PropertyWeek.com

Property needs to learn correct pricing for derivatives

17 December 2010 | By Markus Wolfensberger

Property derivatives are receiving great attention and support because they have much to offer in bringing greater transparency, liquidity and efficiency to the property market

However, before these benefits can be realised, there is a need to address a substantial knowledge gap in the industry that causes derivatives to be misunderstood and mispriced.

It is important to recognise that an investment in property using derivatives looks very similar to a traditional investment in the direct market that is fully funded by a loan.

Consider a direct property investor who expects to receive the rental income, and any capital gains or losses from his buildings, while paying the funding cost of the loan. With a property derivative, the investor enters into a similar arrangement: he receives the total return of the Investment Property Databank (IPD) index and agrees to pay a fixed rate. The risks and rewards are similar and, accordingly, the fixed rate should primarily be thought of as a financing rate.

This sounds simple enough, yet the rate regularly trades above and below fair value, and understanding what fixed rate to pay in a derivative contract is the fundamental issue that the market is grappling with.

Unlike other forms of indirect real estate that can deviate from their true value indefinitely, a derivative agreement has a fixed maturity, at which point the payout is always and exactly the IPD total return minus the fixed rate. This exact link to IPD returns is precisely why an investor must ensure that he or she is pricing property derivatives consistently with the properties in the IPD index.

A simple example illustrates why a commonly held view of pricing derivatives is inconsistent with those property prices.

Direct property example

You are offered an investment in a physical building for its fair market price of £100m with 7% stable returns.

If your investment horizon is four years, you would expect to earn 7% x four years = 28%.

How much should you pay for this property?

This seems like a trivial question: clearly you should pay the fair market price of £100m.

Now consider the same investment made through a derivative.

Derivative example

You are offered a £100m notional investment through a four-year property derivative.

IPD forecast returns are 7% over those four years.

When property derivative investors are asked what rate they should be willing to pay for this derivative investment, a common answer is "up to 7%". However, this answer is the same as suggesting that you would pay up to £128m for the building in the first example.

The error in this reasoning should be immediately apparent: regardless of whether the forecast return is 7% or -10%, paying any price other than the property's current market price – in this case, £100m – would be irrational. This is why you have been hearing the phrase, "Property derivatives do not forecast." The market price of the physical property already reflects the consensus forecast and all of its associated future cashflows. It would make no sense to pay for the same forecast cashflows twice.

Compound error

An extension to this error is quoting a "derivative implied" capital value loss. This loss is calculated to exactly offset expected future profits. Although widely followed as a forecast, the equivalent is to say that we expect the building value to drop 28% in four years (minus funding costs). This is clearly not true and illustrates that implied capital losses are simply mislabelled expected profits.

The correct pricing for property derivatives is one that makes an investment in derivatives economically equivalent to one in the physical properties, while giving consideration for the derivative's benefits. Fixed rates for future years should be thought of simply as a financing

rate. When that rate is above one's own funding rates, it is a free gift to sellers to be exploited. And the same is true for investors when it is below.

Further common mistakes and explanations can be found at propertyweek.com/derivatives in Part II: Pricing Property Derivatives.

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Part II: Pricing Property Derivatives

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In Part I we pointed out that some property derivatives users have been pricing derivatives inconsistently with their underlying physical properties. In Part II, we set out to explain the concepts further and provide a simple framework to arrive at better derivative valuations.

