



The Development and Use of Financial Statements: The Balance Sheet

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Making more money is the goal of many Tennessee farmers. The first step towards this goal can be the development of the farm business' financial statements. Annual financial statements become the 'yardstick' by which the financial goals of the farm and family are measured.

Analyzing the financial situation of a farm through its financial records is important to the ultimate success of the farming operation. Financial statements have become more commonplace as analysis tools. They are used to help monitor financial progress, make comparisons with past performance and provide necessary accounting data for planning and decision making. They are also often required by lenders in the process of obtaining credit.

The balance sheet is one of the financial statements used in farm management. It lists the assets¹ and liabilities of the farm as of the balance sheet date. Assets are items owned by the farm, such as stored grain, cash, livestock, machinery and land. Liabilities are loans against the farm's assets. The balance sheet provides detail of how funds are invested in the farm (assets) and the financial methods used (liabilities) to purchase or own such assets.

The balance sheet shows the farm's equity or net worth², which is the value of total assets less total liabilities. It also can provide information helpful in evaluating the risk-bearing ability of the farm business.

A balance sheet should include:

- descriptions and values of all farm assets and
- the amount and type of liabilities.

A balance sheet may be used to generate:

- indices which measure the business' ability to meet its financial obligations in a timely manner,
- ratios for comparisons with other farms,
- performance measures for tracking progress toward financial goals, and
- documentation of a farm's financial position to outside parties.

¹ Underlined terms are further explained in the Appendix.

² The terms "equity" and "net worth" are used interchangeably in this publication.

The Basic Accounting Equation

A variety of balance sheet forms and formats exist. There is, however, a common link among them all. The balance sheet is organized by the basic accounting equation: Total Assets = Total Liabilities + Net Worth. In other words, the value of all assets must equal the value of the liabilities against those assets plus the value of the farm's equity. The equation balances because assets must be funded by either debt or equity.

Assigning Values

Assets and liabilities are listed on the balance sheet in dollar units. For example, liabilities are borrowed and repaid with dollars. Placing a dollar amount on current assets such as grain, feed and market livestock is relatively easy. However, placing a dollar value on intermediate assets and long-term assets such as breeding livestock, machinery and real estate can be more difficult.

Two methods for valuing assets are the cost value and market value. The cost value method, often called "book value," is the initial cost of an asset, plus improvements, minus accumulated depreciation. Alternatively, the market value is an estimate of what the asset would sell for, less estimated normal selling costs, as of the balance sheet date. The market value method should give an accurate estimate of asset values on the balance sheet date, but because market values can fluctuate over time, the farm's net worth could change simply from such market fluctuations.

Farmers have typically used the market value method while accountants have typically used the cost value method. It is recommended that both market and cost values be listed on the balance sheet. Each method provides useful information concerning the financial position of the farm business.

Determining the cost value of current assets can be extremely difficult. Often on an agricultural balance sheet, one value for current assets is accepted. However, using both valuation methods

for intermediate and long-term assets will result in two values for total assets and total liabilities. The amount that total assets exceed total liabilities is called net worth using the market value method, and retained earnings using the cost value method.

Include Non-farm Information or Not?

The question of whether to include non-farm assets and non-farm liabilities in a farm balance sheet often arises. Many farm operations exhibit characteristics of a small, sole-proprietor, family-operated business. These family operations often do not have separate checking accounts or separate records for farm and family activities. And creditors often do not require a strict separation between farm and family.

As a result of these characteristics, it is common for farm balance sheets to include both personal and farm business assets and liabilities. Some farms, primarily larger operations or those organized as corporations or partnerships, develop farm-only balance sheets. However, most farm financial statements do combine farm and family information.

If a balance sheet is intended to represent only the financial position of the farm as a business, then personal asset and liability information should not be entered. However, personal asset and liability information can easily be included on the balance sheet and can offer substantial additional information. Separate balance sheets for farm and non-farm information are preferred. However, when combined, separate farm and non-farm sections should be used.



Contingent Liabilities

To provide a complete financial picture of the operation, a balance sheet should include contingent liabilities. Contingent liabilities are those liabilities that are “contingent” upon an event. They include estimated taxes owed if assets are sold at their market value. For example, if the market value of land is greater than its cost value, the sale of the land at its market value will generate a tax liability. Therefore, if assets are actually sold at their market value, a tax liability will be incurred. Contingent tax liabilities are a critical part of a farm’s balance sheet, especially when the balance sheet will be used for considerations of liquidation or complete dispersal.

Contingent liabilities may be included in the primary body of the balance sheet or as a footnote. Often, contingent tax liabilities and investment credits are included in the main body, while notes co-signed by the owner are listed as a footnote.

A Balance Sheet Example

Many lending institutions provide pre-printed balance sheet forms. The balance sheet example in this publication is consistent with that of the FINPACK computer software program (Center for Farm Financial Management). The blank balance sheet form included in the appendix is from the FINPACK program as well.

Figure #1 is the January 1, 1994 balance sheet for an example farm which includes 65 milk cows and 160 acres. Current farm assets, intermediate farm assets, long-term farm assets and non-farm assets are summarized in Figure 1 to give total assets. Current farm liabilities, intermediate farm liabilities, long-term farm liabilities and non-farm liabilities are also summarized to give total liabilities. The difference between total assets and total liabilities is shown as net worth for the market value approach and retained earnings for the cost value approach.

Working Through the Balance Sheet

Traditionally, balance sheets have been arranged with assets on the left and liabilities on the right side of a single page. In addition, current, intermediate and long-term divisions of assets and liabilities are listed from top to bottom.

