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Cash Flow Analysis
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Cooperative Extension Service
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Cash Flow Analysis of the Farm Business

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Cash flow analysis is an important tool for use in farm financial management. While intensive analysis may not be necessary in all cases, the uses of cash flow analysis have become increasingly important in a large number of farm business situations. Many farmers now include cash flow budgeting as a part of their regular budgeting and planning for the business year. This seems to be the beginning of a trend toward farmers using those tools of record keeping and financial analysis that have long been used by other businesses. Although many lenders do not now require cash flow statements for farmers, such analysis is likely to be required by lenders in the future as the usefulness of this financial tool becomes recognized.

COOPERATIVE EXTENSION SERVICE
MICHIGAN STATE UNIVERSITY

CASH FLOW ANALYSIS OF THE FARM BUSINESS

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Cash Flow Analysis

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IN A BUSINESS SUCH AS FARMING, large volumes of money move in and out of the business at a rapid rate. Management-minded farmers know that the availability of money at the proper time is of utmost importance to a profitable operation. Many times farmers are frustrated at having to borrow increasingly large amounts even though their income tax reports show profits. The cash flow statement is particularly useful in describing both the inflows and outflows of cash in a business.

The use of the balance sheet and the income statement have long been recognized as being very important in farm financial management. Although balance sheets and income statements are important financial tools, neither provides much information to aid your understanding of the way cash moves into and out of the farm business. Cash flow statements are useful for this purpose.

This report illustrates the preparation of a cash flow statement for a farm business. It explains how the information provided in a cash flow statement can be used by farmers and lenders for improved business analysis and decision-making.

Major sources of cash for a farm business are product sales, sales of capital items, nonfarm income, existing bank balances and newly acquired debt. The major uses or demands for cash in a farm business are farm operating expenses, withdrawals for nonfarm business expenditures, withdrawals for family living expenditures, payment of previous debt commitments, purchases of new or replacement capital items and repayment of new debt. A cash flow statement indicates the capacity of a business to generate cash to meet its cash demands during a period of time.

While a historical cash flow statement presents the record of cash transactions, it is often beneficial to predict future cash flows as well. A projected cash flow statement is a prediction of the firm's capacity to generate cash to meet future cash demands. In this context it is a prediction of a cash or liquidity position. Preparation of a projected cash flow statement requires knowledge of the past and present operations of the business as well as some predictions of the future.

There are many methods of acquiring the data necessary to complete a cash flow projection. A good set of detailed farm business records (including a historical cash flow statement) will provide much of the data needed. Other sources are farm management handbooks and farm business analysis summaries available from universities or county extension agents. In addition, price estimates for some inputs may be available from local businesses. To gain the greatest degree of accuracy and usefulness from a projected cash flow statement, you should use the most applicable data available at reasonable costs within a tolerable time constraint. This usually will include the use of a livestock plan, a debt summary and work sheets for crop production, crop usage, feed requirements and planned capital investments. This budgeting procedure will help estimate many of the expenses and sales expected in the

budget period, but other items will have to be estimated from past experience or by other methods.

Liquidity considerations are important to all farm businesses, although the degree of importance may vary with farm type, size, growth rate and equity level. A cash flow statement prepared monthly can provide information about the liquidity position of the farm business and can be used as a cash management tool. As the projected cash flow statement is a measure of future liquidity, it can be used to pinpoint potential liquidity problems. To borrow an old adage, "A problem well anticipated seldom becomes a problem." In this framework, cash flow statements can be used by farmers and lenders in detecting and heading off farm business liquidity problems.

MECHANICS OF CASH FLOW PREPARATION

Historical Cash Flow Statements

Cash flow statements are usually prepared for a yearly period. Often it is useful to prepare statements on a quarterly or monthly basis for more complete analyses. Monthly statements are the most difficult to prepare. However, the potential benefits from monthly cash flow statements often justify the preparation. The following discussion covers the mechanics of preparing monthly cash flow statements. (Most of the subsequent comments would also apply to quarterly and annual statements.)

The source of data for a historical cash flow statement is your business and family records. Records of monthly income and expenses are easily used to develop a monthly cash flow statement.

Two things are very important to remember when preparing a cash flow statement. First, include only cash transactions; purchases with an agreement to pay at a later date should be entered when payment is actually made. Secondly, **all** cash transactions should be included when they occur. This includes borrowing, payments on account and debt reduction.

Information on cash transactions fed into computerized record keeping systems, such as Michigan State University's Telfarm, provides monthly cash flow statements. However, any accurate and current record keeping system should be able to provide the information sufficient to construct monthly cash flow statements. Most of the information required for cash flow statements is also needed for income tax filing. Therefore, the additional time and costs involved in deriving information from record books is often not substantial.

Worksheet 1 is a cash flow statement for a cattle feeding farm for a recent year. This cash flow statement is shown as it would appear at year's end. The statement includes detail not absolutely necessary in a cash flow, but the usefulness of this detail in analysis will be explained later.

This cash flow statement is not as complex as it might seem at first glance. The actual mechanics of preparing a cash flow are relatively simple with only addition and subtraction required (made easy and relatively fast with an electronic calculator).

Lines 1 through 13 and line 41 on the cash flow statement are used to arrive at total cash income available in each time period. The income can be from many sources including product sales such as crops and livestock, nonfarm wages and sales of capital assets such as breeding livestock and machinery or nonfarm assets. Income from the various sources should be entered on the designated line under the column for the month in which it is received. All lines (except 40, 43, 47, 48 and 49) should be summed across the page to get the amount for the Total column. In the example, operating income from livestock (line 2) totals \$157,401. You should add down the columns to get the figures for lines 6, 10, 13, 32, and 36. The combination of adding down and across provides a "check" for errors. For example, lines 1 through 5 in the Total column are added to get line 6; this should be the same figure you get by adding the monthly amounts across the page on line 6.

Income from the three categories (operating income, capital sales and nonfarm income) is totaled on line 41. Do this by summing lines 6, 10 and 13 in each column to arrive at the figure to be placed on line 41 of the same column.

Cash operating expenses are summarized on lines 14-32. On Worksheet 1 these expenses totaled \$145,877 for the year (see line 32 Total column). Monthly cash expenses are totaled on line 32; for example, January expenses were \$2,224, February \$2,209, March \$3,037, etc.

Capital expenditures are included on lines 33-36. This section includes cash expenditures for items that are not "used up" within the year, but are depreciated over a number of years. You should also include purchases of land and other durable nondepreciable items in this section. (Items used up within one year are normally included under operating expenses.) The purpose of separating capital expenditures is to accommodate the use of the farm business record keeping system; most record systems are designed primarily for income tax accounting, where only depreciation on capital expenditures is allowed as a business deduction. For purposes of the cash flow statement, you include the total expenditure for capital items when the transaction occurs. On Worksheet 1, capital expenditures amounted to \$18,500 (see line 36 Total column). This consisted of machinery purchases made in the Month of May, \$1,520; August, \$1,980; and September, \$15,000.

The Other Expenditures section, lines 37-39, is used to record principal and interest payments on debts incurred in prior years, and for withdrawals from the farm business for family living and nonfarm business expenditures. The separation of debt payments into principal and interest is not an essential part of the cash flow, but is useful for income tax filing and for determining loan balances. It is also not essential to separate payments on debt acquired in prior years from debt acquired in the current year. These lines are included mainly for use in cash flow projections.

