Financial Conditions on U.S. Cotton Farms

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For the last three years, U.S. cotton producers have been heavily dependent on ad hoc emergency disaster and market loss assistance to cash flow their operations. They have not been alone. Wheat, feed grains, oilseeds and rice producers have also been faced with low commodity prices, adverse weather and the need for substantial government assistance. Price support and direct payments by CCC for fiscal years 1998-2000 averaged $17.5 billion per year (USDA Ag Outlook).

Has U.S. program crop agriculture turned the corner or will additional government payments likely be needed to sustain a vulnerable sector? This paper will focus on the outlook for the Agricultural and Food Policy Center's (AFPC's) representative cotton farms over the period 2001-2005. The results reported herein are drawn from AFPC Working Paper 00-4 which goes into greater depth on all 82 representative farms and ranches modeled by AFPC.

Panel Farm Characteristics

As part of AFPC's congressional charge to analyze the economic vitality of farms and ranches across the United States, nine cotton farms have been developed (Figure 1). The cotton farms range in size from a 6,000 acre California farm (CAC6000) to a 1400 acre operation in the Texas Blackland (TXBC1400). All panel farms are developed with the assistance of producers in the region typical of the size and scale being modeled. Table 1 details the basic structure and commodity mix relevant to each of the following nine farms:

- CAC2000 - This operation is located in Kings County California. It grows 600 acres of upland cotton which represented approximately 46 percent of the farm total revenue in 2000. Other crops including wheat, corn and alfalfa have seen increased acres on the farm since 1996.

- CAC6000 - This operation is located in Kings County California. It grows 1200 acres of upland and 1200 acres of Pima cotton. Cotton makes up approximately 36 percent of total revenue on this farm. Additional crops include wheat, corn, alfalfa and numerous vegetable crops.

- TXSP1682 - A Texas Southern Plains farm located in Dawson County that produces 67 percent of its receipts from upland cotton on 1185 acres. Other sources of revenue include peanuts and CRP land.

- TXSP3697 - A large Texas Southern Plains farm in Dawson County that produces 82 percent of its revenue from cotton. This farm also produces peanuts and has some CRP.

- TXRP2500 - A Texas Rolling Plains farm located in Jones County. The farm grows 1240 acres of cotton in addition to wheat. Cotton represents 79 percent of the gross revenue on this farm.

- TXBC1400 - A Texas Blacklands farm located in Williamson county. The farm grows 350 acres of cotton producing 39 percent of its total revenue. As with the California operations, the farm has downsized acreage planted to cotton through the flex provisions and increased production of wheat and corn.

- TXCB1720 - A Texas Coastal Bend San Patricia County farm generating 61 percent of its total revenue on 700 acres of cotton. Other crops used in rotation on the farm include grain sorghum and corn.

- TNC1675 - A Tennessee Fayette County farm producing 70 percent of its total revenue off of 838 acres of cotton. The farm also produces soybeans and corn.

- TNC3800 - A Tennessee Haywood County farm producing 79 percent of its total revenue off of 2508 acres of cotton. Other crops grown include soybeans and corn.

General Assumptions

Actual price and yields observed for 1996-2000 have been incorporated based on panel data. Projections for 2001-2005 are based on the FAPRI November 2000 Baseline analysis reflecting conditions in the Fall of 2000 (Figure 2). Other assumptions include:

- The farms fully participate in flexibility provisions among enterprises included on the farm.

- The farms began in 1996 with assumed term debt levels on land and machinery of 20 percent.

- Provisions of the FAIR Act are incorporated and continued in 2003-2005 at 2002 levels.

- Payment limits are not binding.

- Market loss and disaster assistance legislated in 1998-2000 is incorporated but no additional assistance is assumed for 2001-2005.

