ALTERNATIVES TO IMPROVE THE FINANCIAL PERFORMANCE OF THREE HIGHLY LEVERAGED FARMS A CASE STUDY APPROACH

By

James M. Schuler

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF SCIENCE

Department of Agricultural Economics

1986

ASTRACT

ALTERNATIVES TO IMPROVE THE FINANCIAL PERFORMANCE OF THREE HIGHLY LEVERAGED FARMS A CASE STUDY APPROACH

By

James M. Schuler

The plight of the American farmer has become a major issue in 1985. Farmers must manage their farms in an agricultural economy that is characterized by low commodity prices, falling land values and for many, higher debt levels.

Fortunately, Michigan has not been hit as hard as some mid-western states. There are still many Michigan farmers who are wondering how they are going to survive the depressed state of affairs.

In order to determine what can be done from a financial standpoint, personal on-farm interviews were conducted with three highly leveraged farmers about their situations. These were used as background in developing financial plans to achieve better profitability and solvency.

This thesis is dedicated to my parents,

Donald and Marjorie Schuler.

They are the best.

ACKNOWLEDGEMENTS

I would like to thank my major professor and research supervisor, Dr. Ralph E. Hepp. Had it not been for this man's knowledge and expertise, completion of this project might not have been realized for me. I truly appreciate having had the opportunity to work with a professional of such caliber. His no pressure philosophy is representative of his understanding personality and for this reason will always be held in my highest esteem. I would also like to thank Dr. Gerald D. Schwab for being a member of my committee and contributing his time and assistance.

Several people in the Department of Agricultural Economics contributed to the completion of this thesis. Dr. Lester V. Manderscheid saw to it that all administrative matters were provided. Mrs. Shirley Rabbage was responsible for the secretarial functions involved. Thanks goes to these any many other individuals who helped and encouraged me.

Special thanks must be given to my fiancee, Angela Rodabaugh. Her patience, consideration and sacrifices will always be remembered.

TABLE OF CONTENTS

CHAPTER Page

CHAPTER Page

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

Introduction

A. General Financial Situation

The major problem facing U.S. farmers in the early 1980's is that many farm businesses have been unprofitable. The lack of profitability has reduced the owner's value of the farm and for those farms which carry debt, there have also been problems repaying debts. "Farmers and their backers complain that they are innocent victims of bad weather and of some misguided government policies that have resulted in high interest rates, low commodity prices and declining foreign sales."[1]

A-1. Interest Rates

a. Real Estate

The cost of borrowing increased dramatically from 1977 to 1981.[2] Interest rates rose on FLB (Federal Land Bank) loans from about 8% in 1977 to about 16.5% in 1981.

b. Non-Real Estate

Interest rates charged on non-real estate loans increased from 1977 to 1981.[3] PCA (Production Credit Association) loan rates increased from 8% in 1977 to a high of about 21.5% in 1981.

A-2. Depressed Farm Prices

Table 1A in Appendix A shows the average prices received by U.S. farmers for selected commodities. Because these prices are for the entire U.S. they may or may not represent certain states or local markets. The usefulness of these data are their ability to illustrate the trend in farm prices in recent years.

a. Crop prices have been very volatile. Figures 1 through 5 in Appendix A plot the data for all wheat, corn, hay, soybeans and dry beans, respectively. Note that all crops (except hay) had a dramatic decline in price from 1981 to 1982.

b. Livestock prices (Appendix A) have also been quite volatile. The price of beef in dollars per hundredweight (Figure 6) declined continuously from 1979 through 1983. Calf prices (Figure 7) have done the same, except for a moderate increase in 1983. The same is true for lamb prices (Figure 9). Hog prices (Figure 8) on the other hand, increased from 1980 through 1982 but declined in 1983. Milk prices (Figures 10 and 11) increased from 1979 through 1981, but have declined in 1982 and 1983. Milk prices are not typical of the other price patterns because

of the Federal Milk Marketing order which determines the price.

A-3. Weak World Demand

To compound the problem of low prices received by U.S. farmers, there has been a recent decline in the export of U.S. agricultural production. Table 2A of Appendix A lists the value of U.S. foreign export (agricultural, nonagricultural), October-September 1968 through 1984. Each year from 1969 through 1981 the value of agricultural exports increased on an annual basis. Note however the decline in both 1982 and 1983. Nineteen hundred and eighty-four showed a 9% increase over 1983 but was still lower than the $43,780 million achieved in 1981.

One reason for the decline in world demand for U.S. agricultural exports has been the strength of the dollar relative to foreign currency in the early 1980's. That is, a strong dollar reduces demand for U.S. commodities because importers in foreign countries can buy elsewhere at a lower price. This results in a lower price for U.S. farmers because the supply is higher without the export demand. This leads to lower net income and lower cash flow.

A-4. Decline in Farmland Values

Per acre value of farm real estate increased in the 1960's and 70's. However, the 1980's have seen farmland

values decline for the first time in many years.[4] Table 3A (Appendix A) shows the farm real estate value in dollars per acre from 1967-1984 for selected states. Note that all states show annual increases every year prior to 1981, except for Indiana which had a decrease in 1970. Also note that after 1981 every state showed a decline which has continued through 1984. Michigan is recorded as having no change from 1983 to 1984. The result of the declines in land values has been a decrease in owner's equity. "Many of the farmers who purchased land or started farming in the late 1970's now have debts exceeding the value of their assets."[5] This trend is likely to continue because of the low demand for farmland by existing farmers and the increase in supply of farmland by farmers who liquidate their operations.

A-5. Poor Farm Income

The period of 1976 through 1983 has been one of very low annual net farm income for the United States as a whole. Table 4A (Appendix A) was prepared by the USDA, ERS (United States Department of Agriculture, Economic Research Service). It shows the per-farm net income from 1976 through 1983 for selected states and the U.S. average. Note that the highest average U.S. per-farm net income for this period was recorded in 1979 and was only $13,259 per farm.[6] In addition, 1981 through 1983 had continuous declines from year-to-year.

While the nominal figures show a definite decline, there is no change in the pattern when net farm income is presented in real terms.[7] Table 5A (Appendix A) are lists of nominal and real net farm income for all farms in the U.S. for 1975 through 1983. In particular, note the low income levels for 1981, 1982 and 1983 in both nominal and real terms.

A-6. Increase in Average Debt Level Over Time

A major trend in agriculture is the increase in the amount of debt used to finance real estate and non-real estate. One of the reasons for this increase is the high capital requirements needed for farming. Table 6A (Appendix A) prepared by the USDA lists the amount of farm real estate and non-real estate debt by year from 1971 to 1983. As can be seen, total debt level has increased each year. The cause of this increase is due to low real interest rates in the 1970's which encouraged farmers to invest in land and equipment.[8] Farmers were anticipating land value appreciation which would increase equity over time. Just the reverse has occurred in the 1980's and farmers find themselves with debt levels that exceed the value of assets.

B. Reasons for Concern

The high capital investment requirements in farming mean that many farmers must finance their farms with large

amounts of debt. Those farms with high levels of debt (70-100%) are the focus of this analysis. The following summarizes the main causes for concern.

B-1. Highly Leveraged Position

The term financial leverage can be defined as the degree to which an entity is financed from external sources. Financial leverage creates financial risk.[9] That is, as leverage increases, the degree of risk also increases. This is due primarily to debt servicing requirements. Specifically, the repayment of principal and interest on borrowed funds. Highly leveraged operations can be defined as business entities with debts that are large (70% or greater) in relation to assets.

To illustrate this point, suppose there are two farms in a world without taxes. One has no debt. The other has debt outstanding which requires an annual interest payment of $25,000. Assume each farm has $250,000 of revenue and $225,000 in expenses. In addition, the farm with debt has $25,000 more expenses than the farm with no debt because of the debt service. Table 1-1 shows the farm with no debt has a net income of $25,000 whereas the farm with debt has zero net income. In other words, the debt repayment requirement completely consumed the profit made from the operations.

TABLE 1-1: Effect of Debt on Income

	Farm With No Debt	Farm With Debt Outstanding
Revenue	$250,000	$250,000
Expenses	225,000	250,000
Net Income	$ 25,000	$ 0

Farms with the highest sales also have the highest debt levels.[10] Dairy and cash grain farms in particular have very high debt/asset ratios.

B-2. Cash Flow Needs

Cash needs are generally for family living expenses and debt repayment. Cash available is the sum of net cash income and off-farm income. When cash needs are greater than cash available a cash deficit occurs. Table 7A (Appendix A) prepared by the USDA shows the average cash available and needs by sales class and debt/asset ratio for 1983. Note that all sales classes have cash deficits (shortfalls) with debt/asset ratios over 70%. Also note that all farms with sales less than $100,000 had cash deficits. In general, this suggests that a combination of a high debt/asset ratio and sales of less than $100,000 per year will result in cash flow deficits.

B-3. Thin Profit Margins

Farmers who are highly leveraged have very thin profit margins as pointed out in the previous two sections of this report. Therefore, these farmers are more sensitive to changes in the economy. For example, when exports of U.S. agricultural commodities began to decline in 1981 (see section A-3: Weak World Demand, page 3) prices fell as well. This squeezed farm gross profit and led to decreased net farm income.

B-4. Frequency of Poor Financial Performance

The period of 1982 through 1984 has been one of the worst for U.S. farmers in recent history. This fact is made evident by the rate of loan delinquency. Tables 8A through 10A (Appendix A) were prepared by the Department of Agricultural Economics at Michigan State University.[11] They show delinquency rates on operating, real estate and non-real estate loans for several selected states. Production Credit Association delinquency rates have increased in all four states listed regarding both percent of borrowers and percent of loan volume. Federal Land Bank delinquency rates have had a similar pattern, although the percent of borrowers delinquent in Michigan has declined slightly. Non-real estate delinquency rates at commercial banks in these states have also increased from 1982 through 1984.

Nineteen hundred and eighty-five is projected to show further increases in the delinquency rates as more troubled farmers are unable to meet their debt repayment schedules.

C. Statement of Purpose

There are many farms in Michigan that are experiencing financial difficulty, referred to as financial stress. Highly leveraged farms in particular have had problems generating enough cash flow to repay debts. The purpose of this study is to determine what financial alternatives are viable to improve cash flows so that debt levels can be reduced. In conjunction with this purpose, it is necessary to develop a plan of implementation for all alternatives considered.

It is intended that the results of this study be used as the basis for developing a microcomputer program and teaching materials for extension applications.

D. Objectives

The overall objective of this study is to analyze specific financial alternatives to improve cash flows to reduce debts on highly leveraged farms. This broad objective can be elaborated to specific objectives. These are:

- Identify existing trends within farm types.
- Propose different methods to improve cash flow and reduce debt levels.

- o Analyze effects of specific financial/technical adjustments.
- o To demonstrate through the use of case studies the possible future outcomes of different alternatives.

E. Procedure and Methodology

This study consists of three parts:

1. Assembly and analysis of Telfarm financial statements segregated by debt/asset ratios. The debt/asset ratios were broken down as : 1) less than 10%; 2) 10-39%; 3) 40-69%; and 4) 70-100%.
2. Case Studies
   a) Three case studies illustrating the current financial situation of highly leveraged farms.
   b) Cases used as base for computer simulation.
3. Forecasts of financial performance based on various financial/technical adjustments to improve cash flow.

E-1. Source of Data

The farms used in this analysis are farms with debt levels of 70% or greater and were on the Telfarm accounting system throughout the study period of 1981 through 1983. Telfarm is a computerized financial record keeping system administered by the Michigan State University Cooperative

Extension Service.[12] Telfarm records show there were 65 highly leveraged farms reporting in 1983. Because three years of data were required for the study only 31 of 65 farms are included in this study.

E-2. Case Studies

The 31 farms on Telfarm for at least three years were separated by farm type. The three farm types are: 1) cash grain; 2) hog; and 3) dairy. Of these farm types, the individual farm financial statements that were the closest to their corresponding average financial statements were chosen for study. (See Table 3-1 for the number of farms averaged by type.)

These cases are not intended or recommended for comparison with other farm situations. They are benchmarks for the purpose of exploring possible alternatives for highly leveraged farms.

E-3. Forecasts

Specific alternatives for the case studies were determined by conducting personal, on-farm interviews with the farmers representing their respective farm type. These alternatives were then used to simulate a complete farm planning program. These forecasts are presented in Chapter IV of this report.

CHAPTER II

Description of Financial Statements

Chapter II was written in order to explain the different financial statements (balance sheet, income statement, and cash flow summary). A general description is given for each statement to inform readers who may not have a strong grasp of financial statements of what information is provided by each statement.

The last part of Chapter II contains definitions of financial ratios commonly used by agricultural lenders and other financial institutions. A good working knowledge of these is useful in analyzing farms and other businesses.

A. Balance Sheet

One of the most useful financial statements is the balance sheet or net worth statement as it is also known. This statement is divided into three primary components. These are the assets, liabilities, and owner's equity (net worth) sections. The balance sheet displays the values of each of these as of the particular date of the statement.

The definitional relationship is as follows:

Assets = Liabilities + Owner's Equity

To better understand the balance sheet, it is advisable to classify assets based on their degree of liquidity and

liabilities based on their maturity. Both are normally classified as current, intermediate and long-term.

Telfarm does not specify whether assets or liabilities are current, intermediate, or long-term. Therefore, the author has done so to explain certain financial aspects that otherwise would not be possible from the data.

A-1. Assets

Assets can be defined as "property and service rights, measurable in terms of money, which the entity acquires in transactions for their future economic benefit or value."[13]

a. Current Assets

Current assets include cash and assets that will be converted into cash within a short time (usually less than one year). The current assets included in the data are:

- cash
- crops
- feed
- supplies
- other saleable items
- dairy steers
- dairy calves
- beef calves
- beef steers-raised
- purchased feeders
- market hogs
- feeder pigs
- lambs

Crops, feed, supplies, and other saleable items are all current assets because they are sold or used in the production process within the year.

Likewise, the livestock assets held for slaughter are considered current assets because they have a short cycle from farm to market.

Ordinarily, accounts receivable is considered a current asset because the business expects to be paid within a short time. However, the accounts receivables used in this study consists of:

- Federal Land Bank (FLB) Stock
- Production Credit Association (PCA) Stock
- Bank Stock
- Other Stocks
- Cash Value of Life Insurance
- Notes
- Revolving Cooperative Capital Accounts
- Certificates of Indebtedness
- Retirement Plans

Because of the nature of these accounts, the majority are not going to be converted into cash in the near future. Telfarm does not have information on which accounts will be collected periodically, so the timing of collection is unknown. The FLB stock for instance is held by the FLB until the borrower's loan is paid off. And since FLB loans (real estate) are long-term debts, the amount of FLB stock is held by the FLB for an unknown period (period is known only if loan is paid in accordance with the amortization schedule). In addition, new money may be borrowed periodically while existing loans are paid off. This would, in effect, roll over certain stock. For these

reasons it has been assumed that the accounts receivable are an intermediate asset.

b. Intermediate Assets

Intermediate assets are those that could be converted into cash (liquidated) but it would require more time to sell them at market value.[14] Livestock with a three through five year on-farm use are included in this category. The intermediate assets in this study are:

- o sows
- o boars
- o gilts
- o ewes
- o rams
- o beef cows
- o beef heifers
- o beef bred heifers
- o beef open heifers
- o beef bulls
- o dairy cows
- o dairy heifers
- o dairy bred heifers
- o dairy open heifers
- o dairy bulls
- o machinery and equipment
- o non-farm business assets
- o household assets
- o accounts receivable

Another distinction of intermediate assets is the effect on the farm if such assets were sold. Sale of intermediate assets would substantially alter the composition of an existing farm.

c. Fixed Assets

Fixed assets are those which have long useful lives. Therefore, they are often referred to as long-term assets. Fixed assets include:

- o land
- o permanent buildings and improvements
- o residence
- o non-farm real estate

Proper valuation of farm real estate is important. Farm appraisal texts are very helpful in establishing fair market values. Values received for recent real estate sales in one's local area are also good estimates.

Overestimation of assets can artificially enhance the owner's net worth. This will tend to cover up solvency problems. If such is the case lenders will demand that asset values be reduced to reflect "true" market values. If insolvency results, bankruptcy may follow.

Telfarm records land and residence at cost, with buildings and improvements recorded at book value. However, for determining the value of total assets and net worth farmers report an "estimated market value of real estate." This value may or may not be a realistic value if liquidation were to pursue.

Regardless of the method used to value assets, it should be consistent over time.

A-2. Liabilities

Liabilities are debts and other amounts (leases) owed by the farm. The data source (Telfarm) does not classify liabilities by maturity. Therefore, for purposes of evaluating the liability structure of the data, the debt sources are assumed to mature as illustrated in Table 2-1 on page 18.

a. Current Liabilities

Current liabilities are liabilities that are to be paid within a short time (usually less than one year). Typically, these arise through operating needs such as purchase of feed, seed and fertilizer, or other production inputs. These liabilities are generally paid for with the sale of current assets, particularly crops and livestock. Also included within this section of the net worth statement would be the current portion of principal due on intermediate and long-term debt. In addition, while leases are considered to be an operating expense they are also a current liability because they are contractual agreements that must be paid on a short-term basis.

b. Intermediate Liabilities

Intermediate liabilities are debts that are typically scheduled to be paid within 2 to 10 years.[15]

TABLE 2-1: Percentage Distribution Assumed Among Loan Types, 1980 Telfarm Sample

Source of Data	LOAN REPAYMENT TERMS Short	Intermediate	Long
CROP FARMS:			
Revolving accounts	100	---	---
Merchants or dealers	---	100	---
Production Credit Association	80	20	---
Banks	55	15	30
Federal Land Banks	---	---	100
Insurance Companies	---	---	100
Farmers Home Administration	12	38	50
Other	---	100	---
LIVESTOCK FARMS:			
Revolving accounts	100	---	---
Merchants or dealers	---	100	---
Production Credit Association	20	80	---
Banks	15	55	30
Individuals	---	---	100
Federal Land Banks	---	---	100
Insurance Companies	---	---	100
Farmers Home Administration	12	38	50
Other	---	100	---

Source: "Net Worth, Cash Flows, and Ratios on Telfarmers, 1980." Proctor, M. and S.B. Nott. Department of Agricultural Economics, Michigan State University, East Lansing, Michigan. AEC Report #391, June, 1982. page 10.

This class of liability is usually incurred to purchase assets used in farm production. For example, borrowing money for the purchase of machinery would result in an intermediate liability.

c. Long-term Liabilities

Long-term liabilities are those that have long (10-30 years) repayment schedules. Most commonly long-term debt arises from mortgage loans on real estate.

A-3. Net Worth

Net worth also known as owner's equity is the difference between total assets and total liabilities. It represents the amount of equity the owner(s) have in the business. The greater liabilities are in relation to assets, the lower net worth will be.

B. Income Statement

The income statement is very useful in financial analysis. It summarizes the profitability of business operations over a specified period of time. The income statement is a record of all revenue and expense items for the business. The difference between gross profit and total expenses is the net farm income before taxes. The income statements used in the Telfarm data calculate gross profit, total expenses, and net farm income before taxes.

B-1. Gross Profit

Gross profit equals sales minus purchases for feed purchases and feeder livestock plus or minus changes in inventories. With gross profit, focus is on sales in relation to the costs of production.

B-2. Expenses

There are two primary types of expenses; variable and fixed. Variable expenses are also referred to as operating expenses because they are dependent on the level of production. Fixed expenses on the other hand, arise from ownership and will remain with or without production. Fixed expenses can only be eliminated through liquidation or other transfer of ownership.

B-3. Net Farm Income

Net farm income is the excess of gross profit over total expenses. "It is a measure that indicates the farm's long-run ability to survive and determine profitability."[16]

The Telfarm data used in this study calculates net farm income before taxes. However, there is no change in before and after-tax average net farm income for the data except for hog farms in 1982. On average, the only enterprise that showed any profit from 1981 through 1983 were the hog farms. All other farm types averaged had net losses in 1981, 1982, and 1983.

C. Cash Flow

Cash flow focuses on how cash is generated and used and on the farm's ability to meet its debt repayment schedule. As such, it is used for short-term purposes. It is not intended for long-term solvency evaluation. However, for highly leveraged farms the key to survival may well be the ability to generate positive cash flows in order to repay debts in the long-run.

C-1. Current Cash Flow Problems

One of the major concerns of highly leveraged farms is that many have been unable to generate positive cash flows for the last two or three years due largely to low farm prices and high debt levels. The result has been that many of these farmers have not been able to meet their debt repayment schedules. The lenders of these farmers have refinanced the loans, but now must receive payment or they may be forced to seek foreclosure or partial liquidation of those who can not pay.

C-2. Alternatives to Improve Cash Flows

Different alternatives are available to different farmers depending upon their individual circumstances. Table 2-2 on the following page is a list of the alternatives that should be considered for improving cash flow and/or reducing debt levels.

TABLE 2-2: Proposed Financial Alternatives to Improve Cash Flow and/or Reduce Debt

1. Refinance debt to longer term.
2. Refinance debt through Fm.H.A. at subsidized interest rate loans.
3. Partial liquidation of assets/debts.
4. Increased farm prices for commodities.
5. Off-farm income.
6. Evaluate purchase versus production of feed for livestock.
7. Leaning out of unnecessary expenses.
8. Cooperative buying of agricultural inputs.
9. Analyze lease versus purchase options.
10. Consider organizational structural changes.
11. Evaluate cost of share versus cash rent.
12. Use of P.A. 116 to reduce property tax requirements.
13. Off-farm equity capital.
14. Match liability maturity with asset liquidity.
15. Complete liquidation.
16. Debt repayment deferred.
17. Renegotiation.

While Table 2-2 is not all inclusive, it does include alternatives that are realistic and for the most part readily available. As the current situation develops other alternatives may be unveiled out of creativity and necessity.

The affects of the alternatives can be simulated with the use of computer programming. Evaluation of changes may be assisted by the use of financial ratio analysis.

D. Financial Ratios

Financial ratios are a means of summarizing the financial statements. They are commonly grouped into four categories. These categories are:

1. Liquidity
2. Profitability
3. Activity
4. Leverage

D-1. Liquidity Ratios

Liquidity ratios provide an indication of the business' ability to meet short-term obligations. The three most common liquidity ratios are: 1) current; 2) quick; and 3) net working capital. These ratios are calculated from information found on the balance sheet.

a. Current Ratio

The current ratio is the quotient of current assets divided by current liabilities. A current

ratio with a value less than 1.0 indicates that current assets are not sufficient to pay current liabilities.

b. Quick Ratio

The quick ratio or acid test ratio is a measure of very short-term solvency. It divides monetary assets (current assets minus inventories) by current liabilities. A low quick ratio may mean that there is an insufficient margin between liquid assets and short-term debt obligations.

c. Net Working Capital

Net working capital is not a ratio but is the difference between current assets and current liabilities. It is an important number because it summarizes the sources and uses of funds. Sources typically are funds from operations, sale of assets, and financing. Uses of funds are family living withdrawals, loan payments and capital purchases.

D-2. Profitability Ratios

Profitability ratios measure the return earned on invested capital. They indicate how profitable the business operations have been. Monitoring these ratios over time can provide management with useful information regarding future performance of the business.

Most of the information needed to calculate profitability ratios come from the income statement. Other information is provided from the balance sheet. The profitability ratios used in this study are:

- o sales to net working capital
- o profit as percent of sales
- o return on net worth
- o percent change in gross farm profit
- o percent change in sales
- o operating ratio
- o interest to gross farm profit

a. Sales to Net Working Capital

It is difficult to compare sales to assets because the book value of assets is dependent upon the age of assets and the depreciation method.[17] For this reason sales to net working capital is used to provide a measure of the volume of business generated from a specified capital base.

b. Profit as Percent of Sales

Profit after taxes is normally used as the numerator for this ratio. Profit before taxes is used as the numerator in Chapters II and III because after tax figures are unavailable. This poses no problem because net losses occurred in eight out of nine average income statements analyzed. The profit as

percent of sales provides an indication of the profit margin on sales.

c. Return on Net Worth

Return on net worth is normally the ratio of profit after taxes divided by net worth (owner's equity). Profit before taxes is substituted for after tax profit for the reason sighted above.

d. Percent Change in Gross Farm Profit

This ratio provides an indication of the trend in gross farm profit. By dividing the current year's gross farm profit by the previous year's gross farm profit and subtracting 1 from the result, the annual change (decimal form) in gross profit is determined.

e. Percent Change in Sales

This ratio tells how sales have been changing from period to period. By dividing the current year's sales by the previous year's sales and subtracting 1 from the result, the annual change (decimal form) in sales is determined.

f. Operating Ratio

The operating ratio measures how much of the gross farm profit is needed to meet total operating expenses. The larger the ratio, the more gross farm profit is consumed by operating expenses. If the

ratio is greater than 1.0, gross farm profit is insufficient to cover total operating expenses.

g. Interest to Gross Farm Profit

The ratio of interest to gross farm profit measures the portion of gross farm profit required to pay interest expense. The higher the debt level, the higher this ratio will be because as debt increases the amount of interest due usually increases.

D-3. Activity Ratios

Activity ratios can be used to determine how well assets are employed. The more that assets are used effectively, the less the need for financing. This results in less interest expense and a higher return on assets.

a. Fixed Asset Ratio

The fixed asset ratio measures the turnover on fixed assets. It is calculated by dividing sales by fixed assets. An increase in sales with fixed assets held constant would indicate more utilization from fixed assets.

b. Total Asset Turnover

Similar to the fixed asset ratio, dividing sales by total assets, provides a turnover measure indicating how well all assets are employed by the farm.

D-4. Leverage Ratios

Leverage ratios measure the proportion of borrowed funds in relation to funds supplied by the owner. For profitable businesses the use of debt financing will enhance the return on total assets. However, debt increases the riskiness of the farm and, if used excessively can create financial stress.

a. Debt Ratio

The debt ratio tells how much of the total value of the farm is supplied by creditors. Total liabilities divided by total assets equals the debt ratio. With the debt ratio, focus is on the long-term solvency of the farm.

b. Debt-to-Equity Ratio

Debt-to-equity is another way of measuring the long-term solvency of the farm. It is the ratio of total liabilities to net worth. For highly leveraged farms the debt-to-equity ratio will be substantially greater than 1. This means that the equity in a highly leverage farm will not support "hard times" for very long.

c. Times Interest Earned

Times interest earned measures the extent that interest expense is covered by income. The ratio is found by first adding net cash income, interest

expense and non-farm income together. Then subtract family living withdrawals. Divide the total by the amount of interest expense. Any amount less than 1.0 means that interest expense can not be paid entirely from income.

D-5. Summary of Financial Ratios

There are no rules that dictate what "acceptable" ratios should be. Therefore, determining the financial situation of a farm or other business through ratio analysis is subjective. The real value of ratio analysis is its ability to show how the individual ratios change over time.

Table 2-3 on page 30 summarizes the financial ratios presented in this chapter. Each ratio is listed with its corresponding mathematical formula and brief explanation. Multiplying the formulas for the profitability ratios by 100 will show the ratios in percent.

TABLE 2-3: Summary of Financial Ratios

Liquidity Ratios	Formula	Description
Current Ratio	current assets/current liabilities	Short-term solvency
Quick Ratio	$\frac{\text{current assets - inventories}}{\text{current liabilities}}$	Very short-term solvency
Net Working Capital	current assets-current liabilities	Cash reserve
Profitability Ratios		
Sales to Net Working Capital	sales / net working capital	Measures business volume
Profit as Percent of Sales	net income / sales	Profit margin on sales
Return on Net Worth	net income / net worth	Return on owner's investment
Percent Change in Gross Profit	$\frac{\text{gross farm profit (t)}}{\text{gross farm profit (t-1)}} - 1$	Growth of gross profit
Percent Change in Sales	$\frac{\text{sales (t)}}{\text{sales (t-1)}} - 1$	Growth of Sales
Operating Ratio	$\frac{\text{total operating expenses}}{\text{gross farm profit}}$	Gross profit needed for expenses
Interest to Gross Profit	interest expense/gross farm profit	Gross profit needed for interest
Activity Ratios		
Fixed Asset Ratio	sales / fixed assets	Turnover on fixed assets
Total Asset Turnover	sales / total assets	Turnover on total assets
Leverage Ratios		
Debt Ratio	total liabilities/total assets	Funds provided by creditors
Debt-to-Equity	total liabilities/net worth	Long-term solvency
Times Interest Earned	$\frac{\text{net cash income + interest + nonfarm income - withdrawals}}{\text{interest}}$	Ability to meet current debt

CHAPTER III

Financial Description and Preliminary Analysis of Average Highly Leveraged Farm Types

A. Introduction

The focus of this chapter is on the financial situation of three farm types in Michigan, from 1981 through 1983. Each of the three farm types include only farms which had debt ratios (total liabilities divided by total assets) of seventy percent (70%) or greater in 1983 and were clients of the Telfarm record keeping project sponsored by the Michigan State University Cooperative Extension Service from 1981-83. The three types analyzed are cash grain, hog and dairy farms.

B. Caveats

Before the financial analyses are presented, it is advisable to point out the potential problems of the data which may bias the analyses.

1. Only 3 years are included in the data. In addition, the three year period (1981-83) was the worst for agriculture in recent history.
2. The farms analyzed were all highly leveraged. The high degree of leverage tends to place more burden on these farms than the average Michigan farm because of large debt servicing obligations.

3. Telfarmers have larger farms than average, when compared to census data.
4. Many farmers on Telfarm are inconsistent with their financial reporting.
5. The financial statements analyzed in this chapter are averages taken from each of the three farm types. Therefore, some changes in the financial statements may be the result of using averages.
6. The data includes a total of thirty-one farms, which is about 5% of all farms on Telfarm in 1983.
7. Telfarm is not a double entry accounting system, which means there is no cash flow reconciliation statement. This combined with the fact that not all farmers report data for all cash flow entries makes it impossible to construct a cash flow reconciliation statement using averages.

C. Average Farm Size

The number of farms included in this report are shown on Table 3-1. The number of tillable acres are three-year averages for each farm type.

The cash grain farm type also includes farms classified as Saginaw Valley because both types are cash crop. Dairy farms include both northern and southern specialized dairy farms.

TABLE 3-1: Farms Studied by Type, Number and Size

Farm Type	Number Averaged	Tillable Acres Owned	Tillable Acres Rented
Cash Grain	7	185*	488
Swine	7	259*	174
Dairy	17	180	158

*Adjusted for inconsistencies in data.

D. Purpose of Analyzing Average Farm Types

The purpose of this chapter is to introduce the reader to the general financial situation that highly leveraged Telfarmers experienced from 1981 to 1983 in order to get an idea of why they have experienced financial stress over this period. It is not intended to be used as a basis for determining financial alternatives for these farm types, but rather as a means of conveying how several highly leveraged farm types have survived amidst high debt levels with little or no income.

E. Individual Analyses

The remainder of this chapter analyzes the balance sheets, income statements, cash flow summaries and financial ratios for the three farm types over the three year period. The differences in the farm types require that each be analyzed independent of the other two, so as to provide a more comprehensive and meaningful analysis.

To be consistent in the analyses of the average highly leveraged farm types in this chapter and the case studies in the following chapter, estimated market values were used in the determination of the values of machinery and equipment. The case studies used market values of machinery and equipment to determine the value of total assets whereas the averages used book values. The difference occurs because some Telfarmers use market values while others use book values. Therefore, to determine the estimated market value of machinery and equipment for the average farm types, the average increase in market value over book value was calculated for those farmers who reported market values. This amount was added to the average book value for the corresponding farm type.

