



# Analyzing financial performance

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# Analyzing financial performance



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## Purpose

The purpose of this module is to help you:

1. learn to use information from three financial statements to analyze your business's financial performance,
2. become familiar with four different criteria and several measures you can use to analyze the financial performance of your business,
3. learn how to calculate measures for evaluating liquidity, solvency, profitability and financial efficiency,
4. learn to apply general rules in interpreting liquidity, solvency, profitability and financial efficiency measures, and
5. become aware that there are several other production efficiency measures.

## Videotape script

By Freddie L. Barnard

Financial statements contain much of the information you need to make business decisions. But once you have that information, how do you use it to systematically analyze your farm or ranch business to determine its strengths and weaknesses? During this session, we'll discuss the criteria and measures used to analyze financial performance.

The four criteria most often used to analyze financial performance are liquidity, solvency, profitability and financial efficiency.

Liquidity reflects the ability of a business to meet its financial obligations as they come due, without disrupting normal business operations. Three measures often used to evaluate liquidity are working capital, the current ratio and

This is one module of the *Business Management in Agriculture* series and is intended to be used with its corresponding videotape. The script may vary from the actual videotape text.

the current debt percentage. The information needed to calculate each of these measures comes from a balance sheet.

## How to analyze liquidity

Working capital equals current assets minus current liabilities. Working capital can be calculated using either of the asset valuation methods (market value and cost) which we discussed during our session on the balance sheet. However, since working capital is intended to reflect a business's ability to meet current obligations, the current market value is more appropriate than the cost value.

When calculating working capital, exclude contingent liabilities from current liabilities since contingent liabilities are *contingent* on certain events happening.

If current assets equal current liabilities, working capital is zero. If current assets are greater than current liabilities, working capital is positive. And, of course, working capital is negative when current assets are less than current liabilities.

The greater the amount of working capital, the more liquid the business. One problem with using working capital is comparing the working capital position of businesses of different sizes. Working capital of \$10,000 for a business with \$20,000 in current assets is quite different from working capital of \$10,000 for a business with \$100,000 in current assets.

The **current ratio**, calculated by dividing current assets by current liabilities, is another way of expressing the relationship between current assets and current liabilities.

When the current ratio is 1.0, the value of current assets equals the value of current liabilities. A current ratio of 1.0 corresponds to working capital of zero. If the current ratio is greater than 1.0, a business is considered to be in a liquid position. When the ratio is less than 1.0, a business is not in a liquid position and may have to liquidate intermediate or long-term assets, or refinance some current liabilities, to meet its financial obligations.

Keep in mind that the current ratio is calculated from the information on a balance sheet, which reports your financial position as of a specific date. Since financial position can change during the year, many lenders like to see a current ratio of 1.5 to 2.0 or more at the end of a calendar year. This allows for a liquidity cushion in case of adverse price or production changes during the upcoming year. However, the preferred current ratio can vary depending on the type of business.

The third liquidity measure, the **current debt percentage**, equals current liabilities divided by total liabilities. Current debt percentage shows the percentage of total liabilities that must be paid within 12 months. The

### FINANCIAL PERFORMANCE CRITERIA

- Liquidity
- Solvency
- Profitability
- Efficiency

## GENERAL RULE

Compare the current debt percentage over time and evaluate why it has changed.

higher the percentage, the higher the percent of liabilities that must be paid during the next 12 months. (Any of the liquidity measures can be multiplied by 100 to convert the numbers to a percentage.)

At first glance, many people think the lower the current debt percentage the better the financial position of the business. But that isn't necessarily true. For example, if a business has only an operating loan and no intermediate or long-term liabilities, the current debt percentage is 100. Such a business may be in excellent financial condition, particularly if the business owns substantial amounts of intermediate and long-term assets, and those assets are paid for. It can be misleading to try to set specific guidelines for this measure. Instead, it is better to compare current debt percentage for an individual operation over time and evaluate why the percentage changed.

One reason for an increasing percentage could be repayment of intermediate or long-term debt on an amortized repayment schedule. As each payment is made, a higher percentage of the remaining principal is due during the next 12 months. But if the (debt percentage) increase is the result of an increase in accounts payable to finance operating losses, that would be cause for concern on the part of borrower and lender.

## Is Frank's business liquid?

Now let's use Frank Farmer's example farm to calculate each of these liquidity measures. First let's look at the working capital for Frank Farmer on December 31, 19X0 (see beginning balance sheet, p. 15).

By subtracting current liabilities of \$100,000 from current assets of \$111,000 we get working capital of \$11,000. So Frank does have some working capital and his business is in a liquid position. But just how liquid is his business relative to its size?

