Estimating the Lump Sum

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Rights of Way are often granted for a non-perpetual finite term of years. When such interests are paid for up- front, rather than over time as in a lease, a unique valuation problem arises. The methodology suggested here will address the "term adjustment" in situations when an up front value for a time-limited interest in land is needed.

Often, when appraisers are asked to provide a lump sum market rental payment for use or occupancy of land for a period of time, they estimate value using the sales approach and then develop a market rental by applying an appropriate cap rate to the concluded value. In many appraisals, the next step is to take this market rental and develop a hypothetical income stream for the proposed term of use, which is then discounted to present value using a selected discount rate. The discount rate selection is typically separate from the analysis used to determine the cap rate, and is often accompanied by extensive financial data, rates of return on various terms and quality rated investment vehicles, analyses of published national real estate rates of return and CPI trends over time. The fact is that, when the entire financial component of a transaction is to be concluded in the present tense, all of this investment market analysis is largely irrelevant.

This article will attempt to demonstrate that a discount rate analysis, in the absence of an actual or anticipated payment stream, may not only be unnecessary, but can also be extremely prone to error.

Pitfalls of the Discounted Lease Payment Scenario

The first drawback with this technique is that the income stream is one of the appraiser's creation, and this can vary depending on the appraiser's perception of what the hypothetical income stream would look like. One appraiser might choose a flat rental for the full term of years, while another might index the rental with annual step-ups tied to a presumed inflation rate. Yet another might cite market data showing step-ups at five-year intervals as most appropriate.

Once created, this artificial income stream must be discounted. Then comes the crucial selection of the discount rate. Most appraisers have a pretty well oiled boilerplate for this analysis, complete with up-to-the-minute analyses of various financial instruments, including treasury securities, yields on various quality bonds and

published national real estate rates of returns. In reality, this type of analysis does not apply to a *hypothetical* income stream. In many cases, the result is a separate valuation analysis, which can conclude a value for the interest for time that is not easily reconciled with the value of the total interest, as already concluded. Any attempt to risk rate a hypothetical cash flow using the credit rating of the proposed user can fall flat, since what is being sought is the cash value for a property interest. This value is unrelated to the financial strength of the proposed buyer of the interest. When an interest for time is being sold for cash, no risk factor needs to be added to the rate of return, and when none of the consideration is in the future, no inflation factor needs be considered either. So even if an appraiser elects to use a hypothetical cash flow as a surrogate valuation method, the cap rate should equal the discount rate, unless the hypothetical cash flow is being inflated.

Not surprisingly, the source of most valuation problems for term easements is selecting a discount rate different from the selected rate of return (cap rate). When there is no compelling reason to assume that the income producing capacity of a subject property, or its underlying value, will change other than with inflation, there is no need for a discounted cash flow analysis. Unless the appraiser fully understands this and has expressed a well reasoned justification for selecting a different discount rate, the valuation methodology is probably flawed. It's critical that appraisers also consider the other piece of the pie - the reversion. This is important because it addresses the main "before and after" issue: in the *before* situation, the owner has 100% of the interest being valued, and in the *after* situation, only the reversionary interest. If the before less the after doesn't equal the interest being estimated, there may be some explaining to do.

Consider this case of a 20-year easement to be paid up front:

An appraiser has valued the (perpetual) property interest at $100,000 and has good support for land leases in the market at 10%. After extensive analysis of interest rates and other investment yields in the market, the appraiser concludes that a 20-year payment stream should be discounted at 7%.

The problem is that $10,000 discounted at 7% for 20 years is $105,940, which is more than the conclusion of the total interest! Or how about we make this a 50 year easement where the appraiser makes a good case for a 5% return on land and a 10% discount rate? An amount of $5,000 for 50 years at 10% equates to $49,574, less than half the total or perpetual interest value.

In the first of these examples, the reversion would have to be negative, and in the second, it would have to be enormous. It's possible to have a negative reversion in the event the easement holder is expected to leave a contaminated property and also possible to have a huge reversion in the odd case of an easement over a vein of gold with a 50-year mining restriction. Unfortunately, the above two examples were based on real world appraisals of simple pipeline easements over grazing land with no such characteristics.

The appraisal challenge here is really not so much a discounted cash flow problem as it is a value allocation problem. After reaching a value conclusion for the property or easement interest and an appropriate rental rate, the appraiser has all the components needed to solve this valuation task without resorting to hypothetical income streams and justification of discount rates or application of discounted cash flow models.

Programmed into a spreadsheet, a simple table can be created that calculates the appropriate value ratio for each rate and term.[1] Using the table, appraisers can select their own set of rates and terms.