F. Analysis of Highly Leveraged Cash Grain Farms

F-1. Cash Grain Balance Sheets

a. Assets

According to the values shown on the average balance sheets for 1981-83, highly leveraged cash grain farms have increased their amount of total assets. Table 3-2, on page 35 shows the average balance sheets on highly leveraged cash grain farms for 1981- 83. Total assets were $546,291, $592,977 and $629,251 in 1981, 1982 and 1983, respectively.

TABLE 3-2: Average Balance Sheets On Cash Grain Farms, 1981-83
Telfarmers, For Year Ended December 31, 19XX

ASSETS	1981	1982	1983
Current Assets	$	$	$
Cash	5023	3456	20042
Crops	25910	19525	15732
Feed	34430	48146	23623
Supplies	4020	10631	7070
Total Current Assets	69383	81758	66467
Intermediate Assets			
Accounts Receivable	0	1168	29243
Machinery & Equipment (Market Value)	144322	134751	155925
Non-farm Business Assets	2643	2643	0
Household Assets	0	0	4857
Total Intermediate Assets	146965	138562	190025
Fixed Assets			
Estimated Value of Real Estate	329943	372657	372759
TOTAL ASSETS	546291	592977	629251
LIABILITIES & NET WORTH			
Current Liabilities			
Accounts Payable	857	0	0
Production Credit Association	2871	3211	15396
Banks	28632	51963	56305
Farmers Home Administration	6849	7656	9017
Total Current Liabilities	39209	62830	80718
Intermediate Liabilities			
Merchants & Dealers	1353	3789	52
Production Credit Association	718	803	3849
Banks	7812	14172	15356
Farmers Home Administration	21690	24244	28553
Other Credit Institutions	38614	54323	27693
Total Intermediate Liabilities	70187	97331	75503
Long-term Liabilities			
Banks	15618	28344	30712
Farmers Home Administration	28539	31901	37570
Insurance Companies	44	0	0
Individuals	196927	166192	201937
Federal Land Banks	96068	73714	72244
Total Long-term Liabilities	337196	300151	342463
TOTAL LIABILITIES	446592	460312	498684
Net Worth	99699	132665	130567
TOTAL LIABILITIES & NET WORTH	546291	592977	629251

The increase in the value of total assets from 1981 to 1982 was $46,686. This increase was due to changes in each asset category. Current assets increased by $12,375 primarily because of build-ups of feed and supplies inventories. Intermediate assets declined by $8,403 because of a decline in the estimated market value of machinery and equipment. The estimated value of real estate rose $42,714 but the reason for this increase is not apparent. It may just be due to a change in the values estimated for land, residence and/or buildings and improvements.

The increase in the value of total assets from 1982 to 1983 was $36,274. This increase was the result of changes in current and intermediate assets ($102 change in fixed assets). Current assets declined by $15,291 because of lower values for all inventory items. Combining this with the substantial increase in the amount of cash would suggest a large liquidation of inventories. Other evidence of this is the $51,463 increase in intermediate assets which resulted mainly from a $28,075 increase in accounts receivable.

b. Liabilities

Over the period total liabilities also increased continuously. Total liabilities were $446,592 in

1981, $460,312 in 1982 and $498,684 in 1983. Current, intermediate and long-term debt all increased from 1981 through 1983, indicating more strain on cash flow.

The increase in total liabilities from 1981 to 1982 was $13,720. This increase was due to a $23,621 increase in current liabilities, a $27,144 increase in intermediate liabilities and a $37,045 decrease in long-term liabilities.

Current liabilities increased mostly because of increased borrowing from banks, probably in the form of operating loans. Intermediate liabilities showed increased borrowing from all sources, with the largest portion from banks and others. Offsetting these increases, long-term liabilities declined because of the repayment of principal to individuals on land contracts and the Federal Land Banks on real estate.

Between 1982 and 1983 total liabilities increased by $38,372. This resulted from a $17,888 increase in current liabilities, a $21,828 decrease in intermediate liabilities and a $42,312 increase in long-term liabilities.

Current liabilities increased because of increased borrowing from all operating sources. Although the decline in intermediate liabilities was

partially due to repayment to merchants and dealers for equipment, it is suspected that the majority of the decline resulted from a change in the reporting of liabilities by farmers from other credit institutions to various long-term sources. This would also explain most of the increase in long-term liabilities.

c. Net Worth

Net worth increased from $99,699 in 1981 to $132,665 in 1982 and decreased to $130,567 in 1983. Therefore, the increased use of debt financing has been beneficial in terms of equity for cash grain Telfarmers on average. However, these changes in net worth are based on estimated values of machinery and equipment and fixed assets. As such, changes in the market values have a direct affect on net worth. It might be noted that if machinery and equipment and buildings and improvements were valued at book value and land and residence at cost, total liabilities would have been greater than total assets in all three years, resulting in technical insolvency throughout the period.

F-2. Cash Grain Income Statements

Net farm income was negative each year, meaning that highly leveraged cash grain farms had net losses, on average over the three years analyzed. Table 3-3, on page

40 shows that the average net farm income for 1981, 1982 and 1983 was -$29,579, -$62,531 and -$49,285, respectively.

a. Gross Profit

Gross profit was $135,030 in 1981. This value declined to $119,882 in 1982. In 1983, sales increased which resulted in a gross profit of $146,907.

b. Total Expenses

Total expenses when adjusted for increases in prepaid expenses increased each year. The amounts spent on operating expenses were $165,544, $189,024 and $192,797 for 1981, 1982 and 1983, respectively.

The increase in total expenses before prepaid expenses from 1981 to 1982 was $23,480. One reason for this increase was due to an increase in the number of tillable acres farmed. Total tillable acres (owned and rented) increased from 620 in 1981 to 694 in 1982. Of these totals, the number of rented acres increased from 436 to 510. (No increase in owned acres.) This caused land lease to increase by $11,020. Most other variable expenses increased as would be expected. With the exception of rent expense, interest expense increased the most ($10,956).

Total expenses continued to increase in 1983, but by only $3,771 before prepaid expenses. In 1983, the

TABLE 3-3: Average Income Statements On Cash Grain Farms, 1981-83 Telfarmers, For Year Ended December 31, 19XX

INCOME	1981	1982	1983
	$	$	$
Sales	124813	116525	173706
Purchases	1734	420	2057
Beginning Inventory	48526	60477	64254
Ending Inventory	60477	64254	39512
Gross Profit	135030	119882	146907
EXPENSES			
Hired Labor	4456	6223	5926
Repairs, Maintenance, Tools	10896	11108	11035
Fuel, Oil & Grease	10321	8477	8423
Custom Hire & Lease	9344	9239	8032
Conservation	1064	592	225
Insurance	1189	1181	1416
Building & Land Lease	14878	25898	26970
Fertilizer & Lime	27293	28372	23004
Crop Supplies & Packages	995	365	369
Seed, Plants & Trees	8976	6963	8926
Chemicals	10080	10998	11058
Crop Marketing	1413	1206	414
Other Crop Expense	3919	3701	2011
Feed, Supplements & Additives	70	36	40
Semen & Breeding Fees	0	0	0
Veterinarian,Medicine, & Drugs	0	0	0
Livestock Marketing, Etc.	0	0	0
Livestock Supplies & Other	0	0	0
Property Taxes	4042	3948	6313
Utilities	1433	1896	1946
Interest	29595	40551	48726
Depreciation	23866	24936	26004
Miscellaneous	1714	3334	1959
Total Expenses	165544	189024	192797
Less: Increase in Prepaid Expenses	-935	-6611	3395
Adjusted Total Expenses	164609	182413	196192
NET FARM INCOME BEFORE TAXES	-29579	-62531	-49285

major increase in expenses was due to interest expense ($8,175 increase). This increase was offset by declines in many of the variable expenses although the number of tillable acres increased to 709 (owned and rented).

c. Net Farm Income

In spite of the increase in sales, gross profit and size of operations, net losses increased from 1981 to 1983. However, converting net losses to net incomes would require more than improved operating performance.

F-3. Cash Grain Cash Flows

As it was pointed out at the beginning of this chapter, it is not possible to construct a representative cash flow statement based on averages because of the lack of data provided by individual cash grain farmers. Therefore, only the cash receipts and cash expenses are used in this analysis. The remainder of the cash flow statement is presented on Table 3-4 (page 42) as reported. It is not intended to be used for analytical purposes, but rather to point out some of the inconsistencies reported.

The net cash incomes shown on the average cash flow summary show net cash incomes of -$18,640, -$48,308 and $4,858 for 1981, 1982 and 1983 respectively. These values indicate that no money was available to pay for family

TABLE 3-4: Average Cash Flow Summary On Cash Grain Farms, 1981-83 Telfarmers, For Year Ended December 31, 19XX

	1981	1982	1983
Cash Receipts	$	$	$
Operating Receipts	124691	116200	173706
Resale Items Sold	0	0	0
Raised Livestock Sold	83	0	0
Depreciable Livestock Sold	0	0	0
Total Farm Cash Receipts	124774	116200	173706
Minus			
Operating Expenses (including interest)	141680	164088	166791
Resale Items Purchased	1734	420	2057
Depreciable Livestock Purchased	0	0	0
Total Farm Cash Expenses	143414	164508	168848
NET CASH INCOME	-18640	-48308	4858
Plus			
Machinery Sales	5871	7659	8875
Improvement Sales	5907	229	6964
Land Sales	0	0	5649
Non-farm Capital Investment Sales	0	0	0
Total Capital Sales	11778	7888	21488
Minus			
Machinery Purchases	38871	23044	37858
Improvement Purchases	10677	6361	1397
Land Purchases	27943	0	8517
Non-farm Capital Purchases	0	0	0
Total Capital Purchases	77491	29405	47772
Plus			
Net Non-farm Income	10886	11492	6299
Plus			
New Money Borrowed	201595	198211	162472
Decrease in Receivables	24810	18224	21520
Minus			
Principal Paid	134275	141424	131822
Increase in Receivables	19512	16208	47435
Decrease in Amount Owed	-72618	-58803	-4735
Minus			
Family Living Withdrawals	12296	11664	11167
Plus			
Cash on January 1	4142	5023	3456
Minus			
Cash on December 31	5023	3456	20042
Net Change in Cash on Hand	-881	1567	-16586
NET CASH FLOW	-14026	-9627	-38145

labor, principal payments or capital purchases in 1981 or 1982. A small amount ($4858) was available for such purposes in 1983. Certain capital purchases were made each year as the changes in the liability structure implies. As such, it is assumed that any capital purchases were made possible by borrowing additional money.

F-4. Financial Ratios on Cash Grain Farms

The financial ratios derived from the financial statements on the average highly leveraged cash grain farm for 1981-83 are provided on Table 3-5 on page 44.

The liquidity ratios indicate a decline in liquidity, as measured by the current ratio. In 1983 the current ratio slipped below 1.0, meaning that current liabilities could not be entirely paid from the sale of current assets. Net working capital also shows the decline in liquidity with the continued decline from one year to the next.

Profitability ratios for highly leveraged cash grain farms are representative of the poor income generation that remained throughout the period. Sales to net working capital plummetted to -12.19 because net working capital was negative in that year. Profit as percent of sales and return on net worth were negative each year and worsened over the period. Gross profit and sales both declined in 1982, but grew rapidly in 1983. While growth is desirable,

TABLE 3-5: Average Financial Ratios On
Cash Grain Farms, 1981-83
Telfarmers, For Year Ended December 31, 19XX

	1981	1982	1983
LIQUIDITY RATIOS			
Current Ratio	1.77	1.30	0.82
Quick Ratio	0.13	0.06	0.25
Net Working Capital	$ 30174	$ 18928	$ 14251
PROFITABILITY RATIOS			
Sales to Net Working Capital	4.14	6.16	-12.19
Profit As Percent of Sales	-0.24	-0.54	-0.28
Return on Net Worth	-0.30	-0.46	-0.38
Percent Change in Gross Profit	--	-0.11	0.23
Percent Change in Sales	--	-0.07	0.49
Operating Ratio	1.22	1.52	1.34
Interest to Gross Farm Profit	0.22	0.34	0.33
ACTIVITY RATIOS			
Fixed Asset Ratio	0.38	0.31	0.47
Total Asset Turnover	0.23	0.20	0.28
LEVERAGE RATIOS			
Debt Ratio	0.82	0.78	0.79
Debt-to-Equity	4.48	3.42	3.82
Times Interest Earned	0.32	-0.20	1.00

steady increases or stability are much more favorable than volatile ups and downs. The operating ratio indicates gross profit was inadequate to cover total operating expenses in any year. Interest to gross profit increased over the period by 11%, indicating that interest is consuming a larger portion of gross profit.

The activity ratios suggest that invested capital has not been used very efficiently. The large increase in the fixed asset ratio from 1982 to 1983 was probably the result of the large increase in sales volume which occurred at that time.

The leverage ratios have improved slightly from 1981 to 1983. The debt ratio declined by 3%, showing a small growth in equity. Debt-to-equity also declined as would be expected with a decrease in the debt ratio. Lastly, the times interest earned ratio increased from 0.32 to 1.00. The 1.00 in 1983 means that current debt payments can just be met.

F-5. Summary of Cash Grain Farm Finances

Balance sheet figures show that the average total assets on highly leveraged cash grain farms increased from 1981-83. The annual increases however result from appreciation in the estimated values of machinery and equipment and real estate which may not be realizable values. It would seem that lenders agreed with the market

value estimates, assuming these assets are used as loan collateral. The result of the increase in assets and equities was a decline in the debt ratio meaning less debt for a larger business.

Net farm income before taxes was negative in each of the three years, indicating concern with the ability of highly leveraged cash grain farms to repay their debts.

Unless net losses can be reduced, or more favorably eliminated for the most part and cash income improved, some of the farms averaged may be forced to liquidate. The financial ratios lead to the same conclusion, but in a more concise form.

G. Analysis of Highly Leveraged Hog Farms

G-1. Hog Farm Balance Sheets

a. Assets

The average balance sheet figures on highly leveraged hog farms for 1981-83 are provided on Table 3-6. The amount of total assets was virtually unchanged from 1981 to 1983 but was about $48,000 greater in 1982 than in either 1981 or 1983. The value of total assets averaged $419,493 in 1981, $468,316 in 1982 and $420,350 in 1983.

The $48,823 increase from 1981 to 1982 resulted from a combination of increases in current, intermediate and fixed assets. The $10,765 increase

TABLE 3-6: Average Balance Sheets On Hog Farms, 1981-83
Telfarmers, For Year Ended December 31, 19XX

ASSETS	1981	1982	1983
Current Assets	$	$	$
Cash	3590	3777	2966
Crops	3941	4697	4446
Feed	44582	48973	34454
Supplies	347	205	237
Purchased Feeders	3970	128	71
Feeder Pigs	981	1525	2747
Market Hogs	39791	48662	43266
Total Current Assets	97202	107967	88187
Intermediate Assets			
Accounts Receivable	3175	3251	2426
Sows	17208	19518	10129
Gilts	8395	14208	18361
Boars	3146	3561	2921
Machinery & Equipment (Market Value)	150581	158740	134821
Non-farm Business Assets	0	0	0
Household Assets	1000	1000	387
Total Intermediate Assets	183505	200278	169045
Fixed Assets			
Estimated Value of Real Estate	138786	160071	163118
TOTAL ASSETS	419493	468316	420350
LIABILITIES & NET WORTH			
Current Liabilities			
Accounts Payable	1413	721	2363
Production Credit Association	12066	12782	12665
Banks	4620	4500	4896
Farmers Home Administration	8925	9052	9255
Total Current Liabilities	27024	27055	29179
Intermediate Liabilities			
Merchants & Dealers	466	377	163
Production Credit Association	48265	51130	50660
Banks	16939	16500	17952
Farmers Home Administration	28263	28664	29309
Other Credit Institutions	478	10172	14872
Total Intermediate Liabilities	94411	106843	112956
Long-term Liabilities			
Banks	9240	9000	9792
Farmers Home Administration	37188	37716	38564
Insurance Companies	0	0	0
Individuals	34525	34359	52377
Federal Land Banks	64662	66730	72414
Total Long-term Liabilities	145615	147805	173147
TOTAL LIABILITIES	267050	281703	315282
Net Worth	152443	186613	105068
TOTAL LIABILITIES & NET WORTH	419493	468316	420350

in current assets was due primarily because of an increase in the value of market hogs. Intermediate assets increased by $16,773 in 1982. Note that all intermediate assets except household assets showed increases in 1982 over 1981. Also note the largest increase in 1982 was in the market value of machinery and equipment which is only an estimate. The estimated value of real estate also increased. The $21,285 increase in the estimated value of real estate was partially due to purchases of improvements, but more of the increase was based on appreciation of fixed assets.

Total assets declined in 1983 to $420,350 because of substantial declines in both current and intermediate assets. Current assets declined $19,780 in 1983. This decline resulted mainly because of a $14,519 decrease in the value of feed. This may have resulted from lower inventories and/or prices.

Intermediate assets declined by $31,233. This resulted from declines in all intermediate assets, except for the value of gilts. As in 1982, the largest change was in the estimated value of machinery and equipment. The $23,919 decline in the value of machinery and equipment is assumed to reflect declines due to depreciation and market values.

To offset the declines in current and intermediate assets long-term assets increased, but the $3,047 increase hardly influences the other declines.

b. Liabilities

Total liabilities increased continuously throughout the period. Total liabilities were $267,050, $281,703, and $315,282 in 1981, 1982 and 1983. These increases are sums of increases of each class of liability.

The increase in total liabilities of $14,653 in 1982 was fueled mostly from the $12,432 increase in intermediate liabilities. This increase was due to increased amounts owed to the Production Credit Association, Farmers Home Administration and other credit institutions. Of these, Others increased the most which may just be because of poor accounting on the part of some Telfarmers. The remainder of the increase in total liabilities was caused by a $2,190 increase in long-term liabilities, which resulted mostly from increased amounts owed to the Federal Land Banks.

The amount of total liabilities increased by $33,579 to $315,282 in 1983. Current liabilities

increased $2,124. Intermediate liabilities increased $6,113. Long-term liabilities increased $25,342.

The small increases in current and intermediate liabilities is of little concern. It was the increase in long-term debt that really pushed the debt level up in 1983. From the balance sheet, it can be seen that all long-term lenders had increased amounts owed to them, particularly individuals. Because no other lenders had declines, this increase is not due to a change in creditors. In addition, an average increase of 48 acres was reported in 1983. This would imply that one or more of the farmers purchased land on a land contract in 1983. This is in fact true and will be evident in the following chapter when the hog farm case is presented.

c. Net Worth

As a result of increased debt, combined with the increase in total assets, net worth increased from $152,443 in 1981 by $34,170 to $186,613 in 1982. This value decreased in 1983 by $81,545 to $105,068 for two reasons. One was the decline in the value of total assets. The other was the increase in the amount of total debt.

G-2. Hog Farm Income Statements

Net farm income before taxes was negative in 1981 (-$24,241); positive in 1982 ($34,900) and negative in 1983 (-$17,085). Table 3-7 on page 52 shows the average income statements on highly leveraged hog farms from 1981-83.

a. Gross Profit

Gross farm profit increased from $186,520 in 1981 to $275,448 in 1982. This increase of $88,928 in 1982 was attributed to a $59,535 increase in sales. The remainder of this increase resulted from declines in purchases ($2,880) and beginning inventories ($7,381).

b. Total Expenses

Adjusted total expenses increased by $29,787 from 1981 to 1982. This value declined by $2,365 in 1983.

The increase in 1982 appears to have occurred for three reasons. One was an expansion in crop production, as evidenced by increases in repairs and maintenance, fuel, custom hire and lease, seed, chemicals and other crop expense. The second reason was increased amounts spent on livestock. This can be substantiated by increased feed, veterinarian, livestock supplies and utilities. The third reason for the increase in 1982 was because property taxes and interest expense increased. This would imply some land purchases in 1982. The number of owned

TABLE 3-7: Average Income Statements On Hog Farms, 1981-83
Telfarmers, For Year Ended December 31, 19XX

INCOME	1981	1982	1983
	$	$	$
Sales	200022	259557	250057
Purchases	6121	3241	3702
Beginning Inventory	129467	122086	141763
Ending Inventory	122086	141218	116506
Gross Profit	186520	275448	221098
EXPENSES			
Hired Labor	9291	8886	10061
Repairs, Maintenance, Tools	10380	11879	9255
Fuel, Oil & Grease	5684	6570	5729
Custom Hire & Lease	2662	4625	4132
Conservation	499	823	79
Insurance	1431	1455	1442
Building & Land Lease	6234	7643	9495
Fertilizer & Lime	18308	15334	13433
Crop Supplies & Packages	300	64	46
Seed, Plants & Trees	5777	7363	3668
Chemicals	5419	7670	4698
Crop Marketing	584	740	526
Other Crop Expense	2164	2983	2326
Feed, Supplements & Additives	72568	80972	96845
Semen & Breeding Fees	0	0	0
Veterinarian,Medicine, & Drugs	4583	8071	8123
Livestock Marketing, Etc.	652	799	729
Livestock Supplies & Other	506	752	1170
Property Taxes	4270	7802	5883
Utilities	2393	3348	2477
Interest	32770	36458	31836
Depreciation	21735	22646	23538
Miscellaneous	2501	3522	2819
Total Expenses	210711	240405	238310
Less: Increase in Prepaid Expenses	50	143	-127
Adjusted Total Expenses	210761	240548	238183
NET FARM INCOME BEFORE TAXES	-24241	34900	-17085

acres was reported to have increased from 242 in 1981 to 390 in 1982. Therefore, it is assumed that property taxes and interest went up in 1982 because of land purchases.

The small decline in total expenses during 1983 looks as though it resulted for one thing from a shift in crop production for feed to purchased feed. Some proof of this is the decline in all crop related expenses except hired labor (which may increase for other reasons) and building and land lease. Other evidence is the $15,873 increase in the amount of purchased feed. The net change between crop production expenses, which includes expenses on the income statement from hired labor to other crop expenses and feed, supplements and additives expense was an increase of $4,728.

Property taxes declined by nearly $2,000 in 1983 probably because of tax deferment assuming the farmers who purchased land enrolled in P.A. 116 (Farmland Preservation Act).

The other significant change in expenses that occurred in 1983 was a $4,622 drop in interest expense. This may have occurred because one or more of the farms missed some interest payments and/or

certain loans were renegotiated at lower interest rates.

c. Net Farm Income

The changes that occurred in gross profit and operating expenses led to improved profitability over the period, with the best year being 1982. The $34,900 of net farm income in 1982 was directly related to the market price of hogs increasing in that year. In addition, crop prices fell which would reduce total feed costs per hog.

G-3. Hog Farm Cash Flows

The average net cash income on highly leveraged hog farms was $4,859, $38,499 and $31,370 in 1981, 1982 and 1983, respectively. Consecutive positive values mean that these amounts were available to pay for family labor, principal payments and capital purchases. Table 3-8 on page 55 shows the cash flow summary for highly leveraged hog farms from 1981-83.

The $33,640 increase in net cash income in 1982 was the result of increased cash from operations combined with more value from sales of raised livestock, both of which are due to higher hog prices. To offset the increase in cash receipts, operating expenses increased $28,843.

In 1983 net cash income declined some ($7,129) because resale items and raised livestock sold both fell as a

TABLE 3-8: Average Cash Flow Summary On Hog Farms, 1981-83
Telfarmers, For Year Ended December 31, 19XX

Cash Receipts	1981 $	1982 $	1983 $
Operating Receipts	169246	209286	220042
Resale Items Sold	11030	8002	2612
Raised Livestock Sold	17531	40627	25322
Depreciable Livestock Sold	2152	1583	1867
Total Farm Cash Receipts	199959	259498	249843
Minus			
Operating Expenses (including interest)	189052	217895	215924
Resale Items Purchased	2442	943	1142
Depreciable Livestock Purchased	3606	2161	1407
Total Farm Cash Expenses	195100	220999	218473
NET CASH INCOME	4859	38499	31370
Plus			
Machinery Sales	6613	421	564
Improvement Sales	0	0	0
Land Sales	0	0	0
Non-farm Capital Investment Sales	0	0	0
Total Capital Sales	6613	421	564
Minus			
Machinery Purchases	15072	17678	9742
Improvement Purchases	995	3731	6435
Land Purchases	0	0	0
Non-farm Capital Purchases	0	0	0
Total Capital Purchases	16067	21409	16177
Plus			
Net Non-farm Income	2802	3541	7460
Plus			
New Money Borrowed	159154	162368	189577
Decrease in Receivables	302	16	127
Minus			
Principal Paid	149266	176929	184612
Increase in Receivables	174	28	171
Decrease in Amount Owed	-10016	14573	-4921
Minus			
Family Living Withdrawals	15737	17230	23232
Plus			
Cash on January 1	1707	3590	3777
Minus			
Cash on December 31	3590	3777	2966
Net Change in Cash on Hand	-1883	-187	811
NET CASH FLOW	-9397	-10938	5717

result of lower hog prices. To help improve the decline in cash receipts, cash expenses also declined primarily because of lower operating expenses.

The remainder of the cash flow summary is for illustrative purposes only. No meaningful analysis can be made from negative cash flows. And as stated earlier, it is not possible to reconcile negative cash flows from averages without double entry accounting.

G-4. Financial Ratios on Hog Farms

The average financial ratios on highly leveraged hog farms for 1981-83 are given in Table 3-9 on page 57.

The liquidity ratios all showed increased liquidity from 1981 to 1982. The reason for the increase was the increase in cash and other current assets. All liquidity ratios declined in 1983 below the ratios for 1981, indicating a decline in liquidity over the period. The reason for the declines in 1983 are due to a combination of both a decrease in the amount of current assets and an increase in the amount of current liabilities. On the positive side, the current ratios indicate that current assets could cover current liabilities more than three times in any one year. Net working capital shows that when current assets were sold to pay current liabilities adequate amounts remained each year for other purposes.

TABLE 3-9: Average Financial Ratios On Hog Farms, 1981-83 Telfarmers, For Year Ended December 31, 19XX

	1981	1982	1983
LIQUIDITY RATIOS			
Current Ratio	3.60	3.98	3.02
Quick Ratio	0.13	0.14	0.10
Net Working Capital	$ 70178	$ 80732	$ 59008
PROFITABILITY RATIOS			
Sales to Net Working Capital	2.85	3.22	4.24
Profit As Percent of Sales	-0.12	0.13	-0.07
Return on Net Worth	-0.16	0.19	-0.16
Percent Change in Gross Profit	--	0.48	-0.20
Percent Change in Sales	--	0.30	-0.04
Operating Ratio	1.13	0.87	1.08
Interest to Gross Farm Profit	0.18	0.13	0.14
ACTIVITY RATIOS			
Fixed Asset Ratio	1.44	1.62	1.53
Total Asset Turnover	0.48	0.55	0.59
LEVERAGE RATIOS			
Debt Ratio	0.64	0.60	0.75
Debt-to-Equity	1.75	1.51	3.00
Times Interest Earned	0.75	1.68	1.49

Profitability ratios produced somewhat mixed signals. Sales to net working capital increased continuously which can be interpreted as an increase in business volume. Profit as percent of sales was negative in 1981 and 1983 because of net losses in those years. It was also quite volatile because of the wide variation in sales and net income. Return on net worth was unchanged over the period because the decline in net worth was proportional to the decline in net loss. Both the percent change in gross profit and percent change in sales declined in 1983 when compared to 1982. The degree of volatility is of some concern here because these wide changes raise the question as to whether the level of gross profit and sales are sustainable over several years. The operating ratios reflect the fact that net income was earned only in 1982. Interest to gross profit declined by 4% over the period because interest expense declined slightly from 1981 to 1983, while gross profit increased.

Both activity ratios increased from 1981 to 1983. This would suggest that invested capital was used more efficiently throughout the period. The decline of the fixed asset ratio from 1982 to 1983 was the result of a decline in sales combined with an increase in the estimated value of fixed assets.

The leverage ratios indicate a pattern of decreased long-term solvency. The debt ratio increased from 64% in 1981 to 75% in 1983. The debt-to-equity ratio increased from 1.75 to 3.00 over the same time. These increases represent a higher degree of leverage when debt is compared to assets or equity. The times interest earned ratio increased from 1981 to 1983. This increase means that the ability of highly leveraged hog farms to meet current debt obligations improved over the period.

G-5. Summary of Hog Farm Finances

The balance sheet figures have shown that while total assets remained constant, total liabilities increased. This has increased the degree of leverage. Leverage as measured by the debt ratio increased from 0.64 to 0.75 over the period. Remember that the value of total assets is based on market values of machinery and equipment and real estate. Therefore, whenever market values decline as they have in the recent past, the amount of total assets will decline. Holding constant liabilities, net worth will also decline.

Net losses were reduced and 1982 even saw $34,900 in net income. The inability to maintain steady growth in net income raises questions about the continued ability of highly leveraged hog farms to earn enough profit to pay off debts in the long-run.

The financial ratios summarize the changes in profitability and increase in debt. Examination of the ratios alert one to the concern over the ability to pay back loans and improve long-term solvency.

H. Analysis of Highly Leveraged Dairy Farms

H-1. Dairy Farm Balance Sheets

a. Assets

According to the value of total assets, the average highly leveraged dairy farm declined by $14,461 from $581,383 in 1981 to $566,922 in 1983. The value of total assets in 1981 and 1982 were nearly identical with 1982 showing a value of $581,876. Table 3-10 on page 61 provides information on the average balance sheets of highly leveraged dairy farms from 1981-83.

There was no significant change in the value of total assets during 1982, although the composition of the asset structure changed. Current assets declined by $5,035 primarily because of a decline in the value of feed, which was due to lower prices associated with various feed stuffs. Intermediate assets also declined in 1982. The $9,723 decline was mostly due to lower values per dairy cow (dairy herd size was unchanged) and a decline in the estimated market value of machinery and equipment. These declines were

TABLE 3-10: Average Balance Sheets On Dairy Farms, 1981-83
Telfarmers, For Year Ended December 31, 19XX

ASSETS	19`1	1982	1983
Current Assets	$	$	$
Cash	406	531	146
Crops	1455	1809	1652
Feed	40522	36152	39742
Supplies	1400	1417	1734
Dairy Steers	778	1571	1556
Beef Calves	274	79	274
Beef Steers-Raised	106	141	124
Total Current Assets	44941	39909	43274
Intermediate Assets			
Accounts Receivable	9683	12294	12285
Dairy Cows	95743	89234	85294
Dairy Heifers (all)	35273	34677	27966
Dairy Bull	1006	1381	971
Dairy Calves	5378	5111	5228
Beef Cow	641	300	344
Beef Heifers (all)	212	335	571
Beef Bull	88	141	111
Machinery & Equipment (Market Value)	118334	113256	103321
Non-farm Business Assets	1696	1602	1509
Household Assets	0	0	0
Total Intermediate Assets	268054	258331	237600
Fixed Assets			
Estimated Value of Real Estate	268388	283636	286048
TOTAL ASSETS	581383	581876	566922
LIABILITIES & NET WORTH			
Current Liabilities			
Accounts Payable	1098	1189	2926
Production Credit Association	7224	6711	6086
Banks	2900	1941	7560
Farmers Home Administration	18025	18399	18829
Total Current Liabilities	29247	28240	35401
Intermediate Liabilities			
Merchants & Dealers	8887	2899	1768
Production Credit Association	28898	26843	24349
Banks	10632	7119	27719
Farmers Home Administration	57078	58262	59626
Other Credit Institutions	12787	28616	14304
Total Intermediate Liabilities	118282	123739	127756
Long-term Liabilities			
Banks	5799	3883	15120
Farmers Home Administration	75103	76661	78456
Insurance Companies	449	172	494
Individuals	62263	67601	76167
Federal Land Banks	99834	110462	120168
Total Long-term Liabilities	243448	258779	290405
TOTAL LIABILITIES	390977	410758	453572
Net Worth	190406	171118	113350
TOTAL LIABILITIES & NET WORTH	581383	581876	566922

offset by a $15,248 increase in the estimated value of real estate.

