


Fall 2016

AGEC 3403
Farm Business Management

Chapter 6

Farm Business Analysis




AGEC 3403

Chapter Outline

- Types of Analysis
- Standards of Comparison
- Diagnosing a Farm Business Problem
- Measures of Profitability
- Measures of Size
- Efficiency Measures
- Financial Measures




AGEC 3403

Chapter Objectives

1. Show how farm business analysis contributes to the control function of management
2. Suggest standards of comparison to use
3. Identify measures of business size
4. Outline a procedure for locating economic or financial problem areas
5. Review measures that can be used to analyze solvency, liquidity, and profitability
6. Illustrate the concept of economic efficiency

Table 6-1 Comparisons of Alabama Cattle Farms by Net Operating Income

Why the large difference in income?

Item	Low third	Middle third	High third
Net operating income ($/cow)	-$41	$47	$137
Average calf weight	657	642	650
Pounds of feeder calf per cow	520	528	576
Hay fed (tons/cow)	2.3	1.8	1.6
Seed, fertilizer, chemicals ($/cow)	$119	$91	$78
Purchased feed ($/cow)	$116	$91	$64
Breakeven price ($/lb)	$1.29	$0.99	$0.82
Number of brood cows	262	272	278

Source: Alabama Farm Analysis Association

More lbs of feeder calf

With less hay and other inputs

A complete farm business analysis will give us more detailed answers




Control Function of Management

- Three steps
  1. Establishing standards for comparing results
  2. Measuring the actual performance of the business
  3. Taking corrective action to improve the performance once problem areas have been identified




Types of Analysis

1. Profitability
   - Comparing income and expenses
2. Farm Size
   - Enough resources to generate profits?
3. Financial
   - Solvency, liquidity and owner's equity
4. Efficiency
   - Are we using our resources efficiently




Standards of Comparison

- Once a measure has been calculated, the problem becomes one of evaluating the result.
- Is the value good, bad, or average?
- Compared with what?
- Can it be improved?




Three Basic Standards

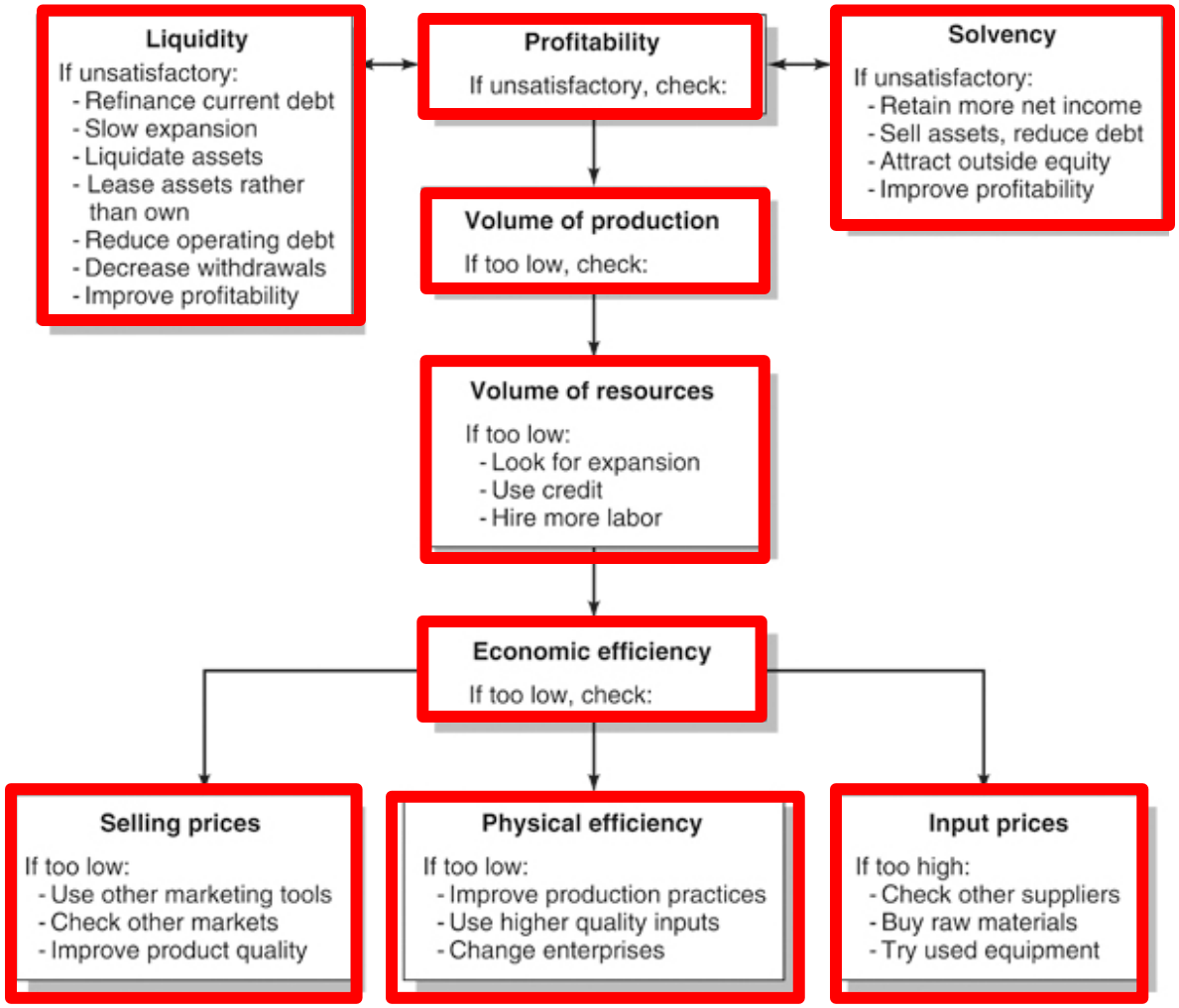
1. **Budgets**: measures are compared against budgeted goals or objectives identified during planning
2. **Comparative farms**: measures are compared against actual results from similar farms
3. **Historical trends**: the manager looks for improvement over time