Performance Variables

This paper focuses on two financial performance variables as an indication of the longer term viability of each type of farming operation. The first variable is the probability of a cash flow deficit (PCFD). This variable indicates the percentage of time the farm will not be able to cover all cash expenses, minimum family living, principal payments, taxes and cash down payments on machinery when the farm is simulated based on its past history of price and yield

risk. Thus, it represents the percentage of time the farm will have to depend on external sources to cover its' cash flow needs.

The second variable reported is the probability of decreasing net worth adjusted for inflation (PDNW). The simulation analysis compared the inflation adjusted net worth on December 31, 2005 to the beginning net worth on January 1, 2000 and calculated the probability that net worth in 2005 was less than beginning net worth. Since a primary objective of most agribusinesses is to maintain or grow firm wealth, the solvency variable, PDNW, reflects a firm's capability to achieve this objective.

Financial Results

Each farm is simulated with the FLIPSIM model developed by AFPC. This model has been used extensively over the past 20 years to analyze a wide array of different farm policies, macro economic scenarios and technologies on farms and ranches throughout the world. The model is described in detail by Richardson and Nixon.

Farm by farm results follow (Table 2):

- California - Both farms appear to face substantial financial pressure without additional government assistance. Escalating input costs especially in fuel and irrigation cost place both farms in a negative net cash farm income position beginning with the 2001 crop. The PCFD exceeds 80 percent early on and is approximately 100 percent through 2005. Consequently, the ability to maintain real net worth is negligible through 2005. With the PDNW of 99 percent in 2005 for CAC2000 and 85 percent for CAC6000.

- Texas Southern Plains - The smaller TXSP1682 basically cannot cash flow throughout the period with the prices projected by FAPRI. PCFDs for this farm exceed 98 percent for each year of the study period. The PDNW is 70 percent on the farm by the 2005. The

larger farm, TXSP3697, also has trouble cash flowing the operation over the period but at

not nearly the extent of its smaller scale counterpart. PCFD ranges from 42 percent to 66

percent for this farm. The farm has a relatively favorable ability to maintain real equity

with a PDNW of 30 percent by 2005. While the large farm does better than its smaller

counterpart in both liquidity and solvency it continues to be in a vulnerable economic

condition without additional government assistance.

- Texas Rolling Plains - Reflecting the high yield risk associated with dryland production

  in this region, the farm is highly vulnerable from both a liquidity (PCFD - 91 to 99

  percent) and solvency perspective (PDNW - 68 to 91 percent).

- Texas Blacklands - The farm experiences increasing cash flow difficulties throughout the

  period with the PCFD growing to 83 percent by 2005. The ability to retain real net worth

  is also vulnerable with the PDNW equaling 82 percent by 2005.

- Texas Coastal Bend - The farm is in a marginal position based on its liquidity (PCFD - 41

  to 51 percent) and solvency (PDNW - 27 to 48 percent), however, it appears to be

  hanging on as price improves in the late years.

- Tennessee - Both farming operations are extremely vulnerable. The PCFD exceeds 59

  percent for the larger operation, TNC3800, and this probability is maxed out at 99 percent

  for the moderate farm TNC1675. Consequently, both farms find it nearly impossible to

  maintain real net worth over the period. The PDNW for the TNC1675 farm is 97 percent

  by 2005, while it is 89 percent for the larger farm.

Concluding Comments

All cotton farms included in the analyses will need additional assistance either from the

market place or from the government if they are to maintain their economic integrity over the

2001-2005 period. They are not alone. Thirteen of the 15 feed grain/oilseed farms AFPC monitors are having substantial liquidity and solvency problems. Eight of the 10 wheat farms are having cash flow problems as well as all nine rice farms. Thus, it is not surprising that the upcoming farm bill debate will be keenly watched by all stakeholders having an interest in the health of U.S. crop agriculture.

AFPC and FAPRI publishes all papers and presentations at their respective websites which can be assessed at www.afpc.tamu.edu.

References

Richardson, J.W. and C.J. Nixon. "Description of FLIPSIM: A General Firm Level Policy Simulation Model." Bulletin 1528, Texas Agricultural Experiment Station, July 1986.

