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The great property price panacea

June 2008

Property derivatives aren't anything new in the UK commercial property market, but they could experience more explosive growth across the pond, where commercial property prices are poised for dramatic falls in the wake of the subprime crisis. Peter Andresén takes a look at the beginnings of the property derivatives market in the US and analyzes how the instruments can be of use to both investors and lenders alike.

When property prices are rising there is little need to consider the risks. However, following a period of five years in which US commercial real estate prices effectively doubled, the effects of the collapse in the residential subprime market have now also begun to be felt in the commercial market.

Structures for mitigating such price volatility have now gained renewed attention. In particular, focus has been cast upon the nascent property derivatives market. Property derivatives are contracts that allow an investor to take a synthetic position in the commercial real estate market by betting on the movement of a commercial real estate index. In the UK, the property derivatives market has ballooned over the past couple of years to an estimated size of more than £10 Bn in 2007, more than twice the size of the market the previous year.

Derivatives contracts are typically structured as either forwards or swaps. Forward contracts are the most simple type of property derivative and allows an investor to buy or sell a contract that will pay out a fixed multiple of the property index at a fixed time in the future. In return the investor pays a fixed price.

Swaps, or total return swaps, on the other hand are more complex derivatives that involve exchanging property index returns for LIBOR, plus an agreed margin.

In the UK, property derivatives are typically based on a property index published by the Investment Property Databank (IPD). FTSE has also recently launched competing indices. Although the UK has seen the largest property derivatives market in Europe, IPD publishes its index for most western European countries, and derivative contracts can, therefore, be specified by geography and sector.

Although the property derivatives market in the US is only in its infancy, some commentators are estimating that it could grow to more than $100 Bn over the next three to five years.

The two key requirements for establishing a robust commercial real estate derivatives market is a reliable real estate index and enough trades to create liquidity for investors. Hitherto, property derivatives in the US have been based on the National Council of Real Estate Investment Fiduciaries Index, but volume has been small due to restrictive licensing of the index.

In expectation of a much larger potential, several initiatives have been launched recently to facilitate a viable market for commercial real estate derivatives. The Chicago Mercantile Exchange, for example, is launching an exchange-traded platform for futures and options on futures based on the S&P/GRA Commercial Real Estate indices, while the International Securities Exchange is launching its own derivatives products based on the REXX commercial real estate index.

So far, institutional investors are showing some interest in using real estate derivative strategies for additional risk management. Pension funds are now poised to use property derivatives to attain their real estate allocation targets. The market is set to take off.

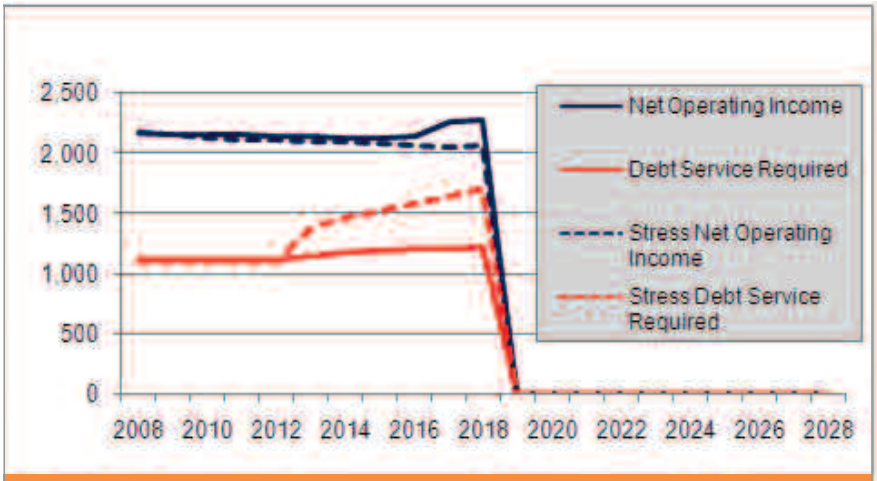

Figure 1. Net operating income vs. debt service required ($k)

