRR distribution for leveraged and un-leveraged portfolio



Background

A mixed UK investment portfolio of 9 buildings, valued at £89.4 million, was simulated through a set of 2,000 correlated scenarios for ERVs, inflation, sector yields, inflation and long and short term interest rates* using ProMSinvestor, a CRE risk management system and simulation model. The equivalent yield of the portfolio was 7.01% and it contained a mixture of over-rented, under-rented and vacant units. The loan was assumed to be for £50million on a fixed rate of 5.02% for 10 years.

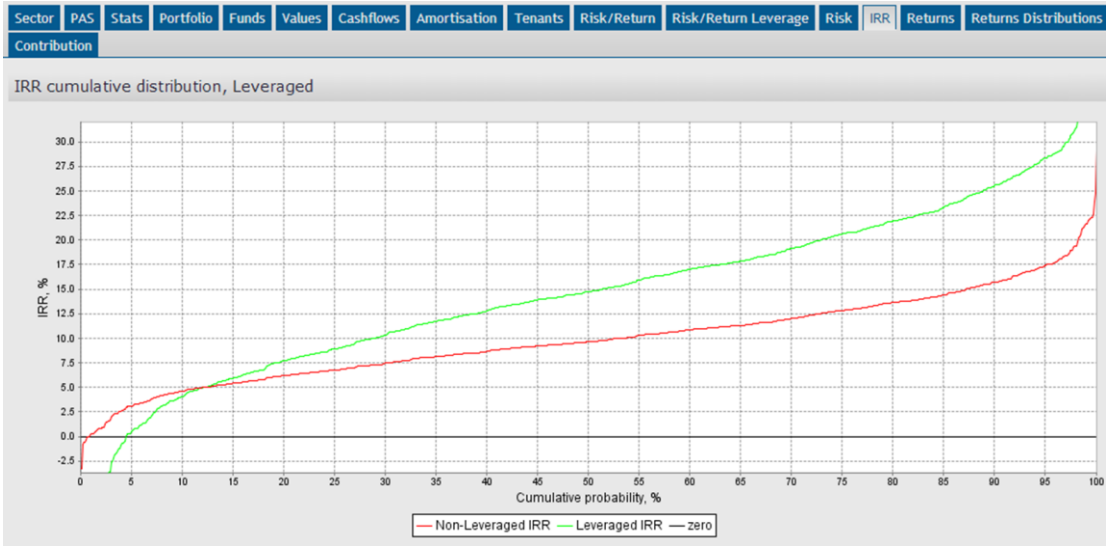
How likely is leverage to be advantageous?

The expected portfolio returns are higher with leverage in all but 12% of scenarios. However the tail risk for the leveraged portfolio is significantly higher:

* Using 2012Q4 investor standard scenario set provided by Radley & Associates.

at a 1% confidence interval (one in a hundred year event), we can say that leveraged 5-year IRR would be -7.8% whilst unleveraged returns would be 0.26%.

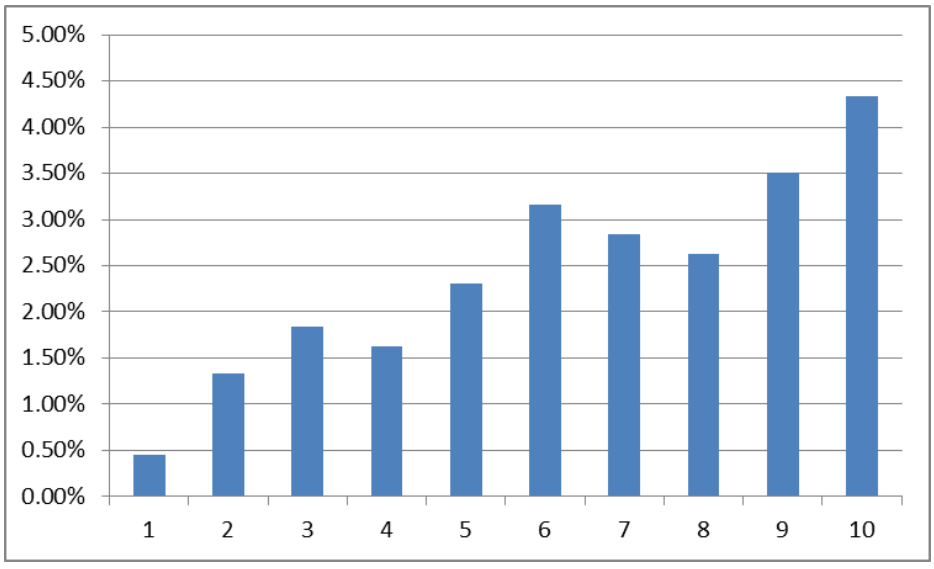
Cumulative IRR distribution for leveraged and un-leveraged portfolio



