Cornhusker Economics

Farmland Valuation: Understanding Income Capitalization and Cap Rates

The income capitalization approach is likely the most challenging and least understood of the three methods that farm appraisers use to inform their opinion of value. In theory, the approach is relatively simple: the income value of a parcel of farmland is simply the present value of the farmland's perpetual stream of net operating income. However, as with many economic approaches and concepts, the devil is in the details. The word perpetual is intentional as the income approach uses the formula for a perpetuity, namely, $V = N/c$, where $V =$ income value, $N =$ net operating income, and $c =$ capitalization rate, or *cap rate* for short. While there are several important assumptions and some requisite mathematical gymnastics to arrive at the perpetuity equation for the income value of farmland, in this article, we'll concentrate on the numerator of the equation, N, and, more importantly, the denominator, c.

Net Operating Income

The numerator of the perpetuity equation, applied to farmland, is the total or per acre net operating income of the farmland being valued, typically annually. Another name for net operating income is the residual return to farmland. While there are several ways to estimate this residual return, it is important to point out that the estimate of N cannot be entirely encumbered from the cap rate, c. Stated differently, the c chosen (or estimated) by an analyst or appraiser needs to be consistent with any assumptions about the nature of N. For example, it is already stated that, typically, N is an annual estimate. This implies that c must also be an annual amount (i.e.,

percent per year). In short, N and c need to be consistent with one another in every way.

Perhaps the easiest way to estimate N is using the cash rent method. Indeed, the cash rent method is ubiquitous among appraisers, brokers, and anyone interested in the value of farmland. To apply the method, an estimate of cash rent, typically on a per acre basis, is obtained from which any expenses required to justify the estimate of cash rent are subtracted, yielding net operating income or the residual return to farmland. While there could be many such expenses, two important ones that come to mind are property taxes and liability insurance.

The ease with which the data required to estimate net operating income is the reason why the cash rent method has become so popular. However, even as easy as this approach is for estimating N, some appraisers and brokers take shortcuts by ignoring expenses altogether, thereby capitalizing gross operating income using the perpetuity formula. The obvious problem with such an approach is that capitalized gross operating income only represents the income value of a parcel of farmland if the cap rate used in the denominator of the perpetuity equation is consistent with gross operating income. However, cap rates (as defined below) are very specific in definition and as such, are always meant to refer to net operating income. If the primary motivation for using gross operating income is speed and relative ease, it would hardly be logical that careful consideration of the cap rate in the denominator had been undertaken. This is because, of the two, the cap rate is typically the more

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challenging to estimate accurately. For this reason, estimates of farmland value based on gross operating income should be treated with skepticism.

Another approach for estimating net operating income is constructing a budget for the entire parcel or on a per acre basis, assuming typical yields, input and output prices, production system, and management ability. This represents a more challenging approach, especially because there appear to be fewer and fewer opportunities for learning how to construct a crop budget appropriately. Regardless, calculated this way, the estimate of the residual return to farmland would not likely be the same as that estimated using the cash rent approach, even for the same parcel of farmland. To understand why, consider that the residual return to farmland calculated using the cash rent approach represents passive income. Whether for an absentee owner or an owner-operator who views cash rent estimated net operating income as an opportunity cost, the residual return to farmland is passive and nearly riskless[1]. The residual return to farmland calculated using a budget assumes an owner-operator situation wherein the landowner bears all the (input and output) price and yield risks. Consequently, one would expect that the budgeted net operating income would typically be higher than the cash rent estimated net operating income. As discussed below, this has implications for selecting an appropriate cap rate.

Many other budgeting approaches are also possible, including various share leases (e.g., 50/50 or 60/40) and leases with flex provisions. In all cases, the estimated net operating income always represents the residual return to farmland to be capitalized at an appropriate cap rate, a subject discussed in the next section.

Cap Rates

As noted above, N and c are a package deal. The specific way net operating income is estimated and what it represents determines the appropriate cap rate required to capitalize the estimate. More clearly, while in all cases, the estimated net operating income is a residual return to farmland, the specific estimate can differ depending on whether, for example, the estimate is obtained via the cash rent method or the owner-operating budgeting method. Yet, there can only be one unique income value associated with a parcel of farmland. It is for this reason that the cap rates are necessarily different between, say, cash rent and owner-operator budgeted net operating income. For example, as noted above, the cash rent method of estimating net operating income typically results in passive income that is nearly risk-free, implying a cap rate that is very near the risk-free rate (something akin to the yield on 10-year Treasury securities). By contrast, the net operating income for an owner-operator is typically much higher and more volatile, implying a cap rate that is higher than the risk-free rate to compensate the owner for the additional price and yield risk.