Assets

As shown in Figure #1, cash and checking account balances, prepaid expenses & supplies, accounts receivable and the quantity and value of stored crops and market livestock are listed under current farm assets. Total current farm assets are \$36,550.

Intermediate farm assets are those with a useful life of one to 10 years. Included in this section are breeding animals and farm machinery for a total intermediate asset value of \$153,990 (cost) and \$166,000 (market value). In this example, the breeding stock have the same cost and market value. This means the breeding stock have been purchased and depreciated to a cost value of \$86,000 (\$63,000 + \$18,000 + \$5,000). This value is also the estimated market value of the breeding stock. The machinery, on the other hand, has a remaining cost basis of \$67,990. However, its estimated market value, or what it could be sold for, is \$80,000.

Long-term farm assets are fixed assets that generally have a life of more than 10 years and include land, buildings and improvements. Total long-term assets consist of 160 acres valued at \$86,000 (cost) and \$128,600 (market)³.

Total farm assets represent the sum of current, intermediate and long-term asset values. Total farm assets added with non-farm assets provides a total asset value of \$303,155 (cost) and \$357,765 (market) to complete the asset side of the balance sheet.

³The difference in cost and market value approaches is generally most obvious in the long-term asset section. The cost value represents the original cost of the asset, plus the value of improvements to the asset, minus depreciation. Because land is not a depreciable asset, the cost value does not tend to change over time. Conversely, the market value reflects land price changes and often is a higher value than the cost value. Market values for land may change quickly during times of rapid inflation or deflation. Therefore, investment decisions should be based on both approaches.

Figure #1
“EXAMPLE BALANCE SHEET, JANUARY 1, 1994”

CURRENT FARM ASSETS				Value	CURRENT FARM LIABILITIES						Balance		
Cash & checking balance (Schedule A)				\$17,800	Farm accrued interest						\$ 7,257		
Prepaid expenses & supplies (Schedule B)				\$1,200	Accounts Payable & Accrued Expenses								
Accounts receivable (Schedule C)				\$ 5,270	Feed Bill						\$1,800		
					Machine Repair						\$ 350		
Crops: (Schedule D)				No.	Value/Unit								
Alfalfa Hay				45	\$ 70.00/Ton	Principal due within 12 months							
Corn Silage				450	\$15.00/Ton	on term liabilities						\$10,966	
Mkt Lvstck: (Shed E)				No.	Value/Unit								
Dairy Steers				8	\$ 85.00/cwt.							\$ 2,380	
Total Current Assets					\$ 36,550	Total Current Liabilities						\$ 20,373	
<hr/>						<hr/>							
INTERMEDIATE FARM ASSETS						INTERMEDIATE FARM LIABILITIES (Schedule J)							
				Cost	Market								
Breeding Livestock (Schd F)				No.	Value	Value (*)	Lender	Int. Rate	Princ. Bal.	P & I Due	Princ. Due	Intermed. Balance	
Cows				60	\$ 63,000	\$ 63,000	Bank 1 10.00% \$52,120 \$7,890 \$2,235 \$49,885						
Replacmnt Heifers				20	\$18,000	\$ 18,000	Bank 2 9.75% \$4,000 \$1,700 \$1,277 \$2,723						
Dry Cows				5	\$ 5,000	\$ 5,000							
Farm Machinery (Shed G)					\$ 67,990	\$ 80,000							
Total Intermediate Assets					\$153,990	\$166,000	Total Intermediate Liabilities						\$ 52,608
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LONG TERM FARM ASSETS							LONG TERM FARM LIABILITIES (Schedule K)						
				Cost	Market								
Land (Schedule H)				Acres	Value	Value	Lender	Int. Rate	Princ. Bal.	P & I Due	Princ. Due	Intermed. Balance	
Smith Place (pasture)				76	\$ 38,000	\$ 60,800	Bank 1 9% \$33,400 \$4,674 \$1,421 \$31,979						
Home Farm (crops)				54	\$ 20,000	\$ 37,800	Bank 2 8% \$30,800 \$8,700 \$6,033 \$24,767						
Jones Farm (crops)				30	\$ 28,000	\$ 30,000							
Total Long Term Assets					\$ 86,000	\$128,600	Total Long Term Liabilities						\$ 56,746
<hr/>							<hr/>						
TOTAL FARM ASSETS					\$ 276,540	\$ 331,150	TOTAL FARM LIABILITIES						\$129,727
NONFARM ASSETS (Schedule I)					\$ 26,615	\$ 26,615	NONFARM LIABILITIES (Schd L)						\$12,503
							Cost						Market
							CONTINGENT LIABILITIES						\$11,345
							TOTAL LIABILITIES						\$ 142,230
							Retained Earnings						\$ 160,925
TOTAL ASSETS					\$ 303,155	\$ 357,765	NET WORTH (Equity)						\$ 204,190

(*) Market values are based on estimates from trade magazines, local auctions and limited appraisals.

Liabilities

Current farm liabilities are the debts which are scheduled to be paid on demand or within one year of the balance sheet date. Accrued interest on all loans, accounts payable and accrued expenses and principal due within 12 months on all notes are included in the total current liabilities of \$20,373. Intermediate farm liabilities are those debts with an original term of one to 10 years. Two intermediate loans, one from Bank 1 and one from Bank 2, sum to the \$52,608 in total intermediate liabilities. These loans were possibly taken to purchase cows, machinery or equipment.

Long-term liabilities are debts for long-term assets. Long-term liabilities in the example are with Bank 1 and Bank 2 at 9 percent and 8 percent interest, respectively. These loans may have been taken to purchase land or build a new structure. Total long-term liabilities are \$56,746.