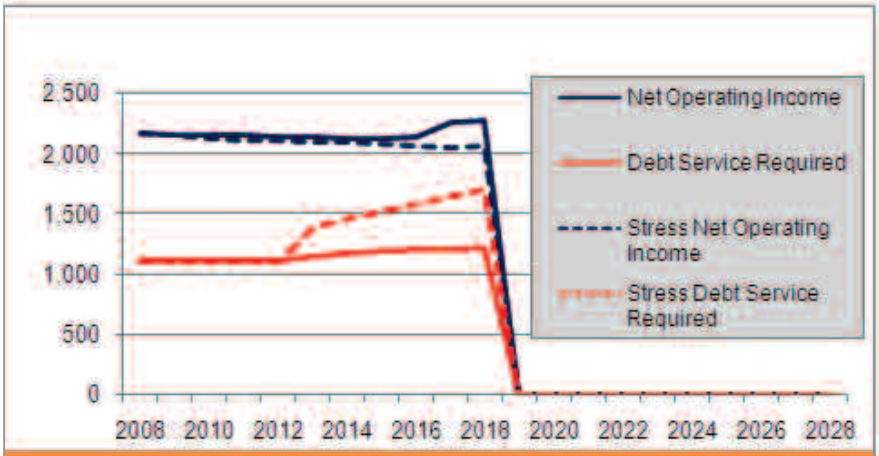

Figure 2. Net operating income vs. debt service required ($k) - with property derivatives (forward)

To date, most of the interest in the property derivatives market has been from traders and institutional investors who are using them as part of their portfolio allocation strategy. However, the most direct impact may be on the structuring of individual commercial real estate deals. With the ready availability of derivatives contracts, new risk-mitigating structures can be incorporated into deals to benefit both investors and lenders.

The simplest, and perhaps most obvious, use of a property derivative, is the use of a forward contract to mitigate the refinancing risk of a deal. This is the risk that at the maturity of a loan, the property value has dropped to such an extent that there are insufficient funds to repay the remaining outstanding balance of the loan. By selling a forward contract for the projected value of the property at the time of maturity, a more stable loan-to-value (LTV) ratio can be ensured as the investor will receive a payout from the contract if the property index falls, which can then be used to pay down the remaining loan.

Although the use of a forward contract reduces the refinancing risk, it also reduces the investor's potential upside if the general property market rises, but, with lower risk, lenders will be more willing to finance a project.

The caveat to such a strategy is that it requires the involved parties to have sufficiently advanced tools to adequately assess and quantify both the inherent risk within the deal and the degree of risk mitigation provided by the inclusion of a derivatives contract. As such, traditional semi-quantitative approaches for assessing the risk of deal, such as scorecards and stress testing, are not sufficient. Scorecards cannot capture the quantitative implications of adding a property derivative, and although stress testing does provide a quantitative view, it only captures the impact for one possible future scenerios and not all possible combinations of events that could lead to default.

The question that needs to be answered is whether the reduction in risk is sufficient to justify the trouble and cost of using a property derivative. Answering this question requires a detailed view of the risk within the deal which can be provided by advanced cashflow simulation. As with stress testing, this approach also makes use of cashflow analysis, but is also based on the concept of generating a stochastic macroeconomic scenario with standard deviations and correlations based on historical market data, and feeding this scenario back into the cashflow model.

By generating a large number (1,000 - 10,000) of such stochastic macroeconomic scenarios and running a cashflow model in each instance, results can be collected and analyzed in a statistical framework. Each scenario represents one possible evolution of a future economic condition. It is then possible to extensively explore and analyze the future performance of the deal under many complex circumstances.

This approach goes far beyond the standard stress test which only provides insight into a limited number of simplified variations of the expected future economic path. In particular, due to the correlations built into the macroeconomic scenarios, the effect is to analyze all possible results of the interaction of all the variables within the model, in other words, one is effectively providing the probabilistic answer to all possible what-if questions.

To illustrate the above, let us consider a deal for a small office complex in New York. The office is currently valued at $23.5m (2008) and is fully occupied with five tenants. The largest tenant is responsible for 56% of the available square footage under a lease that expires in 2017. The deal is supported by one loan with an outstanding balance of $20.0m (LTV = 85%) and maturity in 2018. The debt is fixed rate until 2013, after which it converts to a floating rate. It has fixed principal and interest payments of $1.6m per year. Debt service coverage ratio (DSCR) = 1.35.

Figure 1 shows the standard cashflow analysis for the deal, comparing net operating income (NOI) to the debt service required (DSR). It is evident from this comparison that the deal is healthy with sufficient NOI to service the debt until maturity. Figure 1 also shows the results of a standard stress test with property rents dropping 10%, property valuations dropping 15% and interest rates increasing by 25 basis points per year. Even under this

