The Farm Level Economic Impacts of Increased Cash Lease Rates

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Higher commodity price expectations have led to increases in cash lease rates nationwide. This study evaluates the farm level impacts of higher cash lease rates. Current levels of cash rents along with land tenure arrangements of specific farms are instrumental in determining the impacts of increases in lease rates.

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Background:

The increased demand for corn as a feedstock for ethanol production has had an unprecedented effect on commodity markets. Corn price is at an historical high, and other markets are experiencing indirect benefits as a result. The demand for land in the wake of higher commodity prices has translated into historically high prices for crop land. Although the benefit of higher future commodity prices is not yet fully realized, higher price expectations have led to increases in cash lease rates. Inflationary pressures in land markets and increases in cash lease rates will have significant impacts on producers' bottom lines.

The objective of this study is to evaluate the economic impacts of higher cash lease rates for cropland on agricultural producers at the farm level. A simulation model is used to analyze representative farms under various cash lease rates.

Data and Methods:

This study utilizes primary representative farm data in conjunction with a whole farm simulation model to examine the effects of increasing cash lease rates on agricultural producers. The representative farms were created through a focus group interview process and are maintained and updated through return visits every 2-3 years. Twelve representative farms located in major production regions throughout the Southern United States and the Midwest are analyzed under three alternative increases in cash lease rates. Although many of the representative farms represent diversified operations, the farms are classified into commodity groups based on the chief source of income. This study analyzes impacts on four representative

cotton farms (Louisiana, Georgia, Tennessee, and Texas), four feed grain farms (Indiana, Iowa, South Carolina, and Texas), and four rice farms (Arkansas, Louisiana, Missouri, and Texas). The AFPC maintains eleven representative wheat farms; however, they were excluded from this study because of the prevalence of share lease arrangements on those operations. Wheat is subject to elevated production risk in much of the United States, and share lease arrangements are a common way to alleviate some of the risk experienced by the proprietor. Although the representative farms have unique land ownership and lease arrangements, all farms included in the study share the common trait of cash leasing at least a portion of productive acres. Details of land tenure arrangements for each of the representative farms are provided in Table 1. Additional attributes of the farms are available in the August 2007 AFPC Baseline Working Paper (AFPC 2007).

A farm level simulation model (FLIPSIM) developed by Richardson and Nixon (1986) at Texas A&M University is used to analyze the farms under three percentage increases in cash lease rates. The FLIPSIM model utilizes a multivariate empirical probability distribution for simulating stochastic yields and prices, thus allowing projections to incorporate production and price risk. A description of FLIPSIM is available in Richardson and Nixon (1986) and the random number simulation procedure is described by Richardson, Klose, and Gray (2000). Each cash lease rate increase scenario was simulated 100 iterations for a 2005 to 2012 study period. Average annual projected commodity prices, national average interest rates, rates of change for input prices, and rates of change for U.S. land values utilized in the model were obtained from the August 2007 Baseline Update reported by FAPRI (2007).

Three major assumptions were made in this analysis: (1) long-term and intermediate-term debt beginning in 2005 is 20 percent of beginning asset value for all crop farms, (2) the

provisions of the 2002 farm bill are assumed to continue throughout the projection period, and (3) crop mixes and land tenure are held constant throughout the study period.

The following cash lease scenarios are analyzed and changes are reported relative to the **Base** situation:

- **Base** – Utilized cash lease rates collected at last meeting with the representative farm panel and currently used in all AFPC Baseline analyses
- **25 Percent** – Increased current cash lease rates throughout the study period 25 percent over the Base
- **50 Percent** – Assumed a 50 percent increase in cash lease rates over the Base for the entire study period
- **100 Percent** – Doubled the current cash lease rates experienced in the Base scenario

Results:

Impacts of increased cash lease rates will be evaluated by examining 2012 ending real net worth. All changes and decreases are reported relative to the **Base** scenario. Consistent results were found when average net cash farm income and 2012 ending cash reserves were examined, so, for space considerations, only the 2012 ending real net worth results are provided (Table 2). The farms are classified by commodity type and results are reported based on those categories. The farms were also aggregated by farms cash leasing a majority of leased ground and those cash leasing less than 50 percent of cropland. As expected, farms cash leasing the majority of non-owned land are impacted most adversely. In addition, those already paying relatively high cash lease rates are more vulnerable to these increases. Farms currently share leasing more land are somewhat insulated from increases in cash lease rates.

The large Iowa feed grain farm (IAG3400) experiences the largest decline in real net worth of the feed grain farms in actual dollars. The **25 Percent** scenario results in a $385,000 decline in real net worth by 2012. A decline of just under $1.7 million results from the **100 Percent** scenario, a 17.7 percent decrease as compared to the **Base**. This farm cash leases over 50 percent of its acres, thus making it vulnerable to these types of increases. The Uvalde, Texas farm (TXUG1200) experiences the greatest percentage of real net worth lost; however, this is primarily due to the farm's poor real net worth of just over $13,000 in the **Base** situation.