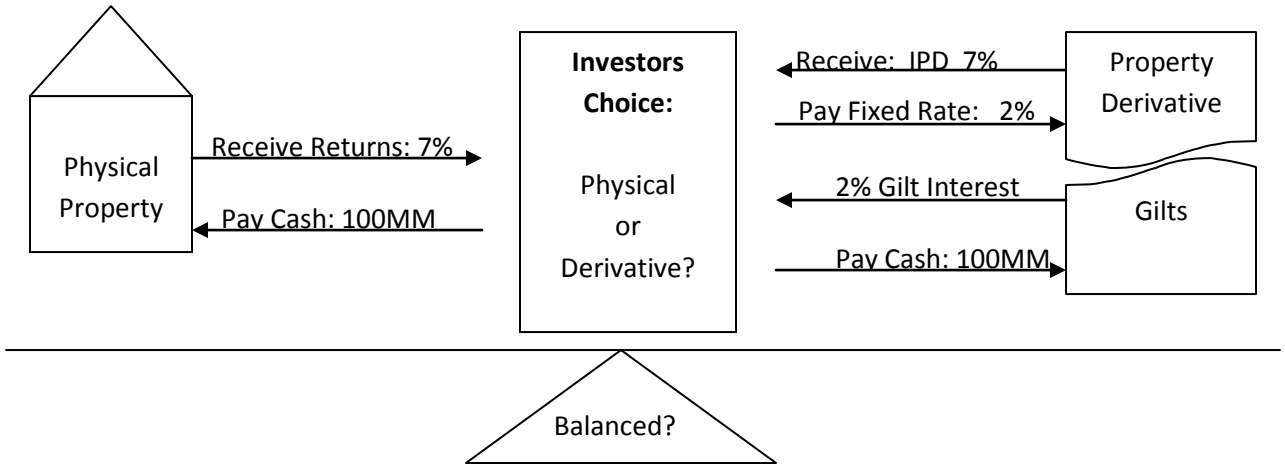
The question at hand is "what is the correct pricing and what do derivatives tell us?" In our earlier piece we pointed out that the industry unwisely looks to derivatives to imply future capital gains/losses. The way the number is calculated starts with the incorrect belief that derivatives should have zero expected future returns. This belief is probably rooted in the fact that derivatives require little to no outlay of capital to enter. The common practice is to derive a market implied capital value gain/loss by calculating a property's expected profits, defined as income minus funding, and then declaring that the property value must drop by that exact amount, thus achieving the zero return. It should be obvious why this is incorrect, foremost because the derivative shares in all the risks and rewards of an investment in physical property. No one invests in property for zero expected yield. This practice of quoting these implied capital value losses is unfortunate as the information is widely misused. Sellers think they are selling at levels below current physical prices. This is false. They are selling at today's price, for which they are giving up all future revenues from owning property. Buyers are wary because they wrongly think this implies an impending fall in capital values. It would be fortunate for all if the market finally came to recognize that these widely disseminated numbers say nothing about expected moves in capital value.

Pricing

A better approach is to recognize that "the correct pricing for property derivatives is that which makes an investment in derivatives economically equivalent to one in the physical properties while giving consideration for the derivative's benefits." To be economically equivalent, and knowing that derivatives have maturities, we must choose an investment horizon for property. In our earlier example in Part I, we used a four year horizon on a building with 7% expected total return. For the derivative, we shall first price the simplest example, a forward starting contract. This means that if today is Sep 30, 2010, we might buy derivatives to give us IPD returns from Dec 31, 2010 (a date that is forward of today's date) to Dec 31, 2014. For benefit of simplicity in the example, we shall assume the following:

- We will ignore the value of greater liquidity and lower transaction costs that derivatives have.
- We will assume that this physical property's return is in line with the IPD Index (7%).
- We will assume that Gilt rates for 4 years are 2% in every year.

Investing in the derivative rather than the physical property leaves one with un-invested cash. This cash must be invested, but to keep the risks equitable one cannot invest in any risk bearing assets, and is thus compelled to purchase the safest alternative, Gilt securities earning 2% per year.



The correct pricing for the derivatives' fixed rate payment is then 2% since this would equate the returns of the derivative with the 7% returns of the physical property. You can see that when the fixed rate and Gilt interest are equal, they simply cancel each other out, and you are

left with the same cashflows as the physical property. Thus, the correct pricing for the fixed rate in the forward starting derivative is simply the time value of the cash (interest rates).

This example was for a derivative that started in the future. There are two adjustments to make when you price a derivative that is starting now or in the past. While it might seem odd to have an agreement that starts in the past, the benefits of standardization mean the market trades agreements in calendar year increments. In the next example we will assume that today is again Sept 30, 2010. We wish to invest starting today, and to receive the returns for this October, November, and December we will trade a contract that starts Dec 31, 2009 and ends Dec 31, 2014.

