Determining Flexible Cash Rents Using the "FlexRent" Spreadsheet

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Background

Traditional crop share rental arrangements have allowed for crop production and pricing risk to be shared between tenants and landowners. However, there has been a trend in Kansas towards more cash rent leases and with fixed cash rental arrangements, tenants bear that risk. Of course, even with fixed annual cash rents, landowners bear the risk of a tenant defaulting on rental payments and the risk of substantial changes in rental payments at the time of lease renewal. Thus, for some landowners and tenants, it may be desirable to allow cash rents to adjust annually (i.e., flexible cash rents) based upon formulas that are mutually agreed upon at the onset of the lease.

Conceptually, flexible cash rents could be based on numerous risk-related factors (e.g., prices, yields, weather, and government factors). The ***FlexRent*** spreadsheet considers three such factors: 1) crop prices, 2) crop yields, and 3) crop revenue (price x yield). With flexible cash rents, some desired level of risk sharing between the landowner and tenant can be obtained.

Base Fixed Cash Rent and Risk Premium

FlexRent assumes that the landowner and tenant can agree upon a base fixed cash rent (*BfixCR*). This should be the cash rent ($/acre/year) expected to be paid over the future time period covered by the lease, if the lease type were a fixed cash rent and not a flexible cash rent. Although the tenant and landowner might agree on any arbitrary value, this value presumably would be close to cash rent market rates in the area.

Compared to share rents, cash rents are generally more risky for the tenant and less risky for the landowner. Typically, investors require compensation for taking on more risk. Thus, when landowners change from share to cash rent, they often are willing to accept a fixed cash rent that is lower than the cash-equivalent of share rents because of the lower risk. At the same time, tenants demand additional returns because they take on more risk with cash rental agreements. That "risk premium" (*RP*) is generally thought to be between 5% and 10% when comparing fixed cash to crop share arrangements. Thus, share-renting landowners who have been receiving an average of $100/acre as net cash equivalents (landowner crop share revenue less crop

expenses paid by the landowner), are often willing to accept 5% to 10% less (i.e., $90-$95/acre) when the lease is changed from crop share to cash rent. Similarly, using *RP* = 5% for example, if $95/acre is the going fixed cash rent in an area, the landowner might require (and the tenant be willing to "pay") around $100/acre in expected net cash-equivalent rents if he (landowner) is to be persuaded to switch from cash rents to crop share rents. That is, the landowner will have an expectation of a higher return to compensate for the yield and price risk they are taking on.

Flexible cash rent arrangements can be designed to transfer virtually any amount of risk from the tenant to the landowner, even to the point where the landowner has greater risk than he would have under a traditional crop sharing arrangement. Thus, depending on the underlying cash rent benchmark, and the level of risk taken by each of the parties to a flexible cash rent agreement, the risk premium might favor either the landowner or the tenant, or it might be 0. In ***FlexRent***, the underlying cash rent benchmark is considered to be the "fixed" value that landowners and tenants are most familiar with – the value that transfers all crop production risk to the tenant. That benchmark is called the base cash rent, and it is denoted by *BfixCR*. Thus, the user-inserted risk premium (*RP*) percent in ***FlexRent*** should generally be positive – because a flexible cash rent arrangement is typically designed to transfer more risk to the landowner than he would have with a fixed cash rent arrangement. Furthermore, because flexible cash rent arrangements can be designed that transfer more risk to the landowner than he would have under a crop-share arrangement, in some cases, the *RP* value may need to be greater than the 5%-10% values suggested earlier. In ***FlexRent***, when the base cash rent is multiplied by (1+*RP*), the result is the annual base flexible cash rent (*BflexCR*) that the landowner is expected to receive (and the tenant pay) on average over the life of the lease: $BflexCR = BfixCR * (1+RP)$.

