Traits of Successful Farms: Financial and Production Performance

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Executive Summary

The goal of this session is to provide information about successful farms and diagnostic tools that can be used to assess farm financial performance. Benchmark financial information and computer decision tools are used to illustrate important concepts.

- Accrual net farm income should be used to measure farm profitability. Cash basis income results in average errors of 24%.
- A case example is used to illustrate the potential problems with using cash basis income.
- The concepts and benefits of returns to management are presented.
- Financial performance ratios permit farmers to compare to benchmarks and their own farm over time. Benchmark data on key financial and production performance measures are provided.
- There are many reasons farm performance may not be high. The sources of potential problems can be asset-, liability-, revenue-, or expense-based. Measures for the problem types are reviewed and benchmarks provided.
- Research results are presented on traits of successful farms. Successful farms tend to be larger, own a lower percentage of their acres farmed, exhibit higher yields, and have substantially lower machinery costs. However, successful farms do not tend to receive significantly higher commodity prices.
- A case study is used to illustrate the performance measures and the data needed to identify strengths and weaknesses on a farm operation.
- Software to compare financial data to benchmarks is presented and FAST computer tools to assist in decision making are illustrated.
Traits of Successful Farms: Production and Financial Performance

Paul Ellinger, Gary Schnitkey and Dale Lattz

http://www.farmdoc.uiuc.edu/
Objectives

• Discuss alternative measures of success

• Describe diagnostic tools to use in evaluating strengths and weaknesses of a farm

• Provide traits of successful farms

• Mini-case study
What is Success?

Who are the Stakeholders/Influencers?

How to Measure?
What is Success?

Possible Responses

• Profitability
• Asset and equity growth
• Highest yield
• Land accumulation
• Quality of life
• Machinery size and type

Likely “influenced” by a Stakeholder
Success should account for risk.
Who are the stakeholders?

Lender

Land Owner

Farm Organizations

IRS

You

Parents

Spouse

Children

Who are the influencers?
Measures of Success

Profitability

1. Net farm income
   - Cash Basis
     schedule F
   - Accrual Basis
     accounts for revenue produced and expenses incurred

2. Management returns
   accounts for labor and capital supplied by operator

3. Ratios
   profitability relative to investment in the business
Net farm income

• **Cash Basis**
  
  *Pros:* simple, accessible, “validated” inputs
  
  *Cons:* **NOT** a good proxy for income

• **Accrual Basis**
  
  *Pros:* more appropriate measure of profitability
  
  *Cons:* requires additional computation, some judgment used on price changes in inventory valuation
Schedule F Vs. Accrual Income

Average yearly difference (based on 966 farms)

<table>
<thead>
<tr>
<th>Year</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>35%</td>
</tr>
<tr>
<td>1996</td>
<td>41%</td>
</tr>
<tr>
<td>1997</td>
<td>34%</td>
</tr>
</tbody>
</table>

Average 3-year difference `95-97 24%

Like measuring the speed of an Indy Car with an hour glass,

Schedule F (cash basis) is not a reliable indicator of profit.
Key Accrual Adjustments

Schedule F

Cash Sales

Accrual Adjustments

+/- Change in inventories
+/- Change in receivables

Cash Expenses

+/- Change in prepaid expenses
+/- Change in accounts payable
+/- Change in accrued interest
Example Calculations: Blue Handout

FAST Tool
Schedule F to Accrual Income Approximation

http://www.farmdoc.uiuc.edu/
Management Returns

\[
\text{Accrual Net Income} - \text{Opportunity Costs Of Labor} - \text{Opportunity Costs Of Capital} = \text{Management Returns}
\]
Profitability Ratios
*Return for a Unit of Investment*

- Rate of Return on Assets

- Rate of Return on Equity

Example
Tools to Assess Profitability

- Compare to other similar farms
  - yellow handout

- Compare to your farm over time
  - stability and level

- Identify strengths and weaknesses

- Develop a strategy to adapt/change
Sources of Profitability Problems

- Assets
- Revenue
- Liabilities
- Expenses
Assets

Problems
Inefficient use of assets
- too many assets
- wrong mix of assets
- price of assets too high

Measures

Asset Turnover = \( \frac{\text{VFP (Gross sales)}}{\text{Total Farm Assets}} \)

Machinery Cost per Acre

Machinery Investment per Acre
# Problems

- Too much leverage (debt)
- Cost of debt is too high
- Wrong mix of debt

## Measures:

<table>
<thead>
<tr>
<th>Liabilities</th>
<th>Debt Assets</th>
<th>Current Debt Current Assets</th>
<th>Noncurrent Debt Noncurrent Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Ratio</td>
<td>$\frac{\text{Current Assets}}{\text{Current Liabilities}}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost of Debt</td>
<td>$\frac{\text{Total Interest Expense}}{\text{Average Total Liabilities}}$ or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest Cost</td>
<td>$\frac{\text{Total Interest Expense}}{\text{Average Total Assets}}$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Problems