1) Because the derivative will pay you a full twelve months of returns for 2010, you will also receive the nine months (Jan to Sept) you don't deserve since you didn't own the position. Sadly, you must pay back these nine months to the seller. Thus, if the IPD returns had been 10% to Sept 30, you would increase your first year's fixed payment by that 10%.

2) The second adjustment is closely related to the first but with a subtlety. The IPD index is a lagging index. The capital values reflect property appraisals that may have happened months ago, and the appraisers may have used comparables which are themselves stale. Thus physical market prices will likely lead the IPD and be at a premium or discount to the latest IPD Index. Note that this is not a forecast; this is today's true property market value. This premium or discount must also be reflected in the fixed payment for the first annual contract. For instance, if properties are 3% higher than the last IPD levels, then the first year contract price should be increased by that 3% since we already know today that the IPD will rise by that amount. Why don't we deserve these 3%? Because the market price rose in the past, a time that we didn't own the investment.

These adjustments only affect the first year's derivative, and thus to come up with a four year number, you will need to calculate them individually and then blend them. While it would be most correct to calculate the blended rate using discounted cash flows of the individual years, for our purposes and especially at these low interest rates, it's fine if we simply average them. These rules define the fundamental building block that represents a neutral fair price.

Relaxing Assumptions

Now that we have defined a simple framework with simplifying assumptions, it's time to relax the assumptions for a more general application. We have previously stated that we must give pricing "consideration for the derivative's benefits". An investor in a property derivative buys property returns with increased transparency, liquidity, cost efficiency, diversification, and leverage compared to physical property. These are all substantial benefits for which an investor should be willing to pay extra for. In some cases it may be quite attractive paying significantly over funding rates. The hasty conclusion might be then that property derivatives should trade above their equivalent physical property prices. But the seller is in a surprisingly similar situation as they benefit equally from each of these attributes. There is a difference however in that the buyer has a choice between property derivatives, physical property, listed and unlisted vehicles. The seller's reality is that property derivatives are the only practical way to either hedge property values or to sell the property market short, thus a seller might be perfectly happy with a fixed rate well below funding or even negative. While the buyers and sellers advantages may seem to net to zero, the lack of alternative for sellers would naturally create a negative bias, which we saw quite dramatically in a mature US CMBS Index Swap market.

Funding costs are also very specific to the investor. A UK pension fund with spare cash should arguably use Gilt rates for their funding rate, because that's the income they can generate with their cash without incurring substantial additional risks. A leveraged REIT should use their own REIT debt yield, and a direct property investor using leverage should use their mortgage rates. A bank hedging its portfolio should use LIBOR since that's where it will likely fund itself. The rates used should also match the period of the derivative. For instance, use a three year funding rate for a swap maturing three years from today. When you look at forward calendar years, you must use forward calendar funding rates.

The final word in fixed rates is that the motivation to trade is personal. We have identified a general framework for fair value pricing, but each investor and hedger is perfectly justified paying through this fair value as long as the benefits of the derivatives over alternative assets outweigh the premium paid.

Finally, we leave you with a kernel of thought that is rarely fully appreciated. The ability to buy and sell at a future date for a future price, when that price is unknown, has no value. This has implications for both property and derivatives. Owning a physical property gives one freedom

to sell at any point one chooses, and while everyone is convinced they will sell at the top, few do. In property derivatives, people frequently assess value to knowing something about the future (again a forecast). As opposed to a swap starting today where the purchased IPD level is known, a forward contract starts at a price in the future and ends at a price further into the future. It's important to appreciate that investing in a forward swap is agreeing to invest, but without knowledge of at what property price. One only knows that the property price will be the price at that time. There is no inherent economic value in forward starting swaps other than the value implied by interest rates on your cash, which is where they should be priced. Any thought to the contrary implies that you not only know what the future holds, but also where the market will be pricing that future! Good luck with that.

This pricing framework is not the end, but a productive beginning to get property derivative participants into the correct frame of mind and with an ability to understand how the pricing relates to their investment decisions. The guiding rule to finding one's own fair value should be, "Where am I indifferent between the derivative and my alternatives?"

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