Financially Resilient Farms
Robert Tigner
Agricultural Systems Economist

U of Illinois Analysis

• Compared farm management characteristics.
• Separated farms into High, Middle and Low profitability groups.
• Looked for farms that were consistently profitable in 2012-2016.
  • What financial differences existed?
Profitable Farm Characteristics

- Higher revenues
  - From 5-7% higher corn yields, 2-6% higher soybean yields
  - Higher prices: 2-5% higher for corn, 2-4% higher for soybeans
  - So no home runs in the revenue data.

Profitable Farm Characteristics

- Lower costs in all categories
Revenue, Costs, and Returns

<table>
<thead>
<tr>
<th></th>
<th>2010 to 2012</th>
<th></th>
<th>2014 to 2016</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Top 1/3</td>
<td>Mid 1/3</td>
<td>Diff</td>
<td>Top 1/3</td>
</tr>
<tr>
<td>Revenue</td>
<td>$958</td>
<td>$870</td>
<td>$88</td>
<td>$783</td>
</tr>
<tr>
<td>Direct Costs</td>
<td>$248</td>
<td>$247</td>
<td>$1</td>
<td>$270</td>
</tr>
<tr>
<td>Power Costs</td>
<td>$98</td>
<td>$115</td>
<td>-$17</td>
<td>$118</td>
</tr>
<tr>
<td>Overhead Costs</td>
<td>$64</td>
<td>$72</td>
<td>-$8</td>
<td>$67</td>
</tr>
<tr>
<td>Total Costs</td>
<td>$409</td>
<td>$433</td>
<td>-$24</td>
<td>$455</td>
</tr>
<tr>
<td>Returns</td>
<td>$549</td>
<td>$437</td>
<td>$112</td>
<td>$328</td>
</tr>
</tbody>
</table>

Source: Paulson, 2018

Production profile of IL farms

- Soil productivity similar
  - High profit farms pay average or less cash rent
- 50/50 corn-soybean rotation
- High Profit farms operate more acres
  - Range is only 200 acres across all groups
How about NE farms

- NE Farm Business Inc. data
  - Same 568 farms from 2012 to 2016
  - Data separated into pentiles by Net Farm Income

### Profitability

<table>
<thead>
<tr>
<th>Avg. Of</th>
<th>Low 20%</th>
<th>20 - 40%</th>
<th>40 - 60%</th>
<th>60 - 80%</th>
<th>High 20%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of farms</td>
<td>568</td>
<td>113</td>
<td>114</td>
<td>113</td>
<td>114</td>
</tr>
<tr>
<td>Profitability (cost)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate of return on assets</td>
<td>4.8 %</td>
<td>-5.0 %</td>
<td>-0.8 %</td>
<td>3.5 %</td>
<td>6.0 %</td>
</tr>
<tr>
<td>Rate of return on equity</td>
<td>5.3 %</td>
<td>14.6 %</td>
<td>3.5 %</td>
<td>3.2 %</td>
<td>7.1 %</td>
</tr>
<tr>
<td>Operating profit margin</td>
<td>11.2 %</td>
<td>18.1 %</td>
<td>-2.4 %</td>
<td>9.6 %</td>
<td>16.5 %</td>
</tr>
<tr>
<td>Asset turnover rate</td>
<td>36.3 %</td>
<td>27.7 %</td>
<td>34.6 %</td>
<td>36.3 %</td>
<td>36.2 %</td>
</tr>
</tbody>
</table>

Inefficient use of assets and poor operating profit margin led to low profits.

