

An Introduction to Basic Farm Financial Statements: Balance Sheet



SOUTHERN
EXTENSION
RISK MANAGEMENT
EDUCATION

*Victoria Campbell, Extension Intern
S. Aaron Smith, Associate Professor
Christopher N. Boyer, Associate Professor
Andrew P. Griffith, Associate Professor
Department of Agricultural and Resource Economics*



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THE UNIVERSITY OF TENNESSEE

Introduction

Tennessee agriculture includes a diverse list of livestock, fruit and vegetable, row crop, and ornamental enterprises. These farms vary in size from less than ¼ of an acre to thousands of acres, and the specific goal for each farm can vary. For example, some producers' goals might include: maximizing profits, maintaining a way of life, enjoyment, transitioning the operation to the next generation, and many others.

Regardless of the farm size, enterprises, and objectives, it is important to keep proper farm financial records to improve the long term viability of the farm. Accurate recordkeeping and organized financial statements allow producers to measure key financial components of their business such as profitability, liquidity, and solvency. These measurements are vital in making knowledgeable decisions to achieve a farm's goals.

The goal of this publication is to provide an introduction to balance sheets. A **balance sheet** is a financial statement that shows a detailed list of all assets, liabilities, and the owner's equity position of the farming operation at a specific point in time. This publication provides an overview of the three principle components of a balance sheet: 1) assets; 2) liabilities; and 3) owner's equity. It also discusses important farm financial measures that can be derived and analyzed from the balance sheet.

Basic Accounting Overview

To begin the introduction of the balance sheet, we need to first start with the standard *accounting equation*:

Total Assets = Total Liabilities + Owner's Equity

The balance sheet is designed with assets on the left-hand side and liabilities plus owner's

equity on the right-hand side. This format allows both sides of the balance sheet to equal each other. After all, a balance sheet must balance.



A change in liquidity, solvency, and equity can be found by comparing balance sheets from two different time periods. Typically, changes in the balance sheet measurements are analyzed for the operations tax year (i.e. Jan. 1 to Dec. 31); however, these values can be compared for any time interval. A change in owner's equity occurs from two sources: 1) income or loss from operations; and/or 2) a change in the value of an asset or liability. Changes in owner's equity can indicate whether the farm is heading in a profitable direction, however, the balance sheet must be analyzed in conjunction with the income statement (Income Statement; Best et al, 2020) to determine profitability. "The income statement summarizes revenue and expenses and is used to compute profit over a period of time" (Income Statement; Best et al, 2020).

Assets

Assets are items of value a farm owns or uses. Assets are split into two categories: current and noncurrent. A **current asset** is either cash (or cash equivalents) or an item that will become cash within a fiscal year (12 months). A **noncurrent asset** is something the farm owns or uses that will *not* turn into cash within the next accounting period and typically has a multi-year useful life. Some balance sheets further divide noncurrent assets into intermediate and long-term assets. In general, an **intermediate asset** is an asset with a **useful life** of one to ten years, and a **long-term asset** has a useful life of greater than ten years (Holland, 1997). For the sake of simplicity, the example balance sheet in Appendix 1 uses

current and noncurrent assets.

Noncurrent Asset Valuation

Assets can be valued using two different approaches: cost value and market value.

Cost valuation, sometimes referred to as *book value*, is the original price paid for the asset minus the accumulated depreciation of that asset. Because the cost method takes into consideration depreciation, a producer can examine changes in the farm's owner's equity (net worth) and the overall invested capital performance (Langemeier, 2017).

Market valuation is an estimate of what the asset would sell for on the date of the balance sheet. This valuation considers current prices meaning the asset is valued based on what a buyer would pay at a specific point in time. For example, the market value for a tractor might be the trade in value or what it could sell for at auction. The market value approach is important because it provides an estimate of what the farmer would actually get paid for an asset if it was liquidated that day (sale proceeds could be less due to transaction costs and **contingent liabilities**). When selling costs are taken out of the market value, a farmer then has a clear picture of what the cost / gain of disposing of that asset would be (Langemeier, 2017). Appendix 1, depicts a simple example of a balance sheet template.