During 1983 the value of total assets declined by $14,954 from the previous year. This decline was also a result of changes in the asset structure. While current and fixed assets increased by $3,368 and $2,412, respectively, intermediate assets fell by $17,246. The reason that intermediate assets decreased by so much was the value of dairy cows (no change in herd size), dairy heifers and the estimated market value of machinery and equipment all fell $4,000 to $10,000 each.

b. Liabilities

Total liabilities increased continuously throughout the period. Total liabilities were $390,977, $410,758 and $453,572 in 1981, 1982 and 1983, respectively.

In 1982, total liabilities crept upward by $19,781. Most of the increase is attributable to increased long-term debt ($15,331). There was at least one land purchase made in 1982, as evidenced by dairy case (Chapter IV). The remaining increase in total debt resulted from a $5,457 increase in intermediate liabilities. This was the net change that occurred from payments to Merchants and Dealers,

the Production Credit Association and Banks, combined with additional borrowing from the Farmers Home Administration and other credit institutions.

The increase in total liabilities during 1983 was $42,814. This is the sum of increases in current, intermediate and long-term liabilities. Current liabilities showed a small amount of additional borrowing from the Farmers Home Administration and due on accounts, but the additional amount of $5,619 borrowed from Banks was most significant. The largest increase owed intermediate term lenders was also to Banks ($20,600 increase). This increase was offset by a $14,312 decrease in the amount owed to other credit institutions. However, these changes in intermediate liabilities may only be the result of more accurate reporting in 1983. That is, some farmers averaged may have reported some amounts owed to Banks in 1982 without providing the creditors' names, then in 1983 they may have provided the missing names, which would cause the shift between Banks and other credit institutions.

The largest portion of the increase in total liabilities in 1983 was by far the $31,626 increase in long-term liabilities. Banks increased by $11,237, which may be due to data reporting as explained above

because the amounts owed creditors short-term (current), intermediate and long-term is a percentage of the total bank borrowing. (See Chapter II, Table 2-1 for percentages of amounts owed creditors by maturity.)

Amounts owed Individuals increased $8,566. The Federal Land Bank debt increased $9,706. The amounts owed to Insurance Companies and the Farmers Home Administration also increased, but by much smaller amounts. Because no land purchases were made in 1983, it is assumed that the increases in long-term debt resulted from refinancing existing assets and/or converting unpaid interest to principal.

c. Net Worth

Net worth declined each year. The total decline over the three year period was $77,056. The rate of decline accelerated in 1983 because net worth was squeezed from both ends as total assets declined and total liabilities increased. In order for net worth to improve, changes are necessary which will increase asset values and/or decrease liabilities.

H-2. Dairy Farm Income Statements

Average net farm income before taxes was negative each year. Net farm incomes were -$12,169, -$11,151 and -$10,114 for 1981, 1982 and 1983, respectively. Table 3-11

on page 66 shows the average income statements on highly leveraged dairy farms for 1981-83.

a. Gross Profit

Gross farm profit was $160,787 in 1981. This value increased to $165,696 in 1982 even though there was a negative change in inventory because sales increased. This may be an indication of some liquidation in order to satisfy creditors.

Although sales were virtually unchanged from 1982 to 1983, gross farm profit increased to $168,015. This increase was again due to the negative change in inventory.

Note that continuous increases can not be sustained with no growth in sales, while depleting inventories because a certain amount of inventory is necessary to maintain operations from one production year to the next. For example, if feed crops are sold which are needed for livestock, then additional feed will have to be purchased. This scenario may improve sales, but it would also increase feed purchases (an operating expense), which may or may not hamper net income, depending on crop and feed prices.

b. Total Expenses

Total expenses increased moderately each year. The increase in 1982 was $3,891 and in 1983 was $1,282.

TABLE 3-11: Average Income Statements On Dairy Farms, 1981-83
Telfarmers, For Year Ended December 31, 19XX

INCOME	1981	1982	1983
	$	$	$
Sales	175444	180246	180625
Purchases	7794	9812	9340
Beginning Inventory	178721	171858	167120
Ending Inventory	171858	167120	163850
Gross Profit	160787	165696	168015
EXPENSES			
Hired Labor	9263	8584	7828
Repairs, Maintenance, Tools	11099	10874	10347
Fuel, Oil & Grease	8120	7366	6243
Custom Hire & Lease	2426	2521	1961
Conservation	200	213	152
Insurance	2184	1967	2142
Building & Land Lease	3937	4475	3530
Fertilizer & Lime	11465	6926	8608
Crop Supplies & Packages	227	335	235
Seed, Plants & Trees	3230	3664	3615
Chemicals	3038	2217	1941
Crop Marketing	372	87	191
Other Crop Expense	605	504	261
Feed, Supplements & Additives	40158	39742	38303
Semen & Breeding Fees	1403	1865	1398
Veterinarian,Medicine, & Drugs	2867	2981	3479
Livestock Marketing, Etc.	6646	7101	10532
Livestock Supplies & Other	4141	4621	4778
Property Taxes	4054	5458	5961
Utilities	4113	4369	4488
Interest	30441	36778	37446
Depreciation	21739	22773	23702
Miscellaneous	1247	1443	1319
Total Expenses	172975	176864	178460
Less: Increase in Prepaid Expenses	-19	-17	-331
Adjusted Total Expenses	172956	176847	178129
NET FARM INCOME BEFORE TAXES	-12169	-11151	-10114

In 1982, most of the crop expenses declined, which would indicate less acres harvested. Actually, total tillable acres harvested increased an average of 17 acres. This explains why land lease, crop supplies and seed expenses increased in 1982.

Of the feed crops harvested, acres of corn and barley declined 23 and 2 acres, respectively. Corn silage, oats and hay equivalents increased 16,11 and 5 acres, respectively. The decline in crop expenses led to lower yields per acre for all crops except corn.

The change in acres harvested per crop caused total production to decline for corn and barley, while production of corn silage, oats and hay equivalents increased. To compensate for the changes in production, more corn, oats and hay equivalents were purchased. Fortunately, prices of these feeds declined, so purchased feed expense declined.

All livestock expenses increased by small amounts. In fact, the total increase spent on breeding fees, veterinarian, marketing and livestock supplies was only $1,511.

Property taxes, utilities, interest, depreciation and miscellaneous expenses also increased. With a $6,337 increase, interest expense had the largest

increase in 1982. This is attributable to the land purchased, which also explains the increase in property taxes. This pattern of changes in expense items continued in 1983, but for different reasons.

In 1983 all crop expenses except fertilizer and lime and crop marketing declined. These declines occurred for two reasons. One was the average number of tillable acres (owned and rented) declined from 346 to 325. The other was that 37 acres (23 owned and 14 rented) were put into land diversion.

The decline in acres harvested was similar to the declines in 1982. The difference in 1983 being, corn, corn silage, oats and barley declined by an average of 35, 10, 18 and 2 acres, respectively. Only acres of hay equivalents showed any increase and it was minor (4 acres).

Again as in 1982, the change in crops harvested per acre caused total production to decline for all feeds, except hay equivalents. This lead to purchasing feed and drawing down feed crop inventories which was not done in 1982. In fact, in 1982 all feed crop inventories except for hay equivalents increased.

All livestock expenses increased in 1983 except for purchased feed, which declined slightly because of the inventory adjustments and semen and breeding fees

expense, which decreased by $467. This translates into an increase in livestock expenses (excluding purchased feed) of $3,619 in 1983. The increase in 1983 was almost entirely due to $3,431 more spent on livestock marketing, which includes trucking.

As was the case in 1982, property taxes, utilities, interest and depreciation expenses increased in 1983. Contrary to 1982, interest expense increased by a small amount ($668).

c. Net Farm Income

The result of the changes in the income and expense items was a decline in the amount of net loss by about $1,000 per year. This is not a substantial improvement, but is a move in the right direction. In addition, it can not be overlooked that without generating net incomes and positive cash flows on a regular basis, creditors may begin to impose credit restrictions on the farm.

H-3. Dairy Farm Cash Flows

Net cash income on the average dairy farm saw little change from 1981-83. This is common with dairy farms because milk prices do not fluctuate like crop and livestock prices due to the milk marketing order. As can be seen on Table 3-12, the average cash flow summary for highly leveraged dairy farms shows net cash incomes of

TABLE 3-12: Average Cash Flow Summmary On Dairy Farms, 1981-83
Telfarmers, For Year Ended December 31, 19XX

Cash Receipts	1981 $	1982 $	1983 $
Operating Receipts	162706	162686	165214
Resale Items Sold	460	174	0
Raised Livestock Sold	6276	12421	10399
Depreciable Livestock Sold	5994	4898	4932
Total Farm Cash Receipts	175436	180179	180545
Minus			
Operating Expenses (including interest)	151234	154091	154759
Resale Items Purchased	84	138	417
Depreciable Livestock Purchased	7710	9673	8922
Total Farm Cash Expenses	159028	163902	164098
NET CASH INCOME	16408	16277	16447
Plus			
Machinery Sales	1256	1635	402
Improvement Sales	0	0	0
Land Sales	0	0	0
Non-farm Capital Investment Sales	0	0	0
Total Capital Sales	1256	1635	402
Minus			
Machinery Purchases	17747	12508	8242
Improvement Purchases	9043	14398	3338
Land Purchases	37471	0	3506
Non-farm Capital Purchases	0	0	0
Total Capital Purchases	64261	26906	15086
Plus			
Net Non-farm Income	1963	1237	2042
Plus			
New Money Borrowed	111571	89166	111313
Decrease in Receivables	2890	3578	3220
Minus			
Principal Paid	70063	92047	102639
Increase in Receivables	2420	3525	1509
Decrease in Amount Owed	-41978	2828	-10385
Minus			
Family Living Withdrawals	29545	25832	27211
Plus			
Cash on January 1	201	406	531
Minus			
Cash on December 31	406	531	146
Net Change in Cash on Hand	-205	-125	385
NET CASH FLOW	-32406	-36542	-12636

$16,408, $16,277 and $16,447 in 1981, 1982 and 1983, respectively.

In 1982, the value of raised livestock sold increased $6,145, which caused total cash receipts to increase. However, operating expenses and purchases also increased, which caused cash expenses to increase in proportion to the increase in cash receipts.

Although cash operating receipts and sales of depreciable livestock increased in 1983, sales of resaleable items and raised livestock declined. In addition, cash operating expenses and resale items purchased increased slightly, while depreciable livestock purchased fell. The net result of these changes in cash receipts and expenses was a net cash income of $16,447.

The other items listed on the average cash flow statements can not be analyzed with any confidence because of the problems addressed at the beginning of this chapter.

H-4. Financial Ratios on Dairy Farms

The average financial ratios on highly leveraged dairy farms are provided on Table 3-13 on page 72.

The liquidity ratios show continued declines in liquidity throughout the period. Even so, the current ratio and net working capital show that current assets were sufficient to cover current liabilities each year.

TABLE 3-13: Average Financial Ratios On Dairy Farms, 1981-83 Telfarmers, For Year Ended December 31, 19XX

	1981	1982	1983
LIQUIDITY RATIOS			
Current Ratio	1.54	1.41	1.22
Quick Ratio	0.01	0.02	0.00
Net Working Capital	$ 15694	$ 11669	$ 7873
PROFITABILITY RATIOS			
Sales to Net Working Capital	11.12	15.45	22.94
Profit As Percent of Sales	-0.07	-0.06	-0.06
Return on Net Worth	-0.06	-0.07	-0.09
Percent Change in Gross Profit	--	0.03	0.01
Percent Change in Sales	--	0.03	0.00
Operating Ratio	1.08	1.07	1.06
Interest to Gross Farm Profit	0.18	0.21	0.21
ACTIVITY RATIOS			
Fixed Asset Ratio	0.65	0.64	0.63
Total Asset Turnover	0.30	0.31	0.32
LEVERAGE RATIOS			
Debt Ratio	0.67	0.71	0.80
Debt-to-Equity	2.05	2.40	4.00
Times Interest Earned	0.63	0.77	0.77

The profitability ratios show little sign of improvement from 1981 to 1983. Sales to net working capital increased partly because sales increased, but mostly because liquidity as measured by net working capital decreased. Profit as percent of sales was negative each year, but improved slightly because net losses declined and sales increased. Return on net worth was also negative each year and worsened because although losses were less, net worth declined. The growth in gross profit as measured by the percent change in gross profit was positive, but by very small amounts. The percent change in sales showed a 3% rate of growth in 1982, but none in 1983. The operating ratio was greater than 1.00 each year, meaning that expenses were greater than gross profit but the decline from 1.08 in 1981 to 1.06 in 1983 is an improvement. This improvement resulted from increased gross profit. And even with the increase in gross profit, interest expense grew at a faster rate causing interest to gross profit to increase from 1981 to 1983.

The activity ratios reflect the change in asset values in relation to sales. The fixed asset ratio had 1% declines each year because sales and the value to fixed assets both increased, with asset values increasing faster. Just the opposite is true of the total asset turnover. It

increased 1% per year because total asset values fell over the period.

The leverage ratios show the increase in debt in relation to total assets and equity, as measured by the debt and debt-to-equity ratios, respectively. The times interest earned ratio increased primarily because of the increase in interest expense over the period, which caused net losses to increase and net cash income to decrease.

H-5. Summary of Dairy Farm Finances

Balance sheet figures show a decline in the value of total assets on the average highly leveraged dairy farm from 1981 to 1983. In addition, if the market values of machinery and equipment and real estate decline in the future, total assets will also decline because it is unlikely that these farms could offset any declines by expanding current or intermediate assets and certainly not with fixed assets, unless a source of outside equity could be found or asset values appreciate. To compound the decline in assets, liabilities increased each year causing net worth to decline.

This analysis also showed that average net farm incomes were negative throughout the period. Even though these losses declined, they were less because of attempts to improve profitability, while jeopardizing the staying power of the business. That is, unless net losses can be

eliminated by means other than continued depletion of inventories and positive cash flows achieved, some highly leveraged dairy farms may find their existence will be short lived.

I. Conclusions of Average Farm Types

From the analyses of the cash grain, hog and dairy farm types it is apparent that, on average, none of these highly leveraged enterprises are in stable condition. Each has experienced different changes over the period of 1981 to 1983.

Balance sheets showed that all three farm types had increased liabilities, while total assets increased on cash grain farms; were unchanged on hog farms and declined on dairy farms.

Income statements indicate that cash grain farms produced greater losses; hog farms had improved profitability and dairy farms had little change in net losses.

The reasons these farms changed as they did is not clear because of working with averages. However, while this chapter is not intended to provide specific answers to determine what alternatives are available to the average farm with high debt levels, it is hoped the reader now has a framework of what each enterprise does and how it has performed on average.

CHAPTER IV

Analysis and Simulation of Case Study Farms

A. Introduction

The case farms were selected from the farms used to construct the average financial statements in Chapter III. In addition to being highly leveraged and having data from 1981-83, the farms chosen as case examples have Telfarm records which are very similar to the average financial statements of the last chapter. By selecting farms with records supportive of the averages, it is hoped that these case farms are most representative of their respective groups.

The three case studies analyzed in this chapter will provide the reader with an understanding of what financial alternatives might be considered, given specific circumstances of an individual farm. To assure the alternatives are based on data as accurate as possible, the case farm financial statements include records for 1984. For each case, the 1984 ending financial statements were used for simulation.

B. Case Study Objectives

The objectives of this chapter are to:

- identify any trends existing and/or developing within the case farms.

- o consider several alternatives for each case to improve net income, cash flow and long-term solvency.
- o simulate future financial performance of case farms to determine what alternative or combination of alternatives will produce the most favorable results.

C. Organization

This chapter is organized similar in fashion to the previous chapter. Each case is presented separately. First, the historical financial statements are presented for each case. Secondly, a base run simulation is explained for each case, demonstrating the future financial outcome. Thirdly, the alternatives which were attempted for each farm are stated and evaluated with their respective outcomes. Lastly, recommendations as to which alternative to implement are made, given the limitations of the data and simulation capabilities.

D. Analysis of Case Study Cash Grain Farm

The cash grain farm is technically classified as a Saginaw Valley farm type. It has usually produced corn, wheat, sugar beets and soybeans. Currently, the farm consists of 850 acres. Three hundred and thirty-five acres are owned and the remaining 515 are being rented. All acreage is reported as tillable. Land rent is paid on a share rent basis. The landlord/operator proportion on land rented was not determined in the analysis.

D-1. Cash Grain Case -- Balance Sheets

a. Assets

The value of total assets was greater than $1,000,000 in each year included in the analysis. Table 4-1 on page 79 shows the balance sheets as reported from 1981 to 1984.

There was a $113,725 decline in total assets during 1982 primarily because the estimated value of real estate fell by $123,000. The decline resulted from declining market values because no real estate was sold at that time. The values of current and intermediate assets increased $4,275 and $5,000 respectively.

Since 1982, current and intermediate asset values have increased, while fixed asset values have remained constant. Current assets increased because of substantial increases in crop inventory values. Intermediate assets increased because of continued replacements of machinery and equipment.

The net change in total assets from 1981 to 1984 was a $54,175 decline. Note however, if the prices associated with crops, the estimated market value of machinery and equipment and/or real estate are inaccurate (too high, more likely than too low) then

TABLE 4-1: Balance Sheets On Cash Grain Farm Case, 1981-84
Telfarmers, For Year Ended December 31, 19XX

ASSETS	1981	1982	1983	1984
Current Assets	$	$	$	$
Cash	5000	2000	1000	1000
Crops	35825	47700	48600	96750
Feed	0	0	22750	0
Supplies	13100	8500	12500	0
Total Current Assets	53925	58200	84850	97750
Intermediate Assets				
Accounts Receivable	0	0	0	0
Machinery & Equipment (Market Value)	175000	180000	200000	200000
Non-farm Business Assets	0	0	0	0
Household Assets	0	0	0	0
Total Intermediate Assets	175000	180000	200000	200000
Fixed Assets				
Estimated Value of Real Estate	933000	810000	810000	810000
TOTAL ASSETS	1161925	1048200	1094850	1107750
LIABILITIES & NET WORTH				
Current Liabilities				
Accounts Payable	0	0	0	0
Production Credit Association	0	0	0	0
Banks	84008	173075	122489	116349
Farmers Home Administration	0	0	0	0
Total Current Liabilities	84008	173075	122489	116349
Intermediate Liabilities				
Merchants & Dealers	2859	1122	1122	1122
Production Credit Association	0	0	0	0
Banks	23193	47202	33406	31731
Farmers Home Administration	0	0	0	0
Other Credit Institutions	23684	18734	136	0
Total Intermediate Liabilities	49736	67058	34664	32853
Long-term Liabilities				
Banks	52574	94405	66812	63463
Farmers Home Administration	0	0	0	0
Insurance Companies	0	0	0	0
Individuals	521760	463660	451060	438960
Federal Land Banks	160202	159278	158234	157065
Total Long-term Liabilities	734536	717343	676106	659488
TOTAL LIABILITIES	868280	957476	833259	808690
Net Worth	293645	90724	261591	299060
TOTAL LIABILITIES & NET WORTH	1161925	1048200	1094850	1107750

the value of total assets may not be realizable. But for now, they are taken as given.

b. Liabilities

Total liabilities on this farm declined from $868,280 in 1981 to $808,690 in 1984. Both intermediate and long-term debt showed declines over the period, while current liabilities increased. This shift in the liability structure most likely put increased drain on an already troubled cash flow.

c. Net Worth

The amount of net worth increased slightly over the period, but had a major decline in 1982 which resulted from the decline in the estimated market value of real estate and from increased borrowing at banks.

In 1983, net worth increased to nearly what it had been in 1981 because of increases in the value of current and intermediate assets and because of declines in total liabilities. Nineteen hundred and eighty-four showed changes similar to 1983 with assets again increasing as liabilities decreased.

D-2. Cash Grain Case -- Income Statements

Net losses were generated each year by the cash grain farm. Table 4-2 on page 81 shows the income statements of

TABLE 4-2: Income Statements On Cash Grain Farm Case, 1981-84
Telfarmers, For Year Ended December 31, 19XX

INCOME	1981	1982	1983	1984
	$	$	$	$
Sales	209948	118792	174406	178409
Purchases	0	0	3000	0
Beginning Inventory	36080	35825	47700	71350
Ending Inventory	35825	47700	71350	96750
Gross Profit	209693	130667	195056	203809
EXPENSES				
Hired Labor	1169	2613	2320	2967
Repairs, Maintenance, Tools	12321	15782	12790	16294
Fuel, Oil & Grease	15957	10522	11578	12730
Custom Hire & Lease	14911	17826	20251	7492
Conservation	0	0	0	0
Insurance	1187	785	526	1357
Building & Land Lease	13300	0	0	0
Fertilizer & Lime	23610	25253	24688	21204
Crop Supplies & Packages	16	0	1419	0
Seed, Plants & Trees	9143	498	1674	3877
Chemicals	15732	9632	18767	14575
Crop Marketing	240	0	0	0
Other Crop Expense	0	0	0	0
Feed, Supplements & Additives	0	0	0	0
Semen & Breeding Fees	0	0	0	0
Veterinarian,Medicine, & Drugs	0	0	0	0
Livestock Marketing, Etc.	0	0	0	0
Livestock Supplies & Other	0	0	0	0
Property Taxes	9128	7607	18472	13087
Utilities	3290	3170	2995	3303
Interest	71452	69430	107622	77357
Depreciation	31202	35189	29090	29681
Miscellaneous	654	3576	2618	753
Total Expenses	223312	201883	254810	204677
Less: Increase in Prepaid Expenses	-6100	4600	-4000	12500
Adjusted Total Expenses	217212	206483	250810	217177
NET FARM INCOME BEFORE TAXES	-7519	-75816	-55754	-13368

this farm from 1981 to 1984. Losses increased greatly in 1982 and have declined since.

The major cause of the large loss in 1982 was the dramatic decline in sales in that year. Lower sales were due to fewer tillable acres farmed and lower prices received per unit. To partially offset the reduction in sales dollars, total expenses were reduced. The most significant decline in expenses was building and land lease. The reason for this is simply no value was reported by the farmer. This farmer leases land on a share rent basis and has not reported the landlord's share as an expense since 1981. This also explains why no values are given for 1983 and 1984. From the data it appears there is no proportion of operator/landlord share per se. For example, some crops grown on rented land go entirely to the operator. In other cases the landlord has received total production. Still others are divided between the two parties, but with no specific ratio.

Sales increased from $118,792 in 1982 to $174,406 in 1983 as a result of higher crop prices, and 9,352 more bushels of soybeans sold. There were also $16,057 more received for sugar beets, but no quantities were given. Quantities of all other crops were less.

Total expenses increased $44,377 in 1983. This was mostly from $38,192 more interest expense. Most crop expenses also increased because 38 more acres were farmed.

Property taxes rose $10,865, which is indicative of a land purchase, although none was reported.

Sales again increased in 1984, but only by $4,003. The increase was attributable to sales of larger quantities, because prices received for crops declined.

There was $33,633 less spent on expenses in 1984. Considerable reductions were in custom hire and lease and interest expense. Some machinery was purchased in 1983 and 1984 which may have been leased early, but no specific information is available. The $30,265 decrease in interest expense may suggest that interest payments were missed, because total liabilities only declined $24,569. Net farm incomes were $-7,519, $-75,816, -$55,754 and -$13,368 for each year analyzed.

D-3. Cash Grain Case -- Cash Flow Statements

Net cash income and net cash flow unaccounted for are provided on Table 4-3 on page 84. Net cash income declined from 1981 to 1983 and improved in 1984. The negative values in both 1982 and 1983 indicate serious cash problems. Since net cash income is used for repayment of principal on borrowed funds the question arises as to how principal payments could have been made in 1982 and 1983 if no cash was available. According to the farmer interviewed, no principal was paid in 1982, 1983 or 1984. If this is true, a substantial amount of the cash

TABLE 4-3: Cash Flow Summary On Cash Grain Farm Case, 1981-84
Telfarmers, For Year Ended December 31, 19XX

	1981	1982	1983	1984
	$	$	$	$
Cash Farm Receipts	196648	118792	174406	178409
Cash Farm Expenses	178812	166694	228719	174997
NET CASH INCOME	17836	-47902	-54313	3412
Plus				
Beginning Cash Balance	0	0	0	0
Non-farm Income	920	28	150	0
Capital Sales	73700	0	6500	0
New Money Borrowed	195475	150700	42500	0
Decrease in Receivables	0	0	0	0
Total Additions to Cash	270095	150728	49150	0
Minus				
Non-farm Expenses	0	0	0	0
Capital Purchases	79178	47411	13800	9707
Principal Paid	261139	76974	166718	28319
Family Living Withdrawals	25000	24000	24010	20000
Increase in Receivables	0	0	0	0
Ending Cash Balance	0	0	0	0
Total Subtractions from Cash	365317	148385	204528	58026
NET CASH UNACCOUNTED FOR	-77386	-45559	-209691	-54614

unaccounted for would be explained. In addition, this farm leases land on a share rent basis. This may explain why land lease does not show up on the income statement from 1982 through 1984 as an expense. When the share rent quantities are used to adjust inventories, additional amounts were available for sale in each year. These adjustments also help to reconcile the cash unaccounted for. Assuming these adjustments are valid and were sold, cash farm receipts would have increased $80,248, $16,502, $3,141 and $27,706 each year, respectively.

D-4. Cash Grain Case -- Financial Ratios

The financial ratios presented in Table 4-4 were calculated from the financial statements as presented in this section. As such, they represent a very poor financial position.

The three liquidity ratios all show signs of liquidity problems. Current assets were inadequate to pay current liabilities. The quick ratio was never more than a fraction greater than zero. Net working capital was negative each year. However, both the current ratio and net working capital improved over the period.

The profitability ratios were also very poor from 1981-84. Sales to net working capital was negative each year because of negative working capital. Profit as percent of sales and return on net worth were negative each

TABLE 4-4: Financial Ratios On Cash Grain Farm Case, 1981-84 Telfarmers, For Year Ended December 31, 19XX

	1981	1982	1983	1984
LIQUIDITY RATIOS				
Current Ratio	0.64	0.34	0.69	0.84
Quick Ratio	0.06	0.01	0.01	0.01
Net Working Capital	-$30083	-$114875	-$37639	-$18599
PROFITABILITY RATIOS				
Sales to Net Working Capital	-6.98	-1.03	-4.63	-9.59
Profit As Percent of Sales	-0.04	-0.64	-0.32	-0.07
Return on Net Worth	-0.03	-0.84	-0.21	-0.04
Percent Change in Gross Profit	--	-0.38	0.49	0.04
Percent Change in Sales	--	-0.43	0.47	0.02
Operating Ratio	1.04	1.58	1.29	1.07
Interest to Gross Farm Profit	0.34	0.53	0.56	0.38
ACTIVITY RATIOS				
Fixed Asset Ratio	0.23	0.15	0.22	0.22
Total Asset Turnover	0.18	0.11	0.16	0.16
LEVERAGE RATIOS				
Debt Ratio	0.75	0.91	0.76	0.73
Debt-to-Equity	2.96	10.55	3.19	2.70
Times Interest Earned	0.91	-0.04	0.27	0.79

year because of continuous net losses. Growth of gross profit and sales were very volatile, but positive in 1983 and 1984. The operating ratio shows expenses were greater than gross profit each year. Interest to gross profit shows that interest expense consumed a larger portion of gross profit over the period.

Both activity ratios indicate that assets have not been used very efficiently on this farm. In fact, there was a downturn in 1982 because of the decline in both sales and fixed assets that caused this farm to experience greater financial distress in 1982 than any other year of the period analyzed.

The leverage ratios indicate the level of debt on this farm may be excessive. While the debt and debt-to-equity ratios show some progress when the first year is compared to the last, the times interest earned ratio worsened. The times interest earned ratio shows that the cash flow on this farm has been inadequate to support the current debt in any year of 1981 through 1984.

D-5. Summary of the Past Finances of the Cash Grain Farm Case

It appears that 1982 was the worst for this farm. Asset values fell by $113,725. Liabilities increased $89,196. Net worth declined $202,921. Sales fell by $97,794. And net losses reached $75,816.

Since 1982 balance sheet and income statement figures have improved, but 1983 and 1984 still saw no profits from this farm and a considerable lack of cash. The cash flow problem has resulted in an inability to repay the debts of this farm. This will likely lead to a complete re-evaluation of the financial structure of the farm in hopes of finding a solution for the owner and the creditors.

D-6. Introduction to Simulation on the Cash Grain Farm Case

From the analysis of the 1981-84 financial statements it was shown that the cash grain farm is in serious financial trouble. The objective in this case is to identify and evaluate alternative operational strategies to improve the profitability of this farm.

a. Base Run Simulation of Cash Grain Farm Case

In order to assess where this farm is likely to be headed in the near future, a scenario was constructed assuming that the farm will continue to operate as it did over the period of 1981-84. Appendix B gives all the input (Tables 1-8) and results (Tables 9-12) of the Base Run. Table 4-5 also shows the values for input used in the Base Run which change in each alternative.

