

Balance Sheet

Agricultural Business Management

Gary A. Hachfeld, David B. Bau, & C. Robert Holcomb, Extension Educators

A complete set of financial statements for agriculture include: a Balance Sheet, an Income Statement, a Statement of Owner Equity and a Statement of Cash Flows. The FINPACK software, developed by the Center for Farm Financial Management, University of Minnesota, generates each of these statements. Other software and paper products generate similar information. Key ratios and measurements covering Liquidity, Solvency, Profitability, Repayment Capacity and Efficiency have become standards in the agricultural industry and are generated from these financial statements.

A "Balance Sheet" lists Assets, Liabilities and Net Worth as of a certain date. It can be thought of as a "snapshot" of your financial condition at that time. For producers whose fiscal year coincides with the calendar year, January 1 is an excellent date for the annual Balance Sheet. It marks the beginning and ending of their business year, and enables the completion of a good accrual adjusted Income Statement. Producers, who have a fiscal year different than the calendar year, should complete their annual Balance Sheet at the beginning of their fiscal year.

An excellent Balance Sheet can be prepared using the FINPACK software. This discussion will focus on that Balance Sheet. Other good Balance Sheets are structured in a similar way. The Assets are shown on the left side of the page, and the Liabilities are shown on the right. The Net Worth appears on the bottom right hand side of the page. When you add the Liabilities plus the Net Worth, they will equal the total of the Assets. That is where the term "balance" sheet comes from. One side balances with the other. Page one of the FINPACK Balance Sheet is the actual Balance Sheet. The additional pages are meant to be helpful, and have schedules that elaborate on various parts of the Balance Sheet.

Assets are items that are owned and have value. They belong on the Balance Sheet whether these items are paid for or whether there is debt against them. The FINPACK Balance Sheet has horizontal lines dividing the Assets between "Current Farm Assets", "Intermediate Farm Assets" and "Long-Term Farm Assets", followed by "Total Farm Assets" (the total of the above), then "Non-Farm Assets",

and then "Total Assets" (the total of all farm plus non-farm assets).

"Current Assets" are those assets that will likely be converted into cash within a year. Besides cash, other examples of "Current Assets" are: supplies; accounts receivable; grain and feed that will be marketed directly or through livestock; and market livestock that is held for the purpose of growing, finishing and selling.

"Intermediate-Term Assets" have a longer life in the operation (usually up to 10 years). Although they can be sold, that is not the specific purpose for owning them. Examples are: breeding stock, machinery, etc.

"Long-Term Assets" have a long life (usually greater than 10 years). Land, buildings, etc. are classic examples.

The FINPACK Balance Sheet has vertical columns in the Intermediate and Long-Term Assets groups marked "Cost Value" and "Market Value". These are different methods of valuing the same assets. The "Cost Value" is the un-depreciated value of the assets (original cost, less depreciation that has been taken over time). The "Market Value" is the value that you could reasonably sell the assets for. The "Current Assets" have only one "Value" (Market Value). Some Balance Sheets use only one valuation method. The accounting world typically uses only the "Cost Value" method. Other Balance Sheets use only the "Market Value" method. The FINPACK Balance Sheet includes both valuation methods. By having both methods, it is possible to calculate a good estimate of the "Deferred Tax Liabilities" and it gives further meaning to your "Net Worth".

In a completed Balance Sheet, the amount of Total Assets in the "Cost Value" column is usually different than the amount shown in the "Market Value" column.

Each is meaningful in its own way. The "Cost Value" total has no inflation in it, and has depreciation working against it. The "Market Value" total is not affected by depreciation, and may have significant inflation built into it. An examination of individual assets that you own may show differences as

dramatic as: the “Cost Value” of a tractor that you have owned for 20 years may be “zero”, but the “Market Value” may be \$20,000. A bare 80 acres that you bought for \$600 per acre years ago could have a “Cost Value” of \$48,000 and a “Market Value” of possibly \$460,000.

The right side of the Balance Sheet lists the Liabilities. These are obligations owed to others. The FINPACK Balance Sheet divides the Liabilities into groups much as was done on the assets side. The “Current Liabilities” are those obligations that are due and payable within one year. They include: interest that has accrued as of the date of the Balance Sheet; accounts payable that are owed to others, short-term operating and feeder loans, and the principal portion of the longer term debt that will be due within the year.

The “Intermediate-Term Liabilities” and the “Long-Term Liabilities” are obligations that are due over time. There is no exact time division between “Intermediate-Term Loans” versus “Long-Term Loans” but as a rule, the “Intermediate-Term Loans” are due over the next 10 or fewer years and those longer than 10 years are considered “Long-Term”. Equipment loans or some facility loans are good examples of “Intermediate-Term Loans”. The classic “Long-Term Loan” is the land loan. The FINPACK Balance Sheet shows the “Principal Balance” (amount owed), the “Principal Due” (that portion of the total principal that is due within one year which has already been moved up to the “Current Liabilities” category), and then the “Intermediate” or “Long-Term Balance” (portion of the loan that is due beyond this next year).