- Low production
- Poor marketing

Revenue

Measures

- Average yield per acre
- Livestock production measures
- Average price received per unit produced
- Profit margin = Net Farm Income / VFP
Problems

- High Crop Costs
- High Machinery Costs
- High Land Rent
- High Interest Costs
- High Other Costs

Expenses

Measures

Profit margin

Cost as a proportion of total income = \( \frac{\text{Cost Item}}{\text{VFP (Gross Sales)}} \)

Examples: \( \frac{\text{Machinery Cost}}{\text{VFP (Gross Sales)}} \) or \( \frac{\text{Interest Expense}}{\text{VFP (Gross Sales)}} \)

Cost per acre = \( \frac{\text{Cost Item}}{\text{Acre}} \)

Examples: \( \frac{\text{Machinery Cost}}{\text{Acre}} \) or \( \frac{\text{Interest Expense}}{\text{Acre}} \)
Your Lender’s Measures of Success

- Profitability
- Debt Repayment Capacity
- Credit Score
  - Consumer
  - Business
- Management Ability

Remember:
Lenders are always concerned about the downside scenarios.
Research Results

Traits of Successful Farms

http://www.farmdoc.uiuc.edu/
Approach

- Sample of 870 FBFM farms
- Certified balance sheets from 1996 to 2000
- Market valuation of assets
- Rank by ROE each year
- Categorize farms into thirds based on ROE
## Classification by ROE over Time

Percent of Farms in ROE Groups  
FBFM Data, 870 Farms  
1996-2000

<table>
<thead>
<tr>
<th>Number of Years</th>
<th>Low 1/3</th>
<th>Mid 1/3</th>
<th>High 1/3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 out of 5 years</td>
<td>31%</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>1 out of 5 years</td>
<td>21%</td>
<td>26%</td>
<td>23%</td>
</tr>
<tr>
<td>2 out of 5 years</td>
<td>19%</td>
<td>20%</td>
<td>19%</td>
</tr>
<tr>
<td>3 out of 5 years</td>
<td>16%</td>
<td>16%</td>
<td>13%</td>
</tr>
<tr>
<td>4 out of 5 years</td>
<td>8%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>All 5 years</td>
<td>6%</td>
<td>4%</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
One Measure of Success

Classify into 1 of 3 groups

• Group 1: High Achievers
  In the high 1/3 return group in at least four of five years

• Group 2: Moderate Achievers
  Farms that have been in high 1/3 in at least one year and not included in Achiever group

• Group 3: Wait until next year
  Never in high 1/3 return group
Farms

Based on ROE
Group 1: 133 farms
Group 2: 478 farms
Group 3: 259 farms

- High: 15%
- Low: 30%
- Moderate: 55%
Counties Classified by Risk

Based on Average Soybean and Corn Insurance Premiums

Separated Into Thirds

- **Low risk**
- **Medium risk**
- **High risk**
# Characteristics

## Demographics

<table>
<thead>
<tr>
<th></th>
<th>High Achievers</th>
<th>Moderate Achievers</th>
<th>Wait Until Next Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm Size (acres)</td>
<td>1,068</td>
<td>960</td>
<td>692</td>
</tr>
<tr>
<td>Value of Farm Production</td>
<td>289,252</td>
<td>251,233</td>
<td>178,774</td>
</tr>
<tr>
<td>Age</td>
<td>45</td>
<td>49</td>
<td>53</td>
</tr>
<tr>
<td>Soil Rating</td>
<td>85</td>
<td>81</td>
<td>78</td>
</tr>
<tr>
<td>% in low risk counties</td>
<td>73%</td>
<td>59%</td>
<td>42%</td>
</tr>
<tr>
<td>% in higher risk counties</td>
<td>7%</td>
<td>10%</td>
<td>8%</td>
</tr>
</tbody>
</table>

- Size matters
- Performance differs by location
## Characteristics

### Leasing Components

<table>
<thead>
<tr>
<th></th>
<th>High Achievers</th>
<th>Moderate Achievers</th>
<th>Wait Until Next Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 year average</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure (% owned)</td>
<td>0.11</td>
<td>0.16</td>
<td>0.30</td>
</tr>
<tr>
<td>Cash Rented Acres/Total Acres</td>
<td>0.29</td>
<td>0.29</td>
<td>0.22</td>
</tr>
<tr>
<td>Cash Rented Acres/Total Leased Acres</td>
<td>0.33</td>
<td>0.35</td>
<td>0.31</td>
</tr>
</tbody>
</table>