The line for family and nonfarm business withdrawals should include all cash expenditures not included in other sections of the cash flow statement. Examples of these expenditures might be income and self-employment taxes, nonfarm insurance premiums and expenditures for food, clothing and vacations.

Cash Flow Summary

The Cash Flow Summary (lines 40 through 49) is the most important section of the cash flow statement. In the Summary, expenditures reported on lines 32 and 36 through 39 are summed and entered on line 42. This sum is the total cash that has left the business or that has been spent during any particular month (except principal and interest payments on current year's debt). Line 41, total income, is the sum of lines 6, 10 and 13, and includes all sources of cash for the business except the bank balance carried over from the previous month, and borrowings during the month. The beginning bank balance (line 40) and income for the period (line 41) are added together, and total expenditures (line 42) are subtracted from this sum. The difference, positive or negative, is reported on line 43 as the cash difference. A negative result indicates that borrowing was necessary. Any borrowings during the month are listed on line 44. You arrive at the ending bank balance by adding the borrowings (line 44) to the (sometimes negative) cash difference (line 43) and then subtracting debt and principal payments on the current year's debt.

Running through this procedure for the months of May and June on Worksheet 1 may make the mechanics of the Cash Flow Summary clearer. In May, cash expenditures were \$19,284 (line 42). Cash income was \$24,308 (line 41), and the beginning bank balance was \$5,018 (line 40). The sum of \$24,308 and \$5,018, minus \$19,284, leave a \$10,042 cash difference (line 43). The manager of this business when faced with a large bank balance decided to reduce his current year's debt by \$4,000 (line 45) on which there was an interest charge of \$82 (line 46). The payment of these debts, incurred in January and February, left an ending bank balance of \$5,960 (line 47) which is carried to line 40 for the June beginning bank balance. Cash income for June was \$175 (line 41) which, coupled with the beginning bank balance, minus cash expenditures of \$53,258 (line 42), left a cash deficit of \$47,123 (line 43). This required borrowing \$47,500 (line 44) which left an ending bank balance of \$377 (line 47). Notice that the amount borrowed is approximately \$1,500 larger than the amount of feeder cattle purchased (line 15). The \$1,500 was borrowed for the payment of other bills, possibly for payment of fertilizer and seed bills incurred previously.

Projected Cash Flow Statement

A projected cash flow is more difficult to prepare than the historical type of cash flow since the needed information is not a matter of record but must be estimated. An easy method of preparing a projected cash flow statement for the coming year is to use figures from the past year as a guide. For example, Worksheet 1 could be used as a basis for predictions, adjusted where major differences are expected. If you expect prices to increase by 20 percent, sales for the past year would be multiplied by 1.2. If you add 50 acres of cropland to 500 acres in a particular crop, it would be an increase of 10 percent, and you could multiply fertilizer, seed, chemical and other appropriate costs, as well as crop sales, by 1.1 to obtain an estimate. This method works reasonably well for items that vary little from year to year or for situations where there is no better source of information. You can also use previous years'

CASH FLOW STATEMENT

Name _____

For Period: 1-1-11

to

12-31-11

OPERATING INCOME	Months:	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	TOTAL	COMPARISON
1. Crops								2,909			2,880			5,789	1.
2. Livestock					56,685	24,308		36,766	39,642					157,401	2.
3. Livestock products															3.
4. Government payments															4.
5. <i>Custom Work</i>				55			175			209				439	5.
6. Total Operating Income				55	56,685	24,308	175	39,673	39,642	209	2,880			163,627	6.
CAPITAL SALES															
7. Livestock (dairy, breeding)															7.
8. Machinery									155					155	8.
9. _____									155					155	9.
10. Total Capital Sales															10.
NON-FARM INCOME															
11. Wages		144	155										126	425	11.
12. _____															12.
13. Total Non-farm Income		144	155										126	425	13.
OPERATING EXPENSES															
14. Hired labor		600	600	600	600	735	810	725	674	635	612	600	600	7791	14.
15. Repairs and Maintenance		97	32	473	558	975	89	1029	54	283	507	21	12	4,130	15.
16. Rent and leases						400							1400	2,800	16.
17. Feed purchased		1,273	1,175	1,254	1,007	935	848	1,080	655	710	1,250	1,275	1,371	12,840	17.
18. Feeder stock purchased							46,125			47,560				93,685	18.
19. Seed and plants						2,960	1,200							4,160	19.
20. Chemicals						1,200	825							2,025	20.
21. Fertilizer and lime				450	575	3,800	1,187	49	100	40	598			7,850	21.
22. Custom hire					160	55		125	50	76	40	60		564	22.
23. Supplies			77	12	89	112	54							695	23.
24. Breeding fees															24.
25. Veterinary, medicine		132	225	175	138	170	550	375	115	945	215	75	212	3,327	25.
26. Gas, fuel, and oil		30		15	45	740	550	230	150	275	350	45		2,430	26.
27. Utilities		92	68	58	42	37	45	29	21	58	60	72	68	650	27.
28. Taxes (property)													1,214	1,214	28.
29. Insurance					612						485			1,097	29.
30. Miscellaneous			32							62				94	30.
31. _____															31.
32. Total Operating Expenses		2,224	2,209	3,037	4,251	13,119	52,883	36,422	1819	51,244	4,417	2,148	4,884	145,817	32.
CAPITAL EXPENDITURES															
33. Livestock (dairy, breeding)															33.
34. Machinery						1,520			1980	15,000				18,500	34.
35. _____															35.
36. Total Capital Expenditures						1,520			1980	15,000				18,500	36.
OTHER EXPENDITURES															
37. Family & non-farm business															37.
38. Prior years debt - Principal Payment															38.
39. Prior years debt - Interest Payment															39.
CASH FLOW SUMMARY															
40. Beginning Bank Balance		1,075	717	303	621	5,018	5,960	379	503	1,735	1,491	257	389	1,075	40.
41. Total Income (6 + 10 + 13)		144	155	55	56,685	24,308	175	39,673	39,642	209	2,880		126	164,207	41.
42. Total Expenditures (32 + 36 + 37 + 39)		2,502	2,569	5,737	52,288	19,284	53,258	41,247	4,124	71,013	6,114	2,863	5,573	266,577	42.
43. Cash Difference (40 + 41 - 42)		-1,228	-1,697	-5,379	5,018	10,042	-47,123	-1,197	36,476	-1,743	-3,611	-2,863	-5,053	-111,245	43.
44. Borrowing Necessary		2,000	2,000	6,000			47,500	2,000	4,000	45,000	2,000	3,000	5,500	115,000	44.
45. Current years debt - Principal Payment															45.
46. Current years debt - Interest Payment															46.
47. Ending Bank Balance		717	303	621	5,018	5,960	379	803	27,245	1,491	257	389	442	263	47.
48. Current Year's Outstanding Debt		2,000	4,000	10,000	10,000	6,000	52,500	55,500	46,500	91,500	93,500	96,500	102,000	102,000	48.
49. Total Outstanding Debt		172,000	174,000	180,000	135,000	129,000	176,500	143,500	134,500	177,500	178,500	181,500	187,000	187,000	49.

cash flow statements to gain information concerning the timing of revenues, expenses and other cash transactions. For example, it may be possible to develop rules of thumb for allocating veterinary expenses, since they correlate to feeder stock purchases or calving periods. It may also be possible to get an idea of the monthly distribution of expenditures for gas, fuel and oil or utilities.