If one’s assets were sold for the market value listed, there would likely be an income tax liability generated by the sale. The “Deferred Liabilities” calculated on the FINPACK Balance Sheet is an estimate of that tax liability. The Deferred Liabilities are calculated by multiplying a tax rate by the difference between the sale price (“Market Value” of the asset) and the tax basis (“Cost Value” of the asset). If the Deferred Tax Liability is not included on the Balance Sheet, the Net Worth is overstated.

As the liabilities are totaled on the Balance Sheet, the sum of the “Cost” column is different than the sum of the “Market” column. The “Cost” column equals the Total Farm Liabilities, plus Non-Farm Liabilities. The “Market” column total includes the Total Farm and Non-Farm Liabilities, plus the Deferred Liabilities.

Net Worth is calculated by subtracting the Liabilities from the Assets. Since the FINPACK Balance Sheet has two columns of assets, and two columns of liabilities, there are two components of the Net

Worth, the “Retained Earnings/Contributed Capital” and the “Market Valuation Equity”. The Total Liabilities in the “Cost” column is subtracted from the Total Assets in the “Cost Value” column to calculate “Retained Earnings/Contributed Capital”. The “Cost Value” portion of the Net Worth was earned. The Assets are shown at their depreciated values. No inflation is included. In the case of an entity (partnership or corporation), the “Retained Earnings/Contributed Capital” includes the capital that was contributed to the entity. In every case, it also represents the retained earnings over the years. The Total Liabilities of the “Market” column is subtracted from the Total Assets in the “Market Value” column to calculate the “Net Worth”. This “Net Worth” is made up of two parts: the “Retained Earnings/Contributed Capital” (explained above) plus the “Market Valuation Equity” (the change in market value net worth due to market value changes that have nothing to do with farm earnings). By studying the two components of the “Net Worth”, one can identify the portion generated by earned capital (Retained Earnings/Contributed Capital), and the effects of inflation, inheritance, etc. (Market Valuation Equity).

A Balance Sheet by itself does not show you whether you are making money or losing money. It does not show you where you have come from or where you are going. However, by comparing several Balance Sheets completed over time, significant trends can be identified. Your Balance Sheet can be analyzed using standard accepted ratios and measurements. By understanding your Balance Sheet and the key “Liquidity” and “Solvency” ratios and measurements, you can identify strengths and weaknesses in your financial life. *See Financial Management Series #5- Ratios and Measurements.*

It is important for the farmer to have good financial statements and analysis, and to understand them. After all, it is their financial life.

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Income Statement

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An "Income Statement" measures profit (loss) in a given length of time. In the case of farms, this length of time is usually one year. The year should be the same as the "tax year". Farmers that do not have a good Income Statement often rely on the Schedule F from their tax return to measure their income. Since most farmers are on a cash basis for taxes, their Schedule F only shows the amount of cash sales less cash purchases, and an allowance for depreciation. Being on the cash basis for income taxes is good, in that it gives the farmer a lot of flexibility in controlling the amount of taxable income that he has for the year. However, the Schedule F is a poor tool to rely on to measure profitability. It measures the amount of cash that was handled, but gives no hint as to whether only a portion of a crop was sold (or perhaps two crops were sold), whether all of the year's bills were paid (or perhaps some of the previous year's bills were also paid), whether all income earned was collected (or if it is still owed), etc.

An "accrual adjusted Income Statement" combines the cash basis farm records with the inventories from the Balance Sheets (the beginning and end of the year) to give a true measure of profitability. The Income Statement produced by the FINPACK software is called FINAN, and is an accrual adjusted Income Statement. Other accrual adjusted Income Statements exist that measure income in a similar way. The process for producing an "accrual adjusted Income Statement" is explained in a 1, 2 & 3 step process in the following paragraphs.

Step 1: The Cash Farm Income and the Cash Farm Expenses are shown on the Income Statement. Each is totaled. The Total Cash Farm Expense is

then subtracted from the Cash Farm Income, to get the "Net Cash Farm Income". This is an accurate measure of the dollars of income and expenses that were handled during the year, but it has not yet measured "profit".

