

## Debt Service Analysis: Can I Repay?

Low prices and incomes have made many farmers—and their lenders—concerned about the farmers' ability to fulfill debt obligations. Lenders are increasingly asking their farm customers for documentation of repayment or debt servicing capacity. Even though financial performance may be acceptable with respect to the key performance ratios described in Table 2 and calculated using Worksheets 1 and 2, farm business managers could encounter debt servicing problems because of cash flow shortfalls or short repayment terms. So an additional task in assessing the overall financial performance of the farm business is to determine whether any difficulties will be encountered in making payments on current debt obligations.

The key issue in repayment capacity analysis is to obtain the best evidence or provide the best documentation that sufficient cash will be available to make scheduled principal and interest payments. The common procedure used to provide that evidence or documentation is the seasonal or annual cash flow. But, as shown in Table 3, other forms of documentation or evidence are available. In some cases, these alternatives may be both more reliable and easier to compute.

A complete repayment analysis requires documentation of the ability to repay the operating loan in a timely fashion and of the ability to make scheduled principal and interest payments on the term (intermediate and long-term) commitments. The documentation or management of repayment capacity can come in three different forms: 1) repayment ratios/measures, 2) operational strategies, and 3) cash flow projections (discussed in the next section).

### Repayment Ratios

Worksheet 3 (p. 18) guides you in computing the repayment capacity measures described in Table 3. You can figure the five repayment measures in Table 3 after the fact using actual performance data. You can also compute them using estimated or projected revenues, expenses, and cash flows. Because the data called for in Worksheet 3 is primarily historical data, the worksheet measures whether the farm had repayment capacity last year and whether the farm currently has enough

**Table 3. Alternative Methods of Repayment Documentation**

Type of Obligation	Repayment Ratios/ Measures	Cash Flow	Operational Strategies
Operating loan/short-term current obligations	Current ratio Working capital	Seasonal or annual cash flow budget	Cash/resource reserves Assignments Contracting/forward pricing
Term debt/long-term obligations	Term debt coverage ratio Term debt repayment capacity Term debt repayment margin	3-5 year annual cash flow budget	Hedging Insurance Controlled spending

liquid assets to pay current obligations. Using data from a projected income statement, you could recompute Worksheet 3 to estimate whether the farm shows repayment capacity for next year.

With respect to repayment ratios or measures, the current ratio indicates the dollars of current assets that are available on the balance sheet date for every dollar of current liabilities on that date. The current ratio is indicative of the farm's ability to pay current obligations as they come due, and thus it is generally classified as a measure of current liquidity. Working capital is determined as the absolute dollar value that current assets exceed current liabilities and reflects the margin or cushion in short-term debt service capacity in absolute terms. Both the current ratio and working capital measures are stock concepts. That is, they take stock of the current assets and liabilities on the balance sheet date. As a result, their usefulness as indicators of repayment is limited to the very near term. The money that must flow out of the farm business during the next year in order to meet obligations may far exceed the working capital on the beginning balance sheet date. In general, the most useful measures of repayment capacity will take into account both the stock of working capital and the expected flows of money that will go in and out of the farm business during the next year.

The debt coverage ratio indicates the net income (not cash flow) from the farm business that is available annually for every dollar of principal and interest payment on term debt. Term debt repayment capacity is an absolute measure of the dollar amount of repayment capacity. Both measures, like the current ratio and working capital, provide alternative ways of looking at the same financial information. The debt repayment margin measures how much of the term debt repayment capacity remains after the scheduled principal and interest payments have been made.

These measures take into account money flows during the year, so they are more useful predictors of repayment ability than liquidity measures. Preferably, you should compute these measures using net income based on accrual-adjusted revenues and expenses. That way, they will reflect changes in current assets such as inventories and current liabilities such as accrued rent or interest. Their usefulness is thus increased by connecting the flow of funds during the year to the stock of working capital on hand on the balance sheet dates.

With respect to term debt coverage ratio, a ratio greater than one indicates that there is more net income being generated than is required for term debt repayment. The larger the ratio, the greater the ability of the farm to weather an income decline. A ratio less than one indicates potential problems for term debt repayment. Similar information is provided by the term debt repayment margin. Using this measure, positive values indicate sufficient income for repayment, and negative values indicate repayment difficulties.

## Operational Strategies

What about operational strategies? How can they provide documentation of repayment capacity? The basic premise of operational strategies is to set limits on either the amount of funds borrowed or on the operating decisions of your farm business. In essence, operational strategies guarantee that adequate cash is available to repay your debt obligations. These strategies can take many forms.