Most farmers will find it to their advantage, from the standpoint of accuracy, to use a reasonably detailed approach for many items when preparing their projected cash flows. The budgets (worksheets) that follow this discussion are helpful in a detailed preparation, but they do not provide all the information needed. They help in estimating livestock and crop sales, feed purchases, feeder livestock purchases, capital investments, crop costs, and debt repayment as well as family and nonfarm business withdrawals. Expenditures for utilities, repairs and supplies might be estimated best from previous years' cash flow statements multiplied by an inflation factor. However, nonfarm income and capital expenditures must be determined by your expectations.

The farm used as an example in the following preparation of a projected cash flow statement is the same farm used for the historical cash flow statement (Worksheet 1).

Crop Production and Costs and Summary of Crop Costs

The objective of these worksheets is to determine the crops that will be grown, and the resulting costs and production associated with these crops. **Worksheet 2, Crop Production and Costs**, provides for listing of crops to be grown, and for the specification of field numbers (if it is necessary to keep fields separate), expected yields and total production. Space is also provided for estimation of the amount of fertilizer, seed and chemicals that must be purchased. If you plan to treat separate fields of the same crop differently (i.e., use different fertility practices, herbicides or insecticides), listings of such items should be prepared for each field. This worksheet can be used jointly with field maps to provide a written record of planned treatment for each field. Yields can be estimated by averaging the recorded yields for the past few years. Adjustments to these historical yield indicators can be made if the crop is to be grown on a different soil type, or if a response is expected because of a change in farming practices.

The farmer preparing Worksheet 2 is planning to grow 360 acres of corn. Some 260 acres will be harvested as grain. The remaining 100 acres will be harvested as corn silage. Alfalfa, soybeans and wheat will also be grown. The farmer plans to treat each field of the same crop with the same fertilizers and chemicals; therefore, fields are not listed individually. Soybeans will be planted in the field designated number 10. No fertilizer application is planned for the soybeans in this crop year. The farmer has 60 acres of established alfalfa which he expects to yield 4.5 tons per acre of 40 percent moisture haylage. He has 50 acres of wheat that were sowed the previous fall; additionally he expects to sow 50 acres of wheat in the coming fall.

Worksheet 3, Summary of Crop Costs, is used to determine the total expenditure for items specified in Worksheet 2 and the months in which payment for these items will be made. If the fertilizer for several crops is to be paid for in the same

month, the expenditure for fertilizer in that month may be specified as one amount on Worksheet 3. For example, the payment for 0-0-60 fertilizer to be applied to corn and alfalfa will be made in June. However, the payment for 0-0-60 fertilizer to be applied to wheat will be made in the fall. Thus, there are two listings for payment of 0-0-60 fertilizer. The month to be listed in Worksheet 3 is the month the expense must be paid; this is not necessarily the month in which the item requiring cash expenditure will be used. However, paying cash for an item at the time of purchase often entitles you to a discount for the immediate payment.

Other items entered on Worksheet 3 for the example farm are payments for herbicide, seed and anhydrous ammonia.

The purpose of listing the expenditures and month of payment is to facilitate the transfer of figures from Worksheet 3 to the projected cash flow statement, Worksheet 10, to be discussed later.

In completing both Worksheets 2 and 3 you should keep in mind factors such as rental or lease arrangements. In a crop-share lease the products and/or crop costs may be divided between the landlord and tenant.

Livestock Plan, Feed Requirements, Crop Usage

Worksheet 4 is used to plan the purchase and sale of livestock. A beginning inventory helps in determining sales from livestock on hand at the start of the period. Beginning and ending inventories enable you to complete a pro-forma income statement if desired (see Worksheet 11). Estimated sale weights for livestock can be determined by using purchase weights and average daily gains.

A method of arriving at prices for some livestock would be to use commodity futures prices with the appropriate adjustment. The adjustment would be the normal difference between the futures market price and the price of the livestock that you buy or sell, near the month of delivery. The differences may arise because of distance from major markets, quality, sex or other factors that might make the livestock you buy or sell different from that specified by the future contract. Many daily papers publish commodity prices. A fairly complete listing is published in the *Wall Street Journal*. Alternatively you could use the average of prices over the past several years. The best method would probably be to formulate your own price expectations based on the information available including future prices, past prices and outlook information.

With prices and marketing weights determined, list the months in which income will be received and purchases are to be made, and list the amount of each cash transaction. These amounts can then be transferred from Worksheet 4 to the Operating Income or Operating Expenses sections of the projected cash flow statement, Worksheet 10.

In the example, the farmer has two lots of cattle. Lot 1 has a beginning inventory of 199 head which he plans to sell in July for \$91,938. He plans to replace these cattle with a purchase of 200 head at a cost of \$50,000 in September, and have an ending inventory of 198 head valued at \$59,000. In lot 2 he has a beginning inventory of 203 cattle which he plans to sell in April for \$89,320. He plans to refill this lot in June with the purchase of 200 head of cattle for \$50,000.

The purpose of **Worksheet 5** is to determine the feed requirements of the planned livestock production. Feed

5

SUMMARY OF CROP COSTS

Fertilizer					Seed					Chemicals				
Analysis	Quantity	Price	Cost	Month Pd.	Kind & Variety	Quantity	Price	Cost	Month Pd.	Kind	Quantity	Price	Cost	Month Pd.
82-0-0	23.1 T.	\$85	\$1963	6	Corn	94	\$29	\$2,726	5	Corn Herb	720	\$2.10	\$1,512	5
0-0-60	35.5 T.	55	1953	6	Broom	30	7	210	6	Insect.	2,520	.32	806	5
0-46-0	23.5 T.	75	1,763	6	Wheat	75	3.75	281	10	Corn Herb	8	20.40	163	6
0-0-60	2.5 T.	55	138	10										
0-46-0	4 T.	75	300	10										

6

requirements can best be determined by past experiences in your own operation. Information is also available from sources such as farm management handbooks, extension personnel and feed companies. Computer programs, such as those available through Michigan State University's Telplan program, can compute a least cost ration and feedlot profit maximization plans based upon crops to be grown, feed purchases and type of livestock to be fed.

In the example, the farmer plans on feeding 5,970 bushels of corn, 250 tons of corn silage carried over, 60 tons of haylage carried over, 30 tons of new crop haylage and 36 tons of purchased protein supplement to finish the beginning inventory of 199 head of cattle in lot 1. Feed requirements have been calculated for other batches of cattle also.

Worksheet 6, Crop Usage, is used to determine the amount of crops to be used for feed or seed and the amounts available for sale or ending inventories. Preparation of Worksheet 6 requires use of information provided in Worksheet 5, Feed Requirements, and Worksheet 2, Crop Production and Costs. The beginning inventory specifies the availability of past years' crops. Sales can be made from crops carried over as beginning inventory and from new crops not used for feed or seed or held as inventory for the next year.

As was the case in projecting livestock sales on Worksheet 4, the formulation of price expectations is important. Futures market prices provide a starting point for some crops. These prices must be adjusted for differences between the crop you sell or buy and the crop specified in the futures contract. Also, differences may arise because of distance to major markets, quality, type of variety, moisture, or for other reasons.