The enterprises (Table 1) include corn, wheat, sugar beets and soybeans. The beginning balance sheet

TABLE 4-5: Input Changes for Cash Grain Farm Alternatives

Alternative Number	Appendix B Reference	Table Location	Base Run Value For 1985	Base Run Value For 1986	Base Run Value For 1987	Change For Alternative 1985	Change For Alternative 1986	Change For Alternative 1987
1	Table 5	Price of corn sold.	$2.47	$2.81	$2.92	$2.47	$2.47	$2.47
		Price of wheat sold.	$3.15	$3.51	$3.65	$3.15	$3.15	$3.15
		Price of sugar beets.	$29.00	$30.00	$31.00	$29.00	$29.00	$29.00
		Price of soybeans sold.	$5.69	$7.25	$8.22	$5.69	$5.69	$5.69
2	Table 8	Non-farm income.	$275	$275	$275	$10000	$10000	$10000
3	Table 2	Land (market value)	$651908	$651908	$651908	$332408	$332408	$332408
		Individual land debt.	$438960	$436291	$433356	$172710	$171660	$170505
	Table 5	Acres corn harvested.	300	300	300	225	225	225
		Acres wheat harvested.	135	135	135	100	100	100
		Acres sugar beets harv.	50	50	50	37	37	37
		Acres soybeans harv.	365	365	365	275	275	275
		Total crop acres.	850	850	850	637	637	637
		Crop acres owned.	335	335	335	122	122	122
		Bushels corn to sell.	30000	30000	30000	22500	22500	22500
		Bushels wheat to sell.	9450	9450	9450	7000	7000	7000
		Tons sugar beets to sell.	1050	1050	1050	777	777	777
		Bushels soybeans to sell.	13505	13505	13505	10175	10175	10175
	Table 6	Labor hours for corn.	1680	1680	1680	1260	1260	1260
		Labor hours for wheat.	311	311	311	230	230	230
		Labor hours for s. beets.	600	600	600	444	444	444
		Labor hours for soybeans.	1132	1132	1132	853	853	853
	Table 8	Other farm income.	$13693	$13693	$13693	$10262	$10262	$10262
		Hired labor.	$495	$495	$495	$0	$0	$0
		Repairs, maintenance.	$13704	$16500	$16750	$10270	$12365	$12533
		Custom hire & lease.	$7500	$7500	$7500	$5621	$5621	$5621
		Fuel, oil & grease.	$12170	$12170	$12170	$9120	$9120	$9120
		Mach. depreciation.	$20767	$20767	$20767	$15563	$15563	$15563
		Property taxes.	$11322	$11322	$11322	$4123	$4123	$4123
		Interest.	$89868	$85487	$80584	$63243	$59024	$54299

TABLE 4-5: (continued)

Alternative Number	Appendix B Reference	Table Location	Base Run Value For 1985	Base Run Value For 1986	Base Run Value For 1987	Change For Alternative 1985	Change For Alternative 1986	Change For Alternative 1987
4	Table 2	Land (market value).	$651908	$651908	$651908	$332408	$332408	$332408
		Individual land debt.	$438960	$436291	$433356	$172710	$171660	$170505
	Table 8	Property taxes.	$11322	$11322	$11322	$4123	$4123	$4123
		Interest.	$89868	$85487	$80584	$63243	$59024	$54299
		Land lease.	$33475	$33475	$33475	$47320	$47320	$47320
5	Table 2	Land (market value).	$651408	$651408	$651908	$0	$0	$0
		Individual land debt.	$438960	$436291	$433356	$0	$0	$0
		Federal Land Bank debt.	$157065	$156529	$155924	$0	$0	$0
	Table 5	Crop acres owned.	335	335	335	0	0	0
	Table 8	Property taxes.	$11322	$11322	$11322	$0	$0	$0
		Interest.	$89868	$85487	$80584	$25553	$21509	$16978
		Land lease.	$33475	$33475	$33475	$55250	$55250	$55250
6	Table 2	Bank debt.	$211543	$178244	$140949	$11543	$9726	$7691
		Individual land debt.	$438960	$436921	$433356	$396025	$393617	$390969
		Federal Land Bank debt.	$157065	$156529	$155924	$0	$0	$0
		FmHA land debt.	N.A.	N.A.	N.A.	$200000	$197117	$194082
		FmHA int. rate - land.	N.A.	N.A.	N.A.	5.25%	5.25%	5.25%
		Years to pay for land.	N.A.	N.A.	N.A.	30.0	29.0	28.0
		FmHA operating loan.	N.A.	N.A.	N.A.	$200000	$177065	$152468
		Int. rate on op. loan.	N.A.	N.A.	N.A.	7.25%	7.25%	7.25%
		Years to pay op. loan.	N.A.	N.A.	N.A.	7.0	6.0	5.0
	Table 8	Interest.	$89868	$85487	$80584	$66156	$63835	$61327

N.A. = not applicable.

TABLE 4-5: (continued)

Alternative Number	Appendix B Reference	Table Location	Base Run Value For 1985	1986	1987	Change For Alternative 1985	1986	1987
7	Table 2	Land (market value).	$651908	$651908	$651908	$0	$0	$0
		Bank debt.	$211543	$178244	$140949	$11543	$9726	$7691
		Individual land debt.	$438960	$436291	$433356	$0	$0	$0
		Federal Land Bank debt.	$157065	$156529	$155924	$0	$0	$0
		FmHA operating loan.	N.A.	N.A.	N.A.	$200000	$177065	$152468
		Int. rate on op. loan.	N.A.	N.A.	N.A.	7.25%	7.25%	7.25%
		Years to pay op. loan.	N.A.	N.A.	N.A.	7.0	6.0	5.0
	Table 5	Acres corn harvested.	300	300	300	375	375	375
		Acres wheat harvested.	135	135	135	170	170	170
		Acres sugar beets harv.	50	50	50	60	60	60
		Acres soybeans harv.	365	365	365	456	456	456
		Total crop acres.	850	850	850	1061	1061	1061
		Crop acres owned.	335	335	335	0	0	0
		Bushels corn to sell.	30000	30000	30000	37500	37500	37500
		Bushels wheat to sell.	9450	9450	9450	11900	11900	11900
		Tons sugar beets to sell.	1050	1050	1050	1260	1260	1260
		Bushels soybeans to sell.	13505	13505	13505	16872	16872	16872
	Table 6	Labor hours for corn.	1680	1680	1680	2100	2100	2100
		Labor hours for wheat.	311	311	311	391	391	391
		Labor hours for s. beets.	600	600	600	720	720	720
		Labor hours for soybeans.	1132	1132	1132	1414	1414	1414
	Table 8	Other farm income.	$13693	$13693	$13693	$17116	$17116	$17116
		Hired labor.	$475	$475	$475	$5000	$5000	$5000
		Repairs, maintenance.	$13704	$16500	$16750	$17130	$20625	$20940
		Custom hire & lease.	$7500	$7500	$7500	$9375	$9375	$9375
		Fuel, oil & grease.	$12170	$12170	$12170	$15210	$15210	$15210
		Mach. depreciation.	$20767	$20767	$20767	$25960	$25960	$25960
		Property taxes.	$11322	$11322	$11322	$0	$0	$0
		Interest.	$89868	$85487	$80584	$16053	$14124	$12041
		Land lease.	$33475	$33475	$33475	$68965	$68965	$68965

TABLE 4-5: (continued)

Alternative Number	Appendix B Reference	Table Location	Base Run Value For 1985	1986	1987	Change For Alternative 1985	1986	1987
8	Table 2	Land (market value).	$651908	$651908	$651908	$0	$0	$0
		Bank debt.	$211543	$178244	$140949	$11543	$9726	$7691
		Individual land debt.	$438960	$436291	$433356	$0	$0	$0
		Federal Land Bank debt.	$157065	$156529	$155924	$0	$0	$0
		FmHA operating loan.	N.A.	N.A.	N.A.	$200000	$177065	$152468
		Int. rate on op. loan.	N.A.	N.A.	N.A.	7.25%	7.25%	7.25%
		Years to repay loan.	N.A.	N.A.	N.A.	7.0	6.0	5.0
	Table 5	Acres corn harvested.	300	300	300	375	375	375
		Acres wheat harvested.	135	135	135	175	175	175
		Acres sugar beets harv.	50	50	50	60	60	60
		Acres soybeans harv.	365	365	365	456	456	456
		Total crop acres.	850	850	850	1061	1061	1061
		Crop acres owned.	335	335	335	0	0	0
		Bushels corn to sell.	30000	30000	30000	37500	37500	37500
		Bushels wheat to sell.	9450	9450	9450	11900	11900	11900
		Tons sugar beets to sell.	1050	1050	1050	1260	1260	1260
		Bushels soybeans to sell.	13505	13505	13505	16872	16872	16872
		Price of corn sold.	$2.47	$2.81	$2.92	$2.47	$2.47	$2.47
		Price of wheat sold.	$3.15	$3.51	$3.65	$3.15	$3.15	$3.15
		Price of sugar beets.	$29.00	$30.00	$31.00	$29.00	$29.00	$29.00
		Price of soybeans sold.	$5.69	$7.25	$8.22	$5.69	$5.69	$5.69
	Table 6	Labor hours for corn.	1680	1680	1680	2100	2100	2100
		Labor hours for wheat.	311	311	311	391	391	391
		Labor hours for s. beets.	600	600	600	720	720	720
		Labor hours for soybeans.	1132	1132	1132	1414	1414	1414

TABLE 4-5: (continued)

Alternative Number	Appendix B Reference	Table Location	Base Run Value For 1985	1986	1987	Change For Alternative 1985	1986	1987
8 (continued)	Table 8	Other farm income.	$13693	$13693	$13693	$17116	$17116	$17116
		Hired labor.	$475	$475	$475	$5000	$5000	$5000
		Repairs, maintenance.	$13704	$16500	$16750	$17130	$20625	$20940
		Custom hire & lease.	$7500	$7500	$7500	$9375	$9375	$9375
		Fuel, oil & grease.	$12170	$12170	$12170	$15210	$15210	$15210
		Mach. depreciation.	$20767	$20767	$20767	$25960	$25960	$25960
		Property taxes.	$11322	$11322	$11322	$0	$0	$0
		Interest.	$89868	$85487	$80584	$63243	$59024	$54299

(Table 2) uses information taken from the 1984 ending balance sheet. The prices per unit for crop inventory were adjusted to average prices for the crop year 1984/85, so all cases would be consistent in valuing inventory.

This case then requires input on crop production (Table 5), including: 1) acres harvested; 2) yields per acre; 3) quantity to sell; 4) prices per unit sold; and 5) crop expenses per acre. Labor requirements (Table 6) are given for each crop also.

The acres harvested and quantities of each crop sold were based on amounts consistent with what the case reports. Yields per acre were calculated as four year averages. Prices per unit sold are 1984/85 crop year averages for 1985 and forecasts of the MSU Agricultural Model for 1986 and 1987. Crop expenses per acre were determined from the Estimated Crop and Livestock Budgets for Michigan, 1984, according to the specific expense items required in the program.[18] These include: 1) seed; 2) fertilizer and lime; 3) pesticides; 4) marketing; and 5) miscellaneous expenses. Labor requirements were determined from the same source as crop expenses, based on yields per acre.

No capital purchases are made in the Base Run, so Table 7 of Appendix B was not used.

The annual income and expenses (Appendix B, Table 8) were determined as follows:

- other farm income ... 4-year average of custom work, refunds and government payments
- non-farm income ... 4-year average
- hired labor ... difference between operator and family labor hours provided and the number of hours required by the farm times $5 per hour
- family labor draw ... operator and family hours provided, times $5 per hour
- variable machinery and improvement expenses ... 4-year average per tillable acre, times 850 acres
- depreciation ... reported amounts of case in 1984
- overhead ... all are 4-year averages except interest, which is calculated

b. Results of Cash Grain Base Run Simulation

The results of this Base Run are provided both in Appendix B and Tables 4-6 through 4-8. The latter three tables are for easy comparison with other alternatives.

In Table 9 of the Base Run labeled "Projected Income Statement," the pro forma income statements for 1985-87 are presented. These statements predict net losses before taxes of $59,297 in 1985 and $21,992 in

TABLE 4-6: Outcomes of Cash Grain Farm Alternatives on the Income Statement and Cash Flow

Projected Income Statement	BASE RUN	ALT. 1	ALT. 2	ALT. 3	ALT. 4	ALT. 5	ALT. 6	ALT. 7	ALT. 8
	$	$	$	$	$	$	$	$	$
Sales:									
1985	224854	224854	224854	168316	224854	224854	224854	279768	279768
1986	260574	224854	260574	195136	260574	260574	260574	324382	279768
1987	279347	224854	279347	209238	279347	279347	279347	347799	279768
Gross Income:									
1985	224854	224854	224854	168312	224854	224854	224854	279768	279768
1986	260574	224854	260574	195136	260574	260574	260574	324382	279768
1987	279347	224854	279347	209238	279347	279347	279347	347799	279768
Total Expenses:									
1985	284151	284151	284151	220705	264172	230289	260439	267704	267704
1986	282566	282566	282566	218581	262749	229041	260914	269270	269270
1987	277913	277913	277913	214044	258274	224760	258656	267502	267502
Net Cash Income:									
1985	(29616)	(29616)	(29616)	(27912)	(9637)	24245	(5904)	46937	46937
1986	7689	(28031)	7689	1032	27506	61214	29341	89986	45371
1987	31115	(23378)	31115	19671	50754	84268	50371	115171	47140
Net Earnings After Taxes:									
1985	(59297)	(59297)	(59297)	(52389)	(39318)	(8267)	(35585)	3283	3283
1986	(21992)	(57712)	(21992)	(23445)	(6115)	13683	(4903)	24529	2249
1987	(3733)	(53059)	(3733)	(7851)	8550	24288	8336	36114	3416
Cash Flow Reconciliation									
Unreconciled Cash Flow:									
1985	(65167)	(65167)	(55442)	(61845)	(43570)	(10933)	(34995)	14357	14357
1986	(98411)	(134130)	(78961)	(99965)	(59155)	(4960)	(42629)	47031	24751
1987	(118298)	(203344)	(89123)	(127216)	(64801)	7086	(39532)	89207	34229
Surplus to Cash:									
1985	0	0	0	0	0	0	0	14357	14357
1986	0	0	0	0	0	0	0	47031	24751
1987	0	0	0	0	0	7086	0	89207	34229
Deficit to Operating Loan:									
1985	65167	65176	55442	61845	43570	10933	34995	0	0
1986	98411	134130	78961	99965	59155	4960	42629	0	0
1987	118298	203344	89123	127216	64801	0	39532	0	0

TABLE 4-7: Outcomes of Cash Grain Farm Alternatives on the Balance Sheet

Projected Balance Sheet	BASE RUN	ALT. 1	ALT. 2	ALT. 3	ALT. 4	ALT. 5	ALT. 6	ALT. 7	ALT. 8
	$	$	$	$	$	$	$	$	$
Current Assets:									
1985	83590	83590	83590	83590	83590	83590	83590	83590	83590
1986	82590	82590	82590	82590	82590	82590	82590	96947	96947
1987	82590	82590	82590	82590	82590	82590	82590	129621	107341
1988	82590	82590	82590	82590	82590	89676	82590	171797	116819
Fixed Assets:									
1985	836028	836028	836028	516528	516528	184120	836028	184120	184120
1986	806347	806347	806347	492051	486847	154439	806347	149246	149246
1987	776666	776666	776666	467574	457166	124758	776666	114372	114372
1988	746985	746985	746985	443097	427485	95077	746985	79498	79498
Total Assets:									
1985	919618	919618	919618	600118	600118	267710	919618	267710	267710
1986	888937	888937	888937	574641	569437	237029	888937	246193	246193
1987	859256	859256	859256	550164	539756	207348	859256	243993	221713
1988	829575	829575	829575	525687	510075	184753	829575	251295	196317
Current Liabilities:									
1985	36826	36826	36826	35208	35208	33622	30366	25075	25075
1986	106374	106374	96649	101271	82996	48599	67682	27004	27004
1987	144521	180241	125071	144117	103307	47158	77824	29087	29087
1988	169405	254451	140230	176169	113754	46783	76944	30846	30846
Long-term Liabilities:									
1985	771864	771864	771864	507232	507232	179043	778324	187590	187590
1986	730657	730657	730657	467806	467806	141377	745637	160586	160586
1987	684546	684546	684546	423654	423654	99179	710443	131499	131499
1988	633439	633439	633439	374701	374701	52397	673030	100653	100653
Total Liabilities:									
1985	808690	808690	808690	542440	542440	212665	808690	212665	212665
1986	837031	837031	827306	569077	550802	189976	813319	187590	187590
1987	829067	864787	809617	567770	526961	146337	788266	160586	160586
1988	802844	887890	773669	550869	488454	99179	749974	131499	131499
Owner Equity:									
1985	110928	110928	110928	57678	57678	55045	110928	55045	55045
1986	51906	51906	61631	5564	18635	47053	75618	58603	58603
1987	30189	(5531)	49639	(17303)	12795	61011	70990	83407	61127
1988	26731	(58315)	55906	(25182)	21621	85574	79601	119796	64818

TABLE 4-8: Outcomes of Cash Grain Farm Alternatives on Financial Performance Measures

Projected Financial Performance	BASE RUN	ALT. 1	ALT. 2	ALT. 3	ALT. 4	ALT. 5	ALT. 6	ALT. 7	ALT. 8
Return on Total Assets:									
1985	3.38%	3.38%	3.38%	1.85%	4.09%	6.85%	3.38%	7.53%	7.53%
1986	7.26%	3.18%	7.26%	6.33%	9.54%	15.84%	6.74%	15.77%	7.00%
1987	9.10%	3.26%	9.10%	8.63%	11.97%	21.05%	8.25%	19.45%	7.40%
1988	--	--	--	--	--	--	--	--	--
Return on Owner Equity:									
1985	-72.83%	-72.83%	-68.73%	-165.68%	-103.04%	-16.19%	-38.15%	5.78%	5.78%
1986	-53.58%	-248.89%	-39.53%	389.37%	-38.91%	25.32%	-6.69%	34.55%	3.76%
1987	-13.12%	166.21%	-7.07%	36.70%	49.69%	33.14%	11.07%	35.55%	5.43%
1988	--	--	--	--	--	--	--	--	--
Total Expenses/Income:									
1985	126.37%	126.37%	126.37%	131.13%	117.49%	102.42%	115.83%	95.69%	95.69%
1986	108.44%	125.67%	108.44%	112.01%	100.83%	87.90%	100.13%	83.01%	96.25%
1987	99.49%	123.60%	99.49%	102.30%	92.46%	80.46%	92.59%	76.91%	95.62%
1988	--	--	--	--	--	--	--	--	--
Debt Servicing/Income:									
1985	56.35%	56.35%	56.35%	58.49%	43.78%	26.32%	42.93%	14.70%	14.70%
1986	73.63%	85.33%	69.90%	82.15%	54.50%	26.91%	50.47%	12.68%	14.70%
1987	80.58%	116.00%	73.62%	94.83%	56.42%	22.96%	49.81%	11.83%	14.70%
1988	--	--	--	--	--	--	--	--	--
Working Capital:									
1985	$46764	$46764	$46764	$48382	$48382	$49968	$53224	$58515	$58515
1986	($23784)	($23784)	($14059)	($18681)	($406)	$33991	$14908	$69943	$69943
1987	($61931)	($97651)	($42481)	($61527)	($20717)	$35432	$4766	$100534	$78254
1988	($86815)	($171861)	($57640)	($93579)	($31164)	$42894	$5646	$140951	$85973
Current Ratio:									
1985	2.27	2.27	2.27	2.37	2.37	2.49	2.75	3.33	3.33
1986	0.78	0.78	0.85	0.82	1.00	1.70	1.22	3.59	3.59
1987	0.58	0.46	0.66	0.57	0.80	1.75	1.06	4.46	3.69
1988	0.49	0.32	0.59	0.47	0.78	1.92	1.07	5.57	3.79
Debt Ratio:									
1985	0.88	0.88	0.88	0.90	0.90	0.79	0.88	0.79	0.79
1986	0.94	0.94	0.93	0.99	0.97	0.80	0.91	0.76	0.76
1987	0.96	1.01	0.94	1.03	0.98	0.71	0.92	0.66	0.72
1988	0.97	1.07	0.93	1.05	0.96	0.54	0.90	0.52	0.67

1986. A small pretax profit is projected for 1987, but this will become a loss of $3,733 after taxes. It is important to inform the reader here that the decreasing losses in 1986 that change to profit in 1987 result from increases in crop prices as forecasted by the M.S.U. Agricultural Model. (See Table 5 of Appendix B for prices per unit sold.) Therefore, if commodity prices are less than those used in the Base Run net losses will increase.

Following Table 9 is the "Cash Flow Reconciliation Statement" (Table 10). This indicates that the net cash flow will produce larger deficits each year, resulting in increased borrowing to cover the deficit to cash.

Table 11, the "Projected Net Worth Statement" shows that total assets are going to continue to decline because depreciation will erode the values of machinery and buildings without new purchases. Real estate values are assumed to remain constant. Total liabilities are predicted to increase in 1986 because of the principal due on the 1985 operating loan. It should then decline in 1987 and 1988, with the projected decline in long-term liabilities. While this is desired, it can not happen without the erosion of net worth (owner equity). From the values

associated with the pro forma owner equity, it can be seen that each year the net losses (after taxes) are reduced by the amount of non-farm income ($275) and the remainder is subtracted from owner equity. It seems likely that insolvency is on the horizon.

Looking at Table 12, the "Projected Financial Performance," return on total assets should improve because interest expense and net losses are expected to decline. Return on owner equity is expected to improve, but will remain negative. Total expenses as a percent of gross income will decline, but not below excessive levels. (A total expenses to gross income ratio of 100% means that gross income would be equal to total expenses.) Earnings after taxes to gross income will be negative each year but should improve. Debt servicing (interest and principal payments) to gross income will increase because of increased borrowing for operating loans. Working capital and the current ratio show the degree of illiquidity will increase from 1985-88. The debt to asset ratio (debt ratio) shows a projected increase of debt in relation to total assets that will approach technical insolvency by 1988.

c. Conclusions of Cash Grain Case Base Run Simulation

The projected financial statements indicate that the cash grain farm will probably have no measurable signs of improvement unless commodity prices increase, assuming the farm continues "business as usual." It is not advisable to count on prices increasing as forecasted over the next couple of years, because of circumstances (like the weather) that cannot be controlled.

If no changes in the finances of this farm are made, bankruptcy may be soon to follow. According to the data, the situation does not appear to be hopeless.

d. Alternatives to Improve the Financial Situation of the Cash Grain Farm Case

Given the results of the Base Run simulation, it seems evident that certain financial and/or production adjustments need to be made in order to achieve the goal of increased solvency through improved profitability. The alternatives attempted toward meeting this goal were:

1. Assume crop prices are constant at 1985 levels.
2. Family member gains off-farm employment.
3. Sell second farm of 213 acres.
4. Partial land liquidation with lease back.

5. Lease land at current rental rate.

6. Refinance from FmHA at subsidized interest rates.

7. Lease back land, refinance and increase level of production.

8. Hold crop prices at 1985 levels using the lease back, refinancing and increased production scenario.

The changes that occur in each alternative are highlighted in Table 4-5 on pages 89 through 93. Referring to this table will provide the reader with the exact differences between each alternative and the Base Run. Only those input variables that change for the alternatives are listed, showing both as they appear in the Base Run and in a particular alternative. The input variables which do not change are not included in Table 4-5.

The results of each alternative by year are provided on Tables 4-6 through 4-8. Table 4-6 contains a condensed version of the projected income statement and cash flow reconciliation. Table 4-7 contains selected values from the balance sheet (net worth statement). And Table 4-8 lists some of the more important measures of financial performance.

Each of the three output tables also include figures from the Base Run for easy comparison. The

eight alternatives which were tried on the cash grain farm are labelled "ALT.1" for the first alternative, "ALT.2" for the second alternative and so forth. Rather than explain each alternative exhaustively, the changes for each are stated, with a brief summary of the outcome. The final alternative selected for recommendation will be presented later, with a comparative analysis of the Base Run.

Alternative 1: Assume Crop Prices are Constant at 1985 Levels

Holding crop prices constant was experimented with to see how much worse off things would be if crop prices did not increase as in the Base Run. This is not technically an alternative. It is really a means of strategic planning. The only change in this alternative was to reduce the crop prices forecasted for 1986 and 1987 to those forecasted for 1985. Table 4-5 on page 89 shows that crop prices are the same throughout the forecast in this alternative.

Table 4-6 shows net cash income would be negative not only in 1985 (like the Base Run) but also in 1986 and 1987. Net earnings after taxes would have larger losses. Cash flow imbalances would be greater, resulting in increased amounts borrowed for operating loans.

Balance sheet figures show no changes in any of the assets or long-term liabilities. Current liabilities would

increase in 1987 and 1988 (from the additional operating loan amounts). This would create technical insolvency by 1987 and worse so in 1988.

Financial performance as measured by return on total assets and return on owner equity would start to decline in 1986 and continue to do so in 1987. Note that return on owner equity would be 166.21% in 1987. Ordinarily, positive returns are desired, however in this instance it results from net losses and negative equity (deficit). Total expenses to income and debt servicing to income would begin to increase in 1986, meaning expenses and debt servicing would be taking more of an already insufficient gross income. Working capital and the current ratio show an increase in the inability to meet current debt with current assets beginning in 1987. Finally, the debt ratio shows how many times greater total debt would be than total assets in 1987 and 1988.

With this scenario, if crop prices remain at 1985 levels, net losses and cash flow shortages would increase. The result would be insolvency within two years.

Alternative 2: Family Member Gains Off-Farm Employment

The only difference between this alternative and the Base Run is that the amount of annual non-farm income increases from $275 to $10,000 as shown in Table 4-5 under Alternative 2. All income and expense items are unchanged

from the Base Run. The amount of unreconciled cash flow and the deficit to operating loans would be improved by $9,725 ($10,000-$275) each year.

The values of assets and long-term liabilities would be the same as the Base Run. Current liabilities would decline by $9,725 each year. This would lower total liabilities by the same amount each year. It would also increase owner equity by $9,725 each year.

Return on total assets would be unchanged. Return on owner equity would improve (although remaining negative). Total expenses to income would be unaffected. Debt servicing to income would be lower because of smaller operating loans needed. Working capital would improve by $9,725 in 1986 and continue on. (See current ratio for relative change.) The debt ratio would be slightly less in 1986, 1987 and 1988 than the Base Run.

Alternative 3: Sell Second Farm of 213 Acres

The cash grain farm actually consists of two farms. One, the family farm. And two, a 213 acre farm purchased a few years ago. The second farm is currently for sale. An offer was made for $1,250 per acre, but fell through. Cost per acre was $1,500. A partial liquidation of this kind would:

- o decrease cost and market value of land by $319,500 ($1,500 X 213 acres).

- o decrease long-term liabilities by $266,250 ($1,250 X 213 acres).
- o decrease acres harvested by 213 acres.
- o eliminate the need for hired labor.
- o decrease variable expenses for machinery and improvements by 213/850, but not for insurance or depreciation on improvements.
- o decrease property taxes by 213 acres X $33.80 (average tax per acre).

A more detailed account of the input changes are presented in Table 4-5.

With lower production resulting from fewer acres farmed, sales, gross income and total expenses would be less each year. Net cash income would also be less. Net earnings after taxes would show a smaller loss in 1985, but larger losses in 1986 and 1987 would occur. Additional money borrowed would be less in 1985, but more in 1986 and 1987.

Fixed and total assets would be less in 1985 by the $319,500 decline incurred from the sale, of which $53,250 would be a loss. Current liabilities would be lower in 1985 and 1986 because lower long-term debt would mean less principal due periodically. However, larger operating loans due in 1987 and 1988 would cause current liabilities to be greater in 1988 than the Base Run. The amount of owner equity would be $53,250 less in 1985 because of the loss incurred on sale of land. The erosion of asset values

without replacements would be faster than the decline in total liabilities, so debts would be greater than assets by 1987.

Return on total assets and return on owner equity would be lower than the Base Run. The reason why the high returns on owner equity in 1986-87 is not an improvement, is that they result from insolvency. Total expenses and debt servicing to income would be greater each year. Working capital would be negative from 1986-88. And 1988 would be worse than the Base Run. The debt ratio would be higher each year, with insolvency occurring in 1987.

Alternative 4: Partial Land Liquidation with Lease Back

The same 213 acre farm sold in Alternative 3 is returned to the lender with a lease back agreement in this scenario. It is assumed that asset values will be reduced by cost ($319,500). Long-term liabilities will decrease by the amount received from liquidation. For illustrative purposes, $1,250 per acre was used for liquidation. This value is probably too high, but allows the reader to see the direct affect when compared to the Base Run and the sale without lease back.

Overhead expenses would change because property taxes would decline by $7,200; interest expense would be less and land lease would increase by $13,845 (213 acres X $65 per

acre). Table 4-5 provides the values used for each of these overhead expenses in this alternative.

With this alternative sales and gross income are unchanged. Total expenses decline because of lower overhead. Net cash income would show an increase of about $20,000 per year. Net earnings after taxes would also improve and would produce a profit of $8,550 in 1987. Cash flow, although still negative, would lead to much smaller operating loans in 1985-87.

Current assets would be the same as the Base Run each year, but fixed assets would be less each year. Because of the lower debt level, current and long-term liabilities would also be less. The decline in total assets and total liabilities would result in lower owner equity each year, because of the loss incurred with liquidation. Even though owner equity would increase in 1988, it would be so small from 1986-88 any unforeseen downturns could lead to insolvency.

The return on total assets shows continued improvement. Return on owner equity would decline initially, but improves in 1986 and would have a "genuine" positive return in 1987. Total expenses to income and debt servicing to income would be less each year. Working capital would still only be positive the first year, but shows improvement. Solvency would be jeopardized more with

this alternative, as measured by higher debt ratios in 1985-87. An improvement of 1% is projected for 1988.

Alternative 5: Lease Land at Current Rental Rate

In this fifth scenario, a lease back of all land is considered. It is assumed that all land assets and debts can be liquidated for values shown on the balance sheet. The deletion of land as an asset is also assumed to eliminate property taxes, although some property taxes would still exist on buildings and residence. This alternative would substantially reduce the amount of interest expense, as shown in Table 4-5. The lease back would increase land lease by $21,775 (335 acres X $65 per acre), annually.

Sales and gross profit would be unchanged from the Base Run, but total expenses would be decreased by slightly over $53,000 each year. Because these declines occur in cash expenses, net cash income increases by the full amount. This translates into profits in both 1986 and 1987. A cash surplus would occur in 1987 and only small operating loans in 1985 and 1986 would be necessary.

Current assets would increase in 1988, with increased cash. Fixed assets would be less than the Base Run each year because only machinery and buildings would remain. Current and long-term liabilities would also be less each year without any land debt to repay. While the result

would be a considerable decline in owner equity in 1985, 1986 would decline much less and 1987 and 1988 would show growth in net worth.

Returns on total assets and owner equity would increase by large amounts. Total expenses to income and debt servicing to income would decline. Working capital would become positive throughout the period. The debt ratio would be lower each year when compared to the Base Run and would decrease at an increasing rate.

Alternative 6: Refinance from FmHA at Subsidized Interest Rates

The FmHA (Farmers Home Administration) allows farmers meeting certain criteria to obtain loans at below market interest rates. The subsidized interest rate on operating loans is currently 7-1/4% and 5-1/4% on real estate loans. The maximum amount that can be borrowed for either purpose is $200,000. Therefore, it is possible to borrow up to $400,000 ($200,000 for operating and $200,000 for real estate) at these lower interest rates. It is also possible to borrow up to $400,000 for operating loans and $300,000 for real estate with a guaranteed loan, but the interest rates are not subsidized. The amortization period (years to repay) of each loan type can also be increased from five to seven years on operating loans and from 30 to 40 years on real estate. This is important, because lengthening the time to repay, will increase the total amount of interest

paid on a loan, but will lower the periodic payments. This helps improve cash flow.

The amount of debt the cash grain farm has is greater than the limits required for each loan type to refinance all debt at the subsidized interest rates. Therefore, this refinancing scenario was designed to restructure the existing loans to take advantage of the subsidized cost of money. This means only part of the total debt can be refinanced. The changes in the liability structure would be as follows:

- decrease bank loan by $200,000.
- create an FmHA operating loan for $200,000 at 7-1/4% for 7 years.
- pay off the $157,065 FLB loan.
- pay off $42,935 of the land contract.
- create an FmHA real estate loan for $200,000 ($157,065 + $42,935) at 5-1/4% for 30 years.

The outstanding loan balance is listed for each loan by year under Alternative 6 in Table 4-5 on page 89. Also listed is the amount of interest expense required each year in this alternative. The amount of interest paid would be $23,712 less in 1985; $21,652 less in 1986 and $19,257 less in 1987.

Sales and gross income would be identical to the Base Run. Total expenses would decline with lower interest expense. Net cash income would be improved for the same

reason expenses would decline. Net earnings after taxes would show a profit of $8,336 in 1987. Unreconciled cash flow would be -$34,995 in 1985; -$42,629 in 1986 and -$39,532 in 1987. Here is where the extra two years added to the operating loan become important. All else the same, if the term were to be five years (as in Base Run) the unreconciled cash flows would be -$46,665, -$66,258 and -$75,602 for 1985-87. It may not seem crucial in this alternative, but in the final alternative these extra two years make the difference between positive and negative cash flow.