Diagnosing a Farm Business Problem

- A whole-farm business analysis can be carried out systematically.
- **Profitability** is generally the first area of concern.
- Inadequate resources may be a problem.
- If resources are adequate, efficiency may be a problem.

Figure 6-1
Procedures for diagnosing a farm business problem






Measures of Profitability

- Profitability analysis starts with Income Statement
  - Net farm income
  - Return to labor and management
  - Return to management
  - Rate of return on farm assets
  - Rate of return on farm equity
  - Operating profit margin ratio

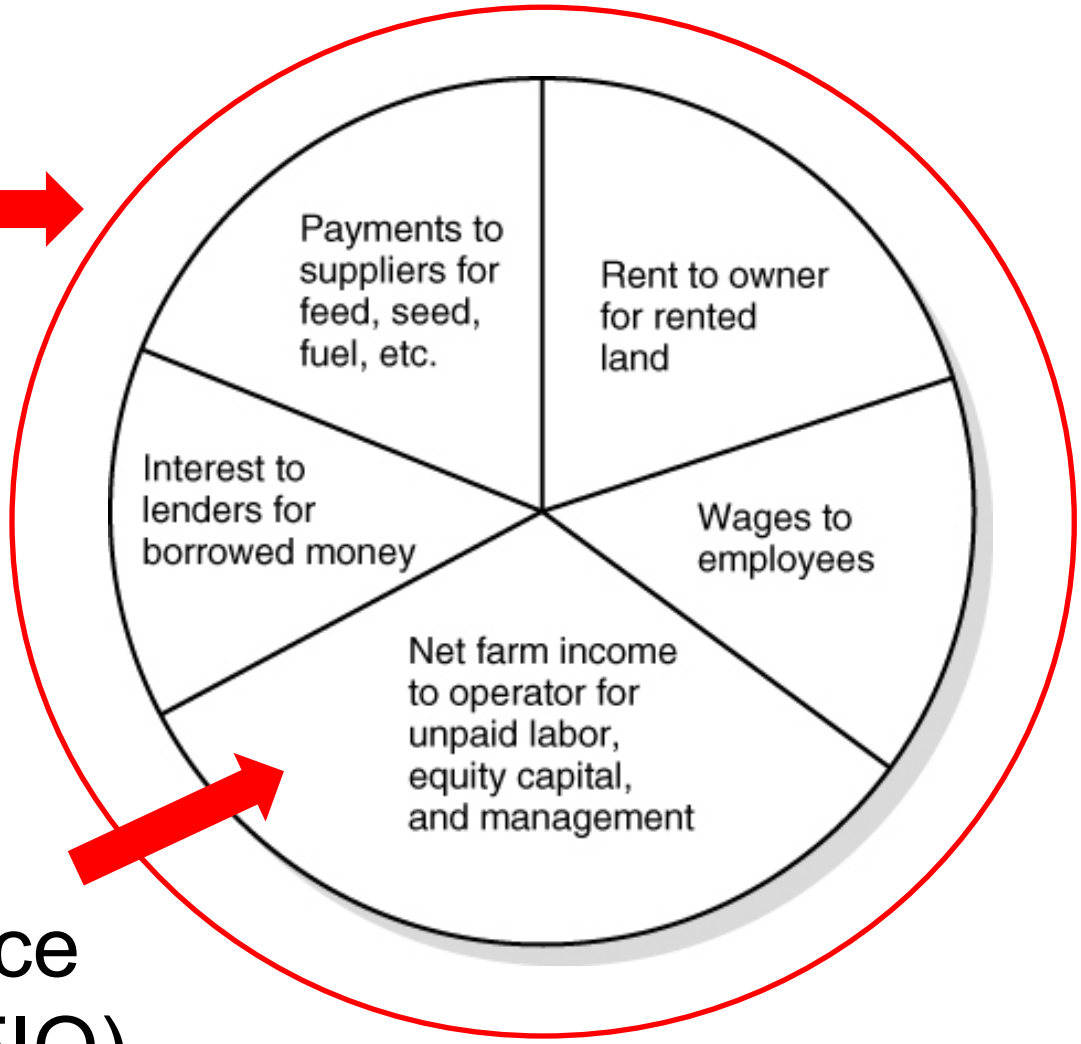



Net Farm Income

- Establishing goals for Net Farm Income
  - Opportunity costs of using the owner's labor, management and capital in nonfarm uses
- Net Income also influenced by the proportion of total resources contributed by the operator
- The greater the owner's equity in the capital used to generate revenues, the higher the income

Figure 6-2
How is the total revenue pie divided?

We want a larger pie… (more revenue)



…and a bigger slice (more NFIO)




General Comments

- Two cautions regarding returns to labor, management, assets and equity:
  - The estimation of opportunity costs used in calculating returns is somewhat arbitrary.
  - The returns are average returns to factors, not the marginal returns.

Table 6-2
Measures of Farm Profitability

Item	comparison group	Our farm	Comments
1. Net farm income from operations	$130,230	$45,486	much lower
2. Return to labor and management	$87,320	$11,069	much lower
3. Return to management	$64,654	-28,931	much lower
4. Rate of return on farm assets	5.50%	1.80%	much lower
5. Rate of return on farm equity	5.60%	0.10%	much lower
6. Operating profit margin ratio	20.10%	4.60%	much lower

Comparison Group Figures Based on Alabama Farm Analysis Association Information

These values identify existence of problems

Next steps – cause and corrective action




Is it Farm Size?
Measures of Size

- Total or gross revenue
- Value of farm production
- Total farm assets
- Total acres farmed
- Livestock numbers
- Total labor used
- Quantity of sales

Table 6-3
Measures of Farm Size