Computing ending inventory values on Worksheet 6 will help in preparing the pro-forma income statement (Worksheet 11). The example farmer has beginning inventories of 17,900 bushels of corn, 490 tons of corn silage, 60 tons of haylage and no wheat or soybeans, as shown on Worksheet 6. From Worksheet 2, Crop Production and Costs, it is determined that expected production is 22,100 bushels of corn, 1,000 tons of corn silage, 270 tons of haylage, 900 bushels of soybeans and 2,000 bushels of wheat. The expected use for feed is taken from Worksheet 5, Feed Requirements. None of the inventories crops will be used as seed. The portion of beginning corn inventory not used for feed is expected to be sold in July. New crop soybeans and wheat are expected to be sold at harvest and new production of other crops will be partially used as feed. The balance of new production of other crops will be carried as ending inventory.

Debt Summary and Repayment Schedule, Planned Capital Investments, Other Major Items

Worksheet 7, Debt Summary and Repayment Schedule, can be used in connection with the projected cash flow statement (Worksheet 10) and can be used as a reminder of payments of notes coming due. It also provides a summary of present debts. For use with the cash flow statement you should determine the amount of each principal and interest payment and when these are to be made.

The example farmer has debt obligations to a bank for machinery, cattle and operating expenses, and to his father for land and buildings. The machinery loan has a remaining balance of \$9,000. Payments of \$1,000 principal plus interest

on the unpaid balance at an 8 percent annual rate must be made in April and October. The loan on land and buildings has an unpaid balance of \$76,000. This loan requires payments of \$2,000 principal plus interest at a 6 percent annual rate on the unpaid balance in the months of May and November. The other loans are due in full within the year.

Worksheet 8, Planned Capital Investments and Other Major Items, is designed to facilitate putting expected major purchases of capital items onto the projected cash flow statement. Worksheet 8 shows that purchases of a field chopper and a self-unloading wagon are planned. Also, as a reminder, the cash rent on a farm is listed, as well as the planned hiring of soybean harvest.¹

Family and Nonfarm Business Budget

Worksheet 9 is used to help determine the amount of money needed to withdraw from the farm business for family living expenditures and nonfarm business expenses and investments. In the example presented on Worksheet 9, only total family living expenditures (line 19) and investments and nonfarm business expenses (lines 20-26) are used. Use of this Worksheet can help in planning for consumption and personal savings in addition to providing information for the projected cash flow (Worksheet 10).²

For preparing estimates of family expenses, Table 1 provides information that you may not have readily available. Tax rates listed are for 1973. In using Table 1, first locate what you expect your "adjusted gross income" to be. Then read the figures across from the appropriate family size. For example, an average family of four expecting adjusted gross income of near \$9,000 would expect to pay \$164 Michigan income tax, \$720 self-employment tax, \$748 federal income tax, and spend \$6,611 on consumption.

Projected Cash Flow Statement

The format of a projected cash flow statement is the same as for historical cash flow statements. An example projected cash flow statement (**Worksheet 10**) is presented for the same farm as used in the worksheets to this point. It should be noted that while you will not be able to predict income and expenditures to the exact dollar, the prediction of income and expenditures is generally close enough to those realized to render a projected cash flow statement very useful. For the example projected cash flow statement (Worksheet 10), Operating Income figures have been derived from the worksheets. From the Livestock Plan (Worksheet 4) you find the prediction of livestock sales (Worksheet 10, line 2). These total \$89,320 in April and \$91,938 in July. Crop sales (Worksheet 10, line 1) have been estimated from Worksheet 6 (Crop Usage). On Worksheet 6 you find that corn and wheat sales are planned in month 7 (July) and that soybeans are expected to be sold in October.

On Worksheet 10 you find that no Capital Sales (lines 7 through 10) or Nonfarm Income (lines 11 through 13) are expected in the period covered by the projected cash flow.

¹These items are not capital investments.

²Those wishing to itemize family expenditures can use lines 1-18 on Worksheet 9.

Worksheet 5

FEED REQUIREMENTS
For 19____

Livestock		Period on Feed	Corn, Bu.		Corn Silage		Haylage		Supplement	Hay, Tons		New	
Kind	Cattle		Old	New	Old	New	Old	New		Old	New	Old	New
Lot #1	199	Jan. - July	5970		250T.		60T.	30T.	36				
"	200	Sept. - Dec.		2200				30T.	18				
Lot #2	203	Jan. - Apr.	4060		203T.				24.5				
"	200	June - Dec.		4000				110T.	36				

Worksheet 6

CROP USAGE

Crop	Beginning Inventory		Expected Production	Expected Purchases			Total Available		Expected Farm Use		Expected Sales			Projected End Inventory	
	Quantity	Value		Quantity	Value	Month	Quantity	Quantity	Feed	Seed	Quantity	Value	Month	Quantity	Value
Corn	17,900	\$28,850					17,900	5970			11,930	\$16,702	7	18,040	\$21,648
Corn silage	490 T.	\$4,900	22,100				22,100	4060							
Haylage	60T.	\$1,200	1,000T.				1,000T.	513						513T.	\$5,130
Soybeans			270T.				270T.	170						100T.	\$2,000
Wheat			900				900				900	\$3,150	10		
			2,000				2,000				2,000	\$3,500	7		

DEBT SUMMARY AND REPAYMENT SCHEDULE

For 19

Date Made	Lender	Description of Loan	Initial Amount	Remaining Amount	Length of Loan	Int. Rate	Payments Per Year	Dollars/Payment		Month of Pay't
								Prin.	Int.	
4-71	Bank	Loan for machinery & equip	\$12,000	\$9,000	6 yrs	8%	2	\$1,000	\$360	4
								\$1,000	\$320	10
5-68	Father	Land & Buildings	\$94,000	\$76,000	23.5	6%	2	\$2,000	\$2280	5
								\$2,000	\$2220	11
6-72	Bank	Cattle (205)	\$46,000		10 mo	7%	1	\$46,000	\$2685	4
6-72	Bank	Operating exp. (100 pd 3-72)	\$1,500	\$500	8 mo	7%	1	\$500	\$23	2
9-72	Bank	Cattle (200)	\$45,000		10 mo	7%	1	\$45,000	\$2625	7
10-72	Bank	Operating expenses	\$2,000		8 mo	7%	1	\$2,000	\$93	6
11-72	Bank	Operating expenses	\$3,000		8 mo	7%	1	\$3,000	\$140	7
12-72	Bank	Operating expenses	\$5,500		8 mo	7%	1	\$5,500	\$257	8

Worksheet 8 - Planned Capital Investments

Other Major Items

Description	Amount	Month Needed	Description	Amount	Month Needed
Field Chopper, corn and hay heads -					
Trade in old machinery	\$4,000	7	Cash rent on 100 acres \$28/yr	\$1,400	5
Self-unloading wagon	\$2,100	5	Custom harvest of soybeans \$7/acre, 30 acres	1,400	10
				\$210	10

Table 1. Estimated current consumption for selected farm family sizes based on the number in the family, adjusted gross income, income taxes, and self-employment taxes.

Adjusted ⁵ Gross Income	Number in Family	Michigan Income Tax ¹	Self- Employment Tax ²	Federal Income Tax ³	After Tax Income	Estimated Current Consumption ⁴
3,000	2	23	240	32	2,705	3,269
	4	0	240	0	2,760	3,704
	6	0	240	0	2,760	3,957
6,000	2	140	480	488	4,892	4,637
	4	47	480	249	5,224	5,397
	6	0	480	32	5,488	5,936
9,000	2	257	720	1,033	6,990	5,724
	4	164	720	748	7,368	6,611
	6	70	720	472	7,738	7,270
12,000	2	374	864	1,534	9,228	6,743
	4	281	864	1,228	9,627	7,741
	6	187	864	1,133	9,816	8,365
15,000	2	491	864	2,045	11,600	7,718
	4	398	864	1,820	11,918	8,781
	6	304	864	1,490	12,342	9,574
18,000	2	608	864	2,885	13,643	8,493
	4	515	864	2,510	14,111	9,699
	6	421	864	2,045	14,670	10,600
21,000	2	725	864	3,680	15,731	9,125
	4	632	864	3,260	16,244	10,540
	6	538	864	2,885	16,713	11,450

¹ \$1,200 per person deduction from income and a tax rate of 3.9 percent.