Crop Prices

Ideally, the crop prices used in developing flexible cash rent formulas would be average prices expected over the future time period covered by the lease. In practice, historical average prices are often used as a reasonable proxy for expected cash prices. Both the historical prices and any real-time prices used in determining a given year's rent must be 1) representative of the area, 2) readily available to both the landowner and the tenant, and 3) difficult to manipulate by the tenant or landowner. Thus, cash rents should not be flexed based on the crop prices actually received by a tenant, but rather on some published price series. Furthermore, the crop prices used in real-time rent determination should come from the same price series as that used in formula development. Thus, if a particular elevator's prices are to be used to determine flexible cash rents, then a historical price series from that elevator would need to be available. In the past we have suggested 10 years might be appropriate to consider, however, given the structural change in the grain markets due to ethanol, it may be more appropriate to use a shorter time

period (e.g., 2006 forward). In most areas of Kansas, a reliable long-term elevator price series might be hard to obtain.

The crop price series we suggest and use in ***FlexRent*** are the crop reporting district (CRD) monthly prices publicly available from the website of the National Agricultural Statistics Service (NASS) of the USDA. Additionally, a substantial historical series is provided in the ***FlexRent*** spreadsheet (note that milo prices are $/cwt.). We believe that the Kansas CRD prices represent a good tradeoff between being locally representative and being readily and publicly available. However, a potential problem with the Kansas CRD price series going forward is that this price series was discontinued beginning in August 2010. Currently region-level prices are estimated each month with these estimates available in the ***GrainSeasonalsCash.xls*** spreadsheet that is posted to the internet (www.agmanager.info/marketing/decisions/). Given that the goal of a flex rent is to pick up "big price moves" from year to year, the fact that these prices are estimated is likely not a major problem. Alternatively, landowners and producers are encouraged to work with their own local price if it is available.

Because it is "differences in prices," rather than actual price levels that drive flexible cash rents, it is not especially important that average crop year prices are used. Thus, to reduce the amount of data handling required of flexible cash rent determination; we believe prices can focus on a single month for each crop. We recommend July for wheat, and October for corn, milo, and soybeans.

Because they sometimes determine prices received by tenants, crop prices used in rent determination must account for government loan prices. Because there are no CRD loan prices, county loan prices should be input into the ***FlexRent*** spreadsheet. Currently, ***FlexRent*** includes only 2011 Kansas county loan prices, as obtained from the FSA's (Farm Service Agency) website, with all prior years filled in with those prices (loan prices have changed little the last few years). In that *expected* loan prices are desired, backfilling earlier years with more recent years' loan prices is not a bad assumption anyway. Furthermore, in the current market environment, the loan prices are not as relevant as in the past as cash prices are considerably higher than loan rates and thus they are not a factor.

In very short (e.g., one year) flexible cash rental arrangements, the tenant and landowner might agree on a "best guess" of the upcoming crops' prices to be used as base prices. In that case, the current price of harvest time futures contracts, along with adjustments for local bases, might be used instead of the historical price series. Alternatively, if forward bids are available for harvest delivery, they could also be used for base prices. As before, the county loan price should be used if projected cash prices are lower.

Whether average loan-adjusted prices, futures-plus-basis prices, or current forward bids are used, the end result is a base price for each crop: *BWprice*, *BCprice*, *BMprice*, *BSprice*, for wheat, corn, milo, and soybeans, respectively. Then, if flexible cash rents are pegged to price, the observed price in a given year is compared to the base price to determine the amount of cash rent to pay that year.

Crop Yields

Because crop yields are much more farm-specific than crop prices, yields used in flexible cash rent determination should be farm-specific. In particular, crop yields should be from the farm actually specified in the rental agreement. It is important that crop yields be reasonable expectations of actual yields, and not merely "targeted" or "no-drought" yields. Furthermore, to foster credibility, we suggest using crop yields directly from crop insurance APH (actual production history) records for the farm being rented. Currently, the crop yield values included in ***FlexRent*** are merely example yields. ***FlexRent*** users must input their own yields.