USDA. <u>Agricultural Outlook</u>. USDA-Economic Research Service, January-February 2001, USDA, AGO-278.

Table 1. Characteristics of AFPC Representative Farms Producing Primarily Cotton.

	CAC2000	CAC6000	TXSP1682	TXSP3697	TXRP2500	TXBC1400	TXCB1720	TNC1675	TNC3800
Total Cropland	2000.	6000.	1682.	3697.	2500.	1400.	1720.	1675.	3800.
Acres Owned	1000.	4800.	606.	1627.	400.	150.	360.	225.	1520.
Acres Leased	1000.	1200.	1076.	2070.	2100.	1250.	1360.	1450.	2280.
Assets($1000)									
Total	4113.	14623.	766.	1854.	333.	567.	915.	1033.	8485.
Real Estate	3397.	14616.	333.	969.	176.	279.	460.	527.	6929.
Machinery	491.	7.	433.	759.	141.	195.	280.	321.	1340.
Other&Livestock	225.	0.	0.	126.	16.	93.	175.	185.	216.
Debt/Asset Ratios									
Total	0.17	0.17	0.43	0.20	0.38	0.11	0.07	0.32	0.11
2000 Gross Receipts ($1,000)									
Total	1479.9	7647.5	523.7	1044.7	243.8	251.3	343.3	576.1	1341.8
Cotton	674.0	2729.1	350.2	855.6	192.5	96.9	207.8	402.4	1053.6
	45.5%	35.7%	66.9%	81.9%	79.0%	38.6%	60.5%	69.8%	78.5%
Sorghum	0.0	0.0	0.0	0.0	0.0	47.2	117.7	0.0	0.0
	0.0%	0.0%	0.0%	0.0%	0.0%	18.8%	34.3%	0.0%	0.0%
Wheat	159.6	289.7	0.0	0.0	47.0	8.7	1.2	0.0	50.2
	10.8%	3.8%	0.0%	0.0%	19.3%	3.4%	0.3%	0.0%	3.7%
Soybeans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	127.4	112.0
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	22.1%	8.3%
Corn	122.5	94.3	0.0	0.0	0.0	76.7	16.5	46.4	119.0
	8.3%	1.2%	0.0%	0.0%	0.0%	30.5%	4.8%	8.0%	8.9%
Hay	523.8	460.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	35.4%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Quota Peanuts	0.0	0.0	73.2	0.0	0.0	0.0	0.0	0.0	0.0
	0.0%	0.0%	14.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Additional Peanuts	0.0	0.0	84.7	182.1	0.0	0.0	0.0	0.0	0.0
	0.0%	0.0%	16.2%	17.4%	0.0%	0.0%	0.0%	0.0%	0.0%
Cattle	0.0	0.0	0.0	0.0	4.3	19.8	0.0	0.0	0.0
	0.0%	0.0%	0.0%	0.0%	1.8%	7.9%	0.0%	0.0%	0.0%
Other Receipts	0.0	1233.0	15.6	7.1	0.0	2.0	0.0	15.2	10.6
	0.0%	16.1%	3.0%	0.7%	0.0%	0.8%	0.0%	2.6%	0.8%
2000 Planted Acres									
Total	2200.0	6000.0	1564.0	3164.0	2065.0	1400.0	1720.0	1675.0	4100.0
Cotton	600.0	2400.0	1185.0	2665.0	1240.0	350.0	700.0	837.5	2508.0
Sorghum	0.0	0.0	0.0	0.0	0.0	400.0	870.0	0.0	0.0
Wheat	400.0	600.0	0.0	0.0	825.0	100.0	0.0	0.0	300.0
Soybeans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	670.0	760.0
Corn	200.0	300.0	0.0	0.0	0.0	550.0	150.0	167.5	532.0
Hay	1000.0	600.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Quota Peanuts	0.0	0.0	65.0	0.0	0.0	0.0	0.0	0.0	0.0
Additional Peanuts	0.0	0.0	131.0	285.0	0.0	0.0	0.0	0.0	0.0
Vegetables	0.0	2100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CRP	0.0	0.0	183.0	214.0	0.0	0.0	0.0	0.0	0.0

Table 2. Implications of the 1996 Farm Bill and the November 2000 FAPRI Baseline on the Economic Viability of Representative Farms Primarily Producing Cotton.