1. Buy crop insurance, and forward contract or hedge product prices to reduce the chances of a cash flow shortage from low yields or poor prices.
2. Maintain cash reserves equal to a specified percentage of existing debt obligations. This is a strategy of maintaining a reserve that you can dip into to make payments if current operations come up short.
3. Maintain a debt repayment margin by only borrowing a specified percentage of the purchase price of capital items. With this strategy you finance a larger proportion of capital expenditures with past earnings, thereby reducing the demands placed on future earnings.
4. Borrow the purchase price of feeder livestock only if adequate feed inventories are available, rather than borrowing for both livestock and feed purchases.
5. Assign the milk check, a procedure whereby a percentage of all proceeds are allocated by the processor or coop to make payments on a debt. This is a strategy that controls spending by ensuring that milk proceeds are used to make payments on existing obligations before the farm has any opportunity to use the proceeds for discretionary spending.
6. Forecast revenues for the upcoming year, and then establish a budget for operating expenses that is well below expected income.

The purpose/intent of these operational strategies is to create operating procedures that almost guarantee that cash will be available to make the loan payments.

A question often asked by farm business managers is, "How far in debt can I safely go?" The answer to this question will be different for each manager and will depend on the risk, return, and repayment capacity of each operation. Essentially, the answer to the question of a safe debt load is the answer you make to a second question, "How much can I repay?"

If we assume an even total debt payment schedule (principal plus interest), you can estimate the amount of term debt that you can support with a given amount of repayment capacity using a table of amortization factors (Table 4, p. 19). In essence, an amortization factor indicates the annual cash requirement associated with repaying a dollar of farm debt. If you borrow money today and plan to repay a specified constant amount of principal and interest each year, you can set up an amortized (equal payment) loan with the lender. The amortization factor

## *Worksheet 3. Repayment Capacity Ratios and Measures*

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<b>1. Current Ratio</b>		
Current assets (Item m) <sup>1</sup>		_____
Current liabilities (Item n)	(÷)	_____
Current ratio	(=)	_____
<b>2. Working Capital</b>		
Current assets (Item m)		_____
Current liabilities (Item n)	(-)	_____
Working capital	(=)	_____
<b>3. Term Debt Coverage Ratio:</b>		
Net farm income (Item z)		_____
Interest (Item x minus operating interest)	(+)	_____
Depreciation (Item c)	(+)	_____
Family living expense (Item v)	(-)	_____
Income for debt servicing and capital replacement	(=)	_____
Cash used for capital replacement (from your records)	(-)	_____
Income for debt servicing	(=)	_____
Scheduled principal and interest payments on term debt (from your records)	(÷)	_____
Term debt coverage ratio	(=)	_____
<b>4. Term Debt Repayment Capacity and Margin</b>		
Net farm income (Item z)		_____
Interest (Item x minus operating interest)	(+)	_____
Depreciation (Item c)	(+)	_____
Family living expense (Item v)	(-)	_____
Income for debt servicing and capital replacement	(=)	_____
Cash used for capital replacement (from your records)	(-)	_____
Term debt repayment capacity	(=)	_____
Scheduled principal and interest payments on term debt (from your records)	(-)	_____
Term debt repayment margin	(=)	_____
<b>5. How much additional debt could this term debt repayment margin service?</b>		
Term debt repayment margin (above)		_____
Amortization factor from Table 4	(÷)	_____
Additional term debt the margin would service	(=)	_____

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<sup>1</sup> Items refer to Worksheet 1.

Table 4. Amortization Factors for Equal Annual Total Payments

Years	Interest Rate															
	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%			
1	1.04000	1.05000	1.06000	1.07000	1.08000	1.09000	1.10000	1.11000	1.12000	1.13000	1.14000	1.15000	1.16000			
2	0.53020	0.53780	0.54544	0.55309	0.56077	0.56847	0.57619	0.58393	0.59170	0.59948	0.60729	0.61512	0.62296			
3	0.36035	0.36721	0.37411	0.38105	0.38803	0.39505	0.40211	0.40921	0.41635	0.42352	0.43073	0.43798	0.44526			
4	0.27549	0.28201	0.28859	0.29523	0.30192	0.30867	0.31547	0.32233	0.32923	0.33619	0.34320	0.35027	0.35738			
5	0.22463	0.23097	0.23740	0.24389	0.25046	0.25709	0.26380	0.27057	0.27741	0.28431	0.29128	0.29832	0.30541			
6	0.19076	0.19702	0.20336	0.20980	0.21632	0.22292	0.22961	0.23638	0.24323	0.25015	0.25716	0.26424	0.27139			
7	0.16661	0.17282	0.17914	0.18555	0.19207	0.19869	0.20541	0.21222	0.21912	0.22611	0.23319	0.24036	0.24761			
8	0.14853	0.15472	0.16104	0.16747	0.17401	0.18067	0.18744	0.19432	0.20130	0.20839	0.21557	0.22285	0.23022			
9	0.13449	0.14069	0.14702	0.15349	0.16008	0.16680	0.17364	0.18060	0.18768	0.19487	0.20217	0.20957	0.21708			
10	0.12329	0.12950	0.13587	0.14238	0.14903	0.15582	0.16275	0.16980	0.17698	0.18429	0.19171	0.19925	0.20690			
11	0.11415	0.12039	0.12679	0.13336	0.14008	0.14695	0.15396	0.16112	0.16842	0.17584	0.18339	0.19107	0.19886			
12	0.10655	0.11283	0.11928	0.12590	0.13270	0.13965	0.14676	0.15403	0.16144	0.16899	0.17667	0.18448	0.19241			
13	0.10014	0.10646	0.11296	0.11965	0.12652	0.13357	0.14078	0.14815	0.15568	0.16335	0.17116	0.17911	0.18718			
14	0.09467	0.10102	0.10758	0.11434	0.12130	0.12843	0.13575	0.14323	0.15087	0.15867	0.16661	0.17469	0.18290			
15	0.08994	0.09634	0.10296	0.10979	0.11683	0.12406	0.13147	0.13907	0.14682	0.15474	0.16281	0.17102	0.17936			
16	0.08582	0.09227	0.09895	0.10586	0.11298	0.12030	0.12782	0.13552	0.14339	0.15143	0.15962	0.16795	0.17641			
17	0.08220	0.08870	0.09544	0.10243	0.10963	0.11705	0.12466	0.13247	0.14046	0.14861	0.15692	0.16537	0.17395			
18	0.07899	0.08555	0.09236	0.09941	0.10670	0.11421	0.12193	0.12984	0.13794	0.14620	0.15462	0.16319	0.17188			
19	0.07614	0.08275	0.08962	0.09675	0.10413	0.11173	0.11955	0.12756	0.13576	0.14413	0.15266	0.16134	0.17014			
20	0.07358	0.08024	0.08718	0.09439	0.10185	0.10955	0.11746	0.12558	0.13388	0.14235	0.15099	0.15976	0.16867			
21	0.07128	0.07800	0.08500	0.09229	0.09983	0.10762	0.11562	0.12384	0.13224	0.14081	0.14954	0.15842	0.16742			
22	0.06920	0.07597	0.08305	0.09041	0.09803	0.10590	0.11401	0.12231	0.13081	0.13948	0.14830	0.15727	0.16635			
23	0.06731	0.07414	0.08128	0.08871	0.09642	0.10438	0.11257	0.12097	0.12956	0.13832	0.14723	0.15628	0.16545			
24	0.06559	0.07247	0.07968	0.08719	0.09498	0.10302	0.11130	0.11979	0.12846	0.13731	0.14630	0.15543	0.16467			
25	0.06401	0.07095	0.07823	0.08581	0.09368	0.10181	0.11017	0.11874	0.12750	0.13643	0.14550	0.15470	0.16401			
30	0.05783	0.06505	0.07265	0.08059	0.08883	0.09734	0.10608	0.11502	0.12414	0.13341	0.14280	0.15230	0.16189			
35	0.05358	0.06107	0.06897	0.07723	0.08580	0.09464	0.10369	0.11293	0.12232	0.13183	0.14144	0.15113	0.16089			
40	0.05052	0.05828	0.06646	0.07501	0.08386	0.09296	0.10226	0.11172	0.12130	0.13099	0.14075	0.15056	0.16042			

indicates the repayment requirements for both principal and interest for each dollar of debt. For example, at 8-percent interest, a loan of \$1,000 repaid over 10 years would require an annual payment of \$149 ( $\$1,000 \times .149$ ). Thus, \$1,000 of annual repayment capacity will pay the principal plus interest on a 10-year loan of \$6,710 ( $1,000 \div 0.1490$ , from Table 4).

You can use the results from the computation of term debt repayment capacity in Worksheet 3 (Item 4) to estimate your maximum safe debt load. The computation requires that term debt repayment capacity be divided by the appropriate amortization factor from Table 4 for the specified interest rate and term of the note. For example, if the value for "term debt repayment capacity" from Worksheet 3 is \$21,000 and the term debt is for 10 years at 8-percent interest, the safe debt load for the business is \$21,000 divided by 0.1490 (from Table 4 for a term of 10 years and 8% interest) or \$140,940. If the repayment period of the loan could be extended to 20 years, \$21,000 of annual repayment capacity would support a loan of \$206,089 ( $\$21,000$  divided by 0.1019). Thus, extending the terms of the loan increases the amount of debt that can be supported with a specified amount of annual repayment capacity.

Because the absolute dollar amount of a farm's repayment capacity will vary from year to year, a prudent farm business manager will not borrow the full amount that could be repaid in any given year. You may also be interested in how much you can afford to borrow in addition to your farm's existing liabilities. In this situation, you would base the computation on your farm's term debt repayment capacity margin rather than repayment capacity. You can use Worksheet 3 to make this computation. Amortization factors for shorter repayment periods and higher interest rates produce more conservative estimates of the amount of additional debt that can be repaid.

With respect to cash flow projections, you can use seasonal or annual cash flow budgets to determine both the timing and the amount of payments that you can make on the operating loan. To obtain evidence on your ability to service term debt, you would need three- to five-year annual cash flow budgets. More information on cash flow budgeting is provided in the next section. Using the FINFLO program in FINPACK\* provides a computerized method of developing these cash flow projections.

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\* See the footnote on page 14 for more information.