Tenants and landowners may wish to modify APH yields because of the following. First, crop insurance policies sometimes allow for especially low yields to be supplanted with some percent of county T-yields. When such yields are averaged with actual yields, it means that APH averages might overstate expected farm yields, which could penalize the landowner. On the other hand, for a new farm with poor historical yield records, APH values might understate expected farm yields, which could penalize the tenant. That situation might also occur in time periods of major yield-increasing technological gains. Regardless, whichever series is used for crop yields, the tenant and landowner should both agree that the average historical yield is a reasonable estimate of expected yield over the lease period. All in all, the APH values are a good place to start.

The end result of this section is a base yield for each crop: *BWyield*, *BCyield*, *BMyield*, *BSyield*, for wheat, corn, milo, and soybeans, respectively. Then, if cash rents are flexed according to yield, the observed yield in a given year is compared to the base yield to determine the amount of cash rent to pay that year.

Crop Revenue

If flexible rents are to be determined from revenue rather than price or yield, then a base revenue for each crop is needed. Note that the base revenue for a crop, say wheat (*BWrev*), is NOT simply the base price times the base yield. Thus, *BWrev* is NOT equal to *BWprice* * *BWyield*. Rather, it is calculated, one year at a time, from the historical price and yield series. Then, the series of annual revenues is averaged to arrive at expected or base revenue. In the 10-year

historical framework suggested here, $BWrev = (Wprice_{2002} * Wyield_{2002} + Wprice_{2003} * Wyield_{2003} + ... + Wprice_{2011} * Wyield_{2011}) / 10$.

The end result of these calculations is a base revenue for each crop: *BWrev*, *BCrev*, *BMrev*, *BSrev*, for wheat, corn, milo, and soybeans, respectively. Then, if flexible cash rents are pegged to revenue, the observed revenue in a given year is compared to the base revenue to determine the amount of cash rent to pay that year.

Crops Grown

With a flexible cash rent, crop mix is important. That is because price, yield, and revenue changes are crop specific. What matters is a particular crop's acres as a percent of all crop (wheat, corn, milo, beans) acres. The percentages should be those expected to occur, on average, across the time period of the lease. The ***FlexRent*** spreadsheet has a place to enter those expected acreage percentages (as decimals). These percentage values are referred to as *W%*, *C%*, *M%*, and *S%*, for wheat, corn, milo, and soybeans, respectively. Note that the sum of these four values must equal 1, or 100%. Note also that crops not grown are simply set equal to 0%.

Lease Adjustment Factor

Whether a lease is flexed on the basis of price, yield, or revenue, the amount of flexing can easily be adjusted to accommodate the joint desires of the tenant and landowner. The lease adjustment factor (*LAF*) can range from 0% to 100% (enter as a decimal), where 0% would be no flexing and 100% would be full flexing. No flexing (*LAF* = 0%) would be equivalent to a fixed cash rent. Full flexing (*LAF* = 100%) would transfer all risk associated with the factor of interest (price, yield, or revenue) to the landowner. Thus, choosing a cash rent flexed on revenue and an *LAF* of 100% would result in the tenant obtaining his expected revenue every year – the landowner would take all of the risks associated with price and yield. Such a lease would be more risky for the landowner (less risky for the tenant) than a traditional crop share lease.

Regardless of the choice of which factor to tie flexible cash rents to (price, yield, or revenue), and regardless of the choice of an acceptable *LAF* value, it should be remembered that flexing should be the same above as below the base value, at least in the framework of the ***FlexRent*** spreadsheet. That is, a tenant wanting support (by paying lower rent payments) in bad years should be willing to relinquish profits (by paying higher rents) in good years.

Determining Rents in a Given Year

Using *Wprice*, *Cprice*, *Mprice*, and *Sprice* to denote crop prices observed in a given year, and *Wyield*, *Cyield*, *Myield*, and *Syield* to denote corresponding observed crop yields in the same year, cash rent adjustments (*CRA*, in $/farm acre), are determined according to the following formulas.