Let's use the current ratio to answer that question. Current ratio equals current assets divided by current liabilities. In Frank's case that is \$111,000 divided by \$100,000, or a current ratio of 1.11. Frank's business is in a liquid position because the current ratio is greater than one. For each \$1 of current liabilities, Frank has \$1.11 of current assets. However, his business is probably not as liquid as Frank and his lender would like it to be. It would probably be to Frank's advantage to have a current ratio of from 1.5 to 2.0.

Now let's look at Frank's current debt position to see what percentage of his total liabilities are due during the next year. Current debt percentage equals current liabilities (\$100,000) divided by total liabilities (\$178,000) or 0.56. Multiplying 0.56 by 100 gives 56%.

In Frank's case, 56% of his liabilities on December 31, 19X0, are due during the next 12 months. Without knowing how the current debt percentage has changed over time or the reasons for that change, it is difficult to say whether 56% is good or bad. Review some of the reasons that could cause the figure to change, and the composition of Frank's liabilities, because in Exercise 2 you'll have a chance to calculate Frank's current debt position for December 31, 19X1.

## Evaluating solvency

The second criterion used to evaluate financial performance is solvency, or whether the sale of all of a business's assets would provide enough cash to cover all outstanding debts. Unlike liquidity, solvency is a long-run concept since we assume all assets are sold and converted into cash, and all liabilities are paid.

Perhaps the most straightforward measure of solvency is net worth. But looking at net worth alone makes it difficult to compare operations of different sizes. So we often use other measures, such as debt-to-asset percentage and the leverage ratio, to evaluate the relationships between claims against the business and total assets or net worth.

**Debt-to-asset percentage** measures the proportion of total assets financed by debt. It is calculated by dividing total liabilities by total assets and multiplying the result by 100 to convert it to a percentage.

The **leverage ratio**, or debt-to-equity ratio, measures the relationship between liabilities and net worth. To calculate the ratio, divide total liabilities by net worth. When the ratio is 1.0, total liabilities equal net worth. This corresponds to a debt-to-asset percentage of 50. A general rule is that when the ratio is greater than 1.0, the lender is financing a greater percentage of the business than the owner. When the ratio is less than 1.0, the opposite is true.

Let's calculate solvency measures for Frank Farmer's operation. First we should decide which valuation method to use to value assets. To be conservative, Frank should use the lower of the cost and market values. However, to accurately represent the current solvency position of his business, Frank will want to use the market value.

We'll calculate debt-to-asset percentage by dividing Frank's total liabilities of \$178,000 by his total assets of \$350,000, using the market-value method. Multiplying the result by 100 gives 51%. This means that for each \$1 of assets, Frank has 51 cents of debt.

Now let's calculate the leverage ratio. Again, we'll use the market-value method of valuing assets and liabilities. Since Frank's debt-to-asset percentage is 51, we know that the leverage ratio will be slightly greater than 1.0. When we

### GENERAL RULE

Use the lower figure of the cost and market valuations.

## HOW TO MEASURE PROFITABILITY

1. Net farm income
2. Return on assets ratio
3. Profit margin ratio

divide Frank's total liabilities of \$178,000 by his net worth of \$172,000, we get a leverage ratio of 1.03. Thus, for each \$1 of net worth, Frank has \$1.03 of debt.

We see that Frank is indeed solvent, but he could be vulnerable to an operating loss or drop in the market value of his assets.

People often want guidelines or standards with which to compare the solvency measures of their businesses. However, each operation is different, as is the ability of each manager to manage debt. The acceptable debt level for a particular business is heavily influenced by the borrower's management ability and the type of operation.

### Measuring profitability

The third criterion used in financial analysis is profitability. I'll discuss four measures of profitability: net farm income, return on assets, return on equity, and profit margin.

In a farm or ranch business, net farm income, our first measure of profitability, is the return to operator labor, unpaid family labor, equity capital and management. It is from this amount, depreciation and non-farm income that family living expenses, income taxes, and principal payments on intermediate and long-term debt must be paid.

You should also evaluate profitability in relation to the amount of capital invested to generate a return. That requires measuring net farm income for a given accounting period and then comparing net farm income to the amount of capital invested in the business.

If you don't relate net farm income to the amount of resources used to generate that income, it's hard to tell whether the return is good or bad. For example, a \$25,000 net farm income might be favorable for a young family with a \$20,000 net worth, but it may not be satisfactory for a family with a \$500,000 net worth. However, it is helpful to evaluate your dollar income figure over time and when comparing similar farms of comparable size.

### Return on assets

A second profitability measure, the rate of return on assets, is calculated as follows:

$$\frac{\text{net farm income} + \text{interest expense} - (\text{unpaid operator and family labor, and management})}{\text{average total assets}} \times 100$$

This measure sorts out returns to operator capital by subtracting unpaid operator, family labor and management expenses. Withdrawals for family living expenses, which



are calculated in the statement of owner equity (p.21), are often substituted for these expenses.