Item	Average of comparison group	Our farm	Comments
1. Gross revenue	$565,179	$406,548	lower
2. Total farm assets	$1,427,154	$1,068,750	lower
3. Total crop acres farmed	930	720	lower
4. Number of brood cows	180	150	lower
5. Total labor	2.2	1.5	lower

Comparison Group Figures Based on Alabama Farm Analysis Association Information

Our revenues, assets, acres, # of cows, and use of labor are all lower

Are we *efficient* with our (fewer) resources?




Value of Farm Production

- Value of farm production is a convenient way to compare the size of different types of farms.
  - Total (gross) revenue
    - ✓ minus livestock purchases
    - ✓ minus feed purchases
  - Equals = **Value of Farm Production**
- Makes for a more fair comparison between farms of various sizes




Efficiency Measures

- Efficiency measures output in relation to input.
- Overall efficiency can be found by dividing the value of total production over the value of total resources used.
- Further measures are also useful.

$$\text{Efficiency} = \frac{\text{production}}{\text{resources used}}$$




AGEC 3403

Economic Efficiency

- **Asset turnover ratio:** gross revenue ÷ market value of total farm assets
  - This ratio measures how efficiently capital invested in farm assets is being used.
- **Operating expense ratio:** total operating expenses ÷ gross revenue
  - what percent of gross revenue went for operating expenses
  - Farms with a high proportion of rented land and machinery or hired labor will tend to have higher operating expense ratios




Economic Efficiency

- **Depreciation expense ratio:** total depreciation expense ÷ gross revenue
  - what percent of gross revenue went for depreciation expense
  - Farms with a relatively large investment in newer machinery, equipment, and buildings will have higher depreciation expense ratios
  - May indicate underused capital assets




Economic Efficiency

- **Interest expense ratio:**
  total farm interest expense ÷ gross revenue
  - what percent of gross revenue went for interest expense
  - Ratios higher than average, or higher than desired, may indicate too much dependence on borrowed capital or high interest rates on existing debt




Economic Efficiency (continued)

- **Net farm income from operations ratio:** net farm income ÷ gross revenue
  - what percent of gross revenue is left after paying all expenses
- **Gross revenue per person**
  - The efficiency with which labor is being used
  - Capital and labor can be substituted for each other, so capital and labor efficiency measures should be evaluated jointly




Economic Efficiency (continued)

- **Livestock production per $100 feed fed**
  - common measure of economic efficiency in livestock production
  - Value of $100 indicates that the livestock just paid for the feed consumed but no other expenses
  - Also depends on the type of livestock

$$\frac{\text{Value of livestock production}}{\text{Value of feed fed}} \times 100$$

Economic Efficiency (continued)

- **Feed cost per 100 pounds of gain**
  - feed cost per 100 pounds of weight gain or
  - per 100 pounds of milk for a dairy
- **Crop value per acre**
  - measures the intensity of crop production and whether high-value crops are included in the crop plan
- **Machinery cost per crop acre**
  - A high value indicates that machinery investment may be excessive
  - Low values may indicate that the machinery is too old and unreliable or too small for the acres being farmed

Table 6-4
Measures of Economic Efficiency

Item	Average of comparison group	Our farm	Comments
Capital Efficiency			
1. Asset turnover ratio	0.4	0.38	about the same
2. Operating expense ratio	0.67	0.8	much higher
3. Depreciation ratio	0.07	0.04	lower
4. Interest expense ratio	0.03	0.04	somewhat higher
5. Net farm income from operations ratio	0.23	0.11	much lower
Labor Efficiency			
6. Gross revenue per person	$256,899	$271,032	higher
Marketing			
7. Price received for calves ($/cwt)	$106.00	$95.00	lower
8. Price received for cotton lint ($/lb)	$0.55	$0.56	about the same
Livestock Efficiency			
9. Purchased feed ($/cow)	$68	$77	higher
10. Production per $100 of feed fed	$178	$142	lower

Comparison Group Figures Based on Alabama Farm Analysis Association Information

Spending too much here

Older equipment?

Purchase more feed per cow

Lower production




Physical Efficiency

- Are we economically inefficient because of poor physical efficiency?

- Poor *economic* efficiency can result from poor *physical* efficiency.
- Physical efficiency measures bushels harvested per acre, pigs weaned per sow, and pounds of milk sold per cow.

Table 6-5
Measures of physical efficiency

Item	Average of comparison group	Our farm	Comments
1. Feeder calves produced (lbs/calf)	650	540	lower
2. Feeder calves produced (lbs/cow)	576	473	lower
3. Hay fed (tons/cow)	1.6	2.1	higher
4. Cotton yields (lbs/acre)	762	750	slightly lower
5. Corn yields (bu/acre)	118	120	about the same

Comparison Group Figures Based on Alabama Farm Analysis Association Information

Lower lbs produced

Feed more hay per cow

It's starting to look like the livestock enterprise may be of concern




Financial Measures

- **Solvency**: debt to asset, change in equity
- **Liquidity**: current ratio, working capital
- Measures of **repayment capacity**: capital debt repayment margin, term debt and capital lease coverage ratio.

Term Debt and Capital Lease Coverage Ratio

- This ratio is computed by dividing the cash available for term debt payments for the last year by the total term debt payments due next year.
- The ratio should be greater than 1.
  - The greater the ratio over 1.0, the greater the margin to cover payments.
- “Term debt” refers to liabilities with scheduled, amortized payments.

Table 6-6
Analyzing the Financial Condition of the Business

Table 6-6 Analyzing the Financial Condition of the Business

Item	Average of comparison group	Our farm	Comments
1. Net Worth	$1,013,210	$736,836	lower
2. Debt/asset ratio	0.29	0.31	higher
3. Current ratio	7.18	1.38	much lower
4. Working capital	$140,187	$23,654	much lower
5. Working capital to gross revenues ratio	24.80%	5.80%	much lower

Comparison Group Figures Based on Alabama Farm Analysis Association Information

Current ratio and Working Capital considerably lower → Liquidity concerns

Farm Business Analysis Case Study

- The example farm had very low net farm income
- **Economic efficiency**
  - measures indicate this farm appears to be spending too much on operating expenses
  - The lower than average depreciation ratio may indicate the farm has older or smaller equipment.
- **Physical efficiency**
  - appeared to be a problem in the cow-calf enterprise
- **Recommendation**?
  - To improve profitability, the farmer should look carefully at the cow-calf enterprise and also assess whether the machinery complement is adequate




Summary

- A whole-farm business analysis is like a complete medical examination.
- It should be conducted periodically to check for symptoms that indicate the business is not functioning as it should.