Assets would be the same as the Base Run. Current liabilities would be less because the lower interest rates and extended term on the operating loan would lower the periodic payment each year. Therefore, not only would the portion of interest decrease, so would the principal portion. If the term on the operating loan was five, rather than seven years, current liabilities would be greater than the Base Run. This would occur because the faster repayment schedule means the total principal ($200,000) would be paid back at a faster rate. In contrast, the long-term liabilities would be greater than the Base Run because the smaller principal payments lead to more debt outstanding at the end of each year.

Owner equity would not be affected in 1985. It would decline in 1986 and 1987, but not as much as the Base Run. In 1988, owner equity would grow $8,611.

Return on total assets would be less in 1986 and 1987. Return on owner equity would improve, showing a positive return of 11.07% in 1987. Total expenses and debt servicing to income, would be less than the Base Run each year, indicating improved repayment capacity. Working capital would show adequate improvements, with current assets satisfying current liabilities throughout the period. The debt ratio would be the same as the Base Run in 1985, but would be lower from 1986-88. However, the debt ratio would still increase by 2% over the period, putting more pressure on solvency.

Alternative 7: Lease Back Land, Refinance and Increase Level of Production

A combination of returning the land to the lender and leasing it back, with refinancing $200,000 (maximum) of Bank notes at 7-1/4% for 7 years from the FmHA was first considered in this alternative. Net earnings after taxes became -$1,997, $17,080 and $26,559 in 1985, 1986 and 1987 respectively. Cash flow became $3,885, $23,917 and $51,344 each year. Solvency as measured by the debt ratio was 0.79, 0.78, 0.69 and 0.57 from 1985-88. To improve on the net loss projected for 1985 an attempt at decreasing crop acreage and crop expenses by 25% was tried. This

resulted in a greater loss in 1985 and lowered profits in 1986 and 1987. The same scenario was run with crop acreage and crop expenses increasing 25%. The results of which are provided on Tables 4-6 through 4-8, under "ALT.7."

There are many changes in the Base Run input which were necessary to simulate the projected outcome of this alternative. Table 4-5 illustrates what returning the land and refinancing $200,000 of the bank debt would do to the asset/liability structure.

Acres of each crop harvested are shown in Table 4-5 with an increase of 25% (rounded to the nearest whole acre). This increased total crop acres harvested from 850 in the Base Run to 1,061 in this scenario. No land is owned, so all would have to be leased. It is assumed that 1,061 acres are rented on a cash basis for $65 per acre and that land would be available.

The increased level of production would allow 25% more quantities of each crop to be sold, keeping inventories the same as in the Base Run. This increased level of production would also require 25% more hours of labor for each crop. This added labor is hired for $5.00 per hour in this alternative.

The remaining changes for Alternative 7 pertain to income and expense items. Other farm income increased (25%) from $13,693 to $17,116. All machinery and

improvement expenses, except for insurance and depreciation on improvements increased 25% over the Base Run. Property taxes were assumed to be zero. Interest expense was calculated to be $16,053 in 1985; $14,124 in 1986 and $12,041 in 1987. Land lease increased from $33,485 per year in the Base Run to $68,965 per year.

Increased production would cause sales and gross income to increase $54,914 in 1985; $63,812 in 1986 and $68,452 in 1987, holding inventory levels the same as the Base Run. Total expenses would decrease although operating expenses and land lease would be greater because of no property taxes and the decrease in interest expense. The amount of interest savings each year would be $73,815, $71,363 and $68,543 for two reasons. One, no land debt eliminates all interest expense on real estate, saving $64,314, $63,978 and $63,607 in 1985, 1986 and 1987, respectively. Secondly, the lower interest rate on the $200,000 FmHA operating loan would decrease interest expense by $9,500, $7,385 and $4,937 throughout 1985-87.

The net effect of increased production level would increase net cash income more than $76,000 per year. Thus converting the -$29,616 of the Base Run in 1985 to $46,937. Net earnings after taxes would show profits each year, rather than consecutive losses as illustrated in Table

4-6. Unreconciled cash flow would be positive from 1985-87 and would grow with increased cash from operations.

Current assets would increase from 1986-88 due to the increased beginning cash balances. Fixed assets would decline by $651,908 in 1985 from the land liquidation and continue to decline by $34,874 throughout the period because without purchasing new equipment no offsets are weighed against the depreciation used in the template. Therefore, total assets would become $267,710, $246,193, $243,993 and $251,295 at the beginning of each year projected.

Current liabilities would decline drastically because the major contributor to long-term debt (land) would be eliminated, causing principal due on existing loans to fall. In addition, no need for operating loans with this alternative and refinancing would lessen current liabilities even further.

Although owner equity would be cut by more than half in 1985, it is projected to increase each of the remaining years. Note that 1986-88 would have larger net worth than the Base Run. In particular, net worth in 1988 would be $119,796 versus $26,731 with the Base Run and increases annually.

As might be expected, financial performance would be the best with this alternative. Return on total assets

would be more than double that of the Base Run. Return on owner equity would be 5.78%, 34.55% and 35.55% from 1985-87, compared to negative returns in the Base Run. Total expenses to income would be less than 100% each year, meaning total expenses are less than gross income. In addition, they will decline, making them more manageable. Debt servicing to income would also be considerably less each year without the land debt and with the refinancing. It would also show annual declines, rather than continuous increases. Changes in current assets and liabilities would result in positive and growing working capital, not negative and shrinking like the Base Run. Finally, the debt ratio would be 79% in 1985 versus 88% in the Base Run. It would decline 3% in 1986, 10% in 1987 and 14% in 1988. This is in contrast to the annual increases with the Base Run. By 1988, the projected debt ratio would be only 52%.

Alternative 8: Hold Crop Prices at 1985 Levels Using the Lease Back, Refinancing and Increased Production Scenario

Because the future for this farm is decided to a large extent by what crop prices are going to be, the previous alternative, (Alternative 7) which produced the most favorable results, was subjected to a "what if" situation where crop prices did not increase at all. The only difference between this alternative and the lease back,

refinancing and increased production alternative is that crop prices are held constant throughout the forecast period at the prices used for 1985. Table 4-5 under Alternative 8 lists the changes for this alternative. The only difference in input between this and Alternative 7 is the crop prices received. Table 4-5 shows that crop prices were not projected to increase in Alternative 8 as they did in the Base Run.

As was pointed out in Alternative 1, where prices were held at 1985 levels in comparison to the Base Run, profitability and solvency would be worsened. Therefore, it seems reasonable, after finding an alternative to recommend for the cash grain farm, to determine the outcome with less optimistic crop price forecasts.

The outcomes of this alternative would obviously be the same as Alternative 7 in 1985. The changes that would occur in the following years would be due only to lower crop prices.

Sales and gross income would be greater than the Base Run but only by $421 in 1987. Keep in mind, this is with 25% more production than the Base Run. Total expenses would be the same as in Alternative 7, but this is less than the Base Run in any year.

The amount of net cash income would be relatively the same each year, varying only $1,769 over the three year

period. Net cash income would not increase as it did when crop prices rose, but it would still be much better than the Base Run. Net earnings after taxes would be only $3,283 in 1985; $2,249 in 1986 and $3,416 in 1987, indicating the 1985 crop prices are very close to break-even prices for this farm, in this scenario.

The unreconciled cash flow would be $14,357 in 1985 and increase about $10,000 per year. Therefore, even without crop price increases, leasing back all land, refinancing and increasing production levels 25% would produce positive cash flows. However, if the refinancing part of this scenario does not include a seven year term on the operating loan, then cash flow would be negative in 1987. Just by changing the term to five years would cause the cash flow of this alternative to be only $2,686 in 1985, $1,123 in 1986 and -$1,666 in 1987. As such, assuming crop prices will not increase in 1986 and 1987, the importance of refinancing over seven years can not be overemphasized if the objective is to be met in this alternative.

Current assets would increase with the annual cash surpluses. Fixed assets would be identical to Alternative 7, both of which are less than the Base Run. As mentioned earlier, this would occur because of the land liquidation.

On the other side of the balance sheet, all liabilities would be the same as Alternative 7, so they

would be less than the Base Run. Owner equity would react the same as it did in Alternative 7 in 1985 and 1986. It would be larger than the Base Run values in 1987 and 1988, but would be less than Alternative 7 because of lower beginning cash balances in those years.

The only measure of financial performance that would not be better than the Base Run would be the return on total assets in 1986 and 1987. The reason being, net earnings after taxes and interest expense would change very little.

Return on owner equity would be similar to what the owner could earn on a savings account at a local bank, but that would be better than the Base Run projections. All but about 4% of gross income would be consumed by expenses each year if crop prices don't increase. Debt servicing to income would remain constant at 14.70% per year. Working capital, while not as great as when crop prices increased, would be at comfortable levels and growing. The debt ratio would decline continuously (but not as fast as Alternative 7). It would be 15% greater in 1988 than Alternative 7, but would still be 30% less than the Base Run.

D-7. Summary and Recommendation for Cash Grain Farm

The objective of doing the computer simulation was to determine what is necessary to improve net farm income and

cash flow in order to increase the level of solvency of the cash grain farm.

While most of the alternatives were a step toward meeting the objective, one was not. This alternative involved the partial liquidation of the farm by selling 213 acres (Alternative 3). This was the only alternative, except for doing nothing and crop prices not increasing (Alternative 1) that lead to technical insolvency.

No alternative by itself was sufficient at meeting the objective. A combination of leasing the land back and refinancing the maximum amount possible on other loans would possibly be acceptable, but to achieve the objective, a 25% increase in production levels would also be necessary. This is especially true if crop prices do not increase over the three year period.

The recommendation is to:

1. Liquidate land and lease back at $65 per acre the 335 acres currently being purchased.
2. Refinance $200,000 of bank debt from FmHA at 7-1/4% for 7 years.
3. Increase level of production 25% with increased acreage.

E. Analysis of Case Study Hog Farm

This hog farm has a farrow-to-finish operation with between 150 and 175 sows, selling from 1,000 to 1,400 hogs per year. The farm includes 235 acres, of which 146 are

tillable. The farm also rents 275 acres. In the past it has grown corn, for feed and has used 35 acres for pasture.

Before discussing the hog farm case, two things should be pointed out. First, this farm switched from Telfarm in 1984 to a record keeping service provided by the Production Credit Association (P.C.A.) called Agrifacts. Because of this, the only records available from 1984 are those prepared for tax purposes. Secondly, this farm violates the criteria of having a debt ratio of 70% or greater in 1983 because $147,000 of real estate purchased in 1983 was not recorded as an asset. It did however show up as a liability. When the correction is made, the debt ratio for 1983 is reduced from 83% to 62%.

The absence of a 1984 ending balance sheet meant that one had to be created in order to provide the necessary simulation input. The monthly cash flow statements were available for 1984. They provide information needed to construct the liability structure of the 1984 balance sheet. Because no data was prepared regarding assets, the values associated with each asset on the 1984 ending balance sheet are either three year averages or estimates based on past trends.

E-1. Hog Farm Case--Balance Sheets

a. Assets

The value of total assets increased over the period of 1981-83 from $410,681 to $586,370. Table 4-9 on page 124 shows the actual balance sheets from 1981-82. The 1983 balance sheet has been adjusted for the $147,000 increase in real estate. Nineteen hundred and eighty-four's balance sheet is an estimate.

During 1982, total assets rose $47,694. This increase occurred from better market prices for livestock and an appreciation in the estimated value of real estate. Although the balance sheet does not show it, the number of each type of livestock declined.

Just the opposite was true of livestock values in 1983. The values of market hogs and sows each declined because prices fell. The number of market hogs actually increased, while the number of sows fell from 175 to 160. Value of boars rose because of keeping more on inventory.

The purchase of a farm was made in 1983. The details of the purchase are not known, but it is assumed to have increased the value of fixed assets by

TABLE 4-9: Balance Sheets On Hog Farm Case, 1981-84
Telfarmers, For Year Ended December 31, 19XX

ASSETS	1981	1982	1983	1984
Current Assets	$	$	$	$
Cash	0	1000	1000	1000
Crops	1000	240	520	587
Feed	43500	45785	46600	48231
Supplies	0	0	0	0
Market Hogs	27880	34400	25250	29177
Total Current Assets	72380	81425	73370	78995
Intermediate Assets				
Accounts Receivable	0	0	0	0
Sows	22300	32000	16500	30000
Boars	2400	4950	5500	5000
Machinery & Equipment (Market Value)	93601	90000	94000	92500
Non-farm Business Assets	0	0	0	0
Household Assets	0	0	0	0
Total Intermediate Assets	118301	126950	116000	127500
Fixed Assets				
Estimated Value of Real Estate	220000	250000	397000	397000
TOTAL ASSETS	410681	458375	586370	603495
LIABILITIES & NET WORTH				
Current Liabilities				
Accounts Payable	0	0	0	0
Production Credit Association	3600	0	2072	3800
Banks	1125	0	0	0
Farmers Home Administration	11902	10365	10860	10440
Total Current Liabilities	16627	10365	12932	14240
Intermediate Liabilities				
Merchants & Dealers	0	0	0	0
Production Credit Association	14400	0	8286	15200
Banks	4125	0	0	0
Farmers Home Administration	37688	32824	34390	33060
Other Credit Institutions	19660	0	4730	4686
Total Intermediate Liabilities	75873	32824	47408	52946
Long-term Liabilities				
Banks	2250	0	0	0
Farmers Home Administration	43590	43190	43250	43500
Insurance Companies	0	0	0	0
Individuals	7069	7360	117000	117000
Federal Land Banks	112814	111423	110275	108760
Total Long-term Liabilities	172023	161972	302525	299260
TOTAL LIABILITIES	264523	205161	362865	366446
Net Worth	146158	253214	223505	237049
TOTAL LIABILITIES & NET WORTH	410681	458375	586370	603495

$147,000 because long-term liabilities increased by that amount in 1983.

The 1984 values of each asset were determined as follows:

- cash..... estimate
- crops..... 3-year average
- feed..... 3-year average of growth
- supplies..... 3-year average
- market hogs..... 3-year average
- accounts receivable..... estimate
- sows..... estimate
- boars..... estimate
- machinery and equipment..... 3-year average
- non-business assets..... 3-year average
- household asset..... 3-year average
- real estate..... estimate

b. Liabilities

Total liabilities increased $101,923 between 1981 and 1984. Current and intermediate liabilities declined over the period, but the land purchase in 1983 of $147,000 caused total liabilities to increase as it did. There does not appear to be any changes that attract attention other than the land purchase.

c. Net Worth

The $107,056 increase in owner equity during 1982 was partially due to the increase in total assets ($47,694) and from the decline in total liabilities ($59,362). The decline of about $30,000 in 1983 occurred from falling market prices for livestock and from more money borrowed for operating purposes. In 1984, net worth should have been $237,049, based on the estimated assets.

E-2. Hog Farm Case--Income Statements

Net income, as shown on Table 4-10 was quite volatile from 1981-83. With a reported net earnings before taxes of $45,630 in 1982, it appears that the increase in hog prices during 1982 had a significant impact on this farm's financial well-being.

In 1982, sales increased $53,944 because more hogs were sold at higher prices. Gross profit also increased with improved sales. Total expenses were also greater in 1982. From the increases in expense items, it looks as though most of the increase was necessary to support a larger hog operation.

As hog prices fell in 1983, so did sales dollars. This resulted in a lower gross profit that year. Total expenses were lower in 1983 as a result of less money spent on crops and livestock. Interest expense was also less,

TABLE 4-10: Income Statements On Hog Farm Case, 1981-83
Telfarmers, For Year Ended December 31, 19XX

INCOME	1981	1982	1983
	$	$	$
Sales	181737	235681	183676
Purchases	3440	3600	3250
Beginning Inventory	138874	97080	117375
Ending Inventory	97080	117375	94370
Gross Profit	136503	252376	157421
EXPENSES			
Hired Labor	2890	1583	1597
Repairs, Maintenance, Tools	7261	9342	9518
Fuel, Oil & Grease	10469	8551	6312
Custom Hire & Lease	1460	555	739
Conservation	140	0	280
Insurance	1307	1207	1201
Building & Land Lease	11401	15364	12455
Fertilizer & Lime	13041	12572	13558
Crop Supplies & Packages	456	290	0
Seed, Plants & Trees	4513	8382	2610
Chemicals	5684	6593	6292
Crop Marketing	307	111	59
Other Crop Expense	2388	4076	2082
Feed, Supplements & Additives	45493	58396	55554
Semen & Breeding Fees	0	0	0
Veterinarian,Medicine, & Drugs	2431	4499	3681
Livestock Marketing, Etc.	364	260	301
Livestock Supplies & Other	188	1279	573
Property Taxes	2418	7855	141
Utilities	1576	1441	1116
Interest	31215	39991	31454
Depreciation	19596	19830	19413
Miscellaneous	1064	4569	1513
Total Expenses	165662	206746	170449
Less: Increase in Prepaid Expenses	0	0	0
Adjusted Total Expenses	165662	206746	170449
NET FARM INCOME BEFORE TAXES	-29159	45630	-13028

this may indicate that some interest payments were missed because the $147,000 land purchase shows no principal paid during 1983. If this is true, losses would have been more in 1983.

E-3. Hog Farm Case--Cash Flows

The sources and uses of cash are presented in Table 4-11 on page 129 for 1981-84. All figures are actual, except family living withdrawals, which was estimated. Notice that the $147,000 does not show up as money borrowed in 1983. It may be that the buyer and seller negotiated a small down payment, since this purchase is being made from an individual. That may explain why only $26,000 was borrowed in 1983.

E-4. Hog Farm Case--Financial Ratios

Although there is a lack of cash, the farm has ample liquidity as measured by growing current ratios and working capital. (See Table 4-12, page 130.)

Profitability has not been so good. Nineteen hundred and eighty-two showed great improvement, but 1983 saw the profitability ratios plummet as fast as they rose the year before. It would be advisable to develop a marketing plan designed to smooth out the radical changes in sales, gross profit and ultimately, net earnings. This might be accomplished with forward contracting, futures markets or options.

TABLE 4-11: Cash Flow Summary On Hog Farm Case, 1981-84
Telfarmers, For Year Ended December 31, 19XX

	1981	1982	1983	1984
	$	$	$	$
Cash Farm Receipts	181708	235681	183676	226464
Cash Farm Expenses	149506	187348	154287	193881
NET CASH INCOME	32202	48333	29389	32583
Plus				
Beginning Cash Balance	0	0	0	0
Non-farm Income	0	352	528	176
Capital Sales	11071	0	0	0
New Money Borrowed	191512	6863	26004	69805
Decrease in Receivables	0	0	0	0
Total Additions to Cash	202583	7215	26532	69981
Minus				
Non-farm Expenses	0	0	0	0
Capital Purchases	44565	8161	8375	2129
Principal Paid	166947	66225	39081	66223
Family Living Withdrawals	23273	18000	8465	34212
Increase in Receivables	0	0	0	0
Ending Cash Balance	0	0	0	0
Total Subtractions from Cash	234785	92386	55921	102564
NET CASH UNACCOUNTED FOR	0	-36838	0	0

TABLE 4-12: Financial Ratios On Hog Farm Case, 1981-83 Telfarmers, For Year Ended December 31, 19XX

	1981	1982	1983
LIQUIDITY RATIOS			
Current Ratio	4.35	7.86	5.67
Quick Ratio	0.00	0.10	0.08
Net Working Capital	$55753	$71060	$60438
PROFITABILITY RATIOS			
Sales to Net Working Capital	3.26	3.32	2.61
Profit As Percent of Sales	-0.16	0.19	-0.07
Return on Net Worth	-0.20	0.18	-0.17
Percent Change in Gross Profit	--	0.85	-0.38
Percent Change in Sales	--	0.30	-0.22
Operating Ratio	1.21	0.82	1.08
Interest to Gross Farm Profit	0.23	0.16	0.20
ACTIVITY RATIOS			
Fixed Asset Ratio	0.83	0.94	0.46
Total Asset Turnover	0.44	0.51	0.31
LEVERAGE RATIOS			
Debt Ratio	0.64	0.45	0.62
Debt-to-Equity	1.81	0.81	1.62
Times Interest Earned	1.29	1.77	1.70

Activity ratios show that since the land purchase, assets have not yet been employed nearly as efficiently as in the past.

The debt and debt-to-equity ratios show that a slight decline in leverage took place from 1981 to 1983. These indicate that expansion has been beneficial for this farm. The times interest earned ratio increased, suggesting an improvement in the ability to repay current debts.

E-5. Summary of Past Finances on the Hog Farm Case

Overall, this farm is not in very bad shape. Developing a marketing plan would probably increase sales dollars (depending on prices). With assets and net worth growing, solvency is not as critical of an issue as generating profits and good cash flows are. If profitability can be restored and volatility smoothed, this farm should maintain continuity.

E-6. Introduction to Simulation on the Hog Farm Case

The Base Run simulation on this farm assumes the hogs' feed will consist of corn only. The inventories of oats and hay are sold in 1985 to help increase the cash flow.

a. Base Run Simulation of Hog Farm Case

The input for this farm is provided in Tables 1 through 8 starting at the beginning of Appendix C.

Table 4-13 also shows the values for input used in the Base Run which change in each alternative.

Table 1 shows breeding livestock and crops which were on the 1984 balance sheet. Table 2 provides the details on assets and liabilities. Table 4 shows the simulated hog operation will include 162 sows producing 27.00 cwt. per head. Prices for output are average dollars received per hundred-weight for 1985. The 1986 and 1987 prices are forecasted hog prices of the MSU Agricultural Model. Other income per head and capital gain income per head are based on the estimates in the Estimated Crop and Livestock Budgets for Michigan, 1984 for a 2 litter farrow-to-finish operation.[18] For example, the 1984 hog price given in the Estimated Crop and Livestock Budgets for Michigan was $50.00 per cwt. Sow price per cwt. was $42.00 and boar price was $37.00 per cwt. Using the average 1985 hog price of $46.70, prices of market hogs declined 6.6% from 1984.[19] Assuming the same reduction in sow and boar prices, they would be $39.22 and $34.56, respectively in 1985. With an estimated 1.60 cwt. of sows sold and 0.18 cwt. of boars sold per head (from budget), the other income per head in 1985 would be: $39.22 * 1.60 cwt. + $34.56 * 0.18 = $68.97. The capital gain income is calculated the same way.

TABLE 4-13: Input Changes for Hog Farm Case Alternatives

Alternative Number	Appendix C Reference	Table Location	Base Run Value For 1985	Base Run Value For 1986	Base Run Value For 1987	Change For Alternative 1985	Change For Alternative 1986	Change For Alternative 1987
1	Table 5	Corn acres harvested.	410	410	410	351	351	351
		Bushels of corn to sell.	5310	5310	5310	0	0	0
	Table 6	Labor hours for corn.	2296	2296	2296	1966	1966	1966
	Table 8	Hired labor.	$6000	$6000	$6000	$4350	$4350	$4350
		Repairs, maintenance.	$8707	$9836	$10956	$7454	$8421	$9379
		Custom hire & lease.	$918	$918	$918	$786	$786	$786
		Insurance.	$1238	$1238	$1238	$1060	$1060	$1060
		Fuel, oil & grease.	$8410	$8410	$8410	$7200	$7200	$7200
		Mach. depreciation.	$14335	$14335	$14335	$12272	$12272	$12272
		Utilities.	$1378	$1378	$1378	$1180	$1180	$1180
		Land lease.	$13426	$13426	$13426	$10535	$10535	$10535
2	Table 7	5-yr. mach. purchased.	N.A.	N.A.	N.A.	$20500	$20500	$20500
		Years to repay loan.	N.A.	N.A.	N.A.	7.0	7.0	7.0
		Interest rate.	N.A.	N.A.	N.A.	10.25%	10.25%	10.25%
	Table 8	Mach. depreciation.	$14335	$14335	$14335	$17410	$20485	$23560
		Interest.	$39624	$38544	$37339	$39624	$40645	$41321
3	Table 4	Hog price per cwt.	$46.70	$48.19	$58.73	$42.55	$43.85	$44.90
		Other income per head.	$68.97	$71.17	$86.74	$62.84	$64.76	$66.31
		Capital gain per head.	$69.00	$71.00	$87.00	$63.00	$65.00	$66.00
		Livestock expense/hd.	$343	$393	$443	$343	$343	$343
	Table 5	Price of corn sold.	$2.47	$2.81	$2.92	$2.47	$2.47	$2.47
	Table 7	5-yr. mach. purchased.	N.A.	N.A.	N.A.	$20500	$20500	$20500
		Years to repay loan.	N.A.	N.A.	N.A.	7.0	7.0	7.0
		Interest rate.	N.A.	N.A.	N.A.	10.25%	10.25%	10.25%
	Table 8	Mach. depreciation.	$14335	$14335	$14335	$17410	$20485	$23560
		Interest.	$39624	$38544	$37339	$39624	$40645	$41321

N.A. = not applicable.

Livestock expenses include: 1) purchased feed; 2) livestock supplies; 3) breeding fees; 4) veterinarian and medicine; 5) marketing; and 6) miscellaneous. The estimates of the budget book for these expenses were adjusted for crop price declines, which includes $100 drop per ton of soybean meal. Because soybeans are forecasted to increase dramatically, the livestock expenses increase $50.00 per year in the Base Run.

Table 5 shows that 410 acres of corn will be harvested and 10 acres will be used as pasture. Yields per acre are 3-year averages. Quantity of corn to feed is estimated. Quantities of corn to sell are amounts which are not needed for feed. Oats and hay sales are amounts in beginning inventory. The quantity of corn to buy in 1985 is what is needed in excess of beginning inventory to feed hogs until November 1st when the new crop is harvested. Quantities in ending inventory are amounts needed to support livestock until the following year's crop is harvested.

Prices per units sold are forecasts for corn and balance sheet dollars per unit for oats and hay. The price of corn to purchase is the 1984/85 average price plus a 20 cent marketing spread.

Crop expenses per acre are estimates from the Estimated Crop and Livestock Budgets for Michigan, 1984. They include: 1) seed; 2) fertilizer and lime; 3) pesticides; 4) marketing; and 5) miscellaneous expenses. They do not increase during the 3-year projection period.

Labor hours per enterprise (Table 6) are hours needed according to the estimated budgets. An average of 1200 hours of hired labor was used in the program because the case farm reports a total which is inconsistent with this size of farm.

No capital purchases are made in the Base Run, so Table 7 is not used.

The annual income and expense items stated in Table 8 are as follows:

- other farm income is zero because it has been included in the other livestock income.
- non-farm income is zero, as reported each year.
- hired labor is 1,200 hours at $5/hour.
- family labor draw is the average for this type of farm.
- repairs and maintenance is based on a 3-year average with annual increases to allow for more repairs as equipment ages. The increase is the average increase from past data.
- custom hire and lease is a 3-year average.

- o insurance is a 3-year average.
- o fuel, oil and grease are 3-year averages.
- o depreciation is a 3-year average with an adjustment for the one year lapse in reporting. Machinery depreciation is based on average decline. Improvements are based on average increase.
- o property taxes are a 3-year average, assuming the change from 1982 to 1983 is due to the land purchase.
- o utilities and miscellaneous are 3-year averages.
- o land lease is based on an average cash rent per acre of $49.00.
- o interest expense is calculated internally.

b. Results of Hog Case Base Run Simulation

The projected outcomes of this Base Run are provided in Tables 9-12, in Appendix C. They are summarized for easy comparison with the other alternatives in Tables 4-14 through 4-16.

The pro forma income statements show sales increasing each year of the forecast. This occurs primarily because hog prices are expected to increase. Crop sales dollars will decline even though prices are going up, because there will be no oats or hay to sell after 1985. Gross income is projected to be $228,561 in 1985 due to the inventory adjustment which takes place. From then on, gross income

TABLE 4-14: Outcomes of Hog Farm Alternatives on Income Statement and Cash Flow

PROJECTED INCOME STATEMENT	BASE RUN $	ALT. 1 $	ALT. 2 $	ALT. 3 $
Sales:				
1985	231721	218605	231721	212575
1986	237234	222313	237234	215407
1987	286442	270937	286442	220251
Gross Income:				
1985	228561	215446	228561	209416
1986	237234	222313	237234	215407
1987	286442	270937	286442	220251
Total Expenses:				
1985	206352	191890	209427	209427
1986	214500	199877	222751	214651
1987	222515	207730	235722	219522
Net Cash Income:				
1985	18163	17446	18163	(983)
1986	41315	38954	39214	25487
1987	82508	79725	78526	28534
Net Earnings After Taxes:				
1985	21638	22526	19088	(11)
1986	14375	14178	10979	24
1987	35622	35291	31579	23
CASH FLOW RECONCILIATION				
Unreconciled Cash Flow:				
1985	8981	7806	9506	(9593)
1986	31246	27812	32381	2327
1987	73554	67725	75380	13752
Suplus to Cash:				
1985	8981	7806	9506	0
1986	31246	27812	32381	2327
1987	73554	67725	75380	13752
Deficit to Operating Loan:				
1985	0	0	0	9593
1986	0	0	0	0
1987	0	0	0	0

TABLE 4-15: Outcomes of Hog Farm Alternatives on the Balance Sheet

PROJECTED BALANCE SHEET	BASE RUN $	ALT. 1 $	ALT. 2 $	ALT. 3 $
Current Assets:				
1985	48374	48374	48374	48374
1986	78982	77808	79508	70001
1987	101247	97813	102383	72329
1988	143555	137726	145381	83753
Fixed Assets:				
1985	554424	554424	554424	554424
1986	535843	537906	553268	553268
1987	517262	521388	549037	549037
1988	498581	504870	541731	541731
Total Assets:				
1985	602797	602797	602797	602797
1986	614825	615713	632775	623269
1987	618509	619201	651419	621365
1988	642235	642596	687112	625484
Current Liabilities:				
1985	9610	9610	9610	9610
1986	10691	10691	12835	22428
1987	11896	11896	16404	16404
1988	13240	13240	20355	20355
Long-term Liabilities:				
1985	356836	356836	356836	356836
1986	346145	346145	364501	364501
1987	334249	334249	368597	368597
1988	321009	321009	368742	368742
Total Liablities:				
1985	366446	366466	366466	366466
1986	356836	356836	377336	386929
1987	346145	346145	385001	385001
1988	334249	334249	389097	389097
Owner Equity:				
1985	236351	236351	236351	236351
1986	257989	258878	255439	236340
1987	272364	273056	266419	236365
1988	307986	308347	298015	236388

TABLE 4-16: Outcomes of Hog Farm Alternatives on Financial Performance Measures

	BASE RUN	ALT. 1	ALT. 2	ALT. 3
PROJECTED FINANCIAL PERFORMANCE				
Return on Total Assets:				
1985	10.06%	10.20%	9.50%	6.46%
1986	8.58%	8.54%	8.04%	6.54%
1987	11.57%	11.51%	10.90%	6.63%
1988	--	--	--	--
Return on Owner Equity:				
1985	8.75%	9.10%	7.76%	0.00%
1986	5.42%	5.33%	4.21%	0.01%
1987	12.28%	12.14%	11.20%	0.01%
1988	--	--	--	--
Total Expenses to Income:				
1985	90.28%	89.07%	91.63%	100.01%
1986	90.42%	89.91%	93.90%	99.65%
1987	77.68%	76.67%	82.29%	99.67%
1988	--	--	--	--
Debt Servicing to Income:				
1985	21.54%	22.85%	21.54%	23.51%
1986	20.75%	22.15%	22.54%	29.28%
1987	17.19%	18.17%	20.15%	26.21%
1988	--	--	--	--
Working Capital:				
1985	$38763	$38763	$38763	$38763
1986	$68291	$67117	$66672	$47573
1987	$89352	$85917	$85979	$55924
1988	$130315	$124487	$125027	$63399
Current Ratio:				
1985	5.03	5.03	5.03	5.03
1986	7.39	7.28	6.19	3.12
1987	8.51	8.22	6.24	4.41
1988	10.84	10.40	7.14	4.11
Debt Ratio:				
1985	0.61	0.61	0.61	0.61
1986	0.58	0.58	0.60	0.62
1987	0.56	0.56	0.59	0.62
1988	0.52	0.52	0.57	0.62

will equal sales, because no further feed inventory changes will be needed.