Since we are calculating a rate of return on total capital (both debt and equity), interest paid to lenders must be added back to net farm income because it is a return that creditors earned on debt capital. Finally, we divide total capital returns by average total assets to get the rate of return for the assets used during the entire period. To calculate average total assets, add total assets at the beginning and at the end of the year. Then divide that amount by two. Keep in mind that this figure equals the return on average total assets before taxes.

Now let's calculate Frank Farmer's rate of return on assets. Remember that we'll need to use information from the beginning and ending balance sheets and the income statement.

We'll use the market value of Frank Farmer's assets to do the calculation. First we'll average the total assets on hand at the beginning and end of the year to find average assets used during the accounting period. The market value of Frank's total assets at the beginning of the period, from Frank's December 31, 19X0, balance sheet, is \$350,000. The market value of Frank's total assets on December 31, 19X1, is \$330,000. The average of these two values is:

$$\frac{(\$350,000 + \$330,000)}{2} = \$340,000$$

Return to total assets equals net farm income plus interest paid minus net withdrawals.

So we add net farm income of \$8,000 to \$18,870, the amount of interest paid, because we are interested in the return on all Frank's assets, regardless of whether those assets are financed by debt or Frank's net worth.

We then subtract from that total Frank's unpaid operator and family labor, and management expenses of \$13,000 to get a return to total capital or assets. We'll use Frank's family living withdrawals of \$13,000 as a substitute for unpaid operator and family labor, and management expenses. The result is a return to assets of \$13,870 (\$8,000 + \$18,870 - \$13,000). Now we divide \$13,870 by average assets (\$340,000), which equals a return of 0.041. Multiplying 0.041 by 100 gives a rate of return on assets of 4.1%. Remember, this is a before-tax rate of return. Also, the 4.1% does not include capital gains or losses.

To put return on assets in perspective, you should compare it to the before-tax return Frank could have earned from other investments, which were probably higher than 4.1%. Frank's 4.1% return on assets does not compare favorably to his average cost of term debt, which was 10.7% for 19X1. Thus, Frank's profitability is not as strong as it

## RETURN ON ASSETS =

Net farm income +  
Interest paid —  
(Unpaid operator and family  
labor, and management)

---

Average total assets

should be and is contributing to his vulnerable liquidity position.

## Return on equity capital

A third profitability measure, return to equity capital, is calculated as follows:

$$\frac{\begin{array}{l} \text{net farm income} \\ - (\text{unpaid operator and family labor,} \\ \text{and management}) \end{array}}{\text{average net worth}} \quad \times 100$$

This measure relates the returns to equity capital generated by a business to an owner's net worth. We calculate average net worth for the year by adding net worth at the beginning and at the end of the year and dividing that amount by two. Many operators attempt to maximize the return on equity. Again, this amount is a before-tax figure. Return to equity and return on assets should be calculated with total assets and net worth adjusted to exclude non-farm assets. This gives profitability measures for only the farm business.

Now might be a good time to calculate Frank's return to equity for year 19X1.

## Profit margin

The fourth profitability measure, profit margin, is calculated as follows:

$$\frac{\begin{array}{l} \text{net farm income} + \text{interest paid} \\ - (\text{unpaid operator and family labor,} \\ \text{and management}) \end{array}}{\text{value of farm production}} \quad \times 100$$

To calculate the value of farm production, subtract purchased feed and feeder livestock from total farm revenue. This gives the revenue that was actually produced on the farm or ranch.

Profit margin gives the percentage of the value of farm production that was earned by the business as a return to total capital. It is an efficiency measure that shows profit per dollar of the value of farm production.

If we add \$8,000 for Frank Farmer's net farm income and \$18,870 for interest paid, then subtract \$13,000 for family living withdrawals, we get \$13,870. Dividing \$13,870 by the value of farm production (\$155,470) gives 0.089. Multiplying by 100 gives a profit margin for Frank Farmer of 8.9%. Thus, for each \$1 of production, Frank is realizing 8.9 cents for his return to total capital investment.

## Measuring financial efficiency

The fourth criterion in financial analysis, financial efficiency, measures the relationship between financial inputs and outputs.

The first measure of financial efficiency is turnover. It is calculated by dividing the value of farm production (from your income statement) by average total assets. This measures how effectively you are using assets to generate revenue.

Turnover shows the efficiency of capital usage. The higher the turnover, the more effectively assets are being used. But keep in mind that turnover will vary depending on type of enterprise. For instance, the turnover for a grain and farrow-to-finish hog operation will usually be higher than the turnover for the same business organized as just a grain farm. To be useful, turnover should be compared with the turnover for similar farms. Turnover is also a measure of volume.

To calculate Frank Farmer's turnover, we take \$155,470, the value of farm production, and divide by average total assets of \$340,000. Multiplying by 100 gives a turnover of 46%.

As you know, you can increase profits by:

1. increasing the volume of production and
2. increasing profit per unit produced.

This relationship is clearly illustrated by a relationship that exists among return on assets, profit margin and turnover. If we multiply the profit margin for a business times the turnover, the result should be return on assets. Let's see if that relationship holds true for Frank Farmer's operation.

Profit margin (0.089) X turnover (0.46) = 0.041.

If we multiply 0.041 by 100, we get 4.1%. This is the return on assets that we previously calculated.

## Operational efficiency measures

There are five operational efficiency measures that reflect the composition of the value of farm production. These measures represent the relationship between a business's financial inputs and outputs. They should add up to 100% if any gain or loss on the disposal of farm or ranch assets is treated as an adjustment. The measures are:

1. operating expenses (excluding depreciation and interest) divided by the value of farm production X 100,
2. depreciation divided by the value of farm production X 100,
3. interest divided by the value of farm production X 100,

### GENERAL RULE

The higher the turnover,  
the more effectively  
assets are being used.

4. net farm income divided by the value of farm production X 100, and
5. gain or loss on the disposal of farm or ranch assets divided by the value of farm production X 100.

Let's calculate the first measure. Frank's operating expenses (excluding depreciation and interest) for 19X1 equal \$111,600. This amount, divided by the value of farm production, \$155,470, equals 72%.

Another measure of financial efficiency is the **debt-servicing percentage**. It is calculated as follows:

$$\frac{\text{interest + principal payments on capital loans}}{\text{value of farm production}} \times 100$$

Principal payments on capital loans are payments made during the past year on intermediate and long-term loans. Debt-servicing percentage reflects how burdensome debt service is on the value of farm production.

For Frank Farmer, interest of \$18,870 added to \$9,000 (principal payments on intermediate and long-term loans) equals \$27,870. Dividing \$27,870 by the value of farm production, \$155,470, equals 0.179, or a debt-servicing percentage of 17.9. This means that for every \$1 of farm production, 17.9 cents went to service debt.

This completes our session on year-end analysis. Due to limited time, our example did not address such production efficiency measures as:

1. yields per production unit for crops,
2. rates of gain for livestock,
3. labor efficiency measures and
4. machinery efficiency measures.

A complete analysis of Frank Farmer's business should also include these measures. Additional information is listed in the references.

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# Exercise 1

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## Video questions

Indicate whether each of the following statements is true (T) or false (F).

- T F 1. The four criteria used to evaluate financial performance are liquidity, solvency, profitability and efficiency.
- T F 2. One definition of liquidity is the ability of a business to generate sufficient cash to meet its financial obligations, without disrupting normal business operations.
- T F 3. One measure of liquidity is current debt percentage.
- T F 4. A high current debt percentage always indicates a worsening liquidity position.
- T F 5. Debt-to-asset percentage is one measure of financial solvency.
- T F 6. Solvency reflects the likelihood that the sale of all farm or ranch assets would provide enough cash to cover all outstanding debts.
- T F 7. If total liabilities equal \$20,000, and total assets equal \$100,000, then debt-to-asset percentage is 5%.
- T F 8. A leverage ratio of 1.0 corresponds to a debt-to-asset percentage of 100.

Match the financial measure with the appropriate equation. All letters will be used one time.

- |   |  |
|---|--|
| _____ 9. return on assets                   | A. $\frac{\text{value of farm production}}{\text{average total assets}} \times 100$  |
| _____ 10. return on equity                  | B. $\frac{\text{interest + principal on capital loans}}{\text{value of farm production}} \times 100$   |
| _____ 11. turnover                          | C. $\frac{\text{operating expenses (excluding depreciation and interest)}}{\text{value of farm production}} \times 100$                                |
| _____ 12. debt-servicing percentage         | D. $\frac{\text{net farm income + interest expense - (unpaid operator and family labor, and management)}}{\text{average total assets}} \times 100$     |
| _____ 13. operational efficiency percentage | E. $\frac{\text{current liabilities}}{\text{total liabilities}} \times 100$  |
| _____ 14. current debt percentage           | F. $\frac{\text{total liabilities}}{\text{total assets}} \times 100$   |
| _____ 15. current ratio                     | G. $\frac{\text{net farm income - (unpaid operator and family labor, and management)}}{\text{average net worth}} \times 100$                           |
| _____ 16. interest expense percentage       | H. $\frac{\text{current assets}}{\text{current liabilities}}$  |
| _____ 17. debt-to-asset percentage          | I. $\frac{\text{interest expense}}{\text{value of farm production}} \times 100$  |
| _____ 18. profit margin                     | J. $\frac{\text{total liabilities}}{\text{net worth}}$   |
| _____ 19. leverage ratio                    | K. $\frac{\text{net farm income + interest expense - (unpaid operator and family labor, and management)}}{\text{value of farm production}} \times 100$ |
| _____ 20. working capital                   | L. current assets - current liabilities  |

# Exercise 2

## Calculating measures of financial performance

1. Using information from Frank Farmer's 19X0 and 19X1 balance sheets, 19X1 income statement and statement of owner equity, calculate the following measures of financial performance.