	CAC2000	CAC6000	TXSP1682	TXSP3697	TXRP2500	TXBC1400	TXCB1720	TNC1675	TNC3800
Annual Change Real Net Worth (%)									
2001-2005 Average	-5.405	-8.107	1.474	6.236	-10.447	1.406	5.981	-9.111	-1.462
Overall Financial Position									
2001-2005 Ranking	Poor	Poor	Poor	Good	Poor	Marginal	Good	Poor	Poor
Cost to Receipts Ratio (%)									
2001-2005 Average	103.251	111.881	84.278	76.208	91.955	73.139	73.834	98.605	99.377
Total Cash Receipts ($1000)									
2001-2005 Average	1482.079	7914.573	548.356	1101.445	264.266	263.418	359.265	594.992	1461.785
Net Cash Farm Income ($1000)									
1996	223.65	598.64	9.36	72.17	16.05	-19.52	-19.87	40.03	241.26
1997	209.32	273.59	71.24	279.90	53.23	118.06	68.39	105.85	271.82
1998	240.28	427.23	-13.09	35.52	-6.50	33.70	-15.49	37.41	134.55
1999	262.42	281.37	92.65	217.99	6.01	117.26	205.73	-94.37	-22.46
2000	22.88	-622.04	89.55	255.15	31.36	74.42	97.39	57.54	158.69
2001	-52.22	-686.43	76.06	243.59	44.94	67.49	108.41	2.35	78.46
2002	-27.38	-598.92	88.31	263.74	44.97	75.42	122.05	-3.91	73.28
2003	-16.82	-594.44	100.00	290.85	45.11	82.42	129.25	33.99	179.72
2004	-7.68	-621.42	102.58	309.87	43.01	75.70	141.04	41.27	204.52
2005	-32.77	-625.98	108.27	326.61	33.57	68.79	145.57	41.42	208.22
Ending Cash Reserves ($1000)									
2000	186.42	-790.07	-144.91	116.80	-95.86	59.85	90.21	-157.01	-92.16
2001	-80.54	-1814.06	-172.17	115.45	-103.94	64.83	121.57	-255.17	-285.12
2002	-268.74	-2725.21	-177.16	178.35	-104.58	88.31	181.25	-339.47	-420.08
2003	-467.94	-3663.18	-182.96	242.80	-117.03	116.07	238.00	-401.45	-473.81
2004	-654.19	-4642.91	-195.90	328.36	-152.64	115.39	296.41	-465.44	-534.18
2005	-936.63	-5646.56	-193.56	425.64	-206.71	111.61	352.45	-532.53	-657.49
Prob. of a Cash Flow Deficit (%)									
2000	86	79	99	42	91	27	41	99	59
2001	98	88	98	50	91	47	45	99	79
2002	91	89	96	37	86	14	38	99	79
2003	96	93	95	38	87	16	39	99	76
2004	97	91	97	33	92	53	36	99	78
2005	99	90	88	31	93	52	44	98	79
Nominal Net Worth ($1000)									
2001	3232.21	11175.97	425.07	1538.67	197.20	517.10	887.62	642.34	566.48
2002	3040.65	10172.11	427.01	1630.65	186.87	527.73	930.58	548.94	7365.47
2003	2850.23	9163.64	429.42	1701.57	168.37	544.40	976.13	490.80	7244.05
2004	2689.12	8176	433.32	1808.87	144.78	549.48	1035.02	440.30	7153.57
2005	2470.86	7182.66	458.08	1918.43	107.91	540.71	1096.38	397.12	7041.84
Prob. of Losing Real Net Worth (%)									
2001	82	75	46	28	58	28	39	79	45
2002	91	75	42	15	56	25	24	91	55
2003	96	80	41	11	61	17	20	91	64
2004	95	82	46	8	65	22	13	93	69
2005	98	80	40	5	70	28	13	94	70

Source: AFPC Working Paper WP00-04.