Total expenses should increase about $8,000 per year as a result of more repairs and higher feed costs for livestock. Overhead is projected to decline from less interest expense, as the loans are amortized.

Net cash income will more than double from $18,163 in 1985 to $41,315 in 1986. This occurs from higher commodity price forecasts and no feed purchases. It nearly doubles again in 1987 as prices for crops and especially hogs continues to rise.

Net earnings after taxes will be $21,638, $14,375 and $35,622. This increase is mostly attributable to the increases that occur in hog prices over the forecast period.

Unreconciled cash flows will be $8,981, $31,246 and $73,554 from 1985-87. The annual increases are attributable to higher beginning cash balances and greater cash from operations.

The Base Run balance sheets have total assets increasing and total liabilities decreasing. Both current assets and liabilities should increase. Current assets will grow as cash balances rise and with the stabilizing of crop inventory in 1986.

Current liabilities will increase as the amortization process causes more principal to be due on long-term debt. This will cause long-term liabilities to be less each year. Fixed assets will also be less each year due to depreciation on machinery and buildings which will not be offset by new purchases. The result of growing assets and declining liabilities is an owner equity which is 39% of total assets and growing.

The projected financial performance measures given in Table 12 indicate the farm is in a fairly good position and it will improve. The returns on total assets and owner equity will decline some in 1986 when income falls, but will show positive growth over the period. Total expenses to income and debt servicing to income will both decline over three years, which should lighten the load on cash flow in the future.

Liquidity as measured by working capital and the current ratio show annual growth. This may make it possible to make some capital purchases to assure continuity of the business. Solvency will be more secure as the debt ratio falls from 61% in 1985 to 52% by 1988.

c. Conclusions of Hog Case Base Run Simulation

The Base Run has shown that this farm can operate as it has in the past and achieve the goal of increased profitability and reduced debt. Evidence of improved profitability is the after tax net earnings which are projected to increase from $21,638 in 1985 to $35,622 by 1987. Support of a lower debt level is given by the projected debt ratio which should decline from 61% in 1985 to 52% by 1988.

The increases in cash, owner equity and working capital indicate this farm could expand if desired. During the on-farm interview the farmer said he had no plans of getting bigger until more debt is repaid. He also said that when extra money was available, he used it to prepay money owed on his F.L.B. loan.

d. Alternatives to Improve the Financial Situation of the Hog Farm Case

Because the results of the Base Run show this farm has a relatively stable financial position, the alternatives concentrate not only on improved profitability and solvency, but also on the affects of expansion and lower commodity prices.

There were three scenarios developed for this farm. They are:

1. Reduce crop production to provide feed needs, without crop sales.

2. Continue to make capital purchases.

3. Determine break-even hog prices.

The third alternative is more of a strategic plan than it is a financial alternative. The importance of determining break-even prices will be evident when Alternative 3 is presented.

Alternative 1: Reduce Crop Production to Provide Feed Needs, Without Crop Sales

To determine whether or not land rented for crops sales adds to profitability, a scenario which included only enough acres harvested to produce the feed requirements was developed. This would allow the number of rented acres to be 59 acres less. (Total bushels of corn for feed is 31,590. At 90 bushels per acre, 351 acres are needed.)

Table 4-13 shows that the acres of corn harvested would fall from 410 in the Base Run to 351 in this alternative. As a result no corn would be available for sale. With fewer acres farmed, less labor would be needed causing labor hours for corn to fall from 2,296 to 1,966. This would cause the amount of hired labor to decrease from $6,000 per year to $4,350. Several of the expenses would also be reduced as noted in Table 4-13.

Total sales would be $13,116 less in 1985 with no corn being sold. The declines in 1986 and 1987 would be $14,921 and $15,505. Gross income would change by these exact same values because 9,658 bushels of corn would still have to be

purchased in 1985 because there is not enough corn in inventory to begin with.

The reduction in total expenses result from less spent on labor, machinery and improvements, crops and overhead. Hired labor would be $4,350 instead of $6,000 used in the Base Run, because total hours of hired labor would drop from 1,200 to 870. At $5.00 per hour, this saves $1,650, annually. It is assumed that machinery and improvement expenses will be reduced by 14.39%, except for depreciation on improvements. Utilities and miscellaneous expenses are also assumed to decline 14.39%. The 14.39% decline is calculated by dividing 59 acre reduction by the 410 acres of corn harvested in the Base Run.

The crop expenses per acre for corn were determined to be $77 in the Base Run. This includes $18 for seed; $43 for fertilizer and lime; $14 for pesticides; and $2 for marketing. By eliminating 59 acres, $4,543 could be saved on crop expenses. Since the 59 acres would come from rented land, land lease would be $2,891 less, using the average rental rate of $49 per acre.

Based on lower expense items, total expenses would be reduced $14,462 in 1985; $14,623 in 1986 and $14,785 in 1987.

Net cash income would not change very much compared to the Base Run. It would be $717 less in 1985. The

reduction in 1986 would be $2,361. In 1987 it would be $2,783.

Net earnings after taxes would be $888 more in 1985. In 1986, net earnings after taxes would only be $197 less. In 1987, the decline would be $331. These minor changes in net earnings after taxes suggest that the added expenses associated with growing corn to sell is not really paying off.

The unreconciled cash flow would be $7,806 in 1985, down $1,175 from the Base Run. The following two years would be less than the Base Run also, but being $27,812 and $67,725 there is no cause for alarm.

Current assets would not be quite as large as the Base Run, because of lower cash balances. Fixed assets would be increased over the Base Run in 1986-88 because less depreciation would be applied to machinery. The net change in assets shows an increase of few hundred dollars per year. The current liabilities are exactly as they were in the Base Run. The same is true of long-term liabilities. With the very small increases in total assets and no change in total liabilities, there would be some insignificant increases in owner equity as well.

Returns on total assets would increase by a fraction of a percent at first, then decline just below the returns of the Base Run in 1986 and 1987. Returns on owner equity

would follow the same pattern. The declines in total expenses that were a little more than those of gross income show up as a positive, but not regarding debt servicing. Debt servicing to income would increase because principal and interest payments would not change.

The degree of liquidity falls with this alternative, but the current ratio shows that over the period, the decline would not be more than 0.44.

As far as solvency is concerned, there are no changes in the debt ratios and those of the Base Run.

The results of this alternative are so close to the Base Run, that subjectivity is needed to choose. However, keeping with the goal of improved profitability and solvency, the Base Run did perform better. The ability to produce more than needed has the added benefit of insurance against lower yields which can occur from unfavorable weather conditions. If lower yields were produced, less would be sold, but unless yields were extremely poor, no purchases would be needed.

Alternative 2: Continue to Make Capital Purchases

In this scenario the owner will purchase $20,500 in machinery in each year of the simulation. The purchases will be financed at 10.25% for 7 years. Table 4-17 below shows how $20,500 would be amortized over a seven-year period.

The annual payment of $4,245.53 was calculated as an annuity payment given the present value.[20] An amortization schedule like the one below is made for each loan. The significance of this will be presented later in this discussion.

TABLE 4-17: Amortization Schedule for a $20,500 Loan at 10-25%, 7-Year Term, Annual Payment

Year	Beginning Balance	Annual Payment	Portion of Payment to Interest	Portion of Payment to Principal	Ending Balance
1.	$20,500.00	$4,245.53	$2,101.25[a]	$2.144.28[b]	$18,355.72[c]
2.	18,355.72	4,245.53	1,818.46	2.364.07	15,991.65
3.	15,991.65	4,245.53	1,639.14	2,606.39	13,385.26
4.	13,385.26	4,245.53	1,371.99	2,873.54	10,511.72
5.	10,511.72	4,245.53	1,077.45	3,168.08	7,346.64
6.	7,346.64	4,245.53	752.72	3,492.81	3,853.83
7.	3,853.83	4,245.53	395.02	3,805.51	0.00

a. $20,500.00 x .1025 = $2,101.25
b. $4,245.53 - $2,101.25 = $2,144.28
c. $20,500.00 - $2,144.28 = $18,355.72

The changes that occur in this alternative are stated in Table 4-13 under Alternative 2. From this table it can be seen that the machinery purchases will increase depreciation $3,075 each year for each purchase. This means that depreciation on machinery will be $9,225 more in 1987 than it was in the Base Run. The only other change that occurs to input in this alternative is the amount of interest expense. Interest will begin to increase in 1986

when the first annual payment is due on the $20,500 loan taken out in 1985 to finance the first machinery purchase. Interest expense will increase again in 1987, because of interest due on the first and second machinery purchase.

There would be no changes in sales or gross income with this alternative. Total expenses would be effected because of added depreciation on machinery and overhead. Overhead would increase when the interest on the new machinery loans becomes due. Because interest is paid once a year on these loans, the increase in interest expense would not show up until the following year. Note that in 1987 overhead would be $3,982 more than in the Base Run. This is equal to the interest due on the $20,500 in years one and two (review amortization schedule), rounded to the nearest dollar. The reason for this is the purchase made in 1985 would be in its second year of repayment and that made in 1986 would be in its first.

Net cash income would be reduced in 1986 and 1987 by the increases in interest expense. In addition to the increases in interest expense, net earnings before taxes would also be reduced by the annual increase in depreciation of $3,075. This would reduce the amount of taxes to be paid, but net earnings after taxes would be lower. Unreconciled cash flows would be slightly greater each year than in the Base Run. This would occur in 1985

because of less taxes paid. The same would be true in 1986 and 1987, plus cash balances would be greater. Even though principal payments would increase according to the amortization on the new loans, the cash surplus would increase in this alternative, because the increases in principal would be less than the increases in cash balances and cash from operations.

The projected balance sheets show annual increases in both total assets and total liabilities. The result is less owner equity in 1986-88.

Current assets would be increased by the increases in beginning cash balances. Fixed assets would increase from 1986 through the remainder of the forecast because of the machinery purchases. These purchases would also increase the depreciation deducted from total cost throughout this period.

Current liabilities would be greater than in the Base Run beginning in 1986 and continuing until the new loans are repaid. If additional borrowing were to occur in the future, then the current liabilities of this alternative would remain greater than in the Base Run for an extended period. Long-term liabilities would be greater than the Base Run also beginning in 1986 by the amount of unpaid principal on the new loans.

The financial ratios, project returns on total assets above those of the Base Run in the first two years, but less in the third year. The increases result from less profit and greater interest expense in relation to larger average total assets. The decline, when compared to the Base Run's return on total assets in 1987 occurs because the profits which are lost and the addition to interest expense are less than the change in average total assets. Returns on owner equity would be less than each corresponding year of the Base Run because the declines in net earnings after taxes are proportionately greater than the declines in owner equity.

With no change occurring in gross income, total expenses to income would be higher in this alternative. Debt servicing to income is greater than the Base Run in the second and third years when principal and interest become due on the new loans.

The liquidity position would drop a small amount because the increases in current liabilities are greater than the increases in current assets. The declines in the current ratios are not enough to prevent an expanded liquidity, but it would be slowed down. This may be better than what the Base Run projects, because current ratios which are too large indicate that capital is not being reinvested as much as it should.

Because total liabilities would increase more than total assets, the solvency position would not improve as much as it did in the Base Run. Annual declines would still prevail, but not as fast.

Alternative 3: Break-Even Hog Prices

As a means of determining how the farm would perform if it made some capital purchases and commodity prices did not behave as forecasted in the Base Run, crop prices were held constant at 1985 levels and hog prices were reduced so that net earnings after taxes would be at break-even.

The changes in the input when compared to the Base Run are shown on Table 4-13 under Alternative 3. Note that the only difference between this alternative and Alternative 2 are the changes that occur in Table 4 of Appendix C which pertain to breeding livestock and the price received for corn sold.

It was found that the price of hogs could fall 8.89% in 1985; 9.00% in 1986 and 23.55% in 1987. With these percentage declines, the prices for each year would be $42.55, $43.85 and $44.90, respectively. To obtain zero net earnings after taxes, the other income and capital gains per head were reduced by the same percentages as the hog prices.

There would obviously be considerable declines in total sales and gross income. There would still be growth

in these areas because the break-even hog price would have to increase each year to keep up with expenses. However, with no increases in crop prices, livestock expenses would be constant. Because of this, total expenses would be less than the Base Run, even with more depreciation and interest expense.

Net cash income would be -$983 in 1985 because of the lower hog price. In the following two years even though the price of corn would remain at $2.47 per bushel, net cash incomes would be $25,487 and $28,534 because no feed would be purchased and hog prices would increase.

Net earnings after taxes are not exactly zero, due to rounding. For all practical purposes they may be interpreted as zero.

Unreconciled cash flows become -$9,593, $2,327 and $13,752 for the years projected. These are substantial reductions when compared to the Base Run cash flows. The $9,593 deficit results from the crop purchases in 1985. In the following years, net cash from operations is greatly improved, but the higher principal payments prevent net cash flows from increasing very much.

The composition of the assets and liabilities would change as a result of the break-even hog prices. Current assets are projected to be less after 1985 because of lower cash balances. Fixed assets would be identical to

Alternative 2 for the reasons discussed in that scenario. Current liabilities would be increased over the Base Run by the principal due on the new machinery. In addition, there would be $9,593 more in 1986 when the 1985 operating loan comes due. Long-term liabilities would be unchanged from the previous alternative, because of the annual purchases.

Owner equity would be held relatively constant from the beginning of 1985 through the remainder of the forecast period. The break-even analysis not only determines the prices needed for hogs to prevent net losses, but also to prevent declines in net worth.

The nature of this scenario dictates that the financial ratios would not be as high as the Base Run's. The returns on total assets would not fluctuate like in the Base Run, but they show annual growth of about 0.10%. There would be no returns on owner equity with zero net earnings after taxes. Total expenses to income must be nearly 100%, since the only difference between total expenses and gross income are taxes. Debt servicing to income would be higher than the Base Run. It would also be higher than in Alternative 2, due to the reductions in gross income from lower commodity prices.

Liquidity suffers from this scenario. The deterioration of the liquidity position worsens over the

period. The reductions in net working capital would be $20,718, $33,428 and $66,917 from 1986 through the beginning of 1988. The current ratios show that there is still an adequate amount of liquidity, but with the projection ending on a downturn it should be monitored so problems do not develop. Solvency does not improve in this scenario. The actual debt ratios over the period are 60.79%, 62.08%, 61.96% and 62.21%. These are rounded to the nearest whole percent. With the more accurate debt ratios, it is seen that the debt ratio would increase 1.42% from the beginning of 1985 to the beginning of 1988.

E-7. Summary and Recommendation for Hog Farm

The problem with this farm in the past has been the inability to earn steady profits. This is partly due to changes in market prices, but also from inconsistent sales volume. The Base Run has shown that this farm should be able to generate net earnings and cash flows. Alternative 1 showed that the size of the crop operation could be cut back without hurting the farm financially. Alternative 2 revealed that this farm can afford to continue making capital purchases equal to the average of its purchases made from 1981-83, without creating any financial stress. The third alternative demonstrated how much hog prices would have to be in each projection year in order for the farm to break-even.

An important advantage of knowing the break-even point is that it gives the farmer a minimum price to work with. If he expects prices to fall below his break-even price, he may be able to use different marketing techniques, such as forward contracting or hedging to lock in a desired price. Since the third alternative was not designed to improve profitability or solvency it is not recommended for implementation, but should be used for decision making. The other alternatives and the Base Run all produced similar results. Each is readily available (assuming no long-term land leases).

Because the farmer stated that he does not wish to expand until he has reduced his debt level, Alternative 2 may be postponed until he is ready, or necessity forces him to replace some machinery or improvements.

This leaves Alternative 1 and the Base Run for recommendation. Since Alternative 1 does not have any excess corn to feed, it might be wiser to evaluate how accurate the simulation is at prescribing feed needs before cutting back on acres of corn grown. If the feed requirements in the Base Run are suffice, then cutting back on corn production could be considered, without the risk of a shortage.

The recommendation for the hog farm is:

1. Keep at least 162 sows for breeding.

2. Maintain livestock production at 27.00 cwt. per sow.

3. Plant and harvest 410 acres of corn, averaging 90 bushels per acre.

4. Sell excess crop inventories.

5. Hire one part-time laborer.

F. Analysis of Dairy Farm Case

The case dairy farm is classified as a specialized southern dairy operation. The historical financial statements include the period from 1981 through 1984. The farm currently milks 112 cows. Land owned includes 275 acres, of which 232 are tillable. An additional 270 acres are rented.

F-1. Dairy Farm Case--Balance Sheets

a. Assets

The total asset value of this farm has been quite volatile. Table 4-18 on page 157 shows total assets of $942,135, $1,007,928, $926,993 and $827,188 from 1981-84, respectively.

The $65,793 increase in total assets that occurred during 1982 resulted from increasing the number of dairy steers from 25 to 54 and doubling the price per head. The numbers and dollars per head of intermediate livestock were unchanged. The market value of machinery and equipment fell by $50,000.

TABLE 4-18: Balance Sheets On Dairy Farm Case, 1981-84
Telfarmers, For Year Ended December 31, 19XX

ASSETS	1981	1982	1983	1984
Current Assets	$	$	$	$
Cash	0	0	0	0
Crops	0	0	15300	18000
Feed	45000	45000	38500	36600
Supplies	0	0	300	300
Dairy Steers	3750	18000	3000	0
Total Current Assets	48750	63000	57100	54900
Intermediate Assets				
Accounts Receivable	3885	5428	6893	8288
Dairy Cows	125000	125000	112000	112000
Dairy Heifers	0	0	15000	13200
Dairy Bred Heifers	32000	32000	30000	29400
Dairy Open Heifers	25000	25000	0	0
Dairy Bull	0	0	0	3000
Dairy Calves	7500	7500	6000	6400
Machinery & Equipment (Market Value)	300000	250000	200000	200000
Non-farm Business Assets	0	0	0	0
Household Assets	0	0	0	0
Total Intermediate Assets	493385	444928	369893	372288
Fixed Assets				
Estimated Value of Real Estate	400000	500000	500000	400000
TOTAL ASSETS	942135	1007928	926993	827188
LIABILITIES & NET WORTH				
Current Liabilities				
Accounts Payable	0	67755	33955	33805
Production Credit Association	0	1980	0	0
Banks	3317	2695	3414	4159
Farmers Home Administration	78342	78196	81519	90112
Total Current Liabilities	81659	150626	118888	128076
Intermediate Liabilities				
Merchants & Dealers	0	0	0	0
Production Credit Association	0	7922	0	0
Banks	12162	9883	12517	15251
Farmers Home Administration	248083	247620	258144	285355
Other Credit Institutions	188708	9134	8066	12390
Total Intermediate Liabilities	448953	274559	278727	312996
Long-term Liabilities				
Banks	9950	5391	6828	8319
Farmers Home Administration	326425	325816	339665	375467
Insurance Companies	0	0	0	0
Individuals	0	97418	97418	97418
Federal Land Banks	0	0	0	0
Total Long-term Liabilities	336375	428625	443911	481204
TOTAL LIABILITIES	866987	853810	841526	922276
Net Worth	75148	154118	85467	-95088
TOTAL LIABILITIES & NET WORTH	942135	1007928	926993	827188

Estimated market value of real estate rose $100,000, because of a land purchase made in 1982.

In 1983, total assets fell by $80,935 primarily because of changes among the intermediate assets. The number of dairy cows declined from 125 to 112 (valued at $1,000 each). The number of heifers increased from 90 to 100, but the dollars per head fell from an average of $633 to $450. The market value of machinery and equipment again fell by $50,000. Fixed assets were unchanged.

The value of total assets continued to decline in 1984 by $99,805. The major contributing factor was a $100,000 depletion in the estimated value of real estate, thus bringing real estate back to what it had been in 1981, reflecting a decline in market values.

b. Liabilities

During 1982 there was a slight decline of $13,177, but more importantly, there was a shift in the liability structure. Current and long-term liabilities values jumped up by $68,967 and $92,250, respectively, while intermediate debt was reduced $174,394. Current liabilities advanced mostly from unpaid accounts ($67,755). Intermediate liabilities went down with the large drop in debts owed to other credit institutions. Long-term liabilities increased

due to a land purchase of 73 acres, financed with a land contract.

It is assumed the change in the amount owed to other credit institutions resulted from a more accurate 1982 analysis of lenders by name and type of debt. This would be explained somewhat by the unpaid open accounts and the Production Credit Association debt, which shows up in 1982, but not in 1981.

There was another small decline in total debt in 1983 ($12,284). This time only the long-term liabilities increased in total. The increase went to the FmHA, which more than likely resulted from non-payment of interest or principal. This conclusion is drawn from the fact that interest expense as shown on the income statement for 1983 declined from 1982 by over $30,000. Note also that the amount owed to individuals was unchanged, meaning no principal was paid on that debt.

Total liabilities crept up to $922,276 in 1984 (a $80,750 increase). It appears that the only creditors who received any money in 1984 were those on account. All other liabilities either grew or were the same. Again, it looks as though the interest may have been added to principal on the FmHA loans. The debt to

individuals also stayed the same as the original amount.

c. Net Worth

By 1984 this dairy farm was technically insolvent. Total liabilities were greater than total assets by $95,088. This occurred when the estimated value of real estate was dropped by $100,000. Based on the estimated market value, real estate values fell from $1,190 per acre in 1982 to $952 in 1984. This is a 20% decline in only two years.

F-2. Dairy Farm Case--Income Statements

In three out of the four years studied, losses were generated. Table 4-19 on page 161 provides the income statements from 1981-84.

Sales and gross income were fairly steady, varying only about $16,000 over the period. Sales shrank by $16,343, while gross income grew by $15,707.

Total expenses declined $26,308 over the four years, but for dubious reasons. With the purchase of land in 1982, one would expect interest expense to increase, but it is reported to have decreased every year. This suggests that interest payments were missed. Other irregularities are the radical changes in amounts spent on fertilizer and feed. It may be that fertilizer used in 1982 was paid for

TABLE 4-19: Income Statements On Dairy Farm Case, 1981-84
Telfarmers, For Year Ended December 31, 19XX

INCOME	1981	1982	1983	1984
	$	$	$	$
Sales	256927	248411	258228	240584
Purchases	0	535	0	0
Beginning Inventory	271500	238250	252500	219800
Ending Inventory	238250	252500	219800	218600
Gross Profit	223677	262126	225528	239384
EXPENSES				
Hired Labor	21718	29178	28865	25220
Repairs, Maintenance, Tools	20158	13152	19091	17424
Fuel, Oil & Grease	18399	17420	13413	8882
Custom Hire & Lease	0	0	1576	1008
Conservation	0	2325	100	0
Insurance	2881	1689	2004	3587
Building & Land Lease	7735	4150	3650	6025
Fertilizer & Lime	42904	1870	32647	21855
Crop Supplies & Packages	54	0	0	115
Seed, Plants & Trees	3624	7466	8769	6194
Chemicals	617	7796	3174	9181
Crop Marketing	0	0	0	0
Other Crop Expense	3847	586	672	0
Feed, Supplements & Additives	46219	52175	42463	63704
Semen & Breeding Fees	3170	2698	2475	3239
Veterinarian,Medicine, & Drugs	2515	2138	3744	3351
Livestock Marketing, Etc.	7635	8289	11565	9853
Livestock Supplies & Other	6031	2106	2807	5135
Property Taxes	3865	4501	7930	9536
Utilities	6377	6880	7146	6060
Interest	48383	36673	17152	11151
Depreciation	36746	36434	38981	40104
Miscellaneous	1375	307	1486	6321
Total Expenses	284253	237833	249710	257945
Less: Increase in Prepaid Expenses	0	0	-300	0
Adjusted Total Expenses	284253	237833	249410	257945
NET FARM INCOME BEFORE TAXES	-60576	24293	-23882	-18561

1981. The increase in feed purchases may be due to poor crop yields.

The results of the changes in income and expenses were net farm incomes before taxes of -$60,576, $24,293, -$23,882 and -$18,561 in 1981, 1982, 1983 and 1984, respectively. Considering that interest payments probably were not made as scheduled, profit would have been less in 1982 and losses would have been greater in 1983 and 1984.

F-3. Dairy Farm Case--Cash Flow Statements

Net cash income improved by more than $37,000 from 1981 to 1982; increased another $1,000 in 1983 and then declined by $24,758 to $22,742 in 1984. Additions to cash were relatively constant, except for 1981 when $131,437 was borrowed, presumably to expand the asset base. The subtractions from cash equal the sources of cash each year, excluding 1981. This is because the amount of family living withdrawals were used to balance the sources and uses of cash. (See Table 4-20.)

F-4. Dairy Farm Case--Financial Ratios

The dairy farm was illiquid in 1981 and became even more so as time went on. Profitability ratios are somewhat misleading. For example, the 20% return on net worth in 1984 occurred because there were both a net loss and a net deficit. Overall, profitability would be mediocre at best. The activity ratios remained relatively constant.

The real picture comes through with the leverage ratios. The debt ratio increased from 92% to 111%, with insolvency occurring in 1984. (See Table 4-21.)

F-5. Summary of Past Finances of the Dairy Farm Case

In retrospect, if the farm had liquidated some assets rather than purchased land back in 1982, it might not have become insolvent in 1984. Even if insolvency could have been avoided, the inability to earn profits would lead to erosion of owner equity, which would create insolvency sooner or later. Therefore, it might have been better to declare bankruptcy instead of waiting for a possible forced liquidation. An interesting point learned at the on-farm interview was that the farmer has wanted to go-out-of-business for the last two years, but the FmHA has pursuaded him to continue. One explanation of why the FmHA wants this farm to continue operating is that since it is a dairy farm, a monthly milk check is issued. This provides cash for the FmHA. If the dairy operation were to stop and the FmHA repossessed the farm, there would be no cash generated at all.

F-6. Introduction to Simulation on the Dairy Farm Case

With this dairy farm insolvent, some action will be taken soon. It's doubtful that the farm will continue to operate as it was at the end of 1984. If this farm is to be salvaged, any adjustments should be thorough enough to

TABLE 4-20: Cash Flow Summary On Dairy Farm Case, 1981-84 Telfarmers, For Year Ended December 31, 19XX

	1981	1982	1983	1984
	$	$	$	$
Cash Farm Receipts	256927	248411	258228	240584
Cash Farm Expenses	247507	201931	210728	217842
NET CASH INCOME	9420	46480	47500	22742
Plus				
Beginning Cash Balance	0	0	0	0
Non-farm Income	6769	2002	1828	98
Capital Sales	0	0	0	3500
New Money Borrowed	131437	42220	45838	40210
Decrease in Receivables	0	0	0	0
Total Additions to Cash	138206	44222	47666	43808
Minus				
Non-farm Expenses	0	0	0	0
Capital Purchases	63042	24000	26272	8337
Principal Paid	82772	49161	58205	41758
Family Living Withdrawals	15500	15998	9224	15060
Increase in Receivables	1192	1543	1465	1395
Ending Cash Balance	0	0	0	0
Total Subtractions from Cash	162506	90702	95166	66550
NET CASH UNACCOUNTED FOR	-14880	0	0	0

TABLE 4-21: Financial Ratios On Dairy Farm Case, 1981-84 Telfarmers, For Year Ended December 31, 19XX

	1981	1982	1983	1984
LIQUIDITY RATIOS				
Current Ratio	0.60	0.42	0.48	0.43
Quick Ratio	0.00	0.00	0.00	0.00
Net Working Capital	-$32909	-$87626	-$61788	-$73176
PROFITABILITY RATIOS				
Sales to Net Working Capital	-7.81	-2.83	-4.18	-3.29
Profit As Percent of Sales	-0.24	0.10	-0.09	-0.08
Return on Net Worth	-0.81	0.16	-0.30	0.20
Percent Change in Gross Profit	--	0.17	-0.14	0.06
Percent Change in Sales	--	-0.03	0.04	-0.06
Operating Ratio	1.27	0.91	1.11	1.08
Interest to Gross Farm Profit	0.22	0.14	0.08	0.05
ACTIVITY RATIOS				
Fixed Asset Ratio	0.64	0.50	0.52	0.60
Total Asset Turnover	0.27	0.25	0.29	0.29
LEVERAGE RATIOS				
Debt Ratio	0.92	0.85	0.91	1.11
Debt-to-Equity	11.54	5.54	9.85	-9.70
Times Interest Earned	1.01	1.89	3.34	1.70

establish good profitability and an owner equity value that could sustain further adversion.

a. Base Run Simulation of Dairy Farm Case

The Base Run for this farm attempts to do the same as it did with the previous two farm types discussed. It assumes a status quo scenario and projects the potential future outcome. The input for the Base Run is given in Tables 1 through 8 in Appendix D. Table 1 shows this farm includes a dairy operation and grows corn, corn silage and hay. Table 2 is the beginning balance sheet and was constructed from the ending balance sheet from 1984. It shows the farm technically insolvent as of the beginning of 1985.

Breeding livestock (Table 4) shows that the number of dairy cows will be 112 throughout the projection period of 1985-87. The quantity of milk produced per cow is to remain constant at 141.00 cwt. The price per cwt. of milk was calculated by the MSU Agriculture Model in the Spring of 1985. Other income per head, capital gain income per head and livestock expenses per head were all determined from the Estimated Crop and Livestock Budgets for Michigan, 1984.[18] These values were adjusted to reflect the price changes as forecasted by the MSU Agricultural

Model. For example, other income includes cows culled and calves sold. According to the livestock budgets, a cow producing 14,000 pounds of milk per year would also cull 3.64 cwt. of cows and sell 0.43 cwt. of calves. The prices per cwt. corresponding to these types of livestock were forecasted in 1985 to be $48.82 and $78.00, respectively.[19] Other income per head in 1985 would then be: 3.64 cwt. culled @ $48.82/cwt. = $177.70 + 0.43 cwt. calves sold @ $78.00/cwt. = $33.54. Total other income per head equals $211.24.

Capital gain income per head is the amount provided in the budget and is adjusted to the change in other income. For instance, capital gain income per head was $145.60 in 1984 and other income was $180.00.[18] Therefore, capital gain income in 1985 would be: $145.60 * (211.24/180.00) = $170.87 per head. Livestock expenses per head include: 1) purchased feed and additives; 2) livestock supplies; 3) breeding fees; 4) veterinarian ; 5) marketing (includes trucking); and 6) miscellaneous expenses. These specific expenses were also taken from the budgets for a cow producing 14,000 pounds of milk and compensates for the decline in feed prices since 1985 ($100 decline in soybean meal per cwt.).