Net Worth Calculation

The sum of current, intermediate and long-term farm liabilities equals total farm liabilities of \$129,727. Adding the total farm liabilities (\$129,727) with non-farm liabilities (\$12,503) gives total liabilities of \$142,230, on a cost basis.

However, if the market value of assets is to be used, contingent liabilities must be included. In this example, the market value of the three parcels of land and the machinery exceed their cost value. Based on this difference and an estimated marginal tax rate, a contingent tax liability of \$11,345 is calculated. So, on market value liabilities, \$11,345 is added to \$142,230 to total \$153,575 in total liabilities.

The difference in cost-valued assets and liabilities is referred to as retained earnings. It represents the capital that the owner has contributed to the business (Center for Farm Financial Management). Therefore, from a cost value standpoint, total assets (\$303,155) minus total liabilities (\$142,230) equals retained earnings of \$160,925. Using the market valuation method, total assets (\$357,765) minus total liabilities (\$153,575) equals net worth of \$204,190.

Additional Information

Additional support information schedules are often helpful in constructing a balance sheet. Examples of some of these schedules are shown in Figures #2, #3 and #4.

Schedule A (Figure #2) shows \$1,800 and \$16,000 in checking and savings accounts, respectively. The balance sheet in Figure 1 shows only the sum of the two accounts. Schedule B shows that eight units of \$150/unit feed is on-hand. Schedule C indicates that the settlement milk check from the previous month is still outstanding and \$850 worth of alfalfa hay has been sold but payment has not yet been received. Schedule D lists 45 tons of alfalfa hay and 450 tons of corn silage in inventory, for a total value of \$9,900. Schedule E shows that eight dairy steers, valued at \$2,380, are on hand for future sale. Schedule F indicates that 60 cows, 20 replacement heifers and five dry cows are on the farm with a total value of \$86,000.

Figure #3 shows schedules G, H and I. Schedule G lists machinery and equipment valued at \$80,000 (market value) and \$67,990 (cost value). Schedule H indicates that the farm's \$86,000, cost value, and \$128,600, market value, in land consists of three tracts of 76, 54 and 30 acres each. Schedule I lists \$26,615 in total non-farm assets consisting of cash in savings and checking, household furnishings & appliances, personal vehicles, life insurance and a retirement account.

Figure #4 contains schedules J, K and L. Schedule J shows that two loans account for the \$52,608 in intermediate farm liabilities. The schedule also lists information on interest rates, accrued interest, normal principal and interest payments, month due, final year of the loan and principal due.

Schedule K indicates that two loans account for the \$56,746 in long-term farm liabilities. The schedule shows that the Bank 1 loan at 9 percent is scheduled for maturity in the year 2005. Schedule L lists one non-farm loan scheduled to be paid-off by 2001.

These underlying or contributing schedules add more detail to a balance sheet and may be helpful as a source of historical financial information. They also make future balance sheets easier to develop and maintain.

Financial Ratios

Individually, assets, liabilities and net worth may not provide a complete picture of the farm's financial situation. Financial ratio analysis, however, allows for comparisons among farms or groups of farms. Ratios also serve as guides for tracking farm financial performance over time and providing relevant data for financial planning and capital budgeting. Financial ratios from the balance sheet address solveny and liquidity and are frequently used in credit analysis. Solveny deals with the equity position of the farm owner, while liquidity measures the ability to meet short-term cash demands. While there are many kinds of ratios, the most useful ones are those that aid the farm owner in evaluating the farm's financial position.

According to the Farm Financial Standards Task Force, (Forbes, Stan and others) the balance sheet provides the necessary components for five recommended financial measures; two liquidity and three solveny measures. These financial measures do not represent an all-inclusive list of ratios. The calculation of additional financial measures may be warranted if accurate information is available and other ratios provide more insight.

Figure #2
"BALANCE SHEET SCHEDULES"

Schedule A: Cash & Checking Balance				
	Value			
Checking Account				\$1,800
Savings Account				\$16,000
Total cash & checking				\$17,800
Schedule B: Prepaid Expenses & Supplies				
	Quantity		Value Per Unit	Value
Feed	8 tons		\$150.00	\$1,200
Total prepaid expenses and supplies				\$1,200
Schedule C: Accounts Receivable				
	Quantity		Value Per Unit	Value
2nd Half of Dec. Check	340 cwts.		\$13.00	\$ 4,420
Alfalfa Hay	10 tons		\$ 85.00	\$ 850
Total Accounts Receivable				\$ 5,270
Schedule D: Crops Held For Sale or Feed				
	Quantity		Value Per Unit	Value
Alfalfa Hay	45 tons		\$ 70.00	\$ 3,150
Corn Silage	450 tons		\$15.00	\$ 6,750
Total crops held for sale or feed				\$ 9,900
Schedule E: Livestock Held for Sale				
	Number Head	Avg. Wt.	Unit Value	Value
Dairy Steers	8	350 lbs.	\$ 80/cwt	\$ 2,380
Total livestock held for sale				\$ 2,380
Schedule F: Breeding Livestock				
	Number Head	Mkt. Value	Cost Value	Market Value
Cows	60	\$1,050/hd	\$ 63,000	\$ 63,000
Repl. Heifers	20	\$ 900/hd	\$18,000	\$18,000
Dry Cows	5	\$1,000/hd	\$ 5,000	\$ 5,000
Total breeding livestock			\$ 86,000	\$ 86,000

Figure #3
"BALANCE SHEET SCHEDULES"