Value Allocation Table

In reviewing the table, it appears well balanced in that all the numbers stay in the financial ballpark. It makes sense that the higher the rate, the more front loaded the model is. This is consistent with a dollar sooner being worth progressively more than a dollar later, the higher the rate. Then, as we approach financial infinity, even for lower rates, the percent of total value is approaching 100%. This also makes perfect sense.

PERCENT OF TOTAL VALUE OF AN INTEREST FOR YEARS

	Years				
Rate	5	10	20	30	50
5%	21.6%	38.6%	62.3%	76.9%	91.3%
6%	25.3%	44.2%	68.8%	82.6%	94.6%
7%	28.7%	49.2%	74.2%	86.9%	96.6%
8%	31.9%	53.7%	78.5%	90.1%	97.9%
9%	35.0%	57.8%	82.2%	92.5%	98.7%
10%	37.9%	61.4%	85.1%	94.3%	99.1%
11%	40.7%	64.8%	87.6%	95.6%	99.5%
12%	43.3%	67.8%	89.6%	96.7%	99.7%
13%	45.7%	70.5%	91.3%	97.4%	99.8%
14%	48.1%	73.0%	92.7%	98.0%	99.9%
15%	50.3%	75.3%	93.9%	98.5%	99.9%

But watch what happens when you make the cap rate different from the yield rate. The first table below systematically undervalues the interest, never approaching 100% value even after 50 years (or after 500 years for that matter).

CAP RATE 3 POINTS LOWER THAN DISCOUNT RATE

	Years				
Rate	*5*	*10*	*20*	*30*	*50*
5%	8.7%	15.4%	24.9%	30.7%	36.5%
6%	12.6%	22.1%	34.4%	41.3%	47.3%
7%	16.4%	28.1%	42.4%	49.6%	55.2%
8%	20.0%	33.6%	49.1%	56.3%	61.2%
9%	23.3%	38.5%	54.8%	61.6%	65.8%
10%	26.5%	43.0%	59.6%	66.0%	69.4%
11%	29.6%	47.1%	63.7%	69.6%	72.3%
12%	32.4%	50.9%	67.2%	72.5%	74.7%
13%	35.2%	54.3%	70.2%	75.0%	76.8%
14%	37.8%	57.4%	72.9%	77.0%	78.5%
15%	40.2%	60.2%	75.1%	78.8%	79.9%

The second builds in a comparable level of distortion and essentially says that a 20 year leasehold or easement is worth more than the total value of the interest. This type of distortion can really undermine a valuation assignment. The point is that we should not just be concerned about the few numbers that are obviously distorted. They're all distorted.

CAP RATE 3 POINTS HIGHER THAN DISCOUNT RATE

	Years				
Rate	*5*	*10*	*20*	*30*	*50*
5%	34.6%	61.8%	99.7%	123.0%	146.0%
6%	37.9%	66.2%	103.2%	123.9%	141.9%
7%	41.0%	70.2%	105.9%	124.1%	138.0%
8%	43.9%	73.8%	108.0%	123.8%	134.6%
9%	46.7%	77.0%	109.5%	123.3%	131.5%
10%	49.3%	79.9%	110.7%	122.5%	128.9%
11%	51.7%	82.4%	111.5%	121.7%	126.6%
12%	54.1%	84.8%	112.0%	120.8%	124.6%
13%	56.3%	86.8%	112.4%	119.9%	122.8%
14%	58.4%	88.7%	112.6%	119.0%	121.3%
15%	60.3%	90.3%	112.7%	118.2%	119.9%

In summary, when an appraiser has a value and a cap rate, then all the elements are in place to calculate the lump sum value of an interest over time using the simple value allocation formula or table. Even when the assignment is to evaluate the alternatives of taking a lump sum versus an actual payment schedule, the allocation table can provide an important benchmark for the evaluation of a real payment stream.

"If the before less the after doesn't equal the interest being estimated, there may be some explaining to do."

So unless you have a real (and asymmetrical) cash flow to value or you expect value and/or income to change at a rate significantly different than underlying inflation, this little table can serve you well. Appraisers who prefer to take the long route using discounted cash flow analysis should just make sure that, when projecting a flat income stream, the discount rate is the same as the cap rate and when adding inflation to the mix, escalate the income stream at the same inflation rate and load the discount rate with it too. That way you will always reach the same conclusion as the table. ✪

[1] (1-(1/(1+i)n))/(1/i) This formula can be described as "the value of a dollar per year at any given rate and term divided by the value of a dollar capped at the same rate."