FINANCIAL ANALYSIS:

RATIOS AND OTHER FINANCIAL MEASURES

by

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Financial Analysis

Effort to determine if business is successfully achieving financial objectives.

Financial analysis can only be performed after financial objectives are defined.

What are the financial objectives of a business?

1. **Profit maximization**
2. **Risk minimization**
3. **Liquidity**

Standards of Performance

1. **Budget and historic performance of business**
2. **Sector norms (dairy and agriculture)**
3. **Market norms (general economy)**

Why are there standards of performance?

Result of competition in capital markets.

Theoretical Function of Capital Markets

Allocate limited capital resources to those activities which yield the greatest level of economic benefits (output, returns, profits, etc.).

Price of Capital

Return per unit of capital over time

Standardized price variables
a. **Unit of capital -- $1**
b. **Time -- 1 year**

Price of capital is thus stated in terms of the returns one may earn annually on each dollar of capital committed to a given economic activity -- interest rate.

<u>Competition Within the Capital Market</u>

Relatively high returns on capital are market signals that the demands for a specific economic good or service are not being satisfied to the extent that other demands are being met. Profit seeking investors will respond to this market signal by shifting capital from low valued activities to high valued activities.

As capital is reallocated, returns from economic activities will change depending on whether capital stocks are increasing or decreasing. Returns will fall as capital stocks expand and they will rise as capital stocks are reduced. These adjustments in returns to capital occur until the capital market is at an equilibrium.

<u>Capital Market Competition</u>

Sector vs. sector
Agriculture vs. manufacturing vs. service industries
Enterprises within agriculture
Dairy vs. beef vs. swine vs. grains

<u>Capital Market Responses to Risk</u>

Maximization of returns is only one of the financial objectives of a business. A second important objective is controlling risks and protecting capital that has been accumulated. (Preservation of wealth)

<u>Price of Capital with Risk</u>

Return from risk-free investment (government security) plus
Premium as compensation for accepting risk

<u>Financial Structure and Level of Risk</u>

Financial structure - mix of debt and equity used to finance business operations

Leverage - debt to equity

As leverage rates increase, more risk of equity being lost if financial adversities are experienced by firm. Risk present because claims of creditors must be satisfied regardless of situation.

Financial Ratios and Key Financial Measures Recommended by Farm Financial Standards Task Force

I. Profitability

A. Rate of return on farm assets
B. Rate of return on farm equity
C. Operating profit margin ratio
D. Net farm income

II. Liquidity

A. Current ratio
B. Working capital

III. Solvency

A. Debt/asset
B. Equity/asset
C. Debt/equity

V. Repayment capacity

A. Term debt and capital lease coverage ratio
B. Capital replacement and long-term repayment margin

IV. Financial Efficiency

A. Asset turnover
B. Operational ratios

Profitability - indication of business ability to use capital, labor, and management to generate economic returns.

Measures:

1. Net farm income

<u>Computation</u>

Revenue - production expenses - financing expenses

<u>Interpretation</u>

Absolute measure of returns to:

a. unpaid operator labor
b. unpaid operator management
c. capital investment (equity)

2. Rate of return on farm assets

<u>Computation</u>

$$\frac{\text{Net income from operating and internal expenses - return to labor and management}}{\text{Average farm assets}}$$

<u>Interpretation</u>

Profit before financing costs earned per dollar invested in farm assets

<u>Usage</u>

a. Management rating
- **High value - good management**
- **Low value - poor management**

b. Economic performance
- **ROA greater than return on alternative investment**
  economic gain from asset selection
- **ROA less than return on alternative investment**
  economic loss from asset selection

c. Financing opportunities
- **ROA greater than interest rate on debt**
  profitable use of credit
- **ROA less than interest rate on debt**
  unprofitable use of credit

Special considerations

a. Asset valuation method impacts ROA value

Market value - reduces ROA

Cost basis - increases ROA

b. Family living withdrawal may be used as measure of returns to labor and management.

3. Average interest rate on debt

Computation

$$\frac{\text{Interest expense}}{\text{Average farm debts}}$$

Interpretation

Average rate of interest paid per dollar of credit used

Usage

a. Cost of financing operations to be compared with ROA

4. Rate of return on equity

Computation

$$\frac{\text{Net income from operations - return to labor and management}}{\text{Average from equity}}$$

Interpretation

Profit earned per dollar invested in farm business

Usage

a. Investment performance

Minimum level – inflation rate (Preservation of capital)

Target level -- ROA or greater

Ideal level -- greater or ROA or opportunity cost of capital

Special considerations

Asset valuation method impacts ROE value

Market value -- reduces ROE

Cost basis -- increases ROE

Liquidity -- indication of a business' ability to:

1. Pay its financial obligations when they come due; and
2. Cover unexpected expenses that periodically occur (repairs, casualties, etc.)

Measures:

1. Current ratio
Current assets divided by current debts

Minimum level	**1.00 : 1**
Acceptable level	**1.20 : 1 or greater**

2. Working capital
Current assets - current debts

Minimum level	**0**
Acceptable level	**20 % of current debts or greater**

Solvency -- indication of business' ability to pay financial obligations and withstand declines in asset returns or increases in interest rates.

Measures:

1. Debt to asset

Maximum level	**1.00 : 1**
High level	**.70 : 1**
Moderate level	**.40 : 1**
Low level	**less than .40**

2. Equity to asset

Minimum level	**0**
Poor position	**.30 : 1**
Fair position	**.70 : 1**
Good position	**greater than .70**

3. Debt to Equity

High level	**2.33 or more**
Medium level	**.67**
Low level	**less than .67**

Maximum debt to equity
Depends on:
a. Level of return on assets
b. Level of interest rate on debt
c. Variability of return on assets
d. Variability of interest rate on debt

Gain in returns from leverage

D/E	ROA	Int	ROE
.67	11%	9%	12.34%
2.33	11%	9%	15.66%

Gain of 3.32% on ROE from leverage.

Volatility in returns due to leverage

Change in interest rate on debt

D/E	ROE	Chg Int	Adj ROE	Chg ROE
.67	12.34%	+1%	11.67%	-.67%
2.33	15.67	+1%	13.33 %	-2.34%

Change in return on assets

D/E	ROE	Chg ROA	Adj ROE	Chg ROE
.67	12.34%	-1%	10.67%	-1.67%
2.33	15.67%	-1%	12.33%	-3.34%

Assessing the risks of leverage

A. Spread between return on assets and interest rates on debts (ROA - interest rate)

Spread	Risk from leverage
Less than 0	Loss position
0% to 1%	High to moderate
1% to 2%	Moderate to low
2% or more	Low

B. Variability of interest rate on debt

Interest rate	Risk from leverage
Variable	High
Variable with cap	Moderate
Fixed	Low

Financial efficiency -- indication of business' success in utilizing productive resources

Measures:

1. Asset turnover

Computation

$$\frac{\text{Revenue}}{\text{Average assets}}$$

Interpretation

Relative measure of how effectively a business is utilizing assets.

Usage

1. Management assessment

High turnover

High production and/or limited investment in assets

Low turnover

Low production and/or excessive investments in assets

2. **Operating profit margin ratio**

Computation

$$\frac{\text{Net income from operating and interest expenses - return to labor and management}}{\text{Revenue}}$$

(Alternatively)

$$\frac{\text{Revenue}}{\text{Revenue}} \quad \frac{\text{Production expenses}}{\text{Revenue}} \quad \frac{\text{Return to labor \& mgmt}}{\text{Revenue}}$$

$$1 \quad \frac{\text{Production expenses}}{\text{Price x output}} \quad \frac{\text{Return to labor and management}}{\text{Price x output}}$$

$$\frac{1}{\text{Price}} \quad \text{Price - average cost of production}$$

Interpretation

Return or profit earned per dollar of output

Usage

Management assessment

Cost of production relative to output price source of profits

a. **High output price**
b. **Low cost of production**

Relationship between turnover, operating profit margin, and ROA

ROA is the product of turnover and profit margin.

3. **Operational ratios**

$$\frac{\text{Operating expense}}{\text{Revenue}}$$

$$\frac{\text{Depreciation expense}}{\text{Revenue}}$$

$$\frac{\text{Interest expense}}{\text{Revenue}}$$

$$\frac{\text{Net farm income from operations}}{\text{Revenue}}$$

Repayment capacity -- indication of business' ability to service term debt and capital lease payments.

Measures:

1. **Term debt and capital lease coverage ratio**

<u>Computation</u>

<u>Cash available to service term debts and leases</u>
Term debt and capital lease commitments

Cash available

Net farm income from operations
Non-farm income
Depreciation expense
Interest on term debts
Interest on capital leases
- Income tax expense
- Withdrawals for family living

Term debt and capital lease commitments

Principal and interest on term debt
Scheduled capital lease payments

<u>Interpretation</u>

Cash available relative to cash needs

Minimum value	**1.00 : 1**
Acceptable value	**1.25 : 1**

2. Capital replacement and long-term debt repayment margin

<u>Computation</u>

Net farm income from operations
Non-farm income
Depreciation expense
- Income tax expense
- Withdrawals for family living

Equals capital debt repayment capacity

- Payment on unpaid operating debts prior period
- Principal payment term debts
- Payments on capital leases

Equals capital replacement and long-term debt repayment margin