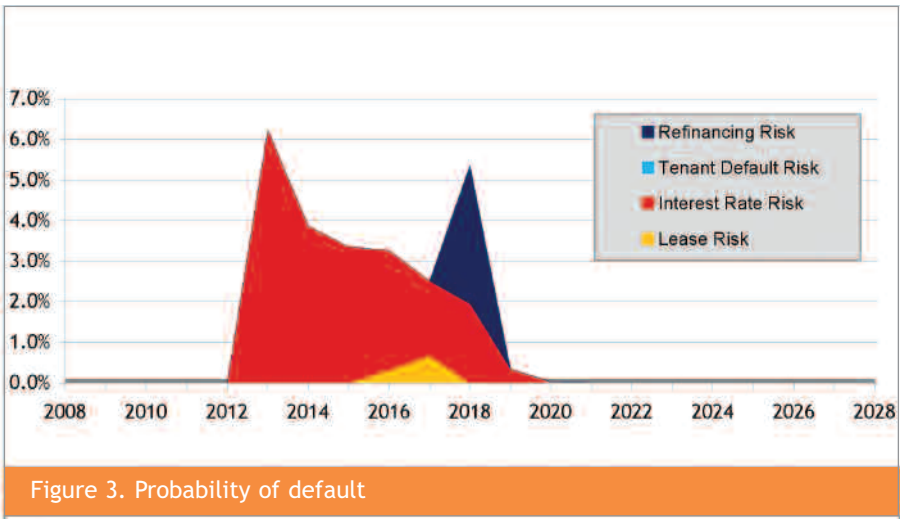

Figure 3. Probability of default

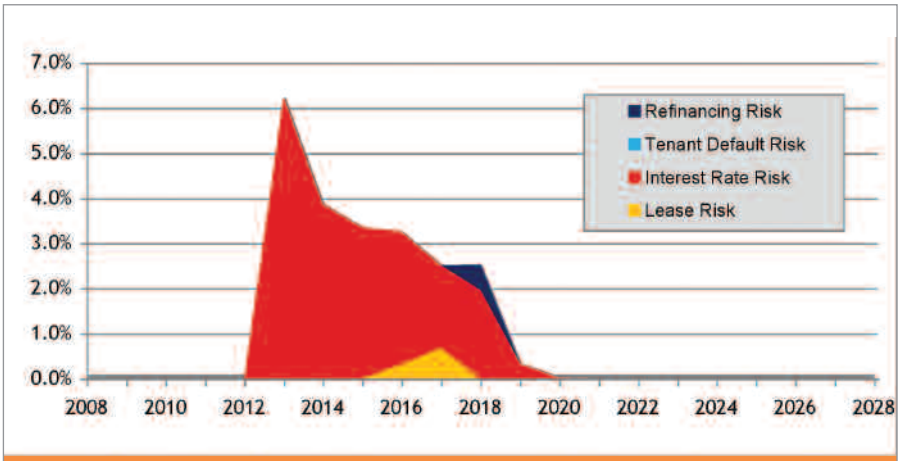

Figure 4. Probability of default with property derivatives (forward)

scenario the deal looks fundamentally healthy, and it still refinances in 2018 as planned.

However, if the economic conditions become sufficiently severe, with property prices dropping substantially below the current level (e.g., 30%), the deal may have trouble refinancing as expected in 2018. One might then consider adding a property derivative to smooth out the deal.

Assuming now that a forward contract can be sold with expiration in 2018 with a strike-price based on current non-stressed property prices, Figure 2 shows the results of the standard cashflow analysis as well as the stress test. Both the base case cashflows as well as the stressed cashflow are virtually identical to the ones presented in Figure 1, and the effect of the property derivative is not evident from this analysis (although one could imagine applying increasingly severe stress case conditions until the impact became apparent).

The inherent refinancing risk and the impact of adding a property derivative to the deal does become very clear when reviewing the results of an advanced cashflow simulation. Figure 3 shows the annual probability of default for the deal in its original state, without a property derivative. One of the strengths of advanced cashflow simulation is that it is able to 'untangle' the risk and identify individual sources of risk. Figure 3 shows that the inherent risk in the deal consists of three components: interest rate risk due to the debt going from fixed to floating rate in 2013, lease risk due to the lease expiry of the anchor tenant in 2017 and refinancing risk in 2018.

Figure 4 shows the results of the advanced cashflow simulation when the property derivative is applied to the deal. Clearly it significantly reduces the refinancing risk of the deal, while all other sources of risk remain the same. The analysis obtained by using advanced cashflow simulation provides a means to quantify the value of the derivative. It also allows for the direct comparison of the reduction in risk, as provided by the derivative, to the cost of obtaining the derivative. This helps decide whether to add a derivative to the deal.

Since the deal exhibits significant interest rate risk, a similar analysis could be run to quantify the effect of adding an interest rate derivative, such as a cap, to the deal. It is almost always the case that the value of reducing risk through the addition of a derivative will be greater than the associated cost, because the wasted administrative and legal costs of default are avoided.

In summary, the property derivatives market is expected to grow significantly in the next few years as traders and institutional investors catch on. Traders will bring their quantitative approaches to derivatives pricing to the competitive commercial real estate market. For commercial real estate professionals to also be able to take advantage of the opportunities these instruments provide, they will have to adopt more advanced quantitative methods for valuing risk in their deals. The ones who succeed in this market will be those who can price, trade and structure transactions using the full range of market knowledge and quantitative skill.

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