The crop production plan (Table 5) includes acres of each crop needed to meet the feed requirements specified in the budgets according to the yields per acre, which were also taken from the budgets. These yields were used because the case yields are so inconsistent from year to year that they are probably incorrect. Low yields per acre were used because the case was somewhat consistent, at least with the reporting of low yields. The quantities of corn, corn silage and hay equivalents to feed per cow are 110 bushels, 9.2 tons and 7.2 tons, respectively as estimated in the budgets.[18] When each is multiplied by 112 cows, total feed needs per year are 12,320 bushels of corn, 1,030 tons of corn silage and 806 tons of hay equivalents.

The feed ration differs in 1985 because there was not enough corn silage in inventory on January 1st to last until the new crop is harvested (November 1). To compensate for this, more corn and hay are fed. According to dairy experts at Michigan State University it takes 115 pounds of corn and 340 pounds of hay to provide a ration similar to 1 ton of corn silage.

Based on the above, ending inventory of corn silage should be 858 tons. However, only 100 tons are

available from January through October and just two months of the new crop will be fed in 1985. This translates to a shortage of 758 tons (Production - beginning inventory - quantity fed) in 1985.

Multiplying the shortage by the conversion factors results in the need for 1,557 more bushels of corn (assuming 1 bushel is 56 pounds) and 129 more tons of hay.

The quantities of crops sold are amounts in excess of feed needs. Alternatively, the quantity of corn to purchase in 1985 is what is necessary beyond beginning inventory.

The quantities of ending inventories are what are needed to last from one harvest period to the next. These quantities prevent the need for further crop inventory adjustments after 1985.

The price of corn sold in 1985 is the 1984/85 average price. The other two years' prices are forecasts. The price of hay sold is the same as the balance sheet price.

The purchase price of corn needed is the sale price plus a market spread of 20 cents. The market spread is included to cover such costs as transportation and storage.

The crop expenses per acre include: 1) seed; 2) fertilizer; 3) pesticides; 4) marketing; and 5) miscellaneous. These were taken from estimated budgets.

Labor requirements (Table 6) are hours necessary, corresponding to herd size and yields per acre from the budgets.[18] For example, 112 dairy cows is between 100 and 200. One hundred cows require 56.1 hours of labor. Two hundred cows require 47.8 hours of labor. The change between 100 and 200 cows is -8.3. The number of cows over 100 in decimal form is 0.12. The reduction in labor hours for 12 more cows is calculated as: -8.3 * 0.12 = -0.996. This means labor hours needed for 112 cows would be 56.1 - 0.996 = 55.1. The total hours available were set equal to those needed because the case does not report enough labor hours for a farm of its size.

It was assumed that the farm was in no position to make any capital purchases, so Table 7 of Appendix D was not used.

The annual income and expense items (Table 8) were determined as follows:

- other farm income ... value used for property tax.
- non-farm income ... 4-year average.

- o hired labor ... 4,712 hours times $5 per hour.
- o family labor draw ... average for dairy farms.
- o machinery and improvement variable expenses (except depreciation) ... 4-year average.
- o depreciation ... 1984 income statement.
- o overhead (except interest and land lease) ... 4-year average.
- o interest ... calculated by program.
- o land lease ... 273 times $16.21 per acre.

b. Results of Dairy Case Base Run Simulation

The results of the Base Run are provided in Tables 9-12 in Appendix D. They are also summarized in Tables 4-22 through 4-24 on pages 172 through 174.

Appendix D, Table 9 (Projected Income Statement) projects that sales and gross income will be at levels characteristic of the past and will increase slightly. Total expenses will be relatively constant and higher than reported in 1982, 1983 or 1984. This may be because all interest is included.

The net cash income should improve from -$21,407 to $11,643, without having to purchase feed and with interest expense going down over the forecast period. Net earnings will be -$34,142, -$37,043 and -$28,148 at the end of each year.

TABLE 4-22: Outcomes of Dairy Farm Alternatives on the Income Statement and Cash Flow

Projected Income Statement	BASE RUN	ALT. 1	ALT. 2	ALT. 3	ALT. 4	ALT. 5	ALT. 6	ALT. 7	ALT. 8
	$	$	$	$	$	$	$	$	$
Sales:									
1985	245698	239240	243666	234678	233360	245698	233360	226902	226902
1986	241371	234913	239339	229223	231255	241371	231255	224797	224797
1987	253934	247476	251902	241390	243422	253934	243422	236964	236964
Gross Income:									
1985	246945	240487	244913	230048	145203	246945	145203	138745	138745
1986	241683	235225	239651	222822	138753	241683	138753	132295	132295
1987	254246	247788	252214	234751	149332	254246	149332	142874	142874
Total Expenses:									
1985	281088	243644	274919	257361	161832	263509	156868	120928	116928
1986	278727	241609	272593	255035	166366	267367	161393	125858	121893
1987	282394	245628	276298	258740	170943	271227	165964	130860	126939
Net Cash Income:									
1985	(21407)	9579	(17270)	(18797)	17648	(3828)	22612	52094	56094
1986	2748	33407	6850	3570	(6089)	14107	(1116)	27961	31926
1987	11643	41951	15707	11793	(87)	22810	4892	33538	37459
Net Earnings After Taxes:									
1985	(34142)	(3156)	(30005)	(27312)	(16629)	(16563)	(11665)	9803	12175
1986	(37043)	(6384)	(32941)	(32213)	(27613)	(25684)	(22640)	6437	10002
1987	(28148)	2160	(24084)	(23990)	(21611)	(16981)	(16632)	11828	14715
Cash Flow Reconciliation									
Unreconciled Cash Flow:									
1985	(72268)	(37002)	(67780)	(69307)	7248	(25462)	11211	39061	40289
1986	(88240)	(17808)	(79365)	(84171)	(10195)	(34619)	(2269)	61445	65130
1987	(97449)	8348	(83986)	(92706)	(22659)	(36813)	(10771)	88623	94130
Surplus to Cash:									
1985	0	0	0	0	7248	0	11211	39061	40289
1986	0	0	0	0	0	0	0	61445	65130
1987	0	8348	0	0	0	0	0	88623	94130
Deficit to Operating Loan:									
1985	72268	37002	67780	69307	0	25462	0	0	0
1986	88340	17808	79365	84171	10195	34619	2269	0	0
1987	97449	0	83986	92706	22659	36813	10771	0	0

TABLE 4-23: Outcomes of Dairy Farm Alternatives on the Balance Sheet

Projected Balance Sheet	BASE RUN	ALT. 1	ALT. 2	ALT. 3	ALT. 4	ALT. 5	ALT. 6	ALT. 7	ALT. 8
	$	$	$	$	$	$	$	$	$
Current Assets:									
1985	45588	45588	45588	45588	45588	45588	45588	45588	45588
1986	72956	72956	72956	72956	40083	72956	44046	71896	73125
1987	73268	73268	73268	73056	32835	73268	32835	94280	97965
1988	73580	81928	73580	73156	32835	73580	32835	121458	126965
Fixed Assets:									
1985	683904	467605	626234	626234	614511	683904	614511	398212	398212
1986	643801	427502	586131	590351	592987	643 01	592987	376688	376688
1987	603698	387399	546028	554468	571463	603698	571463	355164	355164
1988	563595	347296	505925	518585	549939	563595	549939	333640	333640
Total Assets:									
1985	729492	513193	671822	671822	660099	729492	660099	443800	443800
1986	716757	500458	659087	663307	633070	716757	637033	448584	449813
1987	676966	460667	619296	627524	604298	676966	604298	449444	453129
1988	637175	429224	579505	591741	582774	637175	582774	455098	460605
Current Liabilities:									
1985	53536	49256	53185	53185	13075	24309	14076	7694	8837
1986	93763	53890	88889	90416	14029	51401	15039	8252	9360
1987	111767	36277	102368	107175	25247	62298	18338	8850	9915
1988	122996	20209	109066	117786	38809	66351	27940	9491	10503
Long-term Liabilities:									
1985	868739	411198	811420	811420	772900	897966	771899	316460	315317
1986	847244	394310	790311	790311	758871	872027	756860	308209	305957
1987	823817	375840	767307	767307	743819	844348	740792	299359	296042
1988	798270	355631	742227	742227	727669	814810	723622	289868	285539
Total Liabilities:									
1985	922275	460454	864605	864605	772900	922275	785975	324154	324154
1986	941007	448200	879200	880727	758871	923428	771899	316460	315317
1987	935584	412118	869675	874482	743819	906646	759130	308209	305957
1988	921266	375840	851294	860013	727669	881161	751563	299359	296042
Owner Equity:									
1985	(192783)	52739	(192783)	(192783)	(125876)	(192783)	(125876)	119646	119646
1986	(224250)	52258	(220113)	(217420)	(139830)	(206671)	(134866)	132124	134496
1987	(258618)	48549	(250380)	(246958)	(164768)	(229680)	(154831)	141236	147173
1988	(284091)	53385	(271789)	(268273)	(183704)	(243986)	(168788)	155739	164563

TABLE 4-24: Outcomes of Dairy Farm Alternatives on Financial Performance Measures

Projected Financial Performance	BASE RUN	ALT. 1	ALT. 2	ALT. 3	ALT. 4	ALT. 5	ALT. 6	ALT. 7	ALT. 8
Return on Total Assets:									
1985	5.68%	7.08%	5.93%	6.31%	6.39%	5.68%	6.37%	7.46%	7.09%
1986	4.35%	5.23%	4.49%	4.56%	4.75%	4.35%	4.73%	6.54%	6.42%
1987	5.67%	7.22%	5.95%	5.86%	5.79%	5.67%	5.79%	7.56%	7.25%
1988	--	--	--	--	--	--	--	--	--
Return on Owner Equity:									
1985	16.37%	-6.01%	14.53%	13.32%	12.52%	8.29%	8.95%	7.79%	9.58%
1986	15.34%	-12.67%	14.00%	13.87%	18.13%	11.77%	15.63%	4.71%	7.10%
1987	10.37%	4.24%	9.22%	9.31%	12.40%	7.17%	10.28%	7.97%	9.44%
1988	--	--	--	--	--	--	--	--	--
Total Expenses to Income:									
1985	113.83%	101.31%	112.25%	111.87%	111.45%	106.71%	108.03%	87.16%	84.28%
1986	115.33%	102.71%	113.75%	114.46%	119.90%	110.63%	116.32%	95.13%	92.14%
1987	111.07%	99.13%	109.55%	110.22%	114.47%	106.68%	111.14%	91.59%	88.85%
1988	--	--	--	--	--	--	--	--	--
Debt Servicing to Income:									
1985	52.13%	36.72%	50.07%	53.30%	48.91%	33.18%	46.18%	22.48%	20.42%
1986	66.67%	36.31%	62.81%	68.24%	51.19%	44.44%	48.33%	23.58%	21.42%
1987	69.69%	26.72%	64.27%	71.10%	54.39%	45.84%	46.43%	21.83%	19.83%
1988	--	--	--	--	--	--	--	--	--
Working Capital:									
1985	($7948)	($3668)	($7597)	($7597)	$32513	$21279	$31512	$37894	$36751
1986	($20807)	$19065	($15934)	($17461)	$26055	$21555	$29007	$63645	$63765
1987	($38500)	$36990	($29100)	($34119)	$7589	$10970	$14498	$85430	$88051
1988	($49416)	$61719	($35487)	($44630)	($5974)	$7229	$4895	$111967	$116462
Current Ratio:									
1985	0.85	0.93	0.78	0.86	3.49	1.88	3.24	5.93	5.16
1986	0.78	1.35	0.75	0.81	2.86	1.42	2.93	8.71	7.81
1987	0.66	2.02	0.71	0.68	1.30	1.18	1.79	10.65	9.88
1988	0.60	4.05	0.68	0.62	0.85	1.11	1.18	12.80	12.09
Debt Ratio:									
1985	1.26	0.90	1.29	1.29	1.19	1.26	1.19	0.73	0.73
1986	1.31	0.90	1.33	1.33	1.22	1.29	1.21	0.71	0.70
1987	1.38	0.89	1.40	1.39	1.27	1.34	1.26	0.69	0.68
1988	1.45	0.88	1.47	1.45	1.32	1.38	1.29	0.66	0.64

Cash flows are also projected to be negative and declining. This results in the need for operating loans of $72,268 the first year; $88,340 the second and $97,449 the third.

The pro forma balance sheets (Projected Net Worth Statement) indicate current assets will increase with stable crop inventory. Fixed assets will decline by the amount of depreciation each year, assuming no further declines in market values.

Current liabilities will continue to increase as principal becomes due on the new operating loans. Long-term liabilities will be smaller each year, since no more long-term debt will be acquired. Therefore, total liabilities will fluctuate by about $20,000, but is going to be virtually unchanged over the four year forecast.

Based on the changes in assets and liabilities, owner equity will be a thing of the past. Net deficits beginning at $192,783 in 1985 will grow by about $30,000 annually.

The financial performance measures summarize how poorly this farm operates. Returns on total assets look good, but result from large amounts of interest expense and net losses (not good). Returns on owner equity also appear favorable, but again these returns

are based on net losses and net deficits (negative owner equity), so they are meaningless. Total expenses to income show expenses will outweigh gross income by 13.83%, 15.33% and 11.07% from 1985 through 1987. Debt servicing alone will require 52.13% of gross income in 1985 and more in 1986 and 1987. Working capital might even be acceptable at -$7,948 in 1985, but the continued erosion most likely would not. The current ratio shows the growth in decline would be 8% in 1986 and 1987 and 6% in 1988. Finally, the solvency, as measured by the debt ratio suggests total liabilities would be 26% larger than total assets in 1985 and increase throughout the remainder of the forecast period.

c. Conclusions of Dairy Case Base Run Simulation

If this farm were to continue to operate as it has in the past, the Base Run projections should be interpreted as sufficient reasoning for bankruptcy on the part of the owner, or forced liquidation on the part of the creditors.

The only ways that seem feasible to allow this farm to remain in existence are those which would greatly reduce expenses and/or the amount of debt. It would also be advisable to increase sales, but highly unlikely.

d. Alternatives to Improve the Financial Situation of the Dairy Farm Case

With the dismal performance of this farm in the past and that projected for the next three years, it does not seem probable to expect that dairy or crop production will improve. Therefore, the alternatives for this farm concentrate on how total expenses and total debt could be adjusted in order to meet the objective of solvency (in this case) through reduced costs.

There are eight alternatives which were tried on this farm. They are:

1. Liquidate and lease back all land from FmHA.
2. Sell 73 acre farm and lease it from buyer.
3. Sell 73 acres and purchase additional feed.
4. Purchase all feed.
5. Refinance according to FmHA guidelines.
6. Purchase feed and refinance.
7. Purchase feed and liquidate land.
8. Purchase feed, liquidate land and refinance.

The changes that occur to the Base Run in each of these alternatives are provided in Table 4-25 on pages 178-185. Table 4-25 shows only the input values used in the Base Run that change in the alternatives. Values used in the alternatives which are identical to the Base Run are not shown in Table 4-25.

TABLE 4-25: Input Changes For Dairy Farm Alternatives

Alternative Number	Appendix D Reference	Table Location	Base Run Value For 1985	Base Run Value For 1986	Base Run Value For 1987	Change For Alternative 1985	Change For Alternative 1986	Change For Alternative 1987
1	Table 2	Land (market value).	$216299	$216299	$216299	$0	$0	$0
		FmHA land debt.	$364403	$360715	$356760	$0	$0	$0
		Individual land debt.	$97418	$96826	$96174	$0	$0	$0
	Table 5	Crop acres owned.	232	232	232	0	0	0
	Table 8	Other farm income.	$6458	$6458	$6458	$0	$0	$0
		Property taxes.	$6458	$6458	$6458	$0	$0	$0
		Interest.	$75208	$67359	$65426	$39047	$31524	$29943
		Land lease.	$4425	$4425	$4425	$9600	$9600	$9600
2	Table 2	Land (market value).	$216299	$216299	$216299	$158629	$158629	$158629
		Individual land debt.	$97418	$96826	$96174	$39748	$39506	$29241
	Table 5	Crop acres owned.	232	232	232	159	159	159
	Table 8	Other farm income.	$6458	$6458	$6458	$4426	$4426	$4426
		Property taxes.	$6458	$6458	$6458	$4426	$4426	$4426
		Interest.	$75208	$67359	$65426	$69441	$61627	$59732
		Land lease.	$4425	$4425	$4425	$6055	$6055	$6055
3	Table 2	Land (market value).	$216299	$216299	$216299	$158629	$158629	$158629
		Individual land debt.	$97418	$96826	$96174	$39748	$39506	$29241
	Table 5	Acres corn harvested.	200	200	200	127	127	127
		Crop acres owned.	232	232	232	159	159	159
		Bushels corn to sell.	3639	3600	3600	0	0	0
		Bushels corn to purchase.	9783	0	0	11984	2160	2160
		Purchase price of corn.	$2.67	N.A.	N.A.	$2.67	$3.01	$3.12
		Ending corn inventory.	10267	10347	10427	10267	10267	10267
	Table 6	Labor hours for corn.	1140	1140	1140	724	724	724

N.A. = not applicable.

TABLE 4-25: (continued)

Alternative Number	Appendix D Refernce	Table Location	Base Run Value For 1985	1986	1987	Change For Alternative 1985	1986	1987
3 (continued)	Table 8	Other farm income.	$6458	$6458	$6458	$4426	$4426	$4426
		Hired labor.	$23560	$23560	$23560	$21535	$21535	$21535
		Repairs, maintenance.	$17456	$17456	$17456	$14932	$14932	$14932
		Custom hire & lease.	$650	$650	$650	$556	$556	$556
		Fuel, oil & grease.	$14529	$14529	$14529	$12428	$12428	$12428
		Mach. depreciation.	$29184	$29184	$29184	$24964	$24964	$24964
		Interest.	$75208	$67359	$65426	$69441	$61627	$59732
4	Table 2	Machinery cost.	$316435	$316435	$316435	$112205	$112205	$112205
		Accum. deprec. machinery.	$214611	$243795	$272979	$79774	$90379	$100984
		Machinery (market value).	$200000	$200000	$200000	$63700	$63700	$63700
		Accounts payable.	$33805	$0	$0	$0	$0	$0
		Bank debt.	$27729	$23364	$18476	$0	$0	$0
		Individual land debt.	$97418	$96826	$96174	$35042	$34829	$34595
		Other debts.	$12390	$10478	$8318	$0	$0	$0
	Table 5	Acres corn harvested.	200	200	200	0	0	0
		Acres c. silage harvest.	103	103	103	0	0	0
		Acres hay harvested.	202	202	202	0	0	0
		Total crop acres.	505	505	505	0	0	0
		Crop acres to lease.	273	273	273	0	0	0
		Bushels corn to feed.	13877	12320	12320	14231	14436	14436
		Tons corn silage to feed.	272	1030	1030	100	0	0
		Tons hay to feed.	935	806	806	964	981	981
		Bushels corn to sell.	3639	3600	3600	0	0	0
		Tons hay to sell.	67	0	0	0	0	0
		Bushels corn to purchase.	9783	0	0	12230	14436	14436
		Tons hay to purchase.	0	0	0	855	981	981
		Purchase price of corn.	$2.67	N.A.	N.A.	$2.67	$3.01	$3.12
		Purchase price of hay.	N.A.	N.A.	N.A.	$50.00	$50.00	$50.00
		Corn expense per acre.	$68.00	$68.00	$68.00	$0	$0	$0
		C. silage expense/acre.	$65.00	$65.00	$65.00	$0	$0	$0
		Hay expense per acre.	$46.00	$46.00	$46.00	$0	$0	$0

TABLE 4-25: (continued)

Alternative Number	Appendix D Reference	Table Location	Base Run Value For 1985	1986	1987	Change For Alternative 1985	1986	1987
4 (continued)	Table 6	Labor hours for corn.	1140	1140	1140	0	0	0
		Labor hours for silage.	834	834	834	0	0	0
		Labor hours for hay.	1757	1757	1757	0	0	0
		Total hours needed.	9903	9903	9903	6171	6171	6171
	Table 8	Hired labor.	$23560	$23560	$23560	$0	$0	$0
		Repairs, maintenance.	$17456	$17456	$17456	$7276	$7276	$7276
		Custom hire & lease.	$650	$650	$650	$0	$0	$0
		Insurance.	$2540	$2540	$2540	$1281	$1281	$1281
		Fuel, oil & grease.	$14529	$14529	$14529	$1109	$1109	$1109
		Mach. depreciaiton.	$29184	$29184	$29184	$10605	$10605	$10605
		Utilities.	$6616	$6616	$6616	$6281	$6281	$6281
		Interest.	$75208	$67359	$65426	$57947	$56993	$55970
		Land lease.	$4425	$4425	$4425	$0	$0	$0
5	Table 2	Accounts payable.	$33805	$0	$0	$0	$0	$0
		Bank debt.	$27729	$23364	$18476	$0	$0	$0
		"Old" FmHA land debt.	$364403	$360715	$356760	$261821	$259171	$256330
		Individual land debt.	$97418	$96826	$96174	$0	$0	$0
		Other debts.	$12390	$10478	$8318	$0	$0	$0
		"New" FmHA land loan.	N.A.	N.A.	N.A.	$200000	$197117	$194082
		"New" int. rate - land.	N.A.	N.A.	N.A.	5.25%	5.25%	5.25%
		Years on new R/E debt.	N.A.	N.A.	N.A.	30.0	29.0	28.0
		FmHA operating loan.	N.A.	N.A.	N.A.	$73924	$65447	$56355
		FmHA int. rate op. loan.	N.A.	N.A.	N.A.	7.25%	7.25%	7.25%
		Years to repay op loan.	N.A.	N.A.	N.A.	7.0	6.0	5.0
	Table 8	Interest.	$75208	$67359	$65426	$57629	$55999	$54259

TABLE 4-25: (continued)

Alternative Number	Appendix D Reference	Table Location	Base Run Value For 1985	1986	1987	Change For Alternative 1985	1986	1987
6	Table 2	Machinery cost.	$316435	$316435	$316435	$112205	$112205	$112205
		Accum. deprec. machinery.	$214611	$243795	$272979	$79774	$90379	$100984
		Machinery (market value).	$200000	$200000	$200000	$63700	$63700	$63700
		Accounts payable.	$33805	$0	$0	$0	$0	$0
		Bank debt.	$27729	$23364	$18476	$0	$0	$0
		"Old" FmHA land debt.	$364403	$360715	$356760	$199445	$197427	$195262
		Individual land debt.	$97418	$96826	$96174	$0	$0	$0
		Other debts.	$12390	$10478	$8318	$0	$0	$0
		"New" FmHA land loan.	N.A.	N.A.	N.A.	$200000	$197117	$194082
		"New" int. rate - land.	N.A.	N.A.	N.A.	5.25%	5.25%	5.25%
		Years on new R/E loan.	N.A.	N.A.	N.A.	30.0	29.0	28.0
	Table 5	Acres corn harvested.	200	200	200	0	0	0
		Acres c. silage harvest.	103	103	103	0	0	0
		Acres hay harvested.	202	202	202	0	0	0
		Total crop acres.	505	505	505	0	0	0
		Crop acres to lease.	273	273	273	0	0	0
		Bushels corn to feed.	13877	12320	12320	14231	14436	14436
		Tons corn silage to feed.	272	1030	1030	100	0	0
		Tons hay to feed.	935	806	806	964	981	981
		Bushels corn to sell.	3639	3600	3600	0	0	0
		Tons hay to sell.	67	0	0	0	0	0
		Bushels corn to purchase.	9783	0	0	12230	14436	14436
		Tons hay to purchase.	0	0	0	855	981	981
		Purchase price of corn.	$2.67	N.A.	N.A.	$2.67	$3.01	$3.12
		Purchase price of hay.	N.A.	N.A.	N.A.	$50.00	$50.00	$50.00
		Corn expense per acre.	$68.00	$68.00	$68.00	$0	$0	$0
		C. silage expense/acre.	$65.00	$65.00	$65.00	$0	$0	$0
		Hay expense per acre.	$46.00	$46.00	$46.00	$0	$0	$0

TABLE 4-25: (continued)

Alternative Number	Appendix D Reference	Table Location	Base Run Value For 1985	1986	1987	Change For Alternative 1985	1986	1987
6 (continued)	Table 6	Labor hours for corn.	1140	1140	1140	0	0	0
		Labor hours for silage.	834	834	834	0	0	0
		Labor hours for hay.	1757	1757	1757	0	0	0
		Total hours needed.	9903	9903	9903	6171	6171	6171
	Table 8	Hired labor.	$23560	$23560	$23560	$0	$0	$0
		Repairs, maintenance.	$17456	$17456	$17456	$7276	$7276	$7276
		Custom hire & lease.	$650	$650	$650	$0	$0	$0
		Insurance.	$2540	$2540	$2540	$1281	$1281	$1281
		Fuel, oil & grease.	$14529	$14529	$14529	$1109	$1109	$1109
		Mach. depreciation.	$29184	$29184	$29184	$10605	$10605	$10605
		Utilities.	$6616	$6616	$6616	$6281	$6281	$6281
		Interest.	$75208	$67359	$65426	$52983	$52020	$50991
		Land lease.	$4425	$4425	$4425	$0	$0	$0
7	Table 2	Machinery cost.	$316435	$316435	$316435	$112205	$112205	$112205
		Accum. deprec. machinery.	$214611	$243795	$272979	$79774	$90379	$100984
		Machinery (market value).	$200000	$200000	$200000	$63700	$63700	$63700
		Land (market value).	$216299	$216299	$216299	$0	$0	$0
		Accounts payable.	$33805	$0	$0	$0	$0	$0
		Bank debt.	$27729	$23364	$18476	$0	$0	$0
		FmHA bldg.& imp. debt.	$386530	$377356	$368516	$324154	$316460	$308209
		FmHA land debt.	$364403	$360715	$356760	$0	$0	$0
		Individual land debt.	$97418	$96826	$96174	$0	$0	$0
		Other debts.	$12390	$10478	$8318	$0	$0	$0

TABLE 4-25: (continued)

Alternative Number	Appendix D Reference	Table Location	Base Run Value For 1985	1986	1987	Change For Alternative 1985	1986	1987
7 (continued)	Table 5	Acres corn harvested.	200	200	200	0	0	0
		Acres c. silage harvest.	103	103	103	0	0	0
		Acres hay harvested.	202	202	202	0	0	0
		Total crop acres.	505	505	505	0	0	0
		Crop acres to lease.	273	273	273	0	0	0
		Bushels corn to feed.	13877	12320	12320	14231	14436	14436
		Tons corn silage to feed.	272	1030	1030	100	0	0
		Tons hay to feed.	935	806	806	964	981	981
		Bushels corn to sell.	3639	3600	3600	0	0	0
		Tons hay to sell.	67	0	0	0	0	0
		Bushels corn to purchase.	9783	0	0	12230	14436	14436
		Tons hay to purchase.	0	0	0	855	981	981
		Purchase price of corn.	$2.67	N.A.	N.A.	$2.67	$3.01	$3.12
		Purchase price of hay.	N.A.	N.A.	N.A.	$50.00	$50.00	$50.00
		Corn expense per acre.	$68.00	$68.00	$68.00	$0	$0	$0
		C. silage expense/acre.	$65.00	$65.00	$65.00	$0	$0	$0
		Hay expense per acre.	$46.00	$46.00	$46.00	$0	$0	$0
	Table 6	Labor hours for corn.	1140	1140	1140	0	0	0
		Labor hours for silage.	834	834	834	0	0	0
		Labor hours for hay.	1757	1757	1757	0	0	0
		Total hours needed.	9903	9903	9903	6171	6171	6171
	Table 8	Other farm income.	$6458	$6458	$6458	$0	$0	$0
		Hired labor.	$23560	$23560	$23560	$0	$0	$0
		Repairs, maintenance.	$17456	$17456	$17456	$7276	$7276	$7276
		Custom hire & lease.	$650	$650	$650	$0	$0	$0
		Insurance.	$2540	$2540	$2540	$1281	$1281	$1281
		Fuel, oil & grease.	$14529	$14529	$14529	$1109	$1109	$1109
		Mach. depreciation.	$29184	$29184	$29184	$10605	$10605	$10605
		Property taxes.	$6458	$6458	$6458	$0	$0	$0
		Utilities.	$6616	$6616	$6616	$6281	$6281	$6281
		Interest.	$75208	$67359	$65426	$23501	$22943	$22345
		Land lease.	$4425	$4425	$4425	$0	$0	$0

TABLE 4-25: (continued)

Alternative Number	Appendix D Reference	Table Location	Base Run Value For 1985	1986	1987	Change For Alternative 1985	1986	1987
8	Table 2	Machinery cost.	$316435	$316435	$316435	$112205	$112205	$112205
		Accum. deprec. machinery.	$214611	$243795	$272979	$79774	$90379	$100984
		Machinery (market value).	$200000	$200000	$200000	$63700	$63700	$63700
		Land (market value).	$216299	$216299	$216299	$0	$0	$0
		Accounts payable.	$33805	$0	$0	$0	$0	$0
		Bank debt.	$27729	$23364	$18476	$0	$0	$0
		"Old" bldg. & imp. debt.	$386530	$377356	$367516	$124154	$121207	$118047
		"New" bldg. & imp. debt.	N.A.	N.A.	N.A.	$200000	$194110	$187910
		Int. rate on new debt.	N.A.	N.A.	N.A.	5.25%	5.25%	5.25%
		FmHA land debt.	$364403	$360715	$356760	$0	$0	$0
		Individual land debt.	$97418	$96826	$96174	$0	$0	$0
		Other debts.	$12390	$10478	$8313	$0	$0	$0
	Table 5	Acres corn harvested.	200	200	200	0	0	0
		Acres c. silage harvest.	103	103	103	0	0	0
		Acres hay harvested.	202	202	202	0	0	0
		Total crop acres.	505	505	505	0	0	0
		Crop acres owned.	232	232	232	0	0	0
		Crop acres to lease.	273	273	273	0	0	0
		Bushels corn to feed.	13877	12320	12320	14231	14436	14436
		Tons corn silage to feed.	272	1030	1030	100	0	0
		Tons hay to feed.	935	806	806	964	981	981
		Bushels corn to sell.	3639	3600	3600	0	0	0
		Tons hay to sell.	67	0	0	0	0	0
		Bushels corn to purchase.	9783	0	0	12230	14436	14436
		Tons hay to purchase.	0	0	0	855	981	981
		Purchase price of corn.	$2.67	N.A.	N.A.	$2.67	$3.01	$3.12
		Purchase price of hay.	N.A.	N.A.	N.A.	$50.00	$50.00	$50.00
		Corn expense per acre.	$68.00	$68.00	$68.00	$0	$0	$0
		C. silage expense/acre.	$65.00	$65.00	$65.00	$0	$0	$0
		Hay expense per acre.	$46.00	$46.00	$46.00	$0	$0	$0

TABLE 4-25: (continued)

Alternative Number	Appendix D Reference	Table Location	Base Run Value For 1985	1986	1987	Change For Alternative 1985	1986	1987
8 (continued)	Table 6	Labor hours for corn.	1140	1140	1140	0	0	0
		Labor hours for silage.	834	834	834	0	0	0
		Labor hours for hay.	1757	1757	1757	0	0	0
		Total hours needed.	9903	9903	9903	6171	6171	6171
	Table 8	Other farm income.	$6458	$6458	$6458	$0	$0	$0
		Hired labor.	$23560	$23560	$23560	$0	$0	$0
		Repairs, maintenance.	$17456	$17456	$17456	$7276	$7276	$7276
		Custom hire & lease.	$650	$650	$650	$0	$0	$0
		Insurance.	$2540	$2540	$2540	$1281	$1281	$1281
		Fuel, oil & grease.	$14529	$14529	$14529	$1109	$1109	$1109
		Mach. depreciation.	$29184	$29184	$29184	$10605	$10605	$10605
		Property taxes.	$6458	$6458	$6458	$0	$0	$0
		Utilities.	$6616	$6616	$6616	$6281	$6281	$6281
		Interest.	$75208	$67359	$65426	$19501	$18978	$18424
		Land lease.	$4425	$4425	$4425	$0	$0	$0

Alternative 1: Liquidate and Lease Back All Land from FmHA

As an attempt at lowering the debt service requirements the first alternative considers the effects of leasing the land back from the FmHA.