Figure 1. AFPC Representative Farms Producing Cotton
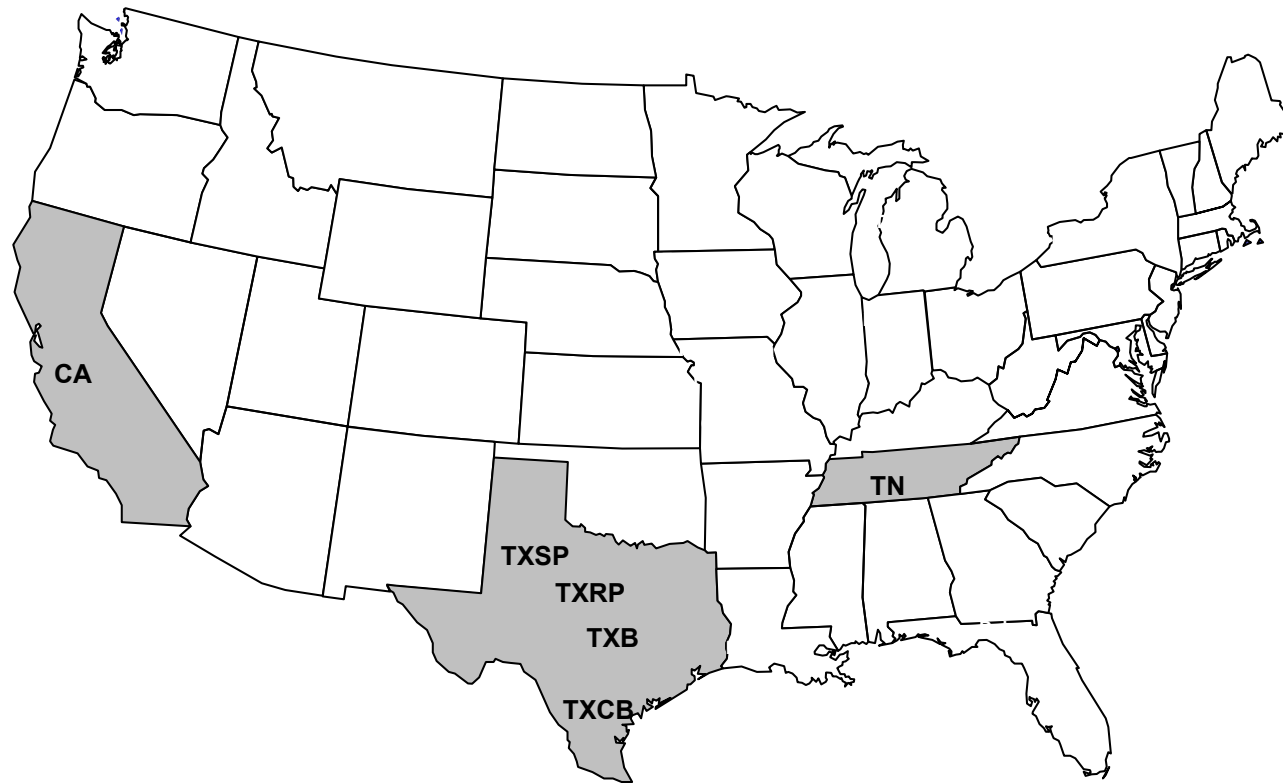
AFPC/TAMU

Figure 2. FAPRI November 2000 Cotton Prices

Cotton Prices