Depreciation

There are two common methods in which assets can be depreciated: straight-line depreciation and declining balance depreciation. **Straight-line depreciation** is when an asset is depreciated by the same amount each year. It is also the simplest type of depreciation to calculate. Table 1 in Appendix 3 displays the calculation for the straight-line depreciation method for the building and machinery that appear on the example balance sheet (Appendix 1). The equation for the *straight-line depreciation* method is (Warren, 2013):

$$\text{Annual Depreciation} = \frac{\text{Original Cost} - \text{Salvage Value}}{\text{Useful Life}}$$

Declining balance depreciation is a method in which an asset depreciates rapidly in the first few years, and then the annual depreciation expense (in dollar terms) becomes smaller the closer the asset gets to reaching the end of its useful life. Initially, the depreciation rate for the declining balance method is double the straight-line depreciation rate (20% compared to 10%; Appendix 3).

The graph below (Figure 1) illustrates the two depreciation methods. With straight line depreciation, the asset depreciates steadily (by the same amount each year) until it reaches its **salvage value**.

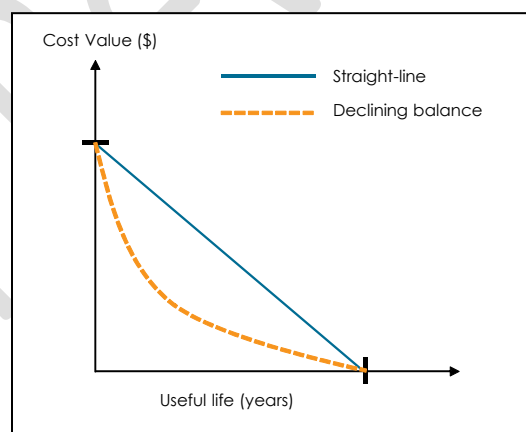


Figure 1. Illustration of straight-line and declining balance depreciation methods

With the declining balance method, the asset depreciates more rapidly initially, but then slowly depreciates until the end of its useful life. In this example, both methods produce the same amount of accumulated depreciation at the end of the useful life of the asset. Table 2 of Appendix 3 shows the declining balance method of depreciation calculated for the same building and machinery.

Liabilities

An obligation to pay a debt is known as a **liability**. Just like assets, the liabilities section of the balance sheet can be

separated into two sections (current and noncurrent), or three sections (current, intermediate, and long-term). A **current liability** is a debt that must be paid within one fiscal year (12 months), an **intermediate liability** is a debt that is due within one to ten years, and a **long-term liability** has a payback term longer than ten years.

Assets	Liabilities
Current	Current
Intermediate (useful life 1-10 years)	Intermediate (due within the next 1-10 years)
Long-term (useful life > 10 years)	Long-term (not payable till > 10 years)
Total Assets	Total Liabilities

* Current: turn to cash or is due in the current fiscal year

* Noncurrent: Intermediate + Long-term

In farming, liabilities are commonly associated with different loan types. An example of a current liability would be an operating or production loan. Operating loans are normally used to finance short term cash flow short falls and/or to cover day-to-day business expenses. Interest on operating loans is typically paid monthly with no set terms of principle repayment (operating loans should be paid in full annually upon the sale of commodities or liquidation of other current assets).

An example of an intermediate liability is a machinery loan. Machinery loans are typically considered intermediate because most farm machinery has an estimated useful life of ten years or less (the machine is worn out or has become technologically obsolete). Intermediate loans should be amortized for fewer years than the useful life of the asset being purchased. These loans can be paid annually or monthly. The payment that is due consists of both interest and part of the principle balance.

Lastly, an example of a long-term liability would be a farm real-estate loan for purchase of land. Typically, farm land can be amortized over a maximum of 30 years. Long-term farm loans are normally paid on an annual basis; however, loan payments should coincide with income (i.e. a dairy may desire weekly or monthly payments, rather than annually).

The loan schedule in Appendix 4 displays all three types of loans, and their payments have been calculated based on individual interest rates and the remaining term of the loan.

Owner's Equity

The difference between a farm's assets and its liabilities is called **owner's equity**. It is sometimes referred to as a farm's net worth. Depending on the legal entity of the farm (sole proprietorship, partnership, LLC, etc.), owner's equity can be referred to differently. As a result, each owner's equity section on the balance sheet will vary. For the purposes of this publication and example balance sheet, owner's equity is simply the farm's net worth, which can be calculated by taking total assets less total liabilities.

Important Farm Financial Measures

Important farm financial measures that can be calculated from a balance sheet include liquidity and solvency.

Liquidity is the ability to meet the short term cash needs of a farm. Two common liquidity measures are the *current ratio* and *working capital*. The *current ratio* is current assets divided by current liabilities. In Appendix 1, the *current ratio* for the beginning of the year was 2.76 meaning that the farm has \$2.76 of current assets for every \$1 of current liabilities. A *current ratio* greater than 2.0 is classified as strong (FINPACK, 2016). *Working capital* is a farm's current assets less its current liabilities. This is the amount of cash the farm would have if all current assets were converted to cash and all current debts (including principle

payments on term debts that are due in 12 months) were paid (excluding contingent liabilities and transaction costs).

Solvency is the ability to repay the money loaned if a farm stopped doing business today. There are three commonly used ratios to measure solvency.

The first is the *debt to asset* ratio, and it is calculated as total liabilities divided by total assets. This ratio signifies a farm's debt load compared to its assets. The higher or closer to 1 a *debt to asset* ratio is, the greater the percentage of farm assets financed by debt (Holland, 1997). In the ratio analysis in Appendix 1, the *debt to asset* ratio at the beginning of the year was 0.229. This means roughly 23 percent of the farm's assets are financed through debt.

The *equity to asset* ratio (total owner's equity divided by total assets) represents the proportion of total assets that are unencumbered (or debt free). A farm will have a higher *equity to asset* ratio the more it is able to pay its expenses without the use of loans.

The last ratio is a measure of how much capital is being supplied by creditors compared to capital used from farm equity. This is called the *debt to equity* ratio and is calculated by dividing the total liabilities by total owner's equity. A lower *debt to equity* ratio is more desirable because that means the proportion of capital the farm is supplying through equity is greater than the portion supplied by creditors (debt).

Appendix 2 contains a breakdown of each of the ratios and includes the desired outcome of each. When calculating solvency, a consistent value method needs to be used: either cost value or market value, but not both.

Conclusion

Understanding how to construct and analyze a balance sheet is important for

farmers. Farmers should develop a balance sheet annually to examine and implement changes to improve their operations financial position. A farmer can use farm financial analysis to identify financial components of his or her business that could be improved (one cannot manage what they cannot measure). Improved financial performance can provide access to credit, reduced interest rates, and open opportunities for expanding the farm.

Appendix 1: Balance Sheet

Assets	Jan. 1, 2019 Beginning Balance	Dec. 31, 2019 Ending Balance	Net Change	Liabilities	Jan. 1, 2019 Beginning Balance	Dec. 31, 2019 Ending Balance	Net Change
Current assets				Current liabilities			
Cash	\$20,000	\$66,505	\$46,505	Accounts payable	\$3,000	\$2,100	-\$900
Accounts receivable	-	-	-	Accrued taxes payable	\$1,750	\$930	-\$820
Inventories	\$54,850	\$54,850	-	Principal due in 12 months	\$23,605	\$12,750	-\$10,855
Prepaid expenses	\$3,400	\$1,955	-\$1,445	Total current liabilities	\$28,355	\$15,780	-\$12,575
Total current assets	\$78,250	\$123,310	\$45,060	Noncurrent liabilities			
Noncurrent assets				Remaining principal balance	\$125,650	\$102,045	-\$23,605
Land	\$285,000	\$285,000	\$0	Total noncurrent liabilities	\$125,650	\$102,045	-\$23,605
Buildings	\$122,000	\$111,110	-\$10,890	Total liabilities	\$154,005	\$117,825	-\$36,180
Equipment	\$168,000	\$142,393	-\$25,607	Owner's Equity			
Investments in cooperatives	\$18,000	\$22,355	\$4,355	Total owner's equity	\$517,245	\$566,343	\$49,098
Total noncurrent assets	\$593,000	\$560,858	-\$32,142	Total owner's equity and liabilities	\$671,250	\$684,168	\$12,918
Total Assets	\$671,250	\$684,168	\$12,918				

Ratio Analysis

Liquidity	Jan. 1, 2019 Beginning Balance	Dec. 31, 2019 Ending Balance	Net Change
Current Ratio	2.76	7.81	5.05
Working Capital	\$49,895.00	\$107,530.00	\$57,635.00
Solvency			
Debt to Asset	0.229	0.172	-0.057
Equity to Asset	0.771	0.828	0.057
Debt to Equity	0.298	0.208	-0.090

*Refer to Appendix 2 for descriptions

Appendix 2: Ratios and Equations

Accounting Equation

$$\text{Total Assets} = \text{Owner's Equity} - \text{Total Liabilities}$$

Liquidity

$$\text{Current Ratio} = \frac{\text{Total Current Assets}}{\text{Total Current Liabilities}}$$

$$\text{Working Capital} = \text{Total Current Assets} - \text{Total Current Liabilities}$$

Desired outcome: positive number

Solvency

$$\text{Debt to Asset Ratio} = \frac{\text{Total Liabilities}}{\text{Total Assets}}$$

$$\text{Equity to Asset Ratio} = \frac{\text{Total Owner's Equity}}{\text{Total Assets}}$$

$$\text{Debt to Equity Ratio} = \frac{\text{Total Liabilities}}{\text{Total Owner's Equity}}$$

Straight-line Depreciation

$$\text{Annual Depreciation} = \frac{\text{Price} - \text{Salvage Value}}{\text{Useful Life}}$$

*Liquidity and solvency ratios sourced from **Klinefelter (2008)**.

*Desired outcomes sourced from **Berry (Penn State)**.

Appendix 3: Depreciation Schedules

Table 1: Straight Line Depreciation

Asset	Opening value (Jan. 1, 2019)	Useful life (in years)	Salvage value	Annual depreciation rate	Annual depreciation expense	Closing value (Dec. 31, 2019)
Building	\$122,000	10	\$13,100	10%	\$10,890	\$111,110
Machinery	\$168,000	6	\$14,661	17%	\$25,557	\$142,444

Table 2: Declining Balance Depreciation

Asset	Year	Beginning book value	Depreciation rate	Depreciation expense	Ending accumulated depreciation	Ending book value
Building	2019	\$122,000	20%	\$24,400	\$24,400	\$97,600
	2020	\$97,600	20%	\$19,520	\$43,920	\$78,080
	2021	\$78,080	20%	\$15,616	\$59,536	\$62,464
	2022	\$62,464	20%	\$12,493	\$72,029	\$49,971
	2023	\$49,971	20%	\$9,994	\$82,023	\$39,977
	2024	\$39,977	20%	\$7,995	\$90,018	\$31,982
	2025	\$31,982	20%	\$6,396	\$96,415	\$25,585
	2026	\$25,585	20%	\$5,117	\$101,532	\$20,468
	2027	\$20,468	20%	\$4,094	\$105,625	\$16,375
	2028	\$16,375	20%	\$3,275	\$108,900	\$13,100
Machinery	2019	\$168,000	33%	\$56,112	\$56,112	\$111,888
	2020	\$111,888	33%	\$37,371	\$93,483	\$74,517
	2021	\$74,517	33%	\$24,889	\$118,371	\$49,629
	2022	\$49,629	33%	\$16,576	\$134,947	\$33,053
	2023	\$33,053	33%	\$11,040	\$145,987	\$22,013
	2024	\$22,013	33%	\$7,352	\$153,339	\$14,661

Appendix 4: Loan Schedules

Loan Classification	Loan Type	Start Date	End Date	Limit	Balance	Interest Rate	Remaining Term/ Amortization* (months)	Payment Due in the Next 12 months		Payment Frequency	Payment Due	Payment Due Date	Remaining Balance
								Interest	Principle				
Current	(1) Operating	1/1/2019	12/31/2019	\$100,000.00	\$75,000.00	6%	12/12	\$375.00	-	Monthly	\$375.00	2/1/2019	\$75,000.00
Intermediate	(2) Machinery	1/1/2019	12/31/2022	\$80,000.00	\$80,000.00	5%	36/60	\$2,516.01	\$15,961.98	Annually	\$18,477.99	12/31/2019	\$61,522.01
Long-term	(3) Land	1/1/2019	12/31/2038	\$160,000.00	\$160,000.00	4%	240/240	\$6,400.00	\$5,373.08	Annually	\$11,773.08	12/31/2019	\$154,626.92

(1) Operating

For a current operating loan, the balance of the loan changes daily, so monthly interest only payments are calculated. The principle for operating loans is normally paid at one specific time of year, for example, after the sale of a crop.

Example: Monthly interest payment = $\$75,000 \times (0.06/12)$

(2) Machinery

Year	Beginning Balance	Payment	Interest	Principle	Ending Balance
19	\$80,000.00	\$18,477.98	\$4,000.00	\$14,477.98	\$65,522.02
20	\$65,522.02	\$18,477.98	\$3,276.10	\$15,201.88	\$50,320.13
21	\$50,320.13	\$18,477.98	\$2,516.01	\$15,961.98	\$34,358.16
22	\$34,358.16	\$18,477.98	\$1,717.91	\$16,760.08	\$17,598.08
23	\$17,598.08	\$18,477.98	\$879.90	\$17,598.08	\$0.00

Annual payment = principle + interest

Interest payment = balance * interest rate

Principle payment = annual payment - interest

*For the current loan, the annual interest rate is divided by 12 to find the monthly payment.

*In this example, interest is compounded annually for both intermediate and long term loans.

(3) Land

Year	Beginning Balance	Payment	Interest	Principle	Ending Balance
19	\$160,000.00	\$11,773.08	\$6,400.00	\$5,373.08	\$154,626.92
20	\$154,626.92	\$11,773.08	\$6,185.08	\$5,588.00	\$149,038.92
21	\$149,038.92	\$11,773.08	\$5,961.56	\$5,811.52	\$143,227.39
22	\$143,227.39	\$11,773.08	\$5,729.10	\$6,043.98	\$137,183.41
23	\$137,183.41	\$11,773.08	\$5,487.34	\$6,285.74	\$130,897.67
24	\$130,897.67	\$11,773.08	\$5,235.91	\$6,537.17	\$124,360.49
25	\$124,360.49	\$11,773.08	\$4,974.42	\$6,798.66	\$117,561.83
26	\$117,561.83	\$11,773.08	\$4,702.47	\$7,070.61	\$110,491.22
27	\$110,491.22	\$11,773.08	\$4,419.65	\$7,353.43	\$103,137.79
28	\$103,137.79	\$11,773.08	\$4,125.51	\$7,647.57	\$95,490.23
29	\$95,490.23	\$11,773.08	\$3,819.61	\$7,953.47	\$87,536.75
30	\$87,536.75	\$11,773.08	\$3,501.47	\$8,271.61	\$79,265.14
31	\$79,265.14	\$11,773.08	\$3,170.61	\$8,602.47	\$70,662.67
32	\$70,662.67	\$11,773.08	\$2,826.51	\$8,946.57	\$61,716.10
33	\$61,716.10	\$11,773.08	\$2,468.64	\$9,304.44	\$52,411.66
34	\$52,411.66	\$11,773.08	\$2,096.47	\$9,676.61	\$42,735.05
35	\$42,735.05	\$11,773.08	\$1,709.40	\$10,063.68	\$32,671.37
36	\$32,671.37	\$11,773.08	\$1,306.85	\$10,466.23	\$22,205.14
37	\$22,205.14	\$11,773.08	\$888.21	\$10,884.87	\$11,320.27
38	\$11,320.27	\$11,773.08	\$452.81	\$11,320.27	\$0.00

Appendix 5: Definitions to Know

Accounts payable: amount of money owed by a firm to others for goods or services bought on credit and for which payment is to be made before the end of the current accounting period.

Accounts receivable: debts that others owe the business, usually arising from previous credit sales.

Amortization: paying off debt with a fixed repayment schedule in regular installments over a period of time.

Asset: something of value a firm owns or uses.

Balance Sheet: a statement of the financial condition of a business on a specific date.

Contingent liability: potential liabilities if certain events occur in the future, i.e. debts that come about due to litigation, environmental matters, guarantees, estate taxes etc. (Warren, 2013)

Cost value: amount of cash paid for an asset, plus the basis of a trade-in if any (Holland, 1997)

Current asset: either cash or an item that will become cash within the accounting period.

Current liability: a debt that must be paid within the next accounting period.

Current ratio: current assets divided by current liabilities as listed on the balance sheet.

Debt to asset ratio: measures the debt load of a business compared to its assets (Holland, 1997).

Debt to equity ratio: measures the relative size of claims on a firm's assets between creditors and the owners.

Declining balance depreciation: provides periodic depreciation expense based on the declining book value of a fixed (noncurrent) asset over its estimated life (Warren, 2013).

Depreciation: decline in market value that occurs in capital assets over time, and which reflects the "consumption" of these assets due to wear and tear, and so forth.

Equity to asset ratio: measures the proportion of total assets financed by equity in the farm (UT Extension, PB 1583).

Intermediate asset: asset with a longer life in the operation (usually up to ten years) (Hachfeld, 2016).

Intermediate liability: debt that is due over the next ten or fewer years (Hachfeld, 2016).

Liability: an obligation to pay a debt.

Liquidity: ability to meet the day-to-day cash needs of the firm.

Long-term asset: asset with a useful life of longer than ten years.

Long-term liability: debt with a payback term longer than ten years.

Market value: an estimate of an asset's sale price, less any expected selling cost (Holland, 1997).

Noncurrent asset: something the firm owns or uses that will not turn into cash within the next accounting period.

Noncurrent liability: debt whose payment will be made after the next accounting period.

Non-farm assets: personal and non-farm business assets of the farm family (Holland, 1997).

Non-farm liabilities: personal and non-farm business liabilities incurred by the farm family (Holland, 1997).

Owner's equity: difference between a firm's assets and its liabilities; sometimes referred to as *net worth*.

Salvage value: value of an asset at the end of its useful life (Warren, 2013).

Solvency: ability to repay the money loaned if the firm stopped doing business today; measure of a firm's debts to its equity.

Straight-line depreciation: depreciation that provides for equal periodic depreciation expense over the estimated life of a fixed (noncurrent) asset (Warren, 2013).

Useful life: an estimate of the number of years an asset is likely to remain in service for its intended purpose.

Working capital: a firm's current assets less its current liabilities; measures the funds that would be available if current assets were sold and current farm liabilities paid (Holland, 1997).

*All definitions provided by the following source unless otherwise cited:
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This material is based upon work supported by USDA/NIFA under Award Number: 2015-49200-24228