Loan covenants

The analysis also shows that, with leverage, the probability the equity value of the portfolio is negative is less than 1% throughout the 10 year period of the loan. However, there is a more significant chance that a 75% LTV loan covenant might be breached. Over time, the probability of a covenant breach rises to about 4.4% in the absence of refinancing or collateral enhancement.

Probability of breaching a 75% LTV covenant during the life of the loan by year



Impact at the asset level

The impact of leverage on individual assets is much more marked than at the portfolio level. Assets with lower expected returns suffer not only in terms of reduced expected IRR but also in terms of increased volatility. In this sample portfolio, the strong increase in returns (and more modest increases in volatility) for assets A008 and A009, result in improvements that compensate for deterioration in returns and/or significant increases in volatility of most of the rest of the assets. A reconfiguration of the portfolio in advance of contracting leverage could result in significant investment improvements.

Impact of leverage at the individual asset level

Asset	IRR	Volatility	IRR with leverage	Volatility with leverage	IRR increase	IRR volatility increase	Risk adjusted return impact
A002	5.83%	3.58%	6.18%	7.59%	0.35%	4.01%	-3.66%
A003	6.88%	3.66%	8.53%	8.69%	1.65%	5.03%	-3.38%
A004	4.45%	5.04%	1.45%	19.08%	-3.00%	14.04%	-17.04%
A005	6.31%	5.02%	5.91%	15.76%	-0.40%	10.74%	-11.14%
A006	9.81%	5.22%	14.21%	11.35%	4.40%	6.13%	-1.73%
A007	11.19%	4.12%	17.28%	7.70%	6.09%	3.58%	2.51%
A008	18.67%	6.07%	29.20%	10.09%	10.53%	4.02%	6.51%
A009	15.84%	5.50%	25.80%	9.45%	9.96%	3.95%	6.01%
A010	5.73%	6.85%	2.91%	24.18%	-2.82%	17.33%	-20.15%
Total	9.92%	4.44%	14.64%	8.71%	4.72%	4.27%	0.45%

Conclusions

Choosing the optimum level of leverage is not straightforward: metrics such as the Sharpe ratio ((Expected IRR – risk free rate)/IRR volatility) are higher in almost all cases with leverage. However, in today's markets, where investors appear to be willing to sacrifice 1% of returns for a reduction in 1% of volatility[†], the leveraged portfolio appears more attractive. But risk appetite could differ for each end investor. This type of analysis can provide the framework for an informed discussion about leverage and risk

Questions

A complete set of data for the test portfolio and a detailed description of the methodology used are available from: Charles Cardozo (020 7794 8202) *charles.cardozo@radleyassociates.com*

[†] Based on 1.7% 5 year gilt, 5 year average total return of FTSE100 of 9.7% with standard deviation of 8.0%. This is the basis used for calculating risk adjusted returns.

Radley & Associates is an independent firm dedicated to the development of advanced simulation based analytics for the Commercial Real Estate industry. Our clients include leading banks, fund managers and REITS. We have deep expertise in property, simulation modelling, econometric analysis and risk.

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