Efficient use of assets and high operating profit margin led to high profits.
Wealth

<table>
<thead>
<tr>
<th></th>
<th>Avg Of All Firms</th>
<th>Less Than 20%</th>
<th>20-40%</th>
<th>40-60%</th>
<th>60-80%</th>
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<tr>
<td>Solvency (end of year at cost)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>114</td>
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<tr>
<td>Total assets</td>
<td>2,975,194</td>
<td>3,117,489</td>
<td>1,558,274</td>
<td>2,145,468</td>
<td>3,094,468</td>
<td>4,993,329</td>
</tr>
<tr>
<td>Net worth</td>
<td>1,986,488</td>
<td>1,332,797</td>
<td>1,019,775</td>
<td>1,581,776</td>
<td>2,037,333</td>
<td>3,492,899</td>
</tr>
<tr>
<td>Net cash provided</td>
<td>850</td>
<td>744</td>
<td>744</td>
<td>744</td>
<td>744</td>
<td>744</td>
</tr>
<tr>
<td>Net profit</td>
<td>37%</td>
<td>54%</td>
<td>37%</td>
<td>25%</td>
<td>21%</td>
<td>12%</td>
</tr>
<tr>
<td>Total debt to asset ratio</td>
<td>35%</td>
<td>31%</td>
<td>35%</td>
<td>35%</td>
<td>31%</td>
<td>30%</td>
</tr>
<tr>
<td>Change in earned net worth %</td>
<td>4%</td>
<td>-1%</td>
<td>-1%</td>
<td>3%</td>
<td>5%</td>
<td>10%</td>
</tr>
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Poor profits led to lost wealth. High profits led to wealth increase more than the stock market.

Ability to cash flow

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<tr>
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</tr>
<tr>
<td>Liquidity &amp; Repayment (end of year)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current assets</td>
<td>871,464</td>
<td>1,059,630</td>
<td>375,841</td>
<td>229,282</td>
<td>204,091</td>
<td>114,080</td>
</tr>
<tr>
<td>Current liabilities</td>
<td>499,693</td>
<td>946,639</td>
<td>229,282</td>
<td>204,091</td>
<td>114,080</td>
<td>114,080</td>
</tr>
<tr>
<td>Current ratio</td>
<td>1.94</td>
<td>1.25</td>
<td>1.25</td>
<td>1.25</td>
<td>1.25</td>
<td>1.25</td>
</tr>
<tr>
<td>Working capital</td>
<td>417,779</td>
<td>211,941</td>
<td>256,598</td>
<td>322,679</td>
<td>669,223</td>
<td>951,765</td>
</tr>
<tr>
<td>Term debt coverage ratio</td>
<td>1.94</td>
<td>0.80</td>
<td>0.42</td>
<td>1.47</td>
<td>2.37</td>
<td>5.01</td>
</tr>
<tr>
<td>Replacement coverage ratio</td>
<td>1.29</td>
<td>-6.16</td>
<td>0.29</td>
<td>1.01</td>
<td>1.80</td>
<td>3.34</td>
</tr>
<tr>
<td>Term debt to EBITDA</td>
<td>1.80</td>
<td>-49.47</td>
<td>3.50</td>
<td>1.75</td>
<td>1.55</td>
<td>0.94</td>
</tr>
</tbody>
</table>

Can’t pay debt when due. Only group that could pay debts on time.
So what do I do to increase liquidity

- Cost control
- Re-negotiate cash rent
- Reduce capital spending
- Reduce family living
- Increase revenue
- Increase non-farm income
- Re-negotiate loan terms

Cost of Production

- Tools for calculation
  - Iowa State University: Ag Decision Maker
  - UNL Agricultural Economics Crop Budgets
Using Financial Analysis

- **Ratio Analysis**
  - Calculate “industry accepted” ratios for your firm
  - Compare your performance to industry “norms”
  - Farm Financial Standards Council (FFSC)

- **Trend Analysis**
  - Analyze your financial ratios over a period of time
  - 3-5 years
  - Look for positive & negative trends

Financial Ratio Calculation

https://www.extension.iastate.edu/agdm/wholefarm/xls/c3-55finperformancemeasures.xlsx
Documents needed

• Balance Sheets
  • Current Balance Sheet
  • 3-5 Historic Balance Sheets & Pro forma

• Income Statements
  • May use tax records as a proxy
  • Current Year's Income Statement
  • 3-5 Year’s Historic Income Statements & Pro forma
    • Can calculate trend analysis

Limitations of Ratio Analysis

• Requires good, accurate data/information
• Ratios do NOT identify the specific problem
  • They point you towards the problem
• Ratios may fluctuate during the year
• Pogo stick syndrome due to accounting methods
• When income & expenses are posted
• Requires knowledge of statements and ratios
• Requires common sense!!!
Liquidity

1. Current ratio
   - Vulnerable
   - 1.3
   - Strong
   - 2.0

2. Working capital
   - $ ______

3. Working capital to gross revenues
   - ___%

Solvency

4. Farm debt-to-asset ratio
   - ___%
   - 60%
   - 30%

5. Farm equity-to-asset ratio
   - ___%
   - 40%
   - 70%

6. Farm debt-to-equity ratio
   - ___%
Profitability

- Net farm income: $______
- Rate of return on farm assets: ___%
- Rate of return on farm equity: ___%
- Operating profit margin: ___%

Financial Efficiency

- Asset-turnover rate: ___%
- Operating-expense ratio: ___%
- Depreciation-expense ratio: ___%
- Interest-expense ratio: ___%
- Net farm income ratio: ___%
Benchmarking

https://finbin.umn.edu/

Ag Decisionmaker
Breakeven Worksheets

Crop Production Costs Budgets (13 Decision Tools)
Use these decision tools to project the costs and returns of growing:
- Corn following Corn
- Corn following Soybean
- Corn Silage following Corn
- Herbicide tolerant Soybeans following Corn (herbicide tolerant)
- Low-till corn following Soybeans
- Low-till drilled Soybeans following Corn
- Strip till Corn following Soybeans
- Strip till Herbicide Tolerant Soybeans following Corn
- Alfalfa or Alfalfa-grass Hay Budget
- Alfalfa or Alfalfa-grass Hay with Oat Companion Crop Budget
- Oat or Other Small Grain Budget
- Improved Grass Pasture
- Improved Grass-legume Pasture

Breakeven Worksheet for Crops
Use this decision tool to find cash-flow requirements per acre and break-even selling prices per bushel or ton for individual crops.

Crop Rotation Summary
Use this decision tool to estimate the returns for different crop rotations

UNL Crop Budgets

cropwatch.unl.edu/budgets

Nebraska Crop Budgets

2016 Nebraska Crop Budgets include 56 crop production budgets for 16 crops, as well as a comparison crop budget, producer, and residual values for retail and wholesale prices, and a crop budget summary sheet. The crop budgets reflect current market conditions. Crop production budgets were prepared by crop and compiled into crop sheets. Crop budgets are subject to change due to market conditions.

These budgets were developed and reviewed by Robert Tigner, extension specialist in Nebraska corn specialist, Roger Willits, extension specialist in Nebraska soybean specialist, and Jim Hageman, extension specialist in crop budgets. The Crop Budgets are intended for use as a tool to help farmers make informed decisions about crop production.
Cost calculation

• Calculate 2 costs
  • Cash flow cost and full economic cost
    • Cash flow costs include all items that are need to fund
      the checking account
      • Does not include family living
    • Full economic cost includes investment, unpaid labor
      and management
      • Does not include principal payments, SS or income taxes

Sources

• Ag Decision Maker: An agricultural economics and business
  web site. (n.d.). Retrieved March 12, 2018, from
  https://www.extension.iastate.edu/AGDM/

  https://cropwatch.unl.edu/budgets

• Lattz, D. "IFES 2017: Habits of Financially Resilient Farms -
  Continued." farmdoc daily, Department of Agricultural and
  Consumer Economics, University of Illinois at Urbana-
  Champaign, January 24, 2018.

• Paulson, N. "IFES 2017: Habits of Financially Resilient
  Farms." farmdoc daily, Department of Agricultural and
  Consumer Economics, University of Illinois at Urbana-
  Champaign, January 10, 2018.