Step 2: The Balance Sheets from the beginning and end of the year lists the farmer's inventories of production assets and liabilities. The values of the farm inventories at the beginning and end of the year, by category (Crop and Feed, Market Livestock, Receivables and Other Income Items, Prepaid Expenses and Supplies, and Payables and Accrued Expenses) are then shown on the Income Statement. The increases or decreases are calculated. The changes for each category are totaled. This Total Inventory Change is then combined with the Net Cash Farm Income, to produce the farm's "Net Operating Profit". This is "profit", without any "depreciation of assets" expense taken.

Step 3: A "Depreciation and Other Capital Adjustments" expense is calculated. This depreciation could be the farmer's actual "tax" depreciation, or it could be the "book" depreciation based more on gradual and realistic "wear and tear" decrease in value over time. The Depreciation is then subtracted from the Net Operating Profit, to calculate the "Net Farm Income". This is your farm's "Profit" or "Loss". This "Net Farm Income", plus any "Non-Farm Income" that exists, is what is needed to provide for family living, payment of income taxes and cover the principal payment obligations that have been committed to.

If we think of our Balance Sheets and the money we spend, here are some questions we need to ask ourselves: 1.) Do the dollars spent for family living show up on Balance Sheet? Of course not. They are gone. 2.) What about the dollars spent for income taxes? Same thing. They are gone. 3.) What about the dollars spent on principal payment of term debt? They do appear on the Balance Sheet, because now the Liabilities are smaller. That is the logic behind the formula Net Income minus Living and Taxes equals Net Worth Change. However, the Net Income must be sufficient to cover the living, taxes and principal payment of term debt. If the net income is not adequate to also cover these term debt principal

payments, either they will: 1.) not get paid, 2.) will get paid, but will be borrowed elsewhere (perhaps on the operating loan), or 3.) will be paid from the liquidation of assets.

The existence of adequate Net Income is absolutely key to the survival of a farm business. How do you measure whether it exists? The “accrual adjusted Income Statement”. Without a good accrual adjusted Income Statement, how would you know if there was a profit? That is a good question.

Liquidity and Solvency ratios and measurements are calculated from your Balance Sheet. When we have a good Income Statement, ratios and measurements on Profitability, Repayment Capacity and Efficiency can be calculated.

Some of these measurements come only from the Income Statement, while others require both a good Balance Sheet and a good Income Statement.

See Financial Management Series #5-Ratios and Measurements.

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Statement of Owner Equity

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The “Statement of Owner Equity” is a financial statement that analyzes why a farmer’s Net Worth (or Owner Equity) changed the way it did in the past year. This change in Net Worth is caused by a number of factors such as earning money, spending money, paying taxes, inheriting or receiving gifts, giving away gifts, having debts forgiven, or having his assets inflate or deflate in value. By simply comparing the Net Worth from one year to another, he can tell whether it went up or down, but he will not know which of the mentioned forces caused the change. That is what this “Statement of Owner Equity” is designed to do.

The following paragraphs describe how the “Statement of Owner Equity” that is generated by the FINPACK software is structured. Other software or paper forms will organize the information in a similar way.

To complete a “Statement of Owner Equity”, one must have a good “Balance Sheet” from the beginning of the year, another for the end of the year, and an accrual adjusted “Income Statement” for the year.

The farmer’s Net Worth at the beginning of the year, taken from the Balance Sheet at the beginning of the year, is the starting figure for this “Statement of Owner Equity”.

The “Statement of Owner Equity” is divided into three groups, each examining an individual portion of his financial life. They are as follows:

- The first group deals with earnings. It lists Net Farm Income (profits, as measured by his Income Statement) and Non-farm Income (if any). These are the earned dollars that have come into his life during the year. It then subtracts out the amount spent for Family Living, and the amount that went for Taxes. It then adjusts (+ or -) the Changes in Value of his Non-Farm Assets, and the Changes in the Non-Farm Accounts Payable. These components are then added, to produce the “Total Change in Retained Earnings”. This figure indicates whether more money was earned than what was consumed for personal use, and what was paid in taxes. If the farmer and his family earned more than what was spent, the result is a positive figure that contributes to his Net Worth. If they spent more than what was earned, the figure will be negative, and will contribute to a decline in his Net Worth.
- The second group deals with items that do not happen every year. Gifts and Inheritances that are received during the year will appear here as well as Debts Forgiven (if any). If he gave away Gifts, they also will be listed in this section. These items are totaled to produce “Total Change in Contributed Capital”. If the total of gifts and inheritances received and debts forgiven exceeds the total of gifts given, then the “Total Change in Contributed Capital” will be a positive number, and will contribute to the Net Worth increase. If it is a minus figure, it will contribute to the Net Worth decrease.
- The third group accounts for the Change in Market Value of Capital Assets during the year, and the Change in Deferred Liabilities from the farmers Balance Sheet at the beginning of the year compared to his Balance Sheet at the end of the year. These items are totaled to produce the “Total Change in Market Valuation”. This figure

either contributes to or has a negative effect on his Net Worth depending on the market valuation changes, and the resulting deferred tax liability change.