Table 4-25 on page 178 lists the changes that occur to the Base Run input under Alternative 1. This alternative assumes that the land is liquidated for the values shown on the balance sheet pertaining to land assets and land debts. Some income and expense items would also be effected by this alternative as noted in Table 4-25, namely other farm income, property taxes, interest expense and land lease.

Other farm income which was set equal to property taxes in the Base Run is zero in this alternative because property taxes are assumed to be zero with no land (although a small amount of property taxes would remain on the buildings and residence). Interest expense would be $39,047, $31,524 and $29,943 each year in this alternative. The annual land lease would increase from $4,425 to $9,600 with lease back, assuming the 232 acres leased back carry a rental rate of $22.31 per acre.

The pro forma income statement on Table 4-22 shows that sales would be lower with this alternative than with the Base Run each year by the amount of other farm income,

because other farm income is the the property taxes not paid due to lack of income. Gross income would be less for the same reason. The total expenses would be lower than the Base Run because eliminating the land debt would lower overhead, by decreasing property taxes and interest expense. The net cash income would then increase by the annual taxes and interest saved (excluding purchases). These reductions in cash expenses would cause net losses to be greatly reduced, with 1987 projected as having a very small profit. Unreconciled cash flows would also improve, with 1987 showing a surplus of $8,348.

Current assets would be unchanged until 1988 when the cash surplus would be added in. The fixed assets would be $216,299 less in 1985 because land would no longer be an asset. Machinery and buildings would still be included as fixed assets.

Current liabilities would be much less each year, with smaller principal due on long-term debt and the lessened dependency on operating loans. The decline in long-term liabilities in 1985 is equal to the amount of land debt liquidated ($461,821) minus the reduction in principal due ($4,280). Total liabilities would be $461,821 less in 1985 and continue to decline, unlike the Base Run which first increases and then declines.

The liquidation of the land would turn insolvency to solvency. Although owner equity would remain about $50,000 over four years, it would be significantly better than the 1985 net deficit of $192,783, which is projected to reach $284,091 by 1988.

The financial ratios would all improve with this alternative. Return on owner equity would be negative in 1985 and 1986, but even this is superior to the same returns of the Base Run because they include equity, not deficits. Debt servicing to income would be more manageable as time passes. Working capital would be growing instead of contracting. It would also be positive from 1986 on. Lastly, while the debt ratio would still be very high, it would begin at 90% in 1985 and decline to 88% in four years, versus 126% and 145%, respectively in the Base Run.

Alternative 2: Sell 73 Acre Farm and Lease it from Buyer

A farm consisting of 73 acres and no buildings adjacent to the family farm was purchased in 1982. It has been for sale since 1984. No offers have been made because of the depressed state of agriculture in the farmer's local area. It seems strange that lenders allowed the farm to expand its acreage at a time when agriculture was showing increased financial stress, but it did occur.

In this scenario the 73 acres will be sold for $57,670 ($790 per acre). Original cost reported was $97,418 ($1,335 per acre). Therefore, a $39,748 loss will occur upon sale, but property taxes are assumed to be lowered by 31.47% (73/232) or $2,032.

To maintain feed production and cash crop sales, the land will be rented from the buyer for $22.31 (average cash rent paid from 1981-84) per acre. This will increase land lease expense $1,630.

Under Alternative 2 in Table 4-25, it can be seen that the market value of land drops $57,670 from $219,299 to $158,629. The amount of money owed to the land contract holder also decreases by $57,670 in 1985. As a result, $39,748 would still be owed on the land contract, even though the farmer would have no asset to show for it. Therefore, it might be better to default on the land contract than to sell the land at a loss.

The same income and expense items are also affected in this alternative as were affected in Alternative 1, but by different amounts. Other farm income and property taxes are reduced from $6,458 to $4,426. Interest expense is $69,441 in 1985; $61,672 in 1986 and $59,732 in 1987. Land lease increases from $4,425 to $6,055 per year.

Tables 4-22 through 4-24 show the results of this alternative would be insignificant either way, when

compared to the Base Run. Sales would decrease by the change in other farm income ($2,032) each year. The same is true for gross income. Total expenses would decline only $6,000.

Net cash income would increase slightly over $4,000. Net earnings would be improved by the same amount. Losses would still occur each year.

Unreconciled cash flow, although better than the Base Run, would produce the need for operating loans every year.

Current assets would be uneffected. Fixed assets would decline by the same amounts as the Base Run, but would be $57,670 less to begin with because of the land sale. The current liabilities would be somewhat less, with less principal due on long-term debt and operating loans. Total liabilities would also be $57,670 less in 1985. The remaining years would follow the same pattern as the Base Run but with less magnitude because of the smaller debt being amortized.

Owner equity would be uneffected in the first year and nearly so in the following years. As such, net deficits would continue to grow thoughout the forecast.

Return on total assets would advance by a fraction of a percent. Returns on owner equity are meaningless for the same reason the Base Run's are (net losses and owner deficits). Total expenses and debt servicing would be

about the same when compared to the Base Run. Negative working capital would still characterize the liquidity aspect. And the debt ratios would be even higher, because of the loss occurring at the time of sale.

Alternative 3: Sell 73 Acres and Purchase Additional Feed

The action taken in this third alternative is similar to that of the second, except that the land was not rented from the buyer. This meant that 73 less acres would be harvested. Acres of corn were reduced because corn is the only crop grown for feed and sale and it is more marketable. Some income and expense items would also decrease. These include: 1) other farm income; 2) hired labor; 3) all machinery and improvement expenses, except insurance and depreciation on improvements; 4) property taxes; and 5) interest expense.

The changes that occur in the asset/liability structure of this alternative are exactly the same as in Alternative 2, as illustrated in Table 4-25. Also note that crop acres owned drops from 232 to 159. In addition, acres of corn harvested falls from 200 to 127. This eliminates the sale of any corn in this alternative. There will be 11,984 bushels of corn purchased in 1985 at $2.47 per bushel. In the following two years, 2,160 bushels of corn will be purchased. Cost per bushel is $3.01 and $3.12 in 1986 and 1987, respectively. There are no buildups of

corn inventory in this alternative. Labor hours required for corn and total hours needed will be 416 less, as compared with the Base Run. Other farm income, property taxes and interest expense are the same as in Alternative 2. Hired labor cost is reduced from $23,560 to $21,535. Repairs and maintenance, custom hire and lease, fuel, oil and grease and machinery depreciation are all reduced by 14.46% (.1446 = 73 acre reduction / total crop acres of 505).

This alternative would cause sales to decrease because just $3,350 worth of corn could be sold the first year and none the following two years. Also, other income would be $2,032 less, annually. Gross income would be lower as a result of greater crop purchases for feed. The decline in total expenses would be roughly $22,000 each year.

Net cash income would improve slightly, but not enough to warrant recognition. Net losses are shown to be a few thousand dollars less than the Base Run.

Cash flow imbalances would require operating loans each year between $3,000 and $5,000 less than the Base Run. However, annual operating loans would still be increasing.

Current assets would be slightly different than the Base Run in 1987 and 1988, but minutely so. Fixed asset values would be $57,670 less in 1985 and would erode with

time due to depreciation. However, depreciation would be less on machinery as pointed out earlier, so the remaining fixed assets would decline at a slower rate.

Current liabilities would be the same in 1985 as Alternative 2 for the reasons sighted in that discussion. They would be greater than Alternative 2 from 1986-88 because larger operating loans would be needed. Fortunately, these would all be smaller than the Base Run, but again not significantly. The long-term liabilities would also be as they were in Alternative 2. These changes in the assets and liabilities would still mean large deficits for owner equity.

Measures of performance indicate this alternative would be nearly as bad as the Base Run. In fact, debt servicing to income would be greater and debt in relation to assets (debt ratio) would be even larger than the Base Run, except in 1988, when they'd be the same.

Alternative 4: Purchase All Feed

This alternative implements the suggestion made by the FmHA to purchase all feed requirements. This would allow all crop land to be sold. This alternative tries to support the farm without selling any land. Some excess machinery is sold, however. Sale items include all but one tractor valued at $20,000; all planting and harvesting equipment and any miscellaneous equipment.

Table 4-25 on pages 179 through 180 shows the exact changes in input that occur in this alternative. The sale of machinery will reduce cost of machinery by $204,230 to $112,205. Accumulated depreciation will be reduced to $79,774 in 1985. The difference between the remaining cost of $112,205 and acculumated depreciation of $79,774 is the book value. Book value in 1985 for this alternative is $32,431. Book value in the Base Run was $101,824. The market value of the remaining machinery is assumed to decline by the same proportion as book value. Therefore, market value of machinery is $63,700 as listed in Table 4-25.

The $136,300 received from the sale of machinery will be used to pay back accounts payable ($33,805), banks ($27,729), others ($12,390) and $62,376 of the land debt owed to individuals. The outstanding loan balance owed to individuals in 1985 would be reduced from $97,418 to $35,042 with this alternative.

Table 4-25 also shows that no crops are grown in Alternative 4 and that no land is rented. Because no crops are grown, the feed rations are changed. This occurs because it is unlikely to purchase the corn silage requirements. The 1985 beginning inventories include 100 tons of corn silage that will be consumed. After that, the corn/hay mixture will be substituted at the ratio used in

the Base Run. That is, one ton of corn silage is equivalent to 115 pounds of corn plus 340 pounds of hay. Therefore, the equivalent of 172 more tons of corn silage will be added in 1985 to the quantities of corn and hay feed. In 1986 and 1987 the purchases of corn and hay will be equivalent to 1,030 tons of corn silage.

In the Base Run, 100 tons of corn silage on inventory were fed, plus 172 tons of the 1985 crop. However, there is no "new crop" in this alternative, so in addition to a 758 ton shortage of the Base Run, there is an additional 172 ton shortage in this alternative in 1985. This translates into 354 bushels of corn, assuming an average bushel of corn weights 56 pounds (172 tons * 115/56). This is added to the 13,877 bushels of corn fed in the first year of Base run, for a total of 14,231 bushels of corn feed in 1985 of this alternative. In 1986 and 1987, 14,436 bushels of corn are fed to compensate for 1,030 tons of corn silage (1,030 tons * 115/56 plus 12,320). Regarding the hay requirement, 29 more tons are needed in 1985 (172 tons corn silage * 340/2,000). This increases total tons of hay fed in 1985 from 935 to 964. In 1986 and 1987, an additional 175 tons of hay are fed, increasing the total from 806 to 981.

Table 4-25 shows that total hours of labor needed would be reduced from 9,903 per year to 6,171 because no

labor is needed for crops when they are purchased. Therefore, no hired labor is needed in this alternative.

The reductions in expenses that would accompany the other changes of this alternative were derived from the "Business Analysis Summary for Specialized Michigan Dairy Farms".[21] This data source shows various expenses per dairy cow. These figures were multiplied by 112 cows in this alternative. The annual expense for repairs and maintenance was reduced to $7,276. No custom hire would be needed. Insurance would drop to $9,281 per year. Fuel, oil and grease would be only $1,109. Depreciation on machinery would be $10,605. Utilities are $6,281. Interest expense is $57,947 in 1985; $56,993 in 1986 and $55,970 in 1987. No land is rented, so land lease is zero.

The projected income statement for Alternative 4 on Table 4-22 on page 172 shows that sales would be less by the value of cash crops foregone, when compared to the Base Run. Gross income would be about $100,000 less each year because of inventory adjustments and feed purchases. Total expenses would be about $120,000 less each year, with declines in all but livestock expenses.

Net cash income would be greatly improved the first year, but with crop prices expected to increase, the additional purchases of feed in 1986 and 1987 cause cash income to decline below the Base Run levels.

Net earnings would still be negative each year, but there would be a savings of $17,513 in 1985; $9,430 in 1986 and $6,537 in 1987. Unreconciled cash flow would show a surplus of $7,248 in 1985. Although negative in the following two years, the cash flow position would be better than the Base Run. The operating loans needed for 1986 and 1987 would be only $10,195 and $22,659, indicating the cash flow problem would not be solved.

The balance sheet figures would all be reduced. Current assets would be less after 1985 because crop inventories would be reduced. Fixed assets would be de-valued by the reduction in the book value of machinery ($69,393) which occurs with the sale in 1985. The remaining declines in fixed assets are attributable to the annual depreciation charges.

Declines in current liabilities occur for three reasons: 1) accounts payable is paid off; 2) smaller and fewer operating loans; 3) less principal due with less long-term debt. In 1985, total liabilities would be reduced by $136,300, which is the money to be received from the sale of machinery. Total liabilities will then decrease according to the normal amortization process.

The reductions in liabilities are greater than those of assets because the template values machinery at book value. This allows owner equity to improve, but deficits

still prevail each year. Note that if machinery were carried at market value, the net deficits would be larger because the decline in fixed assets would equal the decline in total liabilities, but the additional declines in current liabilities would result in a greater reduction in total liabilities than total assets.

Returns on total assets would be improved. Returns on owner equity would be meaningless with net losses and net deficits. Total expenses to income although less than the Base Run in 1985, would be greater by 1987. A similar pattern would occur with debt servicing. Working capital would be much improved over the Base Run. However, the improvement would be short lived, as working capital would erode each year, becoming negative in 1988.

Solvency, can not be achieved with this alternative. The debt ratios show lower values, but they are all over 1.00, meaning the farm is technically insolvent. And like the Base Run, they continue to grow.

Alternative 5: Refinance According to FmHA Guidelines

The FmHA will allow farms experiencing extreme financial stress and that are borrowers of the Farm Credit Services to refinance up to $200,000 of operating loans at 7-1/4% for up to 7 years. A farm can also refinance up to $200,000 of real estate at 5-1/4% for up to 40 years. Doing so will reduce annual interest expense and periodic

payments, which puts less strain on cash flow. According to the FmHA, they have not allowed insolvent farms to refinance as of September 1985, but they expect to do so in the future if it is justifiable. For now, it is assumed this is a viable alternative.

The changes that occur in the liability structure and the amount of interest expense are stated in Table 4-25 under Alternative 5 on page 180. This table shows that accounts payable, bank debt, individual land debt and other debts are paid off in 1985 with new loans from the FmHA. In addition, the current FmHA land debt is reduced to $261,821 in 1985 because $102,582 of that debt is refinanced. The new loans include a $200,000 real estate loan, financed at 5-1/4% for 30 years and a new operating loan for $73,924, financed at 7-1/4% for 7.0 years. Both loans are through the FmHA. As a result of this refinancing, interest expense is reduced to $57,629 in 1985; $55,999 in 1986 and $54,259 in 1987.

The value of cash crops, feeder livestock, livestock products and other farm income would not change, so sales and gross income would be the same as the Base Run. Total expenses would decline by the reduction in interest expense each year.

Because the savings occur in a cash expense, net cash income would increase by $17,579 in 1985, $11,360 in 1986

and $11,167 in 1987. These result in positive cash incomes in all years, except 1985 which would be -$3,828. Likewise, net losses would be improved by the same amounts per year.

Unreconciled cash flows, while still negative would be reduced because of the improved cash income and lower principal payments. Operating loans of $25,462, $34,619 and $36,813 would still be necessary, which means refinancing, alone, will not save this farm.

Balance sheet figures would be the same as the Base Run for current, fixed and total assets. Current liabilities would be less because the accounts payable and other short to intermediate term debt would be shifted out. There would also be smaller operating loans to repay. The shifting of short and intermediate term debt would cause long-term liabilities to increase. These changes would be favorable because both current and total liabilities would decline.

There would be no change in owner equity the first year. The following three years' beginning owner equities would still show growing deficits, although smaller than the Base Run.

Returns on total assets would not change. Returns on owner equity would remain meaningless. Total expenses to income would decline slightly. Debt servicing to income would be at manageable levels, but not without net

earnings. Working capital would become positive each year, but would begin to erode in 1987. Looking at the current ratio, liquidity would be eroding continuously. Finally, the debt ratio would be the same in 1985 (1.26) and although the growth of insolvency would not be as fast as the Base Run, it would climb every year.

It does not appear the FmHA would agree to refinance this farm because refinancing alone would not be enough. If other changes could accompany the refinancing, the results might improve.

Alternative 6: Purchase Feed and Refinance

In a final attempt to save this farm without forfeiting the land, a combination of purchasing feed and refinancing the maximum amount of real estate possible was tried. As such, this alternative combines the input of Alternative 4 with a proposal to refinance $200,000 of the land debt.

Table 4-25 shows that the same machinery sold in Alternative 4 for $136,300 would be sold in Alternative 6. This would reduce cost, accumulated depreciation and market value of machinery to $112,205, $79,774 and $63,700, in 1985 respectively.

As in Alternative 4, the $136,300 would be used to pay off accounts payable ($33,805), bank debt ($27,729), other debts ($12,390) and $62,376 of the individual land debt.

In addition to these changes in the liability structure, the remaining $35,042 of the individual land debt is refinanced from the FmHA for 30 years at 5-1/4%. This amount is subtracted from the maximum limit of $200,000, for a total of $164,958, which is deducted from the old FmHA land debt of $364,403. The $164,958 is combined with the $35,042 for a total of $200,000 which is financed by the FmHA at 5-1/4% for 30 years.

The changes that occur in the crop plan are identical to Alternative 4. Without repeating all of the details, which are explained in Alternative 4, let it be stated that no crops are grown; more corn and hay are fed to replace the corn silage ration; all corn and hay in excess of the 1985 beginning inventory levels are purchased and less labor is required. Table 4-25 shows under Alternative 6 the exact changes that occur with the crop enterprises in Reference Tables 5 and 6. For a more detailed discussion of the input adjustments, see Alternative 4, page 193.

Table 4-25 also shows that all income and expense items (Table 8, appendix D) are the same in Alternative 6, except for interest expense. Interest expense is less in this alternative than the Base Run because $136,300 of total debt is paid in 1985 and $200,000 of the remaining land debt is refinanced at an interest rate 2% below that used in the Base Run. Interest expense is also less in

this alternative than Alternative 4 due to refinancing at a lower interest rate.

Sales and gross income would be the same as Alternative 4 as shown in Table 4-22, so it would be less than the Base Run because no crops would be sold. Total expenses would be about $5,000 less each year than in Alternative 4 because the lower interest rate would reduce overhead.

Net cash income would increase by the exact amount of the savings, since interest is a cash expense. The same is true for net earnings but losses of $11,665, $22,640 and $16,632 would still occur each year.

This alternative would lead to a positive cash flow of $11,211 in 1985. However, cash deficits would return the following year and become larger in 1987. This would create the need for a small operating loan of $2,269 in 1986. A slightly larger operating loan of $10,771 would be required in 1987. Although this is an improvement over the Base Run, the pattern of growing cash deficits remains the same.

Current assets would be the same as the Base Run in 1985, but considerably less in the remaining years of the forecast. The reduction in current assets is attributable to the fact that no crop inventories are carried in this alternative because all feed crops are purchased. The

value of fixed assets is less than the Base Run because of the sale of machinery.

Current liabilities would be less than the Base Run for three reasons. One, accounts payable (a current liability) is paid off early with money from the machinery sale. Two, less long-term debt lowers the annual current portion due. Lastly, the positive cash flow in 1985 reduces the current liabilities because there would be no operating loan to repay in 1986. As just mentioned, long-term liabilities would be less because of the debts repaid at the start of this alternative.

Refinancing the debt along with purchasing feed would reduce the owner's deficit, but it is nowhere near what is needed to restore solvency. Therefore, the combination of purchasing feed and refinancing debt would not work for this farm.

The financial ratios show better returns on total assets than the Base Run, but nearly the same as Alternative 4, indicating the small affect refinancing would have. The same conclusion can be drawn from observing the minor reductions in total expenses and debt servicing to income. Working capital would not be negative in 1988, as in Alternative 4, but the improvement would be short lived. The projected current ratios indicate a rate of decline in liquidity that would result in current

liabilities being greater than current assets in possibly a year or two beyond the forecast. The debt ratios would be 1.19 in 1985 and continue to increase through 1988. And even though it would not be as bad as the Base Run, it shows a minimum level of insolvency of 19%.

As with all the other alternatives which retain ownership of the land, the excessive debt level prevents the owner from achieving any equity. Therefore, liquidation of land must be considered.

Alternative 7: Purchase Feed and Liquidate Land

The results of the previous alternatives suggest that it might be profitable to liquidate the land and purchase feed for cattle. This would reduce both income and expenses.

The changes that occur in Alternative 7 to the asset/liability structure involve the sale of machinery for $136,300 (as in Alternatives 4 and 6), liquidation of land, repayment in full, the accounts payable, bank debt and other debts. The remaining $62,376 received from the machinery sale is applied to the FmHA loan on buildings and improvements, reducing the outstanding loan balance from $386,530 to $324,154 in 1985.

No crops are harvested because all feeds are purchased. As in Alternative 4, more corn and hay are fed, which increases purchases of quantities of these two feed

crops. No corn silage is fed because it is not normally available as a purchased feed. The quantities of corn and hay to feed and purchase in this alternative are the same as in Alternative 4. For an explanation of the changes see Alternative 4 on page 194. Also, as in Alternative 4, the only labor requirements would be for the dairy enterprise, which reduces total labor hours needed from 9,903 to 6,171.

The income and expense items presented in Table 4-25 under Alternative 7 (Table 8) are identical to Alternative 4, except for property taxes and interest expense. There are no property taxes in this alternative. Interest expense in this alternative is $23,501 in 1985; $22,943 in 1986 and $22,345 in 1987.

Sales would be less than any prior alternative, including the Base Run because the only revenue would be livestock products. There are no other sources of farm income in this alternative.

Total expenses would be over $150,000 less than the Base Run each year. This occurs because there are no crop expenses or hired labor. In addition, machinery and overhead are reduced as noted in Table 4-22.

Net cash income would be positive every year forecasted, but decline over the period. The declines which would occur in 1986 and 1987 when compared to 1985 in this alternative, are due to the increased feed purchases

in those years. Net earnings after taxes also would be positive every year. Although the profits would be small, they are definitely better than the losses of the Base Run.

Unreconciled cash flows of $39,061, $61,445 and $88,623 would be generated from 1985-87 primarily because of the decrease in principal payments. In 1985, cash flow would also be improved from the $44,079 received from operations. In 1986 and 1987 cash from operations would drop but the large cash balances cause continued increases in cash flow.

Total assets would be reduced by about a third from the Base Run. Even though crop inventory would be significantly less in this alternative, the large cash surpluses would result in current assets growing over the period. Fixed assets would be reduced $285,692 in 1985 both from the sale of machinery ($69,393 decline in book value) and liquidation of land ($216,299). The other annual declines result from depreciation. Total assets increase over the forecast period because current assets increase more than fixed assets decline. While this is better than the Base Run, it would be more desirable if fixed assets did not decline.

Total liabilities were reduced by nearly $600,000 in 1985 when compared with the Base Run. Current liabilities

would be decreased because the money received from the sale of machinery would be used to pay off accounts payable and other current liabilities. In addition, the liquidation of land would reduce annual payments. Most significantly, there would be no operating loans to repay. Long-term liabilities would be greatly reduced from both the land liquidation and prepayment of the other non-current liabilities.

Without a doubt, the most impressive outcome of this scenario is that the Base Run owner's deficit of $192,783 in 1985 would be changed to an owner equity of $119,646. What is more, owner equity would increase consecutively through the remaining years of the projection.

The measures of financial performance indicate this alternative would be desirable. Return on total assets would be between 6.54% and 7.56%. Returns on owner equity of 7.79%, 4.71% and 7.97% would not only be positive, they would have meaning because they are derived from profits and equity (not losses and deficits). Total expenses to income would still be quite high, but do produce ratios which can be tolerated. The debt servicing to income would be dropped by more than half and does not increase as it did in the Base Run, indicating that it is increasingly more manageable. Working capital would start at $37,894 and grow to $111,967. Liquidity, when measured with the

current ratio, shows continued increase in liquidity (maybe too much).

Solvency, or the lack of, was by far the most critical problem with this dairy farm. This alternative turns the 1985 debt ratio of 1.26 into 0.73, which is projected to decline by 2% in 1986 and 1987 and by 3% in 1988.

Alternative 8: Purchase Feed, Liquidate Land and Refinance

The favorable outcomes of Alternative 7 suggest that it be pursued further. Without changing the dairy enterprise, about the only other option is to refinance the debt in Alternative 7. No attempt was made at changing the dairy enterprise, because of the short time this farm has.

Table 4-25 shows the only difference between Alternative 8 and Alternative 7 is that $200,000 of the building and improvement loan is refinanced at 5-1/4%.

Recall from Alternative 4 that it was assumed that there would be some idle machinery as a result of purchasing all feed requirements. Therefore, all planting and harvesting equipment, miscellaneous and all but one tractor (for hauling) are sold. Using market values, the sale would raise $136,300. This would reduce cost of machinery to $112,205. Accumulated depreciation would be $79,774 in 1985; $90,379 in 1986 and $100,984 in 1987. The market value of machinery remaining after the sale

would be $63,700. Since the land is liquidated, land is no longer an asset in this alternative.

The only liability in this alternative is the $324,154 debt on buildings and improvements. The reason for this is the $136,300 received from the machinery sale would be used to pay off accounts payable, bank debt, and other debts. The remaining $62,276 from the sale would be used to reduce the debt to the FmHA for buildings and improvements. This reduces total building and improvement debt from $386,530 in 1985 to $324,154. No land debts remain in this alternative because it is assumed that the FmHA will take possession of the land without requiring the farmer to pay any losses that may occur.

The old FmHA building and improvement debt will be reduced by $200,000 to $124,154 in 1985. The $200,000 will be refinanced from the FmHA for 20 years at a subsidized interest rate of 5-1/4%. This interest rate is 2% less than that charged on the other $124,154.

No crops are planted or harvested in this alternative, so no cropland is rented. The quantities of corn and hay to feed are greater than the Base Run because no corn silage is to be fed. As was pointed out in Alternative 4, 354 more bushels of corn would be fed in 1985 and 2,116 more bushels of corn would be fed in 1986 and 1987. In 1985, 29 more tons of hay would be fed in this alternative

than in the Base Run. One hundred and seventy-five more tons of hay would be fed in 1986 and 1987.

There are no crop sales because all feed crops are purchased. In 1985, 12,230 bushels of corn and 855 tons of hay would be purchased. In 1986 and 1987, 14,436 bushels of corn and 981 tons would be purchased. The purchase price of hay is assumed to be $50.00 per ton and does not increase during the forecast period.

The only labor requirements in this alternative are for the dairy operation. This reduces total hours needed from 9,903 in the Base Run to 6,171 in this alternative.

Several income and expense items would be affected. There would be no other farm income or hired labor. Repairs and maintenance expense would be $7,276 per year. There is no need for custom hire when feed is purchased. Insurance expense would be reduced from $2,540 in the Base Run to $1,281 because there would be less machinery to insure in this alternative. Fuel, oil and grease would cost $1,109 each year because of the decline in machinery and equipment use. Depreciation on machinery would also decline because there would be less machinery to depreciate. Property taxes would be zero because there is no land to pay taxes on. Utilities would decline slightly, but the dairy operation necessitates a fixed amount of utilities, $6,281 in this case. Land lease would be zero,

since no land is rented. The most significant decline is in interest expense. Total interest expense would be reduced from $75,208 in 1985 to $19,501. In 1986, interest expense would change from $67,359 in the Base Run to $18,978. The amount of interest paid in 1987 would drop from $65,426 in the Base Run to $18,424 in this alternative.

Sales would be less than the Base Run because the only source of revenue would be livestock products, which consists primarily of milk sales. Gross income would also be less because of the feed purchases and lower sales.

Total expenses would be decreased by $164,160 in 1985; $156,834 in 1986 and $155,455 in 1987. These declines occur because no hired labor is needed; machinery expenses are reduced from $75,278 to $31,190 each year and there are no crop expenses, property taxes or land lease in this alternative. The decline is also attributable to large reductions in interest expense each year. Total expenses do increase over the forecast period in this alternative because livestock expenses increase as they did in the Base Run.

As might be expected, net cash income would be the most in this alternative. Net earnings after taxes would also be higher in this alternative than any of the others.

The changes of this scenario would produce net earnings after taxes of $12,175, $10,002, and $14,715 from 1985-87.

Unreconciled cash flows would be greatly improved over the Base Run. In addition to producing positive cash flows, this alternative projects cash flows to increase over the forecast period. The cash flow position is improved from both greater cash from operations and from smaller annual principal payments. Total principal payments would be reduced from $53,536, $93,764 and $111,767 for each forecast year of the Base Run to $8,837, $9,360 and $9,915 in this alternative. Part of the reason annual principal payments drop as they would in this alternative is because no operating loans are necessary. Note the annual cash surpluses are $40,289, $65,930, and $94,130. This indicates the farm would become more liquid over the period.

Current assets would be greater than the Base Run beginning in 1986. The increases are solely attributable to the increased cash balances. Fixed assets are projected to be less than the Base Run because of the machinery sold and the land liquidation.

Current liabilities in Table 4-23 under Alternative 8 show the only amount due would be the annual principal portion due on the buildings and improvements. Long-term liabilities show the outstanding loan balances on the

buildings and improvements over the years covered by the forecast. The difference between long-term liabilities as shown in Alternative 7 and Alternative 8 is the additional principal paid on each annual payment which results from refinancing $200,000 of the total debt in these alternatives.

Owner equity is projected to be $119,646 in 1985. This is $312,429 greater than the $192,783 owner deficit of the Base Run. Alternative 8 also projects owner equity to increase each year. Recall the Base Run projects owner deficits to increase annually.

Although Table 4-24 shows the returns on total assets would not be as great with Alternative 8 as with Alternative 7, the final alternative really has better returns on total assets because the higher returns of Alternative 7 result from greater interest expense. When compared to the Base Run, the returns on total assets are greater with Alternative 8. Remember from the discussion of financial ratios of the Base Run that the returns resulted from the large amounts of interest expense and net losses. Returns on owner equity would be the most favorable in this alternative. Even though they are less than some of the other alternatives and the Base Run, those higher returns are meaningless because they are derived from net losses and owner deficits. Total expenses

to gross income are lower in Alternative 8 than any others, indicating this alternative would generate the largest profits.

One note of caution, the total expenses to gross income increases over the period. This may be evidence that something should be done to improve gross income. Debt servicing to gross income is also the lowest with this alternative. It is projected to decline over the period. If it continues to decline beyond the forecast period, cash flow may improve as a result. Net working capital shows that the farm would become increasingly more liquid, which indicates the farm may be able to replace some of its remaining capital without jeopardizing its financial position. The growth of the current ratio in this alternative also suggests that some new investments could be considered.

Finally, this alternative produces a debt ratio of 0.73 in 1985, which is 0.53 or 53% less than the Base Run. More importantly, insolvency is changed to solvency, making this farm a viable business. In addition, the debt ratