FINANCIAL BENCHMARKS FOR TEXAS COTTON PRODUCERS

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Abstract

The focus of this paper is the benchmarking of financial performance for cotton producers in Texas. Data was obtained from over 250 Texas cotton producers who participated in the Texas Financial and Risk Management (FARM) Assistance Program. This program collects historical yields and crop mix allocations to project likely outcomes (production and financial) with price and production risk factors incorporated. These producers then utilize the results of the FARM Assistance program simulation to assess existing and alternative production plans. An analysis of this database was conducted in order to identify some key production and financial benchmarks that can be used by individual cotton producers as a management target. A discussion of why these benchmarks are critical to profitability is also included. The information provided from this analysis will enable producers in different cotton producing regions and employing alternative tillage systems to evaluate their own performance against a group of their peers and identify where management scrutiny may be most productive.

Introduction

Over the past 50 years, cotton acreage in Texas peaked at 12 million acres in 1951 and dropped to a low of 3.5 million acres in 1967. Since 1970, Texas producers have planted 5 million to 6 million acres of cotton annually. In 2008, Texas planted 5 million acres of cotton, with 1.7 million acres receiving some type of irrigation and 3.3 million acres planted under dryland conditions (United States Department of Agriculture, 2008). Several cotton production areas are prevalent in Texas and each region has unique management issues to confront which affect financial performance.

The Trans-Pecos Valley production region is located in far west Texas. Cotton acreage in this region ranges from 50,000 to 100,000 acres. The area has some dryland production, but most acreage is irrigated. Yields range from 500 to 1,000 pounds of lint per acre. Limiting factors include high irrigation costs, salinity and insects.

The High Plains production region is in the northwest region of Texas. Generally, 3 million to 4 million acres are planted, constituting more than 60 percent of the state's cotton acreage. Although about 60 percent of this acreage has some type of irrigation, many systems are limited based on irrigation well capacity. Irrigated yields average 500 to 1,000 pounds of lint per acre and dryland production averages 250 to 350 pounds of lint per acre. Major problems include a short growing season, sand and hail damage, declining water supplies, disease and cool conditions during boll maturation.

The Rolling Plains production region is in west central Texas. Compared to the High Plains, this region has lower elevation and fewer irrigated acres. Cotton acreage ranges from 1 million to 1.5 million acres. Except for a few scattered areas of irrigation, most of the cotton is grown under dryland conditions. Inadequate moisture and poor rainfall distribution limit dryland yields to 250 to 450 pounds of lint per acre.

The Coastal Bend region, located between the Rio Grande Valley and upper gulf coast is a cotton production region containing about 450,000 to 500,000 acres. The region consists primarily of dryland production; however irrigated acreage has increased over time. Yields vary widely, depending on rainfall, with averages between 450 and 1,200 pounds of lint per acre. The major limiting factors for yield and profit are insect damage and unfavorable weather, including tropical storms in some years.

The Upper Gulf Coast region is similar to the coastal bend but receives more rain. Although the region is primarily dryland, irrigated production is present. Yields range from 500 to 1,000 pounds of lint per acre. Production can be limited by insect outbreaks as well as unfavorable weather during planting and harvest.

The Lower Rio Grande Valley region, located at the southern tip of Texas, has the earliest planted and harvested cotton in the Cotton Belt. Cotton acreage fluctuates from 200,000 to 300,000 acres. Of this acreage, 65 percent can be irrigated depending on the availability of water from upstream reservoirs that supply a system of irrigation canals. Yields average 500 to 650 pounds of lint per acre. Because of the subtropical climate, damage from insects is high, one of the major factors limiting yield and profit. Other factors limiting profitability include tropical storms in late summer, untimely rains, soil salinity, poor drainage and cotton root rot.

The Central Blacklands region stretches from Austin to north and east of Dallas. Cotton acreage ranges from 90,000 to 150,000 acres. The region consists primarily of dryland production but also includes irrigated acreage along the Brazos and Trinity River systems. Yields on dryland production range from 350 to 550 pounds of lint per acre. Production is limited by late planting, poor rainfall distribution, insects and cotton root rot.

Investigating cost of production benchmarks is an ongoing investigation pursued by many agricultural economists. In a recent report, Johnson et al., (2007) reported on profitability of cotton production in the Texas High Plains over a 10 year period based on Cotton Standardized Performance Analysis participants. In this study, it was determined that gross accrual revenues for dryland cotton production averaged $234.71 per acre. Total enterprise costs averaged $198.38 per acre and $0.69 per pound from 1996 to 2005. Cash operating expenses averaged $0.50 per pound over the 10 year period. Net returns averaged $36.74 per acre with negative net returns in 5 of the 10 years. Enterprise cost of production, which represents the cotton lint price necessary to break-even after accounting for all non-primary product income, averaged $0.45 per pound. For irrigated cotton production, gross accrual revenues averaged $332.57 per acre. Total enterprise costs averaged $262.19 per acre and $0.61 per pound. Net returns averaged $70.39 per acre with negative returns in only one year. Enterprise cost of production averaged $0.40 per pound and cash operating expenses averaged $0.49 per pound.

The purpose of this study was to focus on the financial benchmarks of performance as an indicator for management targets and goals. To help assess the various levels of financial performance achieved by a broad collection of Texas cotton producers, the Texas Financial and Risk Management Assistance (FARM Assistance) database was utilized. FARM Assistance is a whole farm computerized decision support system for long-term strategic planning provided by Texas AgriLife Extension. This service provides the ability to deliver information and analyses based upon the assimilation of comprehensive farm level production and financial records. Using actual farm data, the FARM Assistance database can provide a foundation to investigate the impacts of many policy related issues as well as identify the characteristics of successful producers (Klose, 2007).

One of the objectives of analyzing the financial performance of the FARM Assistance participants is to learn what makes some farmers more successful than others. The idea is to identify the characteristics or factors that are true of the financially successful producer, as well as those characteristics of the financially stressed. No single measure of financial performance is adequate for evaluating a farm business. Evaluation of several financial measures may be more useful in directing the manager to ask the right questions than in providing solutions to the financial issues confronting a business (Love, 2004). Once these critical factors have been determined, the information can be used by all producers to improve financial performance.

Methods

The FARM Assistance database contains a wide spectrum of management abilities. Within the database are farming operations that could be described as full-time, commercial, innovative, forward-thinking managers seeking strategic planning guidance. On the other hand, some producers have utilized the FARM Assistance program facing dismal financial outlooks or even to investigate bankruptcy or exit strategies. Therefore, the database contains an array of producers with differing financial situations. For the 2003 to 2008 period, 270 cotton farming operations had completed the FARM Assistance program. The data from these operations served as the basis for the results provided in this study. The database contained detailed information for 202 cotton farming operations in the Trans-Pecos Valley, High Plains, and Rolling Plains and 68 cotton farming operations in the Coastal Bend, Upper Gulf Coast, Lower Rio Grande Valley and Central Blacklands regions.

The FARM Assistance program results provide numerous financial measures detailing the current financial position related to all aspects of a farm business (liquidity, solvency, profitability, efficiency, and repayment capacity). Several measures must be considered when assessing the complete picture of any farm's true financial position (Doye, 2007). For the purposes of this study, information related to three separate financial criteria were extracted and analyzed. Financial measures detailing profitability, solvency, and financial efficiency were examined. Each of these criteria measures a different aspect of financial performance.

Profitability is an indication of the level of income produced by the farm business. Measures of profitability indicate the financial performance of the farm over a period of time, usually a year. Net cash farm income represents the returns to unpaid labor, management, and owner equity. Changes in inventory (accrual adjustments) may add to income through increases in accounts receivable, prepaid expenses, cash investments in growing crops, supplies on hand) or decrease income (increases in accounts payable, taxes due, or other liabilities). Net cash farm income comes directly from the income statement and is calculated by subtracting all farm operating expenses incurred to create revenues, including interest on debt from gross farm revenue. Net cash farm income is a dollar amount and not a financial ratio. Thus, no one standard is appropriate for all farm operations or to make comparisons with other agricultural businesses. Net cash farm income should be positive and sufficiently large to compensate the owner for utilizing their labor, management, and equity capital in the farming operation.

Solvency measures the ability of the farm to pay all debts if the assets of the business are sold. Generally, if the market value of total assets exceeds existing debt obligations against those assets, the business is solvent. The debt to asset ratio measures the proportion of total farm assets owed to creditors. The higher the ratio, the greater the financial risk exposure for the business and those providing loan funds for the business and the less flexibility the operator has to respond to adverse natural or market changes. Although there is no exact standard for farm businesses, a debt-to-asset ratio greater than 0.50 indicates that a majority of the value of the farm's total assets is contributed by creditors. High debt-to-asset ratios have been interpreted as an indication of "farm financial stress."

Financial efficiency measures the degree of efficiency with which labor, management, and capital are used in the business. Financial efficiency measures help evaluate whether or not farm assets are being used efficiently to generate income. The operating expense to receipts ratio indicates the proportion of total income used to pay expenses. This ratio reflects the extent to which gross farm revenues are expended on farm operating inputs, excluding depreciation and interest. Since total operating expenses are defined without including interest expenses, this ratio compares non-interest, non-depreciation operating expenses to total farm revenues. The higher the ratio, the larger the proportion of gross farm revenues needed to offset all operating expenses and the greater the financial risk in periods of low market prices. In general, operating expenses to receipts ratios in the 0.40 to 0.60 range would be relatively efficient, with efficiency declining as the ratio rises. Ratios in the 0.60 to 0.75 range would reflect average efficiency, while ratios of 0.75 or more would reflect marginal efficiency.

Results

The comprehensive Texas Farm Assistance database of 270 cotton farming operations was examined based on separate screens for net cash farm income, debt to asset ratio, and operating expenses to receipts ratio. In each case, farming operations were classified into performance quartiles: top 25percent, 2nd 25 percent, 3rd 25 percent, and bottom 25 percent.

Table 1 presents the quartile performance spectrum when farms were screened based on a measure of financial profitability: net cash farm income. The top 25 percent of cotton farming operations averaged net cash farm income of over $520,000 while the bottom 25 percent of cotton farming operations averaged less than $9,200. While this might indicate purely the benefits of large farm size, further investigation shows that this is not the case. The top 25 percent averaged net cash farm income per planted acre of $131.42 versus only $34.88 for the lowest performing 25 percent of farms.

Table 1. Financial performance screened for profitability (by quartile) for Texas cotton operations (2003-2008).

NET CASH FARM INCOME	Top 25%	2nd 25%	3rd 25%	Bottom 25%
Average	$520,950	$149,320	$77,630	$9,130
Range ($1,000)	$207 to $2,705	$109 to $206	$47 to $107	-$162 to $47
Average NCFI per planted acre	$131.42	$101.85	$71.65	$34.88
Average Farm Size (planted acres)	4,191	1,831	1,605	1,147
% owned	24%	28%	30%	37%
% leased	76%	72%	70%	63%
Cotton Acres	1,477	805	656	594
Cotton as a % of Planted Acreage	35%	44%	41%	52%
Dryland Cotton	52%	54%	61%	55%
Irrigated Cotton	48%	46%	39%	45%
Average Debt to Asset Ratio	0.3509	0.4673	0.5031	0.5940
Average Operating Expense to Receipts Ratio	0.6398	0.6620	0.6985	0.8594

Economies of size does play a factor in cotton farming operations as farm average size declined linearly from 4,191 acres, to 1,147 acres as you move down the performance spectrum of quartile performance based on net cash farm income. Interestingly, owned acreage (as a percentage of total acreage), increased as you move down the performance spectrum. This implies that the top operators relied more heavily on favorable lease arrangements as a critical component of their operation.

When the database was screened based on net cash farm income, the various quartiles also demonstrated linear performance for the other financial measures (debt to asset ratio and operating expenses to receipts ratio). This implies that the top performing cotton operations (based on net cash farm income) also exhibited lower relative reliance on debt (as a percentage of assets) and were able to convert expenses more efficiently into a dollar's worth of crop receipts. In other words, operations that tended to rank higher on net cash farm income also possessed a higher degree of solvency and higher level of financial efficiency.

Table 2 presents the quartile performance spectrum when farms were screened based on a measure of financial solvency: debt to assets ratio. The top 25 percent of cotton farming operations demonstrating the highest financial solvency averaged a debt to asset ratio of 0.16 while the bottom 25 percent (least solvent) averaged a debt to asset ratio of 0.87. This means that (on average) only 16 percent of the top 25 percent of operations were owned by creditors versus 87 percent creditor ownership by the bottom 25 percent of operations. In the case of the debt to asset ratio screen, economies of size continued to play a factor as average farm size declined linearly from 2,854 acres to 1,426 acres as you move down the performance spectrum of quartile performance.

Table 2. Financial performance screened for solvency (by quartile) for Texas cotton operations (2003-2008).

DEBT TO ASSET RATIO	Top 25%	2nd 25%	3rd 25%	Bottom 25%
Average	0.1601	0.3595	0.5393	0.8735
Range	0.0 to 0.26	0.27 to 0.45	0.46 to 0.63	0.64 to 1.97
Average Farm Size (planted acres)	2,894	2,642	1,801	1,426
% owned	27%	25%	39%	19%
% leased	73%	75%	61%	81%
Cotton Acres	989	1,071	815	681
Cotton as a % of Planted Acreage	34%	41%	45%	48%
Dryland Cotton	53%	69%	44%	47%
Irrigated Cotton	47%	31%	56%	53%
Average Net Cash Farm Income	$293,920	$229,660	$146,600	$84,590
Average NCFI per planted acre	$86.17	$88.03	$100.55	$64.17
Average Operating Expense to Receipts Ratio	0.6962	0.7142	0.7033	0.7493

When the database was screened based on debt to asset ratio, the various quartiles demonstrated linear performance for net cash farm income, although net cash farm income per acre did not decline linearly as you move down the performance spectrum. Similarly, the average operating expense to receipts ratio did not exhibit linear declines across the performance spectrum. This indicates that attention to financial solvency does not automatically result in improvement in other financial measurements indicating profitability and efficiency. One explanation of this is that the measure used to rank financial solvency (debt to asset ratio) does little to explain the type of debt or the level of interest expenses associated with debt. In general, if an operation's percentage return on assets is larger than the interest cost of debt, then borrowing can be profitable. The debt to asset ratio (as a standalone measure) does little to indicate whether this is the case. That does not imply that attention should not be focused on financial solvency; simply that that measure alone is insufficient to provide a complete picture of overall financial performance.

Table 3 presents the quartile performance spectrum when farms were screened based on a measure of financial efficiency: operating expenses to receipts ratio. The top 25 percent of cotton farming operations averaged an operating expenses to receipts ratio of 0.52 compared to an average of 0.87for the bottom 25 percent. This means that for every dollar of receipts, the top 25 percent of operations has 48 cents that are available to cover interest expenses, depreciation, principal payments, family living, taxes and capital purchases. Cotton operations falling into the lowest performing quartile group only have about 13 cents of every dollar of receipts to pay for these same items.

Economies of size is less apparent using financial efficiency as the primary delineator. For each quartile, the average farm size was over 2,000 acres and did not exhibit a linear decline. When the database was screened based on the operating expenses to receipts ratio, the various quartiles also demonstrated linear performance for the other financial measures (net cash farm income and debt to asset ratio). Similarly, net cash farm income per planted acre was also highest for the top 25 percent and declined linearly as the 2nd, 3rd, and bottom 25 percent of operations were examined.

This implies that the top performing cotton operations (based on financial efficiency) also exhibited higher net cash farm incomes (gross and per acre) and less relative reliance on debt (as a percentage of assets). In other words, operations that tended to rank higher in financial efficiency also exhibited higher average financial profitability and solvency.

Table 3. Financial performance screened for efficiency (by quartile) for Texas cotton operations (2003-2008).

OPERATING EXPENSE to RECEIPTS RATIO	Top 25%	2nd 25%	3rd 25%	Bottom 25%
Average	0.5220	0.6646	0.7582	0.8735
Range	0.19 to 0.61	0.61 to 0.72	0.72 to 0.80	0.80 to 1.38
Average Farm Size (planted acres)	2,346	2,134	2,081	2,181
% owned	32%	27%	22%	27%
% leased	68%	73%	78%	73%
Cotton Acres	864	906	789	962
Cotton as a % of Planted Acreage	37%	42%	38%	44%
Dryland Cotton	57%	53%	50%	58%
Irrigated Cotton	43%	47%	50%	42%
Average Net Cash Farm Income	$307,280	$233,950	$166,350	$48,280
Average NCFI per planted acre	$131.19	$107.40	$79.25	$22.33
Average Debt to Asset Ratio	0.4060	0.4814	0.4985	0.5253

Recognizing that there are distinctly different types of cotton production environments in Texas. The database was further separated into two groups to provide financial benchmarks for cotton producers in two differing production areas. This resulted in a database of 202 observations relating to cotton producers in the Trans-Pecos Valley, High Plains, and Rolling Plains of Texas and 68 observations for cotton producers in the Coastal Bend, Upper Gulf Coast, Lower Rio Grande Valley, and Central Blacklands region of Texas.

Table 4 provides the average measures for performance quartiles based on financial profitability, solvency, and efficiency for the Trans Pecos Valley, High Plains, and Rolling Plains cotton producers. Each quartile represents the average performance for approximately 50 operations. It should be noted that the database was screened for each financial measure separately, and this table provides the benchmark levels (for each measure) that would place an individual operation into one of the classifications (top 25 percent, 2nd 25 percent, 3rd 25 percent, or bottom 25 percent). For this group, placement in the top 25 percent of operations would involve average net cash farm income of $543,000 (or net cash farm income per acre of $135), an average debt to asset ratio near 0.19, or an operating expenses to receipts ratio of 0.52.

Table 4. Financial performance measures for profitability, solvency, and efficiency for Texas cotton producers in the Trans-Pecos Valley, High Plains and Rolling Plains regions of Texas.

	Top 25%	2nd 25%	3rd 25%	Bottom 25%
NET CASH FARM INCOME				
Average	$542,800	$135,220	$69,230	$5,630
Range ($1,000)	$171 to $2,705	$100 to $171	$44 to $96	-$162 to $43
Average NCFI per planted acre	$135.03	$107.27	$84.78	$27.94
DEBT TO ASSET RATIO				
Average	0.1852	0.4177	0.5789	0.9160
Range	0.01 to 0.30	0.31 to 0.49	0.49 to 0.65	0.66 to 1.97
OPERATING EXPENSES TO RECEIPTS RATIO				
Average	0.5173	0.6514	0.7472	0.9212
Range	0.19 to 0.60	0.60 to 0.70	0.70 to 0.79	0.79 to 1.38

Table 5 provides the average measures for alternative performance quartiles based on financial profitability, solvency, and efficiency for the Coastal Bend, Upper Gulf Coast, Lower Rio Grande Valley, and Central Blacklands cotton producers. Each quartile represents the average performance for approximately 17 operations. Again, the database was screened for each financial measure separately. For this group, placement in the top 25 percent of operations would include an average net cash farm income of $441,000 (or net cash farm income per acre of $128), an average debt to asset ratio near 0.11, or an operating expenses to receipts ratio of 0.53.

Table 5. Financial performance measures for profitability, solvency, and efficiency for Texas cotton producers in the Coastal Bend, Upper Gulf Coast, Lower Rio Grande Valley, and Central Blacklands regions of Texas.

	Top 25%	**2nd 25%**	**3rd 25%**	**Bottom 25%**
NET CASH FARM INCOME				
Average	$441,740	$199,830	$102,900	$25,150
Range ($1,000)	$261 to $825	$156 to $244	$77 to$132	-$79 to $70
Average NCFI per planted acre	$128.02	$83.66	$51.31	$32.81
DEBT TO ASSET RATIO				
Average	0.1132	0.2586	0.3744	0.6434
Range	0.0 to 0.19	0.19 to 0.32	0.32 to 0.44	0.44 to 1.07
OPERATING EXPENSES TO RECEIPTS RATIO				
Average	0.5397	0.7141	0.7782	0.8462
Range	0.35 to 0.64	0.65 to 0.75	0.76 to 0.81	0.81 to 0.92

Conclusions

Financial ratios condense a large amount of information into a convenient form for analysis. Both the magnitude of the measure and the relationships between measures should be considered. It is often difficult to compare the absolute levels of financial measures for different farms due to fundamental differences in the size, capital requirements, and cash flow produced by the operations. However, examining some benchmark measures for a wide spectrum of farming operations can provide some targets that management may use to evaluate their own financial performance/position and areas where management scrutiny may be focused in the future. Comparisons of measures from year to year signal whether the business financial performance is satisfactory and whether the business financial performance is improving or deteriorating. These financial benchmarks are intended to provide a foundation for comparison as well as some management targets to help guide management decisions.

In many cases, it can be noted that operations that achieved superior financial performance in one area also achieved superior financial performance in other areas simultaneously. The natural conclusion that would be drawn is that managers who demonstrate competence in managing expenses relative to generating profits, are also well equipped to deploy those profits for the longer-term benefit of the operation.

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