The “Change in Retained Earnings”, the “Change in Contributed Capital” and the “Change in Market Valuation” are then totaled to produce the “Total Change in Net Worth”. This is the amount that his Net Worth increased or decreased from one year ago.

The “Total Change in Net Worth” is added to the beginning “Net Worth” to come up with the “Ending Net Worth”. This “Ending Net Worth” is the same as that shown on the farmer’s year-end Balance Sheet.

Your Net Worth will change every year. Is it because you earned more money than was consumed and spent for taxes? Have you inherited or received gifts? How much of your Net Worth change was caused by inflation or deflation of your assets? These are answered by your “Statement of Owner Equity”.

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Statement of Cash Flows

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The “Statement of Cash Flows” examines how cash has entered and left our financial life during the year. We need cash to flow into our lives so it is available to cover our family living, pay our taxes, service the debt we are committed to, and to make investments in our business and personal lives.

Cash Flow and Net Profit are not the same thing. One could have sufficient profits but insufficient cash flow. Or, one’s cash flow could be adequate but profits are lacking. A complete set of financial statements and proper analysis of them will show financial strengths and weaknesses.

The following paragraphs describe how the “Statement of Cash Flows” generated by the FINPACK software is structured. Other software or paper forms will organize the information in a similar way.

To complete a “Statement of Cash Flows”, one must have a good “Balance Sheet” from the beginning of the year, another for the end of the year, and an accrual adjusted “Income Statement” for the year.

The “Statement of Cash Flows” begins by showing the farmer’s “Beginning Cash Balance” (farm and non-farm). This is the cash and account balances that are shown on his Balance Sheet from the beginning of the year.

The “Statement of Cash Flows” is divided into three groups, each examining a different source of and use for cash. These are “Cash from Operating Activities”, “Cash from Investing Activities” and

“Cash from Financing Activities”. We will look at each one separately:

- The first group identifies “Cash from Operating Activities”. This is cash that came into the farmer’s life from farm income and from non-farm income. The cash also leaves his life as he pays farm expenses. Family living takes cash out as does income tax and social security tax. These sources and uses are added up to produce “Cash from Operations”. If his earnings (farm and non-farm) bring in more cash than what went out for living and taxes, then “Cash from Operations” will be a positive number (desirable). If more cash left, than came in, then this will be a negative number (not desirable).
- The second group identifies “Cash from Investing Activities”. Cash is generated by the sale of assets (farm and non-farm), and is used in the purchase of assets (farm and non-farm). These sources and uses are totaled to produce “Cash from Investing Activities”. If this total is a positive number, it is contributing cash. If it is a negative number, it is using cash. It is quite common for this “Cash from Investing Activities” to be a negative figure for farmers because of the nature of the farming business. The farmer must invest in assets which are expensive and usually by the time they are sold, many are old or obsolete with little value.
- The third group identifies the “Cash from Financing Activities”. Cash is generated by borrowing money and is used up in the repayment of principal (the interest portion is an operating expense, and has already been counted in the farm expenses of the first category). Also shown in this category are inflows from gifts and inheritances received, and outflows from gifts given. These sources and uses are totaled to produce “Cash from Financing Activities”. This figure may be positive or negative, depending on whether

he borrowed more funds than he repaid or repaid more than was borrowed, and whether he received more gifts and inheritances than were given away

The “Cash from Operating Activities”, Cash from Investing Activities” and “Cash from Financing Activities” are then totaled to produce the “Net Change in Cash Balance”.

The “Net Change in Cash Balance” is added to the “Beginning Cash Balance” to produce the “Ending Cash Balance”. This number will be the same as the cash and account balance shown on the farmer’s Balance Sheet at the end of the year.

The “Statement of Cash Flows” is an interesting statement and can identify a number of things happening in your financial life. Perhaps the cash generated from the “Operating” part of your life was sufficient to fund some “Investing” and also reduce some debt “Financing” (this would be good).

Perhaps the “Operating” portion contributed cash but the “Financing” cash had to increase to fund the “Investments” made during the year (this may be satisfactory, as long as things stay in appropriate balance). Another scene (not a good one) would be that the “Operating” portion of your life was not sufficient to cover the living and taxes so debt “Financing” was needed to fund the rest of it, plus any “Investments” made during the year.

Another scene (not a good one) might find that the assets “Investments” are being sold off to fund the shortages in the “Operating” portion of their life, and/or to reduce debt.

It is important for the farmer to have good financial statements and analysis, and to understand them. After all, it is his financial life.

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Ratios & Measurements

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In the last few decades, much progress has been made to standardize financial statements in agriculture. This allows for ratios and measurements commonly used in other industries, to become standard in the farmer's financial world. Now the individual farmer can measure and understand the strengths and weaknesses within his financial life, and to benchmark himself with others in his peer group.

The Center for Farm Financial Management at the University of Minnesota has been a key player in this evolution. The FINPACK software developed by them is a leader in the farming industry. The paragraphs written here apply to the financial statements and ratio analysis produced by the FINPACK software. Other good financial software and paper forms products produce information that is similar.

With good financial statements, excellent measurements can be made in: Liquidity, Solvency, Profitability, Repayment Capacity and Efficiency. A Balance Sheet is necessary to measure "Liquidity" and "Solvency". In order to measure "Profitability", "Repayment Capacity" and "Efficiency", a good accrual adjusted Income Statement is also needed.

Liquidity:

Liquidity measurements deal with the upper part of the Balance Sheet (the relationship of the Current Assets to the Current Liabilities). By definition, Liquidity is concerned with the ability of the farm business to generate sufficient cash flow for family living, taxes, and debt payments. "Current Farm Assets" include cash, and those items that you will convert into cash in the normal course of business, usually within one year. "Current Farm Liabilities", include those items that need to be paid within one year. In simple terms, the "Current Assets" are needed to pay the "Current Liabilities". Could we expect that one can repay \$120,000 in Current Liabilities, if he has \$200,000 of Current Assets available to convert to cash? It is pretty safe to say that yes he can, and it looks like he would have a cushion of \$80,000 remaining.

Two common "Liquidity" measurements are the

"Current Ratio" and "Working Capital". The "Current Ratio" is calculated by dividing the Current Assets by the Current Liabilities. Using the former example of \$200,000 of Current Assets divided by the \$120,000 of Current Liabilities, we calculate the "Current Ratio" to be 1.67. What this really means is that for every dollar of current debt, he has \$1.67 of current assets to pay it with. That should work. Commonly accepted ranges state that a Current Ratio greater than 1.7 is "Strong"; a 1.7 to 1.1 would fall in the "Caution" range; and less than 1.1 would be "Vulnerable". Our 1.67 Current Ratio in this example would be in the middle to strong range.

"Working Capital" is not a ratio, but is a measurement of dollars. It is calculated by subtracting the "Total Current Liabilities" from the "Total Current Assets". In our example, we said that he has a "cushion" of \$80,000 (\$200,000 minus \$120,000). That is his "Working Capital". There is no standard acceptable dollar amount of "Working Capital". We need to look at your Working Capital figure and think in terms of "adequacy". Is an estimate of your income taxes liability listed as a current liability on your balance sheet? (It is good to have it listed.) If not, you need working capital to cover that. Are your property taxes listed as a current liability? (It is good to have them listed.) If not, you need working capital to cover them, also. How much family living must come from the farm? In some cases, all of it must. In other cases none of it has to. These items help to define how adequate the working capital is. Remember the definition of "Liquidity" is the ability of the farm business to generate sufficient cash flow for family living, taxes and debt payment. If the bills pile up faster than they can be paid, or the operating loan has to be refinanced because it will not get paid off, liquidity is not sufficient. Does that mean that you are broke? No! In fact you could be very wealthy, but just not "liquid" enough.

Would "Working Capital" of \$80,000 be adequate for your farm? It may be, or it may not be. A recent revision to the FINPACK software adds a new measurement to determine the adequacy of "Working Capital", by computing the "Working Capital to Gross Income Ratio". By comparing the

level of "Working Capital" to a farm's annual "Gross Income", it puts some perspective into how adequate the "Working Capital" is. A farmer that has a "Working Capital to Gross Income Ratio" of 8% will rely heavily on borrowed operating money, because he will run out of his own "Working Capital" early in the year. A farmer that has a "Working Capital to Gross Income Ratio" of 26% will rely on borrowed money during the year, but not as heavily and not as soon. This measurement is too new to have established benchmarks (adequate, weak, etc.). However, it is the opinion of this author that a "Working Capital to Gross Income Ratio" should be at least 25% to be considered adequate.

Remember that your "Balance Sheet" is a snap-shot of your financial condition on a given day. Each day your Balance Sheet will change as you conduct business, pay bills, harvest crops, etc. Many of the business actions that you conduct each day affect your "Current Ratio" and "Working Capital". A few of these are:

Business Action:

	<u>Current Ratio:</u>	<u>Working Capital:</u>
Sell Current Assets to pay Current Debt	<i>Increase</i>	<i>No Change</i>
Sell Current Assets to accelerate Long-Term Debt	<i>Decrease</i>	<i>Decrease</i>
Sell Long-Term Asset to pay Current Debt	<i>Increase</i>	<i>Increase</i>
Sell Current Asset (exp. grain) and keep as cash	<i>No Change</i>	<i>No Change</i>
Buy Current Asset with Short-Term Loan	<i>Decrease</i>	<i>No Change</i>
Buy Current Asset with Long-Term Loan	<i>Increase</i>	<i>Increase</i>
Buy Long-Term Asset with Short-Term Loan	<i>Decrease</i>	<i>Decrease</i>
Buy Long-Term Asset with Cash	<i>Decrease</i>	<i>Decrease</i>
Refinance Short-Term Loan into Long-Term Loan	<i>Increase</i>	<i>Increase</i>

If your actions decrease your "Current Ratio", is that bad? Possibly, but maybe not. It depends on what it was before and what it will be afterwards. If your intended purchase will decrease your "Working Capital", is that bad? Possibly, but maybe not. Again, it depends on how adequate it was before, and what it will be afterwards.

If you refinance short-term debt (Current Liability) into a longer-term debt, will that improve your "Current Ratio" and "Working Capital"? Yes and Yes. Is that good? It will improve the numbers and ratios, and make life more comfortable, at least for a while. However, this is a real good time to perk up and look

at the situation. What is the reason that this short-term debt is so large that it needs re-structuring? If it is due to an infrequent, explainable force (exp. "got hauled out, and insurance was inadequate" or "lost a lot of pigs due to disease that hopefully will not happen again"), but otherwise the operation has had sufficient net profits, then the refinancing should be beneficial in both the short-run and the long-run. However, if this operating loan has been growing over the years because the profits have not been sufficient to provide the living, pay the taxes, and service the debt, then this liquidity problem is just a symptom of another problem. See *Financial Management Series #2-Income Statement*. To refinance without fixing the problem will give you temporary relief, but it is not the long-term cure. Now, you have a new longer-term loan that has a new annual payment (principal portion of term debt is a "Current Liability") that you did not have before. If the payments in the past were excessive, they will be just that much heavier now. Yes, the old ugly, growing, operating loan is gone, but just wait. It will return.

Solvency:

Solvency, by definition, is the ability to pay off all debts if the business were liquidated. Solvency ratios deal with the relationship of the Total Assets, the Total Liabilities, and the Net Worth. Three standard Solvency Ratios are: "Debt to Asset Ratio"; "Equity to Asset Ratio" and "Debt to Equity Ratio". Each ratio is listed as a percentage.

The "Debt to Asset Ratio" is calculated by dividing the Total Debt by the Total Assets. A figure of 44% would mean that the debt equals 44% of the assets. Another way of saying this is that for every one dollar of assets that you have, you have forty-four cents worth of debt.

The "Equity to Asset Ratio" is calculated by dividing the Total Equity by the Total Assets. A figure of 56% would mean that your equity (net worth) equals 56% of the assets. Another way of saying this is that for every one dollar of assets that you have, you are contributing 56 cents of it, in the form of your net worth.

When you add the "Debt to Asset Ratio" percentage to the "Equity to Asset Ratio" percentage, they will always equal 100%. By looking at these ratios together, you could verbalize and say "of all the assets that I control, my creditors are furnishing 44% of the capital (debt) and I am furnishing 56% of the capital (equity).

The third "Solvency" ratio listed above is the "Debt to Equity Ratio". It is calculated by dividing the Total

Debt by the Total Equity. This ratio is sometimes called the “Leverage Ratio”, in that it looks at how your equity capital is leveraged by using debt capital. It compares the relationship of the amount of debt to the amount of equity (net worth). This “Debt to Equity Ratio” is more sensitive than the “Debt to Asset Ratio” and the “Equity to Asset Ratio” in that it jumps (or drops) in bigger increments than the other two do, given the same change in assets and debt. The balance sheet that gave us the 44% debt and 56% equity ratios would calculate out to a Debt to Equity Ratio of 78.6%. It is saying that for every one dollar of Net Worth you have, there is 78.6 cents of Debt.

The FINPACK Balance Sheet shows these solvency ratios listed in two columns, “Cost” and “Market”. That is because the Balance Sheet has the assets listed in a “Cost” column and a “Market” column. The ratios have been calculated on each. Since the “Cost” column has the assets listed as “cost, less depreciation”, the dollars of value on machinery, breeding stock, land, etc., may not resemble their true value. For that reason one would focus mainly on the solvency ratios in the “Market” column.

The FINPACK Balance Sheet also calculates “Deferred Tax Liability” and lists it along with the other debts. Because of that, it produces two sets of Solvency Ratios: “with Deferred Liabilities” and “excluding Deferred Liabilities”. The ratios that “exclude Deferred Liabilities” may be the most meaningful.

Having debt allows you to control more assets than you would if your capital (equity) was financing all of the assets. Understanding this concept could lead the un-informed person to believe that the more debt you have, the more assets you control, and the bigger and better things will be. The informed person, however, understands that renting someone else’s money comes at a cost, just as renting someone else’s land comes at a cost. In the case of renting money, the rent is called “interest”. There are times when the rent is fairly reasonable. There have been times in the past, and likely the future, when the rental cost of money is extremely high. This leaves the individual that has a lot of debt (highly leveraged) quite vulnerable to any interest rate changes - the reason you want to lock low rates in for a long time, if you can.

It is important for you to be aware of what your “Debt to Asset Ratio” is now. It is equally important to look at the trends of what it has been doing over years. It is commonly believed that a “Debt to Asset Ratio” less than .3 (30% debt) should be comfortable; between .3 and .6 (30% to 60% debt) is a medium to

heavy load; and over .6 (60% debt) becomes heavy, and if high enough, impossible to service.

Just as your business actions affect your “Liquidity” daily, they also affect your “Solvency”. The same examples that we looked at when discussing “Liquidity” are listed here, along with their effects on your “Net Worth”, and your “Debt to Asset Ratio”:

<u>Business Action:</u>	<u>Net Worth:</u>	<u>Debt to Asset Ratio:</u>
Sell Current Assets to pay Current Debt	No change	Decreases
Sell Current Assets to accelerate Long-Term Debt	No change	Decreases
Sell Long-Term Assets to pay Current Debt	No change	Decreases
Sell Currents Assets (exp. grain) and keep as cash	No change	No change
Buy Current Asset with Short-Term Loan	No change	Increases
Buy Current Asset with Long-Term Loan	No change	Increases
Buy Long-Term Asset with Short-Term Loan	No change	Increases
Buy Long-Term Asset with Cash	No change	No change
Refinance Short-Term Loan into Long-Term Loan	No change	No change

In these examples, “Net Worth” is pretty stubborn. It does not change as you buy or sell assets. It increases when you make more profit than you spend for consumption and income taxes, and it decreases when profits are insufficient. “Net Worth” changes if the value of your assets change. It increases if assets are inherited or gained by a gift. It decreases if assets disappear.

The “Debt to Asset Ratio” increases when assets are purchased with borrowed money and decreases when assets are sold and the debt is repaid. If “Solvency” is a problem, fixing it usually requires the sale of assets, and repayment of debt. These decisions often result in soul searching. Many come with tax ramifications. One needs to be careful that the “factory” does not leave you, when the assets are sold.

Profitability:

Four measures of profitability are: “Rate of Return on Farm Assets”; “Rate of Return on Farm Equity”; “Operating Profit Margin” and “Net Farm Income”.

“Rate of Return on Farm Assets” can be thought of as an interest rate your farm earned in the past year, on all money invested in the business. In the

FINPACK analysis, there is a “Cost” measurement and a “Market” measurement. The “Cost” measurement represents the actual return on the average dollar (average of the beginning of year and the end of the year) invested in the business. The “Market” measurement can be looked at as the opportunity cost of investing money in the farm, instead of alternate investments. It is commonly thought that a “Rate of Return on Farm Assets” (cost) greater than 8% is strong; one between 4% and 8% is thought to be in the caution range; and one that is less than 4% is considered to be vulnerable.

“Rate of Return on Farm Equity” is the interest rate your equity (net worth) in the business earned in the past year. Again in the FINPACK analysis, there is a “Cost” measurement and a “Market” measurement. The “Cost” measurement represents the actual rate of return to the amount of equity capital you have invested in the farm business. The “Market” measurement can be compared to the returns available if the assets were liquidated and invested in alternate investments. A return (cost) greater than 10% is thought to be strong; one between 3% and 10% is in the caution range; and less than 3% is considered to be vulnerable.

An important study can be made by comparing your “Return on Assets” to your “Return on Equity”. If your “Return on Assets” is higher than your average interest rate paid on borrowed money, your “Return on Equity” will be still higher. This indicates a positive use of financial leverage, meaning that your loans are “working for you”. If your “Return on Assets” is lower than your average interest rate, then your “Return on Equity” will be still lower. This indicates a negative financial leverage, meaning that your loans are “not working for you” at this time.

“Operating Profit Margin” is a measure of the operating efficiency of the business. It indicates the average percentage operating profit margin per dollar of farm production. It measures how effectively you are controlling operating expenses relative to the value of output. Low prices, high operating expenses, or production problems are all possible causes of a low operating profit margin. An Operating Profit Margin (cost) greater than 25% is considered strong; one 25% to 15% is considered in the caution range; and one less than 15% is considered to be vulnerable. (By itself, the Operating Profit Margin is not adequate to explain the level of profitability of your business, but is used along with another ratio to produce the “Rate of Return on Farm Assets”.)

“Net Farm Income” is your measurement of farm

profits. In the FINPACK analysis, there is a “Cost” measurement and a “Market” measurement. The “Net Farm Income” figure in the “Cost” column is the figure (profit or loss) generated by the accrual adjusted Income Statement. The figure in the “Market” column is the Net Farm Income, plus the change in market valuation of assets that were adjusted (inflation or deflation) on the year-end balance sheet.

Repayment Capacity:

Repayment Capacity is measured by the “Term Debt Coverage Ratio” and the “Capital Replacement Margin”.

“Net farm income”, plus “non-farm income” must cover family living, income taxes and social security taxes, and then cover the payments on term (intermediate and long-term) loans. The “Term Debt Coverage Ratio” measures the ability to meet these payments. If anything is left over after the payments are made, that is the “Capital Replacement Margin”.

“Term Debt Coverage Ratio” is expressed as a percentage. A figure of 100% would indicate that the payments could be met, but with nothing to spare. A figure less than 100% indicates that the ability to make these payments was less than adequate. A figure of greater than 100% indicates that the payments could be made, and there was some room to spare. In the FINPACK analysis, there is a “Cash” measurement and an “Accrual” measurement. The figure shown under the “Cost” column shows the repayment capacity generated by the “Net Cash Farm Income” (no inventory changes involved). The figure shown under the “Accrual” column shows the repayment capacity generated by the Net Farm Income (the profit figure that includes the changes in inventory – the more meaningful of the two). A “Term Debt Coverage Ratio” greater than 140% is considered strong; one in the 110% to 140% range is considered to be in the caution range; and one less than 110% is considered vulnerable (less than 100% is inadequate).

“Capital Replacement Margin” is the amount of money remaining after all operating expenses, taxes, family living and debt payments have been accounted for. It is the cash generated by the farm business that is available for financing the purchase of capital replacements such as machinery and equipment. Again, the FINPACK analysis produces a “Cash” measurement and an “Accrual” measurement. The “Cash” measurement is the margin when inventory changes are not included. The “Accrual” measurement is the margin generated by the Net Farm Income (including the inventory).

The “Accrual” measurement of “Capital Replacement Margin” is the more meaningful of the two.

If the “Term Debt Coverage Ratio” is greater than 100%, then the “Capital Replacement Margin” (dollars left over after the payments are made) is a positive number. (That is good.) If the “Term Debt Coverage Ratio” is less than 100%, then the “Capital Replacement Margin” is a negative number. (Not good).

Efficiency:

Five efficiency measures produced by FINPACK are: “Asset Turnover Rate”; “Operating Expense Ratio”; “Depreciation Expenses Ratio”; “Interest Expense Ratio”; and “Net Farm Income Ratio”. Other financial software and paper forms products will generate similar measurements.

Asset Turnover Rate (Market) is a measure of the efficiency of using capital. It is the amount of gross production per dollar of investment. Neither the asset turnover rate nor the operating profit margin (discussed earlier) are adequate to explain the level of profitability of the business, but when used together, they are the building blocks of the farm’s level of profitability. (Operating Profit Margin x Asset Turnover Rate = Rate of Return on Assets)

The other four efficiency measurements can be thought of as pieces of the same pie. The “Operating Expense Ratio”, the “Depreciation Expense Ratio”, the “Interest Expense Ratio” and the “Net Farm Income Ratio” reflect the distribution of gross income. When added together, they will always equal 100%. You could look at these four together, while asking yourself “OK, I had gross income of so much, where did it all go?” The biggest share likely went to the pay the operating expenses, some went to depreciation, some went to pay interest, and you got

to keep the rest (net profit). These four measurements show where your income went. The following grid gives some guidance as to what is strong, weak, etc.

	Strong	Caution	Vulnerable
Operating Expense Ratio	<60%	60 to 80%	>80%
Depreciation Expense Ratio	< 5%	5 to 15%	> 15%
Interest Expense Ratio	< 5%	5 to 10%	> 10%
Net Farm Income Ratio	> 20%	20 to 10%	< 10%

As a farmer gains in understanding his own financial statements, ratios and measurements, he will become less and less financially vulnerable. That is important. After all, it is his financial life.

FINBIN is an excellent source of farm financial and production data from thousands of farms in several states. It was developed and is maintained by the Center for Farm Financial Management at the University of Minnesota. It is available on the Internet at: www.finbin.umn.edu.

Caution: This publication is offered as educational information. It does not offer legal advice. If you have questions on this information, contact an attorney.