	<u>19X0</u>	<u>19X1</u>
A. working capital	\$11,000	_____
B. current ratio	1.11	_____
C. current debt percentage	56%	_____
D. debt-to-asset percentage	51%	_____
E. leverage ratio	1.03	_____
F. return on assets	NA	4.1%
G. return on equity	NA	_____
H. profit margin	NA	8.9%
I. turnover	NA	46%
J. operating expenses (excluding depreciation and interest)/value of farm production	NA	72%
K. depreciation/value of farm production	NA	_____
L. interest/value of farm production	NA	_____
M. net farm income/value of farm production	NA	_____
N. gain or loss on disposal of assets/value of farm production	NA	_____
O. debt-servicing percentage	NA	17.9%

2. Comparing Frank Farmer's working capital and current ratio on December 31, 19X0, to those measures on December 31, 19X1, Frank Farmer is (more) or (less) liquid in 19X1 than in 19X0?
3. Current debt percentage for Frank Farmer increased from December 31, 19X0, to 19X1, due to an increase of \$4,000 in accounts payable and the fact that the principal on intermediate and long-term loans had been paid in 19X1. Assume that accounts payable on the 19X1 balance sheet are the same as in 19X0 (\$82,000), so total current liabilities equal the same as on December 31, 19X0, \$100,000. Thus, total liabilities on 12/31/19X1, equal \$169,000. In that case, what is the current debt percentage? Will it increase or decrease in 19X1 compared to 19X0?



4. What is Frank Farmer's debt-to-asset percentage on December 31, 19X0, and 19X1 using the cost method of valuing assets? Are those percentages higher or lower than the percentages calculated for 19X0 and 19X1 using the market-value method?
  
5. The total of Frank's operating, depreciation and interest expenses as a percentage of the value of farm production in 19X1 equals \_\_\_\_%. If that amount is added to net farm income/value of farm production, the total equals \_\_\_\_%.

# Beginning balance sheet

Name: Frank Farmer

Date: December 31, 19X0

Assets			Liabilities and net worth		
	Cost	Market value		Cost	Market value
<b>Current assets</b>			<b>Current liabilities</b>		
Cash	\$ 6,000	\$ 6,000	Accounts payable	\$ 82,000	\$ 82,000
Livestock:			Portions of I-T and L-T debt due in 12 months:		
Hogs	20,000	20,000	Intermediate (I-T)	6,000	6,000
Grain inventory:			Long-term (L-T)	3,000	3,000
Corn	60,000	60,000	Accrued interest:		
Soybeans	20,000	20,000	Accounts payable	5,500	5,500
Supplies	5,000	5,000	Intermediate (I-T)	1,800	1,800
			Long-term (L-T)	0	0
			Accrued taxes:		
			Real estate	500	500
			Income & Soc. Sec.	1,200	1,200
Other	0	0	Other	0	0
<b>Total current assets</b>	<b>\$ 111,000</b>	<b>\$ 111,000</b>	<b>Total current liabilities</b>	<b>\$ 100,000</b>	<b>\$ 100,000</b>

Assets			Liabilities and net worth		
	Cost	Market value		Cost	Market value
Intermediate assets			Intermediate liabilities		
Machinery:			Machinery loan (Amount due beyond 12 months)		
Cost     \$127,000	\$ 127,000	\$ 102,000		\$ 24,000	\$ 24,000
Acc. Dep. 30,000	97,000				
Breeding livestock	10,000	10,000			
Other	0	0	Other	0	0
<b>Total intermediate assets</b>	<b>\$ 107,000</b>	<b>\$ 112,000</b>	<b>Total intermediate liabilities</b>	<b>\$ 24,000</b>	<b>\$ 24,000</b>
Long-term assets			Long-term liabilities		
Land and buildings:			Real estate mortgage (Amount due beyond 12 months)		
Cost     \$124,000	\$ 124,000	\$ 127,000		\$ 54,000	\$ 54,000
Acc. Dep. 12,000	112,000				
Other	0	0	Other	0	0
<b>Total long-term assets</b>	<b>\$ 112,000</b>	<b>\$ 127,000</b>	<b>Total long-term liabilities</b>	<b>\$ 54,000</b>	<b>\$ 54,000</b>
			<b>Total liabilities</b>	<b>\$ 178,000</b>	<b>\$ 178,000</b>
			<b>Net worth</b>	<b>\$ 152,000</b>	<b>\$ 172,000</b>
<b>Total assets</b>	<b>\$ 330,000</b>	<b>\$ 350,000</b>	<b>Total liabilities and net worth</b>	<b>\$ 330,000</b>	<b>\$ 350,000</b>

# Ending balance sheet

Name: Frank Farmer

Date: December 31, 19X1

Assets			Liabilities and net worth		
	Cost	Market value		Cost	Market value
<b>Current assets</b>			<b>Current liabilities</b>		
Cash	\$ 9,660	\$ 9,660	Accounts payable	\$ 86,000	\$ 86,000
Livestock:			Portions of I-T and L-T		
Hogs	22,000	22,000	debt due in 12 months:		
Grain inventory:			Intermediate (I-T)	6,000	6,000
Corn	60,000	60,000	Long-term (L-T)	3,000	3,000
Soybeans	15,000	15,000	Accrued interest:		
Supplies	3,340	3,340	Accounts payable	5,860	5,860
			Intermediate (I-T)	1,440	1,440
			Long-term (L-T)	0	0
			Accrued taxes:		
Other	0	0	Real estate	500	500
			Income & Soc. Sec.	1,200	1,200
			Other	0	0
<b>Total current assets</b>	<b>\$ 110,000</b>	<b>\$ 110,000</b>	<b>Total current liabilities</b>	<b>\$ 104,000</b>	<b>\$ 104,000</b>

Assets			Liabilities and net worth		
	Cost	Market value		Cost	Market value
Intermediate assets			Intermediate liabilities		
Machinery:			Machinery loan (Amount due beyond 12 months)		
Cost     \$136,000	\$ 94,000	\$ 94,000		\$ 18,000	\$ 18,000
Acc. Dep. 45,000	91,000				
Breeding livestock	9,000	9,000			
Other	0	0	Other	0	0
<b>Total intermediate assets</b>	<b>\$ 100,000</b>	<b>\$ 103,000</b>	<b>Total intermediate liabilities</b>	<b>\$ 18,000</b>	<b>\$ 18,000</b>
Long-term assets			Long-term liabilities		
Land and buildings:			Real estate mortgage (Amount due beyond 12 months)		
Cost     \$124,000	\$ 117,000	\$ 117,000		\$ 51,000	\$ 51,000
Acc. Dep. 14,000	110,000				
Other	0	0	Other	0	0
<b>Total long-term assets</b>	<b>\$ 110,000</b>	<b>\$ 117,000</b>	<b>Total long-term liabilities</b>	<b>\$ 51,000</b>	<b>\$ 51,000</b>
			<b>Total liabilities</b>	<b>\$ 173,000</b>	<b>\$ 173,000</b>
			<b>Net worth</b>	<b>\$ 147,000</b>	<b>\$ 157,000</b>
<b>Total assets</b>	<b>\$ 320,000</b>	<b>\$ 330,000</b>	<b>Total liabilities and net worth</b>	<b>\$ 320,000</b>	<b>\$ 330,000</b>

# Income statement

Name: Frank Farmer

12-month period ending: 12-31-19X1

Revenue				Cash accounting	Accrual accounting
Cash farm revenue					
Corn .....	\$	76,050			
Soybeans .....		44,600			
Market hogs .....		53,760			
Breeding livestock .....		3,060			
Other .....		0			
Total cash farm revenue				\$ <u>177,470</u>	\$ <u>177,470</u>
Inventory adjustments					
		<u>Inventories</u>		<u>Difference</u>	
		Beg.	End.	(End.-Beg.)	
Corn	\$	60,000	\$ 60,000	\$ 0	
Soybeans		20,000	15,000	- 5,000	
Market hogs		20,000	22,000	+ 2,000	
Breeding livestock		10,000	9,000	- 1,000	
Other		0	0	0	
Total inventory adjustment				\$ <u>NA</u>	\$ <u>- 4,000</u>
Total farm revenue				\$ <u>177,470</u>	\$ <u>173,470</u>

Expenses		Cash accounting	Accrual accounting
- Feed purchased		\$ <u>-18,000</u>	\$ <u>-18,000</u>
Value of farm production		\$ <u>159,470</u>	\$ <u>155,470</u>
<b>Cash farm operating expenses</b>			
Interest .....	\$ <u>18,870</u>		
Other cash farm operating expenses .....	<u>105,940</u>		
Total cash farm operating expenses		\$ <u>-124,810</u>	\$ <u>-124,810</u>
Net cash farm income		\$ <u>34,660</u>	\$ <u>NA</u>
- Depreciation		\$ <u>-17,000</u>	\$ <u>-17,000</u>
<b>Other non-cash expense adjustments</b>			
<b>Assets</b>			
	<u>Accounts</u>		<u>Difference</u>
	Beg.	End.	(End.-Beg.)
Unused supplies	\$ <u>5,000</u>	\$ <u>3,340</u>	\$ <u>-1,660</u>
Other	<u>0</u>	<u>0</u>	<u>0</u>
<b>Liabilities</b>			
			<u>Difference</u>
			(Beg.-End.)
Accounts payable	\$ <u>82,000</u>	\$ <u>86,000</u>	\$ <u>-4,000</u>
Accrued interest	<u>7,300</u>	<u>7,300</u>	<u>0</u>
Accrued taxes	<u>1,700</u>	<u>1,700</u>	<u>0</u>
Other	<u>0</u>	<u>0</u>	<u>0</u>
Total other non-cash expense adjustments		\$ <u>NA</u>	\$ <u>-5,660</u>
Net farm income		\$ <u>17,660</u>	\$ <u>8,000</u>

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# Statement of owner equity

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Name: Frank Farmer

12-month period  
ending 12-31-19X1

1. Beginning cost net worth	\$ 152,000
2. Net farm income (accrual)	<u>8,000</u>
3. Gifts and inheritances	<u>0</u>
4. Additions to paid-in capital	<u>0</u>
5. Total available (Sum of lines 1, 2, 3 and 4)	\$ 160,000
6. Gifts made	<u>0</u>
7. Ending cost net worth	<u>147,000</u>
8. Withdrawals (Line 5 minus lines 6 and 7)	\$ 13,000



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# Answer key 1

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## Video questions

Indicate whether each of the following statements is true (T) or false (F).

- T F** 1. The four criteria used to evaluate financial performance are liquidity, solvency, profitability and efficiency.
- T F** 2. One definition of liquidity is the ability of a business to generate sufficient cash to meet its financial obligations, without disrupting normal business operations.
- T F** 3. One measure of liquidity is current debt percentage.
- T F** 4. A high current debt percentage always indicates a worsening liquidity position.

**Comment: False.** A high current debt percentage doesn't *always* indicate a worsening liquidity position. It could be the result of an amortized loan being repaid, with an increasing percentage of the principal paid off each year. It could also signify a term loan being repaid in full, with the only remaining loan an operating loan or accounts payable.

- T F** 5. Debt-to-asset percentage is one measure of financial solvency.
- T F** 6. Solvency reflects the likelihood that the sale of all farm or ranch assets would provide enough cash to cover all outstanding debts.
- T F** 7. If total liabilities equal \$20,000, and total assets equal \$100,000, then debt-to-asset percentage is 5%.

**Comment: False.** The debt-to-asset percentage is 20%, because \$20,000 divided by \$100,000 equals 0.2 or 20%.

- T F** 8. A leverage ratio of 1.0 corresponds to a debt-to-asset percentage of 100.

**Comment: False.** A leverage ratio of 1.0 corresponds to a debt-to-asset percentage of 50%.

Match the financial measure with the appropriate equation. All letters will be used one time.

- |  |  |
|--|--|
| <u>D</u> 9. return on assets                   | A. $\frac{\text{value of farm production}}{\text{average total assets}} \times 100$  |
| <u>G</u> 10. return on equity                  | B. $\frac{\text{interest + principal on capital loans}}{\text{value of farm production}} \times 100$   |
| <u>A</u> 11. turnover                          | C. $\frac{\text{operating expenses (excluding depreciation and interest)}}{\text{value of farm production}} \times 100$                                |
| <u>B</u> 12. debt-servicing percentage         | D. $\frac{\text{net farm income + interest expense - (unpaid operator and family labor, and management)}}{\text{average total assets}} \times 100$     |
| <u>C</u> 13. operational efficiency percentage | E. $\frac{\text{current liabilities}}{\text{total liabilities}} \times 100$  |
| <u>E</u> 14. current debt percentage           | F. $\frac{\text{total liabilities}}{\text{total assets}} \times 100$   |
| <u>H</u> 15. current ratio                     | G. $\frac{\text{net farm income - (unpaid operator and family labor, and management)}}{\text{average net worth}} \times 100$                           |
| <u>I</u> 16. interest expense percentage       | H. $\frac{\text{current assets}}{\text{current liabilities}}$  |
| <u>F</u> 17. debt-to-asset percentage          | I. $\frac{\text{interest expense}}{\text{value of farm production}} \times 100$  |
| <u>K</u> 18. profit margin                     | J. $\frac{\text{total liabilities}}{\text{net worth}}$   |
| <u>J</u> 19. leverage ratio                    | K. $\frac{\text{net farm income + interest expense - (unpaid operator and family labor, and management)}}{\text{value of farm production}} \times 100$ |
| <u>L</u> 20. working capital                   | L. current assets - current liabilities  |

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# Answer key 2

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## Calculating measures of financial performance

1. Using information from Frank Farmer's 19X0 and 19X1 balance sheets, 19X1 income statement and statement of owner equity, calculate the following measures of financial performance.

	<u>19X0</u>	<u>19X1 *</u>
A. working capital	\$11,000	<u>\$ 6,000</u>
B. current ratio	1.11	<u>1.06</u>
C. current debt percentage	56%	<u>60%</u>
D. debt-to-asset percentage	51%	<u>52%</u>
E. leverage ratio	1.03	<u>1.10</u>
F. return on assets	NA	4.1%
G. return on equity	NA	<u>-3.0%</u>
H. profit margin	NA	8.9%
I. turnover	NA	46%
J. operating expenses (excluding depreciation and interest)/value of farm production	NA	72%
K. depreciation/value of farm production	NA	<u>11%</u>
L. interest/value of farm production	NA	<u>12%</u>
M. net farm income/value of farm production	NA	<u>5%</u>
N. gain or loss on disposal of assets/value of farm production	NA	<u>0%</u>
O. debt-servicing percentage	NA	17.9%

\* See p. 26 for actual calculations.

2. Comparing Frank Farmer's working capital and current ratio on December 31, 19X0, to those measures on December 31, 19X1, Frank Farmer is (more) or (less) liquid in 19X1 than in 19X0?

Answer: Less

3. Current debt percentage for Frank Farmer increased from December 31, 19X0, to 19X1, due to an increase of \$4,000 in accounts payable and the fact that the principal on intermediate and long-term loans had been paid in 19X1. Assume that accounts payable on the 19X1 balance sheet are the same as in 19X0 (\$82,000), so total current liabilities equal the same as on December 31, 19X0, \$100,000. Thus, total liabilities on 12/31/19X1, equal \$169,000. In that case, what is the current debt percentage? Will it increase or decrease in 19X1 compared to 19X0?

**Answer: 59%; Increase**

4. What is Frank Farmer's debt-to-asset percentage on December 31, 19X0, and 19X1 using the cost method of valuing assets? Are those percentages higher or lower than the percentages calculated for 19X0 and 19X1 using the market-value method?

**Answer: 19X0 = 54%; 19X1 = 54%; Higher**

5. The total of Frank's operating, depreciation and interest expenses as a percentage of the value of farm production in 19X1 equals \_\_\_\_%. If that amount is added to net farm income/value of farm production, the total equals \_\_\_\_%.

**Answer: 95%; 100%**

# Calculations

## Exercise 2

Measure	Equation	Answer
A. working capital	current assets - current liabilities	\$110,000 - \$104,000 = \$6,000
B. current ratio	$\frac{\text{current assets}}{\text{current liabilities}}$	$\frac{\$110,000}{\$104,000} = 1.06$
C. current debt percentage	$\frac{\text{current liabilities}}{\text{total liabilities}} \times 100$	$\frac{\$104,000}{\$173,000} \times 100 = 60\%$
D. debt-to-asset percentage	$\frac{\text{total liabilities}}{\text{total assets}} \times 100$	$\frac{\$173,000}{\$330,000} \times 100 = 52\%$
E. leverage ratio	$\frac{\text{total liabilities}}{\text{net worth}}$	$\frac{\$173,000}{\$157,000} = 1.10$
F. return on assets	$\frac{\text{net farm income} + \text{interest} - (\text{unpaid operator and family labor, and management})}{\text{average total assets}} \times 100$	$\frac{\$8,000 + \$18,870 - \$13,000}{\$340,000} \times 100 = 4.1\%$
G. return on equity	$\frac{\text{net farm income} - (\text{unpaid operator and family labor, and management})}{\text{average net worth}} \times 100$	$\frac{\$8,000 - \$13,000}{\$164,500} \times 100 = -3.0\%$
H. profit margin	$\frac{\text{net farm income} + \text{interest} - (\text{unpaid operator and family labor, and management})}{\text{value of farm production}} \times 100$	$\frac{\$8,000 + \$18,870 - \$13,000}{\$155,470} \times 100 = 8.9\%$

Measure	Equation	Answer
I. turnover	$\frac{\text{value of farm production}}{\text{average total assets}} \times 100$	$\frac{\$155,470}{\$340,000} \times 100 = 46\%$
J. operating expense percentage	$\frac{\text{operating expenses (excluding dep. and interest)}}{\text{value of farm production}} \times 100$	$\frac{\$111,600}{\$155,470} \times 100 = 72\%$
K. depreciation percentage	$\frac{\text{depreciation}}{\text{value of farm production}} \times 100$	$\frac{\$17,000}{\$155,470} \times 100 = 11\%$
L. interest percentage	$\frac{\text{interest}}{\text{value of farm production}} \times 100$	$\frac{\$18,870}{\$155,470} \times 100 = 12\%$
M. net farm income percentage	$\frac{\text{net farm income}}{\text{value of farm production}} \times 100$	$\frac{\$8,000}{\$155,470} \times 100 = 5\%$
N. gain or loss on disposal of assets percentage	$\frac{\text{gain or loss on disposal of assets}}{\text{value of farm production}} \times 100$	$\frac{\$0}{\$155,470} \times 100 = 0\%$
O. debt-servicing percentage	$\frac{\text{interest + principal on capital loans}}{\text{value of farm production}} \times 100$	$\frac{\$18,870 + \$9,000}{\$155,470} \times 100 = 17.9\%$

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