² Rate of 8 percent of income up to \$10,800 of income.

³ \$750 per exemption, percentage standard deduction of 15 percent up to \$2,000 or low income allowance of \$1,300, are used in figuring tax.

⁴ Using the equation $C = 22.96 P^{.41} I^{.59} S^{.163}$
Where C=consumption, I=income after taxes, S=size of family, P=ratio of current to 1961 CPI. Assuming current CPI=140, 1961=89.6

⁵ Adjusted Gross Income on Federal Income Tax Form 1040.

Source: J. R. Brake, "Firm Growth Models Often Neglect Important Cash Withdrawals", American Journal of Farm Economics, August 1968, pp. 769-772.

Worksheet 9

FAMILY AND NON-FARM BUSINESS BUDGET

For Period _____ to _____

FAMILY LIVING EXPENDITURES	Total	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1. Food and beverages													
2. Clothing													
3. Rent or leases													
4. House repairs													
5. House furnishings & equipment													
6. House operations													
7. Utilities and fuel (non-farm)													
8. Education and reading													
9. Recreation													
10. Transportation													
11. Medical, dental, health													
12. Personal care													
13. Health insurance													
14. Life and other insurance (non-farm)	914		457						457				
15. Child care													
16. Gifts and donations													
17. All other family expenditures	5,400	400	400	400	400	400	400	600	400	400	400	400	800
18.													
19. Total Family Expenditures	6,314	400	857	400	400	400	400	600	857	400	400	400	800

INVESTMENTS AND NON-FARM BUSINESS EXPENSES

20. Personal savings	500												
21. Investments							500						
22.													
23. Income and self-employment taxes	2,500			2,500									
24. Property taxes (non-farm)													
25. Non-farm business expenses													
26. Total (lines 19 + 20 thru 25)	9,314	400	857	2,900	400	400	900	600	857	400	400	400	800

A number of the figures for the Operating Expenses section (lines 14 through 32) of Worksheet 10 have been derived from the previous worksheets.

From Worksheet 3 (Summary of Crop Costs), you find the amount and month of expenditure for fertilizer (Worksheet 10, line 21), seed (Worksheet 10, line 19), and chemicals (Worksheet 10, line 20).

Worksheet 4 (Livestock Plan) provides the figures for feeder stock purchased (Worksheet 10, line 18).

Worksheet 8 (Other Major Items) provides the amounts and month of expenditure for rent and leases (Worksheet 10, line 16) and custom hire (Worksheet 10, line 22).

The figures on Worksheet 10 for repairs (line 15), veterinary expenses (line 25), utilities (line 27), fuel and oil (line 26), supplies (line 23) and miscellaneous (line 30) will probably not be the same as the previous year, but last year's data were still the best information available for the example farm. Property taxes (line 28), insurance (line 29) and hired labor (line 14) are probably close to that which will be realized by using last year's data.

Feed purchases (line 17) have been estimated by using several sources of information. The historical cash flow (Worksheet 10) is a source of an estimate of the total expenditure and distribution of this expenditure. Worksheet 5 (Feed Requirements) provides an estimate of protein supplement required. From the Livestock Plan (Worksheet 4) you can determine when the cattle lots will be full. This information will help in determining the seasonal variation in feed purchases. If there were a need to purchase corn or other crops, that need would be listed in Worksheet 6 (Crop Usage).

Capital Expenditures (Worksheet 10, lines 33 through 36) have been estimated on Worksheet 8 (Planned Capital Investments).

Other Expenditures (Worksheet 10, lines 37 through 39) are also derived from the worksheets. Family and nonfarm business expenditures (line 37) are found on the Family and Nonfarm Business Budget (Worksheet 9, line 26). Principal and interest payment on prior years' debt (lines 38 and 39 respectively) are derived from the Debt Summary and Repayment Schedule (Worksheet 7, last two columns).

The figures on the projected cash flow statement are handled in exactly the same manner as for the historical cash flow statement, the only differences being that the figures are projections and you can immediately finish the projected cash flow statement for the entire year.

Lines 1-13 on Worksheet 10 are used to arrive at expected cash income in the period. In the example, income is expected from cattle sales in April, from wheat, corn and cattle sales in July, and from soybean sales in October. The projected cash income totals \$204,610 compared to \$164,207 actual income for the previous year (see line 41 Total and Comparison columns). The difference lies in two areas: (1) the dollar value of cattle sales is larger because of higher expected prices, and (2) crop sales are larger, probably resulting from a larger carry-over of corn than in the previous year.

Projected cash operating expenses are summarized on lines 14-32 (Worksheet 10). These expenses are projected to be a total of \$149,685 (see line 32 Total column) in the example. The total for the previous year was \$145,877. The increase in expected operating expenses is due mainly to higher expected costs of feeder cattle (see line 32 Total and Comparison columns).

Capital expenditures, lines 33-36, Worksheet 10, are expected to total \$6,100 (see line 36 Total column) in the example. This is significantly less than the \$18,500 actual expenditures the previous year (line 36, Comparison column). This might also suggest that needs have not been accurately assessed.

The Other Expenditures section, lines 37-39, Worksheet 10, includes the projected family and nonfarm business withdrawals, and expected repayment of debt from prior years. The amount of debt from prior years to be repaid is \$108,000 compared to \$85,000 actually repaid last year (see line 38). The large increase is due in large part to the increased cost of purchased feeder livestock the past year over the preceding year. The loans for purchased feeder stock are repaid when the livestock is sold, which is in the year after purchase.

Another factor contributing to the projected increase in repayment of prior years' debt is the fact that a larger amount of grain is carried over into the coming year than was carried over last year. This necessitated short-term loans to cover operating expenses last year which must be repaid during the next year.

CASH FLOW SUMMARY

When you have completed the necessary projections, carried the figures to the projected cash flow form (Worksheet 10) and completed lines 1-39, you are ready to do the Cash Flow Summary (lines 40-49). Total cash expenditures and total cash income, lines 42 and 41 respectively, can be completed at the beginning, but other lines must be completed as you go along. Starting in January (column one), add the income for that month (line 41) and the beginning bank balance (line 40), then subtract from that sum expenditures for the month (line 42) to arrive at the cash difference (line 43). A negative result indicates a need to borrow, and a positive number indicates excess cash. In the latter case, you might reduce debt incurred the current year, hold the balance for use in later months, advance the scheduled repayment of prior years' debt, make additional capital expenditures or invest in nonfarm items such as stocks, bonds or certificates of deposit.

If projected net income (found on Worksheet 11 which will be discussed later) is larger than normal and more cash than necessary is available, you could consider ways of transferring income to the next year, ways in which the extra cash could be used for tax saving expenditures or other possibilities. The cash balance at the end of the month (line 47) is carried to the beginning balance (line 40) for the next month. This procedure should be carried out for all months. Then, after summing lines 44, 45, and 46 horizontally, follow the same procedure for the Total column. Line 40 plus line 41 (using the same beginning bank balance as for January) minus line 42, plus line 44, minus lines 45 and 46, should arrive at the bank balance for the month of December.

Lines 48 and 49 concern accumulated borrowing and are not really part of the cash flow although it is easy to compute these figures, and they are helpful in the analysis. Line 48 is accumulated borrowing for the budgeted year. Add to this total the figure on line 44 (borrowing) or subtract the figure on line 45 (debt payment-principal). Line 49 is a running total of all debt outstanding. As you can see, the beginning total for a year is the year-end total for the previous year. Additions to line 49 are made when you borrow (line 44), and subtractions are made for the principal payments on debt (lines 38 and 45).

CASH FLOW STATEMENT

OPERATING INCOME	Months:	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	TOTAL	COMPARISON
1. Crops								20,302			9,150			29,452	5,787
2. Livestock					89,320			9,438						184,358	157,401
3. Livestock products															
4. Government payments															
5. <i>Other income</i>															
6. Total Operating Income					89,320			112,140			9,150			204,610	439
CAPITAL SALES															
7. Livestock (dairy, breeding)															
8. Machinery															
9.															155
10. Total Capital Sales															
NON-FARM INCOME															
11. Wages															155
12.															
13. Total Non-farm Income															
OPERATING EXPENSES															
14. Hired labor		600	600	600	600	750	750	750	700	650	600	600	600	7,800	7,791
15. Repairs and Maintenance		350	350	350	350	350	350	350	350	350	350	350	350	4,200	4,130
16. Rent and leases														2,800	2,800
17. Feed purchased		1,200	1,200	1,200	1,200	850	850	850	850	1,200	1,200	1,200	1,200	13,000	12,840
18. Feeder stock purchased						30,000	30,000			30,000				100,000	93,685
19. Seed and plants						2,726	2,726				381			3,217	3,460
20. Chemicals						3,318	3,318				738			6,117	7,850
21. Fertilizer and lime						5,679	5,679				710			11,064	13,644
22. Custom hire		50	50	50	50	50	50	50	50	50	50	50	50	600	695
23. Supplies															
24. Breeding fees		300	300	300	300	300	300	300	300	300	300	300	300	3,600	3,327
25. Veterinary, medicine														2,500	2,430
26. Gas, fuel, and oil		50	50	50	50	50	50	50	50	50	50	50	50	600	650
27. Utilities														1,220	1,214
28. Taxes (property)														1,100	1,097
29. Insurance		20	20	20	20	20	20	20	20	20	20	20	20	240	244
30. Miscellaneous															
31. Total Operating Expenses		2,570	2,570	2,670	2,885	14,843	53,143	2,770	2,520	5,300	5,784	3,670	3,790	149,685	145,877
CAPITAL EXPENDITURES															
32. Livestock (dairy, breeding)															
33. Machinery															
34.															
35.															
36. Total Capital Expenditures															
OTHER EXPENDITURES															
37. Family & non-farm business															
38. Prior years debt - Principal Payment		400	857	2,800	400	400	900	600	857	400	400	400	800	9,314	7,231
39. Prior years debt - Interest Payment															
CASH FLOW SUMMARY															
40. Beginning Bank Balance		472	472	522	452	23,413	1,740	604	34,492	25,358	938	584	392	4,42	1,075
41. Total Income (6 + 10 + 13)		0	0	0	89,320	0	0	112,140	0	0	9,150	0	0	204,610	164,207
42. Total Expenses (32 + 36 + 37 + 38 + 39)		2,970	3,920	5,270	53,728	21,673	56,136	53,135	9,134	5,340	7,504	7,390	4,570	284,100	260,577
43. Cash Difference (40 + 41 - 42)		-2,528	-3,448	-5,048	36,044	1,740	-54,396	54,609	-23,358	-2,810	-3,416	-6,706	-4,286	-72,048	-104,285
44. Borrowing Necessary		9,000	4,000	5,500			55,000							112,500	112,000
45. Current years debt - Principal Payment														32,500	13,000
46. Current years debt - Interest Payment														348	363
47. Ending Bank Balance		4,472	522	452	23,413	1,740	604	34,492	25,358	938	584	392	704	704	542
48. Current Year's Outstanding Debt		3,000	7,000	12,500	0	0	55,000	35,000	35,000	65,000	65,000	75,000	80,000	80,000	103,000
49. Total Outstanding Debt		190,000	193,500	199,000	139,500	137,500	190,500	183,500	117,000	146,000	149,000	154,000	159,000	159,000	187,000

The last column in the cash flow is for comparisons. You can compare projections for a new year with the actual results from the previous year, as has been done in the example.

An explanation of the step-by-step procedure of the cash flow summary may be helpful. Starting in January the total expected expenditures, line 42, are \$2,970. No income is expected, and the beginning bank balance, from the December ending balance on the historical cash flow for the previous year, is \$442 (see Worksheet 1). The projection, therefore, is for a cash deficit of \$2,528 in January, with borrowings of \$3,000 necessary to leave an ending bank balance of \$427. This borrowing puts accumulated borrowing for the current year, line 48, at \$3,000 and brings total accumulated borrowing to \$190,000.

Total accumulated borrowing is computed by taking the previous year's ending total, \$187,000, and adding the \$3,000 borrowed in January. For February the beginning bank balance plus zero expected income, minus expenditures of \$3,950, leaves a cash deficit of \$3,478. Borrowing \$4,000 leaves an ending bank balance of \$522. Accumulated borrowing for the current year now amounts to \$7,000 (see line 48) and total accumulated borrowing is \$193,500 (see line 49).

Notice the \$500 repayment of debt on line 38 which is taken into account in computing the latter accumulated borrowing figure. It is expected that March expenditures will exceed the bank balance plus cash income by \$5,048 (see line 43). Borrowing \$5,500 leaves a bank balance of \$452 and brings accumulated borrowing figures to \$12,500 and \$199,000. In April it is expected that there will be a cash difference of \$36,044 resulting from a bank balance of \$452, income of \$89,320 and expenditures of \$53,728. The excess cash provides adequate funds to repay the current year's accumulated debt of \$12,500, and the \$131 of interest accrued on the borrowing by April. The repayment of debt in this month reduces total accumulated borrowing to \$139,500.

Check for Errors

These calculations are carried out for all months and for the Total column. A "check" for errors is provided; the ending bank balance for the Total column is equal to that for December if no error has been made. You can also check the accumulated borrowing figures by adding the total outstanding debt at the start of the year (line 49, January column) and total borrowing necessary for the current year (line 44, Total column). Then subtract from that sum the payment of prior and current year's debt (lines 45 and 38, Total column). This subtraction should give the total outstanding debt at the end of the year (line 49, Total column). For example this calculation would be: $(187,000 + 112,500) - (108,00 + 32,500) = 159,000$.

Pro-forma Income Statement¹

After completing Worksheets 2 through 9 and the projected cash flow statement, Worksheet 10, you have compiled nearly all the information needed for a pro-forma income statement. **Worksheet 11** is a format for such a statement with example data provided.

¹"Pro-forma" is a term used in accounting meaning to arrange data in a specific form prior to the realization of the actual data. Therefore, a pro-forma income statement is a projection of what profit or loss will be for some period in the future.

Total operating income (Part I, a) is taken from line 6, Total column, of the projected cash flow statement (Worksheet 10). The amount is \$204,610 for the example.

Capital gains (Part II) are computed by subtracting from total capital sales, line 10 on Worksheet 10, the "basis" of the capital assets sold. The "basis" is the undepreciated value of the capital item and must be acquired from depreciation schedules maintained for income tax purposes. For home-raised breeding or dairy livestock, which would not be included in your depreciation records, the basis would be zero. Therefore, do not subtract anything from the sale. However, inventory changes of livestock will be reflected in Part IV.

Part III, expenses, is computed by adding total operating expenses (line 32, Worksheet 10), interest (lines 39 and 46, Worksheet 10), and depreciation. Depreciation estimates on inventoried capital items can be derived from schedules maintained for income tax purposes. Depreciation for capital items to be purchased should also be estimated and included.

The change in livestock and crop inventory, Part IV, is computed by subtracting beginning inventories from expected ending inventories. The inventories can be found on the worksheets. Livestock inventories are found on Worksheet 4 (Livestock Plan). Feed and grain inventories have been estimated on Worksheet 6 (Crop Usage). For breeding and dairy livestock include only that which is home raised; other breeding and dairy stock should be included in depreciation records.

Net profit or loss, Part V, is computed by subtracting expenses, c, from the sum of total operating income, a, and capital gains, b, and either adding or subtracting the change in inventory, d, depending upon whether there has been an increase or decrease. The example farm has a projected profit of \$25,764.

If you have a change in accounts payable from the previous year (on items that would be entered under Operating Expenses on the cash flow statement), you should adjust the net profit or loss figure by the net change. An increase in accounts payable should be subtracted, and a decrease should be added to the net profit figure.

A distribution of income may be calculated in Part VI. From Worksheet 9 you can find projected family living, nonfarm business expenses (h), and income and self-employment taxes. With these uses of income identified, the balance would be the change in net worth from operation (i). Unrealized changes in the value of capital items (j) should also be reflected in the calculation of total change in net worth (k).

PRO-FORMA INCOME STATEMENT
For Year 19 _____

1. Total Operating Income (from line 6, Worksheet 10)a. \$ 204,610**2. Capital Gains or Losses**

Capital Sales (from line 10, Worksheet 10)

--Basis of Capital Assets Sold¹--

Capital Gain or Loss

b. --**3. Expenses**

Operating Expenses (from line 32)

\$ 149,685

Interest (from lines 39 + 46)

11,249

Depreciation

16,580

Total

c. \$ 117,514**4. Change in Inventory**

Feed & Grain

Livestock

Ending Inventory

\$ 28,778\$ 127,000

Beginning Inventory

(-) 32,950(-) 124,160

Net Change

- \$ 4,172+ \$ 2,840= d. \$ -1,332**5. Net Profit or Loss (a + b - c + (-) d)**e. \$ 25,764**6. Distribution of Income**

Net Profit or Loss (e above)

f. \$ 25,764

Self-employment and Income Taxes (from Worksheet 9)

g. \$ 2,500

Family Living and Other Nonfarm Expenses

h. \$ 6,314

Change in Net Worth From Operation (f - g - h)

i. \$ 16,950

Unrealized Change in Value of Real Estate or Other Assets

j. \$ 2,000

Total Change in Net Worth (i + j)

k. \$ 18,950

¹The "basis" is the undepreciated value of the capital item, plus the salvage value of the capital item used in setting up the depreciation schedule.

USING CASH FLOW STATEMENTS IN FINANCIAL MANAGEMENT

Cash flow statements are important tools in financial management. They can provide information that is useful in the management of cash, inventories, liabilities and capital assets. The usefulness of historical and projected cash flow statements to farmers and their lenders in financial management and credit analysis is discussed in the following sections.

CASH FLOW ANALYSIS IN CASH AND INVENTORY MANAGEMENT

Cash

The management of cash is an important but often overlooked aspect of financial management. The cost of holding cash balances is an opportunity cost (the amount the money could earn elsewhere). Still, there are motives for holding cash. You need some minimum level of cash to carry out normal transactions without making frequent trips to the bank for deposits. In addition, a cash reserve may be held for a cushion against unexpected expenses or to take advantage of attractive investments (such as a good buy at a sale).

The objective of a profit-minded manager might be to maintain a minimum cash balance and keep all cash in excess of this minimum (within a reasonable range) invested. Such an objective is much easier to meet through the use of cash flow analysis. Projected cash flow statements provide information about the expected sources and uses of cash in coming periods. Such information allows you to plan for an appropriate level of cash balances. In periods when you anticipate excess cash, you might consider the following alternatives: (1) cash discounts on purchases, (2) early retirement of debt or (3) investing in short term securities. With cash flow statements to act as a guide, you should be able to coordinate cash balances with uses of cash more effectively and thus increase profitability.

Inventories

The level at which a firm keeps inventories is an important financial consideration. Our purpose here is to investigate briefly the cash flow implications of inventory management.

The portion of the cost of carrying inventories that interests us here is the opportunity cost of capital invested in inventories (e.g., the return you could earn on the revenue from the sale of a crop). This opportunity cost often may be fairly low (e.g., the passbook savings rate), but, if the business is in a cash bind and cannot easily obtain a loan, the opportunity cost on inventory may be quite high. This higher cost may be in a form such as not being able to take attractive cash discounts, forced liquidation of inventories at undesirable (distressed) prices, or extension of the firm's debt beyond prudent limits.

Cash flow analysis can help you incorporate the opportunity cost concept into planning inventory levels. By knowing ahead of time when you are likely to be in a tight cash situation (high opportunity cost for holding inventories), you can use the information to make better decisions about: (1) whether or not to store cash crops, (2) when and how much feed to purchase and

(3) what number and weight of feeder livestock to purchase. However, cash flow considerations are not the only factors to consider in making these decisions. But, without planning in a manner that incorporates cash flow considerations, you may get into difficulties where immediate cash flow problems force actions at inopportune times.

MANAGEMENT OF LIABILITIES—

CREDIT ANALYSIS

Debt Management

The need for credit arises in periods when cash outflows exceed cash inflows. Credit is used to bridge this gap and/or provide reserves. Needs for credit can be projected through the use of cash flow statements.

Let's use the projected monthly cash flow statement (Worksheet 10) to examine the credit needs of the example farmer. The borrowing necessary for a particular period is shown on line 44 (Worksheet 10). For the example farmer, \$3,000 is needed for January, \$4,000 for February, \$5,500 for March, and so on.

The net borrowing for the current year is shown on line 48 of the cash flow statement (Worksheet 10). (See page 13 for computation instructions.) Notice on Worksheet 10 that net borrowing for the current year reaches \$80,000 by the year's end. This figure is of use in obtaining and setting up a line of credit.

A line of credit is an agreement between a borrower and a lender in advance of credit needs which allows the borrower credit, up to an agreed-upon amount, without having each individual loan approved. In the example, ignoring previous debt with the bank, a line of credit of \$80,000 should carry this farmer to the end of the year.

Knowledge of net borrowing for the current year and total accumulated borrowing (lines 48 and 49 respectively, Worksheet 10) may also help identify potential line-of-credit problems. If the total credit line is too great, changes in the farm plan may be necessary.

A cash flow statement provides a basis for a more detailed look at your loan needs and repayment performance. By looking at the sources of inflows and outflows, you gain insight into the financial condition of your business through time. The cash flow statement may help answer questions such as: Must capital assets be sold to meet cash commitments? Are funds being borrowed for general operating expenses, for capital purchases, for inventory items or for family living expenses? Is debt being served via acquisition of additional debt? Is total debt increasing or decreasing?

Scheduling debt payments is an important part of financial management. Cash flow statements pinpoint times when cash will be available to pay down your debt as well as times when additional credit will be needed to maintain a desired cash balance. Also, accurate cash flow projections give you lead time to work out plans of action for meeting temporary financial problems.

One of the most important factors in the acquisition of intermediate and long-term debt is repayment capacity. Repayment capacity here refers to the firm's ability to make interest and principal payments on nonoperating loans.

Cash flow statements provide the basis for examining debt repayment capacity. To measure the amount of debt other than operating loans your business is capable of retiring in a year, first consider total cash income. From this, subtract cash expenditures including operating expenses and interest, family living expenses and all or a portion of capital purchases. If the capital purchase is to be financed with debt, only the cash down payment, if any, would be subtracted. If the capital item is to be a cash purchase, the whole amount would be subtracted. The remainder is the amount available to service nonoperating debt.

Projected total cash income for the example farm is \$204,610 (Worksheet 10, line 41). Total operating expenses (line 32), interest (lines 39 and 46), family and nonfarm business expenditures (line 37) and total capital expenditures (line 36) sum of \$176,348. (It was assumed that the capital expenditure was a cash purchase.) When this sum is subtracted from total cash income, the remainder is \$28,262. This amount represents what could be applied toward principal payments on intermediate and long-term debt, if short-term debt were maintained at the previous year's level. If there has been an adjustment in the farming operation, such as changes in the acreage farmed, the value of inventories or size of dairy herd, then the level of short-term debt that you can carry is affected, and an adjustment must be made to the repayment capacity figure. You should add to your repayment capacity figure the amount by which these changes allow you to increase short-term debt, or subtract the amount by which you have to reduce your short-term debt load.

Excess repayment capacity may be measured by subtracting required principal payments on intermediate and long-term debt from repayment capacity. The required debt payments of this type for the example farm are \$2,000 for machinery and equipment and \$4,000 on real estate for a total of \$6,000 (see Worksheet 7). This gives an excess repayment capacity of \$22,262 (\$28,262 less \$6,000).

Excess repayment capacity is especially important when you are considering expanding your intermediate and long-term debt (e.g., debt for land or machinery purchases). It is a first approximation of your ability to handle payments on this type of debt. For a more complete analysis you should do a projected cash flow that takes into account changes in income, expenses and short-term debt that the new investment implies.

Be very careful when making an interpretation of repayment capacity from only one year's cash flow statement. Repayment capacity should be examined over a period of several years, because variations in your operation and the level of profitability can cause wide fluctuation in the figure.

Leasing, Renting and Accounts Payable

Alternatives in addition to debt for acquisition of capital include leasing, renting and accounts payable.

An increase in your accounts payable is an increase in liabilities very similar to debt. Purchases on account are not cash transactions and, therefore, have not been included in the example cash flow statements (Worksheets 1 and 10). So, while cash flows are not involved, credit flows are. In cases where accounts payable are an important part of your liabilities, you may want to include them in your projected cash flow

statement for a more complete credit analysis. To make this addition to your cash flow statement, you will need to add lines for increasing and decreasing accounts payable. These lines should be included in the Cash Flow Summary portion of the cash flow statement. When accounts payable are included, you should include purchases on account when they are made and offset these with increases in account payable. Payments on account would be entered as decreases in accounts payable. In credit analysis and calculation of repayment capacity, accounts payable should be treated as short-term debt.

Lease and rental agreements are popular alternatives to outright ownership of assets. Such agreements do not increase debt. However, long-term lease or rental agreements with fixed commitments do not differ greatly from principal and interest payments on debt. You should use projected cash flow statements in the analysis of the financial impacts of leasing or renting just as you would if the assets were going to be acquired by way of debt.

Business and Personal Finances

A farmer's business and personal finances are normally quite interrelated, and this is a cause of concern for many lenders. It is important to realize the effect of cash withdrawals from the business for nonbusiness uses. For instance, higher family withdrawals will reduce repayment capacity. Cash flow analysis provides a means for analytically separating your business and personal finances. It can also provide a basis for analysis of consumption expenditures.

Capital Budgeting

One procedure for determining the profitability of long-term investment projects is called Capital Budgeting.¹ Capital budgeting analyzes the cash inflows and outflows over the duration of the investment since the profitability of a project depends upon the timing and quantity of cash flows.

In addition to the profitability considerations of capital budgeting, you should do a multi-year projected cash flow to determine the cash flow feasibility of an investment project. This is especially important when the initial outlays are large (thus, requiring debt that must be served) or if cash inflows from the investment are low for some initial period. An investment that would otherwise be profitable may be infeasible if the business does not have the excess repayment capacity to handle the cash deficit of the initial period.

Often it is useful, and analytically preferable, to prepare the projection in two parts. The cash flows for the project itself may be analyzed. This gives you an analysis of the cash drain (or surplus) of the project or the credit requirement of the project itself. The second portion of the analysis is to project the cash flows for the whole business, including the new project.

This type of multi-year cash flow analysis allows you to determine if your business has the repayment capacity to handle the investment under consideration. It also gives you and your lender an idea of what your long-run credit needs will be. In addition, this analysis will help demonstrate to a lender whether a planned investment is financially sound.

¹For a discussion of the technique of capital budgeting, see Hopkin, John A., Peter J. Barry, C. B. Baker, **Financial Management in Agriculture**, Interstate Printers and Publishers, Danville, Illinois, 1973.

COST AND FINANCIAL CONTROL

Historical and projected cash flow statements can be used in cost and financial control. This may be accomplished by direct comparison of the budgeted (projected) and actual cash flow figures as the year progresses. You can use the columns on the cash flow statement as indicated below for this purpose:

Using cash flow statements in this manner will keep you "on top" of many financial aspects of your business. You can catch overruns, lower than expected sales and other developing problems. This procedure can provide a basis for revision of cash flow projections during the year. A complete cash flow analysis would include revision of cash flow projections when there are significant changes in your expectations of inflows or outflows of cash.

Name	This Month		Year to Date	
	Budgeted	Actual	Budgeted	Actual
OPERATING INCOME				
1. Crops				
2. Livestock				
3. Livestock products				
4. Government payments				
5.				
6. Total Operating Income				
<hr/>				
39. Prior yrs. debt-Int. Pay't.				
CASH FLOW SUMMARY				
40. Beginning bank balance				
41. Total income (6+10+13)				
42. Total expenditures (32+36+37+38+39)				
43. Cash difference (40+41-42)				
44. Borrowing necessary				
45. Current yrs. debt-Princ. pay't.				
46. Current yrs. debt-Int. pay't.				
47. Ending bank balance				
48. Current year's outstanding debt				
49. Total outstanding debt				

Cash flow analysis is an important tool for use in farm financial management. While intensive analysis may not be necessary in all cases, the uses of cash flow analysis have become increasingly important in a large number of farm business situations. Many farmers now include cash flow budgeting as a part of their regular budgeting and planning for the business year. This seems to be the beginning of a trend toward farmers using those tools of record keeping and financial analysis that have long been used by other businesses. Although many lenders do not now require cash flow statements for farmers, such analysis is likely to be required by lenders in the future as the usefulness of this financial tool becomes recognized.

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