In the simplest terms possible, a cap rate is a rate of return (on assets). It is an annual percentage return or yield that represents the opportunity cost of dollars invested in a farm property by a typical buyer. It is the next best yield facing a typical buyer on an alternative investment with comparable risk and return characteristics. However, while all cap rates are rates of return, not all rates of return are cap rates. This is perhaps the most confusing issue for those interested in farmland value.

It has become commonplace for analysts and appraisers to estimate a cap rate for a property by expressing the cash rent of comparable properties to observed market (i.e., sales) values and averaging across the comparable properties. This approach is often referred to as the "direct capitalization" method or the "going to the market" method of determining a cap rate. As a simple example, three comparable properties with cash rents and recent sales prices are shown in Table 1.

Comparable	Cash Rent/Acre	Sales Price/Acre	Implied "cap rate"
1	$450	$15,000	$450/$15,000 = 3.0%
2	$410	$12,800	$410/$12,800 = 3.2%
3	$310	$10,000	$310/$10,000 = 3.1%

[1]The landowner likely bears some small amount of (default) risk attributable to the likelihood that a tenant doesn't pay cash rent in full and on time.

The average implied "cap rate" across the three comparable properties would be 3.1%. An estimate of a property's cash rent of, say, $375 per acre would then result in an estimate of "value" of $375/0.031 = $12,097.

There are numerous problems with this approach. First, cash rent, as noted above, is a measure of gross operating income, and it is net operating income that is required to estimate the income value for farmland. Second, Sales Price/Acre is not income value but rather an estimate of market value. By using sales prices, the implied rates shown in the rightmost column of Table 1 are likely too small to be true cap rates since buyers of farmland typically pay for more than just income value. For example, Comparable 1, with an observed sales price of $15,000/acre, may have an income value of only $12,000/acre, meaning that the buyer was willing to pay an additional $3,000/acre to gain control of the resource. The buyer simply paid for more than just the value of the stream of net operating income. A particular parcel of farmland may have never been available for purchase and would complement more than one farmer's farmland portfolio. Investors may seek the return characteristics of farmland and/or its diversification benefits. Potential buyers may also be willing to pay more for farmland if they anticipate a large capital gain in the future. Scarcity, competition, diversification, and anticipated capital gains are all reasonable and applicable explanations for why farmland, more often than not, changes hands at higher prices than the income approach to value suggests.

A more correct estimate of the income value for the property would be to net out property taxes and insurance from the estimate of cash rent and capitalize this result at a rate consistent with the next best yield facing a typical buyer on an alternative investment with comparable risk and return characteristics. Given $375/acre cash rent and assuming $25/acre for property taxes and $5/acre for insurance, an estimated net operating income of $345/acre results. Given the near riskless nature of passive income of $345/acre, an appropriate cap rate may be the yield on a 10-year Treasury security at 4% plus a small premium to compensate the owner for the possibility that a tenant defaults on the rent payment (e.g., 0.1%). This implies a cap rate of 4.1%, yielding an income value of $345/0.041 = $8,415/acre.

Two things worth noting are the impact of risk and the income value of $8,415 compared to $12,097. First, riskier income streams are capitalized at higher cap rates, resulting in lower values. If there were no default risk, the resulting value would be $345/0.04 = $8,625, which is $210/acre higher. While merely an example, the fact that a tenant may default means the asset (i.e., the farmland) is worth a little less than otherwise. Second, the difference of $3,682 ($12,097 - $8,415) is attributable to (1) the difference between using gross and net operating income and, more importantly, (2) using a more appropriate cap rate of 4.1% compared to the implied rate of 3.1%.

When one of the authors (the older one) took Ag Econ 510 - Farm Appraisal from Professor Robert Suter at Purdue University in the 1980s, Suter lectured somewhat derisively about "direct capitalization" or what he referred to in his classic text *The Appraisal of Farm Real Estate* (1980) as the "going to the market" method. His feeling perhaps best summarizes the main issue in this article where on page 296 of Suter (2002), he writes:

"In going to the market to ascertain a capitalization rate, the appraiser is essentially attempting to make his earnings value equal his market value. He has eliminated a very important part of an appraisal. Traditionally, the two values have been established independently and as a check against each other. The value based on income has usually been lower than the value based on the market. This difference should be explained and this is where many appraisers flunk the course."

References

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