Schedule G: Farm Machinery

	Year Purchased	Cost Value	Market Value
Tractor	92	\$16,150	\$19,000
Tractor	80	\$ 7,225	\$ 8,500
Tractor	89	\$ 4,250	\$ 5,000
Corn Planter	90	\$ 4,250	\$ 5,000
Silage Chopper	93	\$ 1,445	\$ 1,700
Wagons	85	\$1,360	\$ 1,600
Hay Equipment	80	\$ 595	\$ 700
Maintenance Equipment	70	\$ 340	\$ 400
Maintenance Equipment	80	\$ 680	\$ 800
Field Equipment	90	\$1,870	\$ 2,200
Trailers & Wagons	80	\$ 2,710	\$ 3,200
Pick-up	90	\$ 6,800	\$ 8,000
Pick-up	80	\$1,955	\$ 2,300
Farm Trucks (3)	85	\$ 5,100	\$ 6,000
Other Equipment	80	\$1,700	\$ 2,000
Milking Equipment	88	\$ 4,760	\$ 5,600
Shop Equipment	90	\$ 6,800	\$ 8,000
Total Machinery & Equipment		\$ 67,990	\$ 80,000

Schedule H: Land

	Acres	Mkt. Value Per Acre	Cost Value	Market Value
The Back 40	76	\$ 800	\$ 38,000	\$ 60,800
Home Place	54	\$ 700	\$ 20,000	\$ 37,800
Jones' Farm	30	\$1,000	\$ 28,000	\$ 30,000
Total Land			\$ 86,000	\$ 128,600

Schedule I: Nonfarm Assets

	Cost Value	Market Value
Savings & Checking	\$ 7,200	\$ 7,200
Furnishing & Appliances	\$10,000	\$10,000
Personal Vehicles	\$ 4,115	\$ 4,115
Cash Value of Life Insurance	\$ 3,500	\$ 3,500
Retirement Account	\$1,800	\$ 1,800
Total Nonfarm assets	\$ 26,615	\$ 26,615

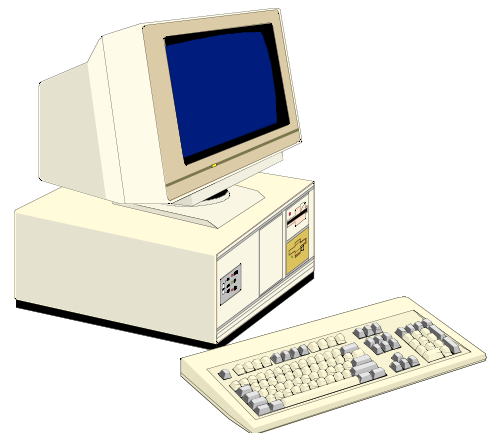


Figure #4
“BALANCE SHEET SCHEDULES”

Schedule J: Intermediate Farm Liabilities

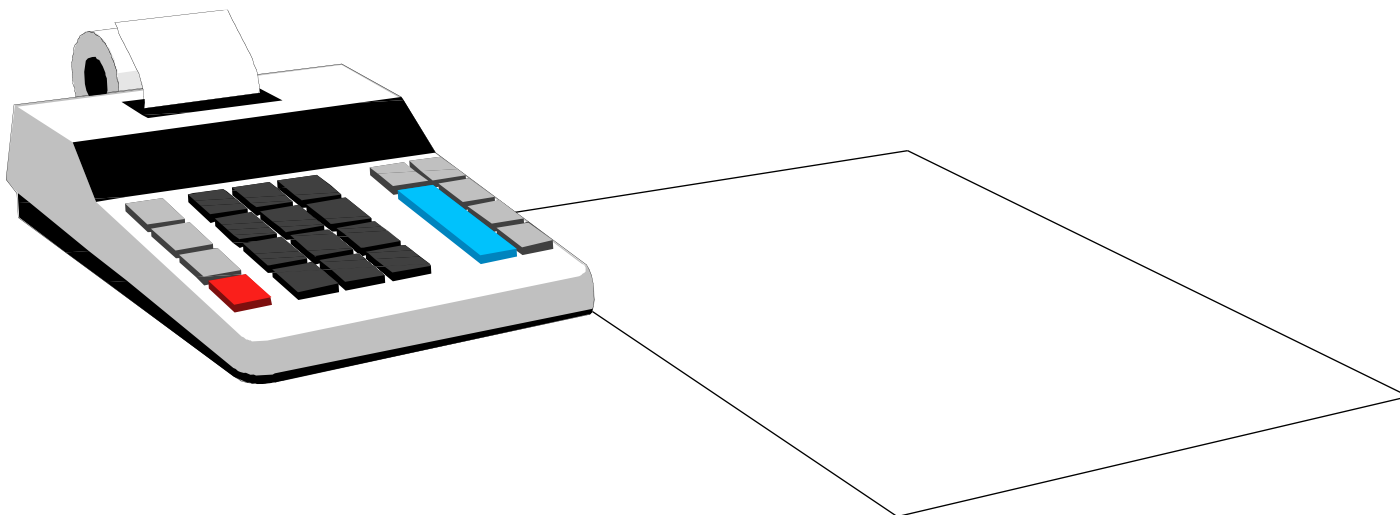
Lender	Interest Rate	Principal Balance	Accrued Interest	Normal P & I	Month Due	Final Year	Princ. Due	Intermed. Balance
Bank 1	10.00%	\$ 52,120	\$ 5,212	\$ 7,890	1	2002	\$ 2,235	\$ 49,885
Bank 2	9.75%	\$ 4,000	\$ 98	\$ 1,700	10	1996	\$ 1,277	\$ 2,723
Total intermediate farm liabilities		\$ 56,120	\$ 5,310	\$ 9,590			\$ 3,512	\$ 52,608

Schedule K: Long Term Farm Liabilities

Lender	Interest Rate	Principal Balance	Accrued Interest	Normal P & I	Month Due	Final Year	Princ. Due	Intermed. Balance
Bank 1	9.00%	\$ 33,400	\$ 502	\$ 4,674	11	2005	\$ 1,421	\$ 31,979
Bank 2	8.00%	\$ 30,800	\$ 1,445	\$ 8,700	6	1998	\$ 6,033	\$ 24,767
Total long term farm liabilities		\$ 64,200	\$ 1,947	\$ 13,374			\$ 7,454	\$ 56,746

Schedule L: Nonfarm Liabilities

Nonfarm accrued interest								\$ 503
Principal due within 12 months on term loans								\$ 2,478
Lender	Interest Rate	Principal Balance.	Accrued Interest	Normal P & I	Month Due	Final Year	Princ. Due	Intermed. Balance
Bank 3	10.00%	\$12,000	\$ 503	\$ 3,780	8	2001	\$ 2,478	\$ 9,522
Total nonfarm liabilities		\$12,000	\$ 503	\$ 3,780			\$ 2,478	\$ 12,503



Liquidity

The **Current Ratio** is calculated by dividing current assets by current liabilities. It indicates how well the business is meeting its bills and short term debt payments and the extent to which current farm assets, if liquidated, would cover current farm liabilities. A current ratio of less than one (100 percent) could indicate a problem with short-term debt payments.

With current farm assets of \$36,550 (Figure #1) and current farm liabilities of \$20,373, the current ratio is calculated as:

$\$36,550/\$20,373 = 1.79:1$ or 179 percent.

That is, current farm assets are 179 percent of current farm liabilities. The higher the current ratio, the larger the difference in current assets and current liabilities. A current ratio of 2:1, or 200 percent, indicates that current assets are twice the current liabilities.

Another recommended liquidity measure is **Working Capital**. Working capital is calculated as total current assets minus total current liabilities. It measures the funds that would be available if current assets were sold and current farm liabilities paid.

With total current farm assets of \$36,550 and total current farm liabilities of \$20,373, the working capital is calculated as:

$\$36,550 - 20,373 = \$16,711$. Here, the working capital indicates that approximately \$16,000 is available to purchase inputs and inventory items after current assets are sold and current liabilities paid.

Working capital is an absolute amount and is therefore difficult to compare to the working capital of other businesses. It is impossible and impractical to establish one standard for all farms, because the amount of working capital considered adequate must be related to the size of the farm business.

Solvency

The **Debt-to-Asset Ratio** is calculated as total liabilities divided by total assets. It measures the debt load of a business compared to its assets. For example, with \$153,565 in liabilities and \$357,765 in assets, (market value) a debt-to-asset ratio is calculated as:

$\$153,565/\$357,765 = .429:1$ or 42.9 percent. That is, 42.9 percent of the value of the farm's total assets have debt against them.

In comparison, a farmer with \$30,000 in liabilities and \$45,000 in assets has a debt-to-asset ratio of $(\$30,000/\$45,000)$ 66.7 percent. The farm with the smaller debt load of \$30,000 has the higher debt-to-asset ratio of 66.7 percent. The farm with \$153,575 of debt has relatively more assets supporting its debt and thus has a lower debt-to-asset ratio.

The higher the debt-to-asset ratio (closer to 100 percent), the greater the percent of farm assets financed by debt. Recently acquired farms and farms that have a change in ownership may have relatively higher debt-to-asset ratios. Higher debt-to-asset ratios do not necessarily signal financial problems, although they may represent higher levels of risk. As long as the farm generates positive financial returns above production costs, debt payments and family living withdrawals, the debt-to-asset ratio should decrease over time. As it does, the farmer's equity in the farm will grow.

There are no specific rules-of-thumb on how high or low a debt-to-asset ratio should be. Before an investment is made, or money is borrowed, a financial plan should be evaluated. If the additional debt can show positive returns to the overall business, with allowance for risks, the investment should be considered, regardless of the debt-to-asset ratio.

Over time, an increasing debt-to-asset ratio can signal problems in production, profitability and/or family living withdrawals. As a financial analysis tool, the debt-to-asset ratio can alert the farm owner to look deeper into the farm's production and finances before a problem worsens.

The **Equity-to-Asset Ratio** is another measure of solvency that can be calculated from the balance sheet. It is calculated as equity divided by total assets. This ratio measures the proportion of total assets financed by equity in the farm. The ratio can be calculated from either cost or market values. However, due to the impact of possible fluctuating market values, comparisons between accounting periods are more reliable through the cost approach.

With an equity of \$160,925 and total assets (cost value) of \$303,155, the equity-to-asset ratio is calculated as:
 $\$160,925/\$303,155 = .531:1$ or 53.1 percent. The higher the value of the ratio, the more total capital supplied by the farm and less by creditors.

The balance sheet also provides the necessary information for the calculation of the **Debt-to-Equity Ratio**. This ratio reflects the extent to which debt capital is being combined with equity capital. It is calculated as total liabilities divided by equity. The higher the debt-to-equity ratio, the more total capital supplied by creditors and less by the farm.

With total liabilities of \$153,575 and equity (market value) of \$204,190, the debt-to-equity ratio is calculated as:
 $\$153,575/\$204,190 = .75:1$ or 75.2 percent.

A Final Word on Ratios

Most farms find it difficult to establish a minimum, maximum or “happy medium” for financial ratios. However, some general “rules-of-thumb” may exist. A current ratio of 2.0:1, (current assets are twice the value of current liabilities) or more, is normally considered strong. A current ratio of less than 1:1 indicates that current liabilities exceed current assets, and could signal problems in profitability of the farm.

Balance sheet ratios are used to convey solvency and liquidity information about the farm business. Excessive emphasis should not be placed on any single ratio. Each ratio should be tracked over time. As the ratio changes from year to year, the cause of the change should be identified and

evaluated. In general, higher debt-to-asset ratios will be associated with farms that have recently acquired relative high-cost assets.

Specific ranges of ratios which reflect “good” or “bad” levels can be misleading. During the farm financial crisis of the 1980s, debt-to-asset ratios above 40 percent were considered “high” by some. Others had different levels where the ratio was considered high.

However, farms with higher debt-to-asset ratios can be more profitable than farms with lower ratios, but they are typically more risky as well. The debt-to-asset ratio (along with other ratios) should be treated as a symptom, rather than a complete financial diagnosis.

If a farm has a high debt-to-asset ratio, and over time, the ratio remains constant or increases, some change in the farm’s management, production, or financial arrangements may be needed. It is the direction of the change in the ratios over time and the reason for the change that is important, rather than an absolute value. Balance sheet ratios should be used to provide a signal, not an absolute cutoff or critical value. Profitability, which is not measured in the balance sheet or by the debt-to-asset ratio, is the key to financial success. All other things being held constant, profitable farm operations should see increases in net worth from year to year.

Comparison to Previous Years

An effective method of evaluating the balance sheet involves comparisons over time. For such comparisons, a balance sheet should be prepared on the same day each year.

Comparing farm balance sheets from year to year allows the farm manager to measure progress toward financial goals. Attention can be focused on changes in assets, liabilities and net worth.

Figure #5 is the balance sheet for the example farm as of January 1, 1995. Figure #5 and Figure #1 represent a “snapshot” of the farm’s financial position one year apart. From January to December of 1994, the farm obtained an additional intermediate loan which increased total liabilities. The difference in the total assets and total liabilities on the January 1, 1995 balance sheet is reflected by the net worth of \$206,582. Similarly, the liquidity and solvency measures for the January 1, 1995 balance sheet can be calculated as:

Liquidity and Solvency Measures from the January 1995 Balance Sheet			
----- Cost -----		----- Market -----	
Current Ratio:			
1.25:1	(\$35,435/\$28,461)	1.25:1	(\$35,435/\$28,461)
Working Capital:			
\$6,974	(\$35,435 - \$28,461)	\$6,974	(\$35,435 - \$28,461)
Debt-to-Asset Ratio:			
.53:1	(\$170,049/\$321,940)	.47:1	(\$181,468/\$388,050)
Equity-to-Asset Ratio:			
.47:1	(\$151,891/\$321,940)	.53:1	(\$206,582/\$388,050)
Debt-to-Equity Ratio:			
1.12:1	(\$170,049/\$151,891)	.88:1	(\$181,468/\$206,582)

Ratios provide an effective measure of change from year to year. The above liquidity and solvency measures are calculated from the January 1, 1995 balance sheet can be compared to the ratios from the January 1, 1994 balance sheet given on page 12.

Liquidity and Solvency Measures from the January 1994 Balance Sheet

----- Cost -----		----- Market -----	
Current Ratio:			
1.79:1	(\$36,550/\$20,373)	1.79:1	(\$36,550/\$20,373)
Working Capital:			
\$16,177	(\$36,550 - \$20,373)	\$16,177	(\$36,550 - \$20,373)
Debt-to-Asset Ratio:			
.47:1	(\$142,230/\$303,155)	.43:1	(\$153,575/\$357,765)
Equity-to-Asset Ratio:			
.53:1	(\$160,925/\$303,155)	.57:1	(\$204,190/\$357,765)
Debt-to-Equity Ratio:			
.88:1	(\$142,230/\$160,925)	.75:1	(\$153,575/\$204,190)

Higher current liabilities in 1995 caused the current ratio to drop from 1.79:1 to 1.25:1 and the working capital to reduce to \$6,974 from \$16,177. The decline in the current ratio and working capital indicates that part of the investments during 1994 (waste management system and additional machinery) were made with cash. In addition, a drop in market steer prices reduced the value of current assets, and an increase in the principal due within 12 months and a rise in feed and machinery repair bills caused an increase in current farm liabilities.

Due to increases in intermediate liabilities and assets, from the purchase of additional milk cows and equipment during 1994, the debt-to-asset ratio rose from 46.9 percent to 52.8 percent as of 1/1/95. The equity-to-asset ratio decreased to 47.2 percent from 53.1 percent. That is, as of 1/1/95, 47.2 percent of the farm's

assets were financed by equity compared to 53.1 percent a year earlier. Therefore, the additional assets acquired by the farm during the year were likely financed from credit more than by equity as is further evidenced by the debt-to-equity ratio increase to 112.0 percent from 88.4 percent.

These changes in ratios from one year to the next should concern the farm owner. Further analysis of the profitability of the farm is needed to determine if the ratio changes are an aberration or a trend.

Figure #5
“EXAMPLE BALANCE SHEET, JANUARY 1, 1995”

CURRENT FARM ASSETS				Value	CURRENT FARM LIABILITIES						Balance
Cash & checking balance				\$ 9,600	Farm accrued interest						\$ 7,119
Prepaid expenses & supplies				\$1,200	Accounts Payable & Accrued Expenses						
Accounts receivable				\$ 9,055	Feed Bill						\$ 4,500
					Machine Repair						\$1,200
Crops:					Principal due within 12 months						
Alfalfa Hay	No.	Value/Unit			on term liabilities						\$15,642
Corn Silage	70	\$70.00/Ton	\$ 4,900								
	600	\$15.00/Ton	\$ 9,000								
Mkt Lvstck:											
Dairy Steers	No.	Value/Unit									
	8	\$60.00/cwt.	\$1,680								
Total Current Assets				\$ 35,435	Total Current Liabilities						\$ 28,461
<hr/>					<hr/>						
INTERMEDIATE FARM ASSETS					INTERMEDIATE FARM LIABILITIES						
					Int.	Princ.	P & I	Princ.	Intermed.		
Breeding Livestock	No.	Cost Value	Market Value (*)	Lender	Rate	Bal.	Due	Due	Balance		
Cows	70	\$ 68,000	\$ 73,500	Bank 1	10.00%	\$43,230	\$7,890	\$3,200	\$40,030		
Replacmnt Heifers	20	\$ 23,000	\$ 27,000	Bank 2	9.75%	\$7,196	\$1,700	\$939	\$6,257		
Dry Cows	5	\$ 6,800	\$ 8,000	Bank 1	8%	\$41,723	\$7,000	\$3,388	\$38,335		
Farm Machinery											
		\$ 75,990	\$ 88,000								
Total Intermediate Assets				\$172,990	\$196,500	Total Intermediate Liabilities				\$ 84,622	
<hr/>					<hr/>						
LONG TERM FARM ASSETS					LONG TERM FARM LIABILITIES						
					Int.	Princ.	P & I	Princ.	Intermed.		
Land	Acres	Cost Value	Market Value	Lender	Rate	Bal.	Due	Due	Balance		
Smith Place (pasture)	76	\$ 38,000	\$ 60,800	bank 1	9%	\$31,979	\$4,674	\$1,559	\$30,420		
Home Farm (crops)	54	\$ 20,000	\$ 37,800	Bank 2	8%	\$24,767	\$8,700	\$6,556	\$18,211		
Jones Farm (crops)	30	\$ 28,000	\$ 30,000								
Total Long Term Assets				\$ 86,000	\$128,600	Total Long Term Liabilities				\$48,631	
<hr/>					<hr/>						
TOTAL FARM ASSETS				\$ 294,425	\$ 360,535	TOTAL FARM LIABILITIES				\$161,714	
<hr/>					<hr/>						
NONFARM ASSETS				\$ 27,515	\$ 27,515	NONFARM LIABILITIES				\$ 8,335	
					<u>Cost</u>						<u>Market</u>
					CONTINGENT LIABILITIES						\$11,419
					TOTAL LIABILITIES						\$170,049
					Retained Earnings						\$151,891
<hr/>					<hr/>						
TOTAL ASSETS				\$ 321,940	\$ 388,050	NET WORTH (Equity)				\$ 206,582	

(*) Market values are based on estimates from trade magazines, local auctions and limited appraisals.

If the financial decline is indeed a one-year aberration, then no changes in the farm plan are required. But, if further analysis reveals that the trend is likely to continue, changes in the farm plan should be considered immediately. Continuing with the same plan would only further decrease the financial position of the farm owner.

Comparisons with Other Farms

Comparing financial conditions among similar farms often reveals opportunities for effective production and management changes. For example, comparisons of current ratios could instigate a change in loan structures. Similarly, viewing another farm's increasing net worth from year to year could lead to changes in production plans that in-turn lead to higher levels of profitability. However, sharing personal financial information with others can be difficult and uncomfortable. It is tempting to compare an individual farm's financial information with "example farms" or "average farms" published in newspapers, magazines or research reports.

However, care should be taken when comparisons are made because each set of financial information can be presented differently. For example, some balance sheets may contain non-farm items, or may be calculated using a market value approach. If balance sheets are not prepared using the same assumptions, comparisons among them will not be accurate. Comparisons of financial information with other sources are helpful only when both have been prepared using the same format and assumptions.

Summary

Financial analysis has become an integral part of successful farm management. Financial statements can be analyzed to track the financial progress of the farm business over time. They can also be used to report financial status and to accompany loan applications. The balance sheet is a financial report of the farm's asset and debt situation that reflects the farm's ability to meet financial obligations and incur additional debt. It is recommended that all farms, regardless of size, prepare a balance sheet.

Additional information concerning farm financial statements and construction of a balance sheet is available through the MANAGE program of The University of Tennessee Agricultural Extension Service. The MANAGE program provides one-on-one personal assistance for farm families in developing and analyzing a farm financial plan. Information and/or appointments can be made by contacting the local Agricultural Extension Office.



APPENDIX

Defining the Terms

Assets: Assets are all items of value owned by the farm on the balance sheet date. Assets include cash, accounts receivable, land, capital leases, investments in cooperatives, retirement accounts, buildings, machinery, equipment, livestock, inventory values, prepaid expenses and supplies.

Balance Sheet Date: The balance sheet date is the date on which the balance sheet was prepared. It is understood that the values on the balance sheet represent values as of the balance sheet date.

Contingent Liabilities: Contingent liabilities represent those items that are contingent upon events. Contingent liabilities include estimated taxes from capital gains and estimated income taxes from taxable values of current inventories. Contingent liabilities can have a major effect on the solvency position of the farm. Including them in the calculation of a net worth with market values provides a more accurate picture of the equity available if the farm were dispersed. Contingent liabilities are included in a balance sheet only when assets are valued at their market value. Contingent liabilities, like the underlying market values, are an estimate.

Cost Value: The cost value of an asset is the amount of cash paid for the asset, plus the basis of a trade-in if any, plus improvements to the asset, minus depreciation. The cost value balance sheet is a useful measure of progress over time because only changes in net worth from earnings are included.

Current Farm Assets: Current farm assets include cash and other assets that can be easily converted to cash. Current farm assets are items expected to be received, converted to cash or consumed during the coming business year. Current assets also include inventory items that will be used-up during the coming year. Current farm assets include: cash, grain and forage inventories, supplies, feeder and market livestock, cull livestock, hedging accounts, crops under government loan, accounts receivable, cash invested in growing crops and prepaid expenses.

Current Farm Liabilities: Current farm liabilities or debts are those which are to be paid on demand or within one year of the balance sheet date. They also include notes scheduled to mature within one year. Current farm liabilities include accounts payable, rents, taxes due, operating notes and interest and principal payments due in the coming year on current, intermediate and long-term notes.

Equity or Net Worth: Equity or net worth is the dollar representation of the owner's stake in the operation. It is the difference between total assets and total liabilities.

$$\begin{array}{r} \text{Total Assets (market value)} \\ - \quad \text{Total Liabilities} \\ = \quad \underline{\underline{\text{Net Worth}}} \end{array}$$

Intermediate Farm Assets: Intermediate farm assets are those assets with a useful life of one to 10 years. Most intermediate assets support production and are not sold or converted into cash on an annual basis. Intermediate assets include: machinery, equipment and breeding livestock.

Intermediate Farm Liabilities: Intermediate farm liabilities are those debts with a term of one to 10 years. The amount of principal and interest due in the coming 12 months on such loans is included as a current liability. Therefore, the value given as intermediate liabilities on the balancesheet should reflect the balance remaining after the coming year's principal and interest have been paid.

Liabilities: Liabilities or debts are the debt obligations of the farm on the balance sheet date. Liabilities include accounts payable, loans, accrued interest, accrued expenses, real estate loans, non-real estate loans and operating loans.

Liquidity: Liquidity represents the ability of a farm to generate cash to pay bills without disrupting normal business operations. It indicates the operation's ability to meet financial obligations, transactions or investment opportunities as they come due. Liquidity information from the balance sheet should be interpreted in conjunctions with information from the cash flow statement. Liquidity is measured by the current ratio and working capital.

Long-term Farm Assets: Long-term or fixed farm assets have useful lives of more than 10 years and usually cannot be easily sold without disrupting the business. Long-term assets include land, buildings and improvements. Land and buildings are often classified as one unit. However, separate values and descriptions on the balance sheet provide a clearer picture of the farm business. Improvements often include barns, irrigation systems, waste management systems and other storage facilities.

Long-term Farm Liabilities: Long-term farm liabilities are farm debts with a term greater than 10 years and generally represent debt of a long-term farm asset. The liability value on the balance sheet is the loan balance less the principal and interest due within 12 months. The principal and interest due within 12 months will be listed as a current farm liability.

Market Value: The market value of an asset is an estimate of its sale price, less any expected selling cost. Market value is useful to evaluate the solvency position of the farm and estimate its net worth, if all assets were sold. It is recommended that a footnote appear in balance sheets constructed using market values identifying the source of the value estimation. When the market value is used, however, it is difficult to determine how much of a net worth change is due to earned income and how much is due to market forces and inflation.

Non-farm Assets: Non-farm assets are personal and non-farm business assets of the farm family. They can also be divided into current, intermediate and long-term classifications. Non-farm assets can include non-farm cash and savings, non-farm vehicles, household furnishings and non-farm real estate.

Non-farm Liabilities: Non-farm liabilities are those personal and non-farm business liabilities incurred by the farm family. Non-farm liabilities can also be divided into current, intermediate and long-term classifications. Non-farm liabilities represent debts incurred for the purchase of non-farm assets.

Total Assets: Total assets represent the value of all farm and non-farm assets, as is shown below:

+ Current Farm Assets
+ Intermediate Farm Assets
+ Long-term Farm Assets
= Total Farm Assets
+ Non-Farm Assets
= Total Assets

Total Liabilities: The total liabilities of an operation are the values of all farm and non-farm liabilities as shown below:

+ Current Farm Liabilities
+ Intermediate Farm Liabilities
+ Long-term Farm Liabilities
= Total Farm Liabilities
+ Non-Farm Liabilities
= Total Liabilities

Ratio Analysis: Ratio analysis can be used to measure the farm's financial condition and compare it to other farms. Several ratios can be calculated from the balance sheet. Balance sheet ratios address the farm's solvency and liquidity.

Retained Earnings: Retained earnings are calculated by subtracting total liabilities from total assets on a cost value basis. It is a useful measure of earned growth in the business over time. It does not consider inflation or appreciation of assets, but does reflect farm and non-farm earnings re-invested in the farm business.

Solvency: Solvency is a measure of a farm's equity. A solvent operation has a greater dollar value of assets than liabilities. Solvency can be measured by the debt-to-asset, equity-to-asset and debt-to-equity ratios. All three of these solvency measures are related through the accounting equation.

REFERENCES

Center for Farm Financial Management, "FINPACK User's Manual," Department of Agricultural and Applied Economics, Minnesota Extension Service, University of Minnesota, 1993.

Forbes, Stan, and others, "Recommendations Of The Farm Financial Standards Task Force," Southern Extension Farm Management Committee, 1991.

Note:

The numbers and values expressed in this document are based on a case study analysis from 1994 and 1995. While the values represented here may not be equivalent to today's market conditions, the basic principles still apply. As is the case with any balance sheet, the information and absolute values represent a specific point in time. That specific point is indicated by the balance sheet date.

Appreciation is extended to the University of Minnesota Extension Service, Center for Farm Financial Management, for permission to use the FINPACK Balance Sheet form in this publication.

PB1583-1.2M-4/97 (Rep)
E12-2015-00-070-97



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