- Lower ROE as ownership increases
- Cash renting not a distinguishing component
- **Reminder**: Valuation changes not included in ROE
## ROE Components

<table>
<thead>
<tr>
<th></th>
<th>High Achievers</th>
<th>Moderate Achievers</th>
<th>Wait Until Next Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5 year average</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROE</td>
<td>0.126</td>
<td>0.032</td>
<td>-0.016</td>
</tr>
<tr>
<td>Debt to Asset Ratio</td>
<td>0.334</td>
<td>0.325</td>
<td>0.253</td>
</tr>
<tr>
<td>ROA</td>
<td>0.108</td>
<td>0.046</td>
<td>0.008</td>
</tr>
<tr>
<td>Interest/Assets</td>
<td>0.024</td>
<td>0.025</td>
<td>0.020</td>
</tr>
<tr>
<td>Profit Margin</td>
<td>0.227</td>
<td>0.115</td>
<td>0.015</td>
</tr>
<tr>
<td>Asset Turnover</td>
<td>0.473</td>
<td>0.361</td>
<td>0.244</td>
</tr>
</tbody>
</table>

- More than a just a tenure issue
- Differences largely driven by ROA – not leverage
## Prices and Yields

<table>
<thead>
<tr>
<th></th>
<th>High Achievers</th>
<th>Moderate Achievers</th>
<th>Wait Until Next Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5 year average</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Corn Yield</td>
<td>156</td>
<td>149</td>
<td>143</td>
</tr>
<tr>
<td>Average Bean Yield</td>
<td>50</td>
<td>48</td>
<td>46</td>
</tr>
<tr>
<td>Average Corn Price</td>
<td>2.29</td>
<td>2.25</td>
<td>2.18</td>
</tr>
<tr>
<td>Average Bean Price</td>
<td>6.22</td>
<td>6.20</td>
<td>6.17</td>
</tr>
</tbody>
</table>

- Yield productivity highly related to performance
- Price not as highly related
- Some price differences may be due to location (basis)
# Financial Efficiency

<table>
<thead>
<tr>
<th></th>
<th>High Achievers</th>
<th>Moderate Achievers</th>
<th>Wait Until Next Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Cost/VFP</td>
<td>0.56</td>
<td>0.62</td>
<td>0.66</td>
</tr>
<tr>
<td>Crop Cost/VFP</td>
<td>0.24</td>
<td>0.26</td>
<td>0.27</td>
</tr>
<tr>
<td>Power and Machinery/VFP</td>
<td>0.10</td>
<td>0.11</td>
<td>0.13</td>
</tr>
<tr>
<td>Other Expense/VFP</td>
<td>0.22</td>
<td>0.25</td>
<td>0.26</td>
</tr>
<tr>
<td>Interest Cost/VFP</td>
<td>0.06</td>
<td>0.07</td>
<td>0.09</td>
</tr>
<tr>
<td>Depreciation Cost/VFP</td>
<td>0.11</td>
<td>0.13</td>
<td>0.15</td>
</tr>
</tbody>
</table>

- Cost efficiency is critical
- Interest cost relationship with leverage
- Power and equipment, depreciation costs very important
# Operating Costs/Acre

<table>
<thead>
<tr>
<th>FARM COSTS</th>
<th>High 1/3</th>
<th>Mid 1/3</th>
<th>Low 1/3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil Fertility</td>
<td>39</td>
<td>41</td>
<td>42</td>
</tr>
<tr>
<td>Pesticides</td>
<td>32</td>
<td>33</td>
<td>34</td>
</tr>
<tr>
<td>Seed</td>
<td>22</td>
<td>25</td>
<td>24</td>
</tr>
<tr>
<td><strong>Crop Total</strong></td>
<td><strong>$93</strong></td>
<td><strong>$99</strong></td>
<td><strong>$100</strong></td>
</tr>
<tr>
<td>Utilities</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Machinery Repairs</td>
<td>12</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td>Machine Hire and Lease</td>
<td>6</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Fuel &amp; Oil</td>
<td>7</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Light Vehicle</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Machinery Depreciation</td>
<td>28</td>
<td>30</td>
<td>32</td>
</tr>
<tr>
<td><strong>Power &amp; Equipment Total</strong></td>
<td><strong>$58</strong></td>
<td><strong>$63</strong></td>
<td><strong>$73</strong></td>
</tr>
<tr>
<td>Drying</td>
<td>7</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Storage</td>
<td>5</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Building Repair and Rent</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Building Depreciation</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td><strong>Building Total</strong></td>
<td><strong>$18</strong></td>
<td><strong>$18</strong></td>
<td><strong>$22</strong></td>
</tr>
</tbody>
</table>

Complementary study on management returns: Schnitkey & Lattz: 2001
## Operating Costs/Acre, cont.

<table>
<thead>
<tr>
<th>Cost Category</th>
<th>High 1/3</th>
<th>Mid 1/3</th>
<th>Low 1/3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor Unpaid</td>
<td>27</td>
<td>28</td>
<td>43</td>
</tr>
<tr>
<td>Labor Paid</td>
<td>5</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td><strong>Labor Total</strong></td>
<td><strong>$32</strong></td>
<td><strong>$35</strong></td>
<td><strong>$48</strong></td>
</tr>
<tr>
<td>Vet, Medicine and Livestock Supplies</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Insurance</td>
<td>10</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>5</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Interest Charge Nonland</td>
<td>32</td>
<td>34</td>
<td>35</td>
</tr>
<tr>
<td><strong>Other Costs, Total</strong></td>
<td><strong>$48</strong></td>
<td><strong>$50</strong></td>
<td><strong>$54</strong></td>
</tr>
<tr>
<td>Interest Charge</td>
<td>17</td>
<td>22</td>
<td>43</td>
</tr>
<tr>
<td>Taxes</td>
<td>4</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Cash Rent</td>
<td>31</td>
<td>40</td>
<td>33</td>
</tr>
<tr>
<td>Leasing Cost</td>
<td>52</td>
<td>47</td>
<td>47</td>
</tr>
<tr>
<td><strong>Land Total</strong></td>
<td><strong>$104</strong></td>
<td><strong>$114</strong></td>
<td><strong>$133</strong></td>
</tr>
<tr>
<td><strong>TOTAL NON-FEED COSTS</strong></td>
<td><strong>$353</strong></td>
<td><strong>$379</strong></td>
<td><strong>$430</strong></td>
</tr>
</tbody>
</table>

Complementary study on management returns: Schnitkey & Lattz: 2001
## Other Measures

<table>
<thead>
<tr>
<th></th>
<th>High Achievers</th>
<th>Moderate Achievers</th>
<th>Wait Until Next Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 year average</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FMV Machinery/Tillable Acre</td>
<td>220</td>
<td>262</td>
<td>313</td>
</tr>
<tr>
<td>Net Farm Income/Operator Acre</td>
<td>120</td>
<td>77</td>
<td>48</td>
</tr>
<tr>
<td>Annual Equity Growth (Mkt. Value)</td>
<td>0.1040</td>
<td>0.0745</td>
<td>0.0539</td>
</tr>
</tbody>
</table>

*Too much machinery?*
Mini-case Study

Pink Handout

http://www.farmdoc.uiuc.edu/
Case Objectives

- Identify
  - 3 major strengths of farm
  - 3 major weaknesses of farm

- Use the Benchmark Reports
Demo of Upcoming Farmdoc tool

Where do I stand financially?

http://www.farmdoc.uiuc.edu/
**Liquidity**

**Current Ratio**

*Interpretation:* This ratio (usually expressed as X:1) indicates the extent to which current farm assets, if liquidated, would cover current farm liabilities. The higher the ratio, the greater the liquidity.

\[
\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}
\]
About Your Farm

Select from each of the following items to describe your farm. This information will be used for comparison of your farm to the Illinois averages.

Name: Sample Farm

Sales (VFP) Category: $75,000 to $150,000

Age: 40 to 4

Farm Type: Grain

Tenure Category (acres owned/acres operated): 11 to 25%
Peer Analysis for Current Ratio

Upper Quartile 75
Median 50
Lower Quartile 25

Farm Type VFP Category All Farms
Age Tenure Ratio

<table>
<thead>
<tr>
<th>Quartile Values</th>
<th>Farm Type</th>
<th>Age</th>
<th>VFP Category</th>
<th>Tenure Ratio</th>
<th>All Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hbg</td>
<td>Less than 30</td>
<td>Less than $75000</td>
<td>0 to 10%</td>
<td>3.47</td>
</tr>
<tr>
<td>Median 50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.56</td>
</tr>
<tr>
<td>Bottom 25%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.98</td>
</tr>
<tr>
<td>Your Farm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.00</td>
</tr>
</tbody>
</table>

Change Information About Your Farm
Adapt Strategies to Change

**FAST Decision Tools**
- Cash Flow Planning Tool
- Enterprise Analysis
- Machinery Economics
- Lease Analysis
- Lease v Purchase
- Land Purchase Analysis

<table>
<thead>
<tr>
<th>What direction?</th>
<th>Scenarios</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity analysis</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Costs of production?</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Machinery timeliness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machinery efficiency</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compare cash and share leases</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Evaluate the profitability of leasing</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>How much to bid for land?</th>
</tr>
</thead>
</table>
Summary

- Measures of success
- Diagnostic tools
- Benchmark measures
- Case study