A 22.1 percent decrease in real net wroth results from the **25 Percent** scenario for the Louisiana cotton farm (LAC2640). This farm would actually descend from a positive ending real net worth of $991,000 to a negative $56,000 ending real net worth resulting from doubling the cash lease rate in the **100 Percent** scenario. This demonstrates the vulnerability of operations owning little or no land to any increase in the cost of rental rates.

In the **Base** scenario, the Bay City, Texas rice farm (TXBR1800) has a projected 2012 real net worth of nearly negative $1.2 million. This is another example of a farm owning no land and experiencing a severe decline by any increases in cash lease rates. By doubling the cash lease rate in the **100 Percent** scenario, this farm's 2012 real net worth is reduced another $635,000 to negative $1.8 million. The northern Louisiana farm (LANR2500) loses approximately 25 percent of its real net worth as a result of the **100 Percent** scenario, a decline of just over $800,000.

When aggregated by farm type, the cotton farms are the most sensitive to increases in cash lease rates, experiencing a decline in real net worth of 30.9 percent under the **100 Percent** scenario. The feed grain farms are slightly more vulnerable than the rice farms as they

experience a 17.7 percent decline in real net worth under the double cash lease rate, while the rice farms experience a 16.6 percent decrease in 2012 projected real net worth.

Finally, the farms were aggregated by those cash leasing greater than 50 percent of rented ground versus those that share lease more rented ground results. As expected, the farms cash leasing more land experience greater declines in real net worth as cash lease rates increase. On average, the farms cash leasing the majority of rented ground experienced a 24.2 percent decline in real net worth under the 100 Percent scenario, while the group of farms share leasing more land only suffered a 16.3 percent decrease in projected 2012 real net worth.

Discussion:

Producers in different regions and those producing various commodities face unique circumstances and challenges in today's environment of increasing land rents. Improved commodity markets, resulting at least partially from increased demand for renewable fuels, may ultimately benefit landowners more than producers, as landowners will likely adjust cash lease rates upward to capitalize on improvements in market conditions.

Complexities associated with farm bill provisions (such as payment limits) and increasing numbers of absentee landowners are just two of the many reasons cited for cash leases gaining in popularity throughout the country. The findings of this study support the idea that the prevalence of cash leases has a considerable influence on the overall financial impact of increasing cash lease rates. An interesting topic of future research is to determine price levels needed for commodities to completely offset increased cash demands as a result of increasing cash lease rates.

References

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Table 1. Land Tenure Arrangements for AFPC Representative Farms, 2005-2012.

	Cash Leased	Share Leased	Owned	Total
	--Acres--	--Acres--	--Acres--	--Acres--
Feed Grain				
IAG3400	1,913	638	850	3,400
ING2200	1,073	358	770	2,200
SCG3500	2,100	0	1,400	3,500
TXUG1200	1,200	0	0	1,200
Cotton				
TXMC1800	405	1,215	180	1,800
GAC2300	1,610	0	690	2,300
TNC1900	1,256	419	225	1,900
LAC2640	1,320	1,320	0	2,640
Rice				
TXBR1800	1,800	0	0	1,800
LANR2500	875	375	1,250	2,500
ARHR3000	400	1,600	1,000	3,000
MOWR4000	1,000	1,000	2,000	4,000

Table 2. Average Projected Real Net Worth for AFPC Representative Farms Given Alternative Cash Lease Rate Increases, 2012.

	Base	25 Percent	50 Percent	100 Percent
	--$1,000--	--$1,000--	--$1,000--	--$1,000--
Feed Grain*	5,642.0	5,408.0	5,161.0	4,641.0
IAG3400	7,026.7	6,642.1	6,234.3	5,358.9
ING2200	7,250.8	7,021.4	6,793.4	6,334.4
SCG3500	8,276.4	8,182.4	8,086.7	7,906.8
TXUG1200	13.0	-213.8	-470.6	-1,035.6
Cotton*	2,512.6	2,352.0	2,178.6	1,736.7
TXMC1800	903.9	867.1	829.2	751.2
GAC2300	4,645.9	4,359.8	4,044.8	3,146.4
TNC1900	3,509.6	3,409.0	3,307.7	3,105.1
LAC2640	990.9	772.0	532.7	-55.8
Rice*	4,172.0	4,002.6	3,830.0	3,480.0
TXBR1800	-1,179.2	-1,336.6	-1,496.2	-1,814.6
LANR2500	3,207.4	3,008.2	2,808.9	2,405.7
ARHR3000	3,771.7	3,666.5	3,560.9	3,349.1
MOWR4000	10,888.0	10,672.4	10,446.4	9,979.8
Majority Cash Leased	3,878.4	3,671.4	3,451.6	2,941.1
Majority Share Leased	4,339.1	4,170.3	3,994.7	3,630.8

*Average for the four farms aggregated under each commodity classification