. . . when using only prices to flex rents:

$$CRA = LAF * [(Wprice - BWprice) * BWyield * W\% + (Cprice - BCprice) * BCyield * C\% + (Mprice - BMprice) * BMyield * M\% + (Sprice - BSprice) * BSyield * S\%]$$

. . . when using only yields to flex rents:

$$CRA = LAF * [(Wyield - BWyield) * BWprice * W\% + (Cyield - BCyield) * BCprice * C\% + (Myield - BMyield) * BMprice * M\% + (Syield - BSyield) * BSprice * S\%]$$

. . . when using revenue to flex rents:

$$CRA = LAF * [(Wprice * Wyield - BWrev) * W\% + (Cprice * Cyield - BCrev) * C\% + (Mprice * Myield - BMrev) * M\% + (Sprice * Syield - BSprice) * S\%]$$

Using the *FlexRent* Spreadsheet

Cells in the ***FlexRent*** spreadsheet are color coded to aid understanding. Blue numbers are values that the tenant and landowner should modify together until an acceptable flexible cash rent program is agreed upon. These include the base fixed cash rent (*BfixCR*) value and the risk premium (*RP*), which together imply a calculated expected flexible cash rent (*BflexCR*), and the lease adjustment factor (*LAF*), which determines the amount of flexing.

Depending on the *BflexCR* value, if the *LAF* value is set too high, it can be seen that negative rents will emerge – which implies that the landowner would pay the tenant in such years. This is somewhat like a crop-sharing landowner who had helped purchase crop inputs and later ended up with a crop failure. Typically, it is mostly this factor that will be modified by the user, in an attempt to reach an acceptable flexible rent program. If *LAF* is set to 0 then *RP* should be set to 0, as this is merely the fixed cash rent program. As ever larger *LAF* values are considered, the *RP* factor should also be adjusted upwards – because higher *LAF* values are associated with the landowner increasing his risk exposure and the tenant reducing his risk exposure. In most cases, for a flexible cash rent agreement to be acceptable to both the tenant and the landowner, it is important that adjustments of *LAF* and *RP* factors be made with the understanding of both parties to the lease.

The ***FlexRent*** spreadsheet has a test area where the user can insert hypothetical prices and yields. The program then calculates the flexible rent for that test year given that rents are allowed to flex based only on price, only on yield, or on revenue.

Other Concerns with Flexible Rents

What is not covered in the ***FlexRent*** spreadsheet is special government program payments associated with low revenue, for example SURE or ACRE. That is, a landowner may be reluctant to agree to lower rent payments in low-revenue years, when he knows that a portion of that low revenue is implicitly compensated for by low-revenue-type program payments from the government. This is something that should be addressed in the rental arrangement. In ***FlexRent*** this can be handled by inserting "additional" revenue beyond price x yield – in those years where he believes such payments might be triggered. Similarly, ***FlexRent*** makes no allowance for crop insurance indemnities in low-revenue years. But, that can be handled the same way as just suggested, i.e., by arbitrarily inserting an additional revenue value. Obviously, this can get quite complicated and tenants and landowners may just decide to ignore such payments or arbitrarily divide them if and when they come.

It is also important when considering flexible cash rent to check with your local FSA Office to make sure this will lead to undesirable consequences with regards to program payment eligibility. Specifically, landowners typically do not receive government payments with cash rents, whereas they do with crop share arrangements. It is our understanding that a flexible cash rent that flexes up and down with no guarantee (i.e., the landowner has similar risk as crop share) will be treated as a crop share lease. However, if there is some base price or fixed portion to the rent the lease will be classified as a cash rent lease. Regardless of our interpretation, this is something a tenant and landowner should ask about ahead of time, to be sure it is understood whether the FSA considers their particular proposed lease cash rent or share rent.

For those who wish other information on the economics of various rental arrangements, we point them to ***KSU-Lease.xls***, which is available at www.agmanager.info. That spreadsheet is principally designed for generating equitable crop-share lease arrangements. But, it also provides insight for cash rent determination when market cash rental rates are poorly known. Finally, it also has a flexible rent section. That section, although not as thorough as ***FlexRent*** when it comes to assessing risk, allows a bit more flexibility. For example, it allows consideration of a one-direction flex, where a base cash rent is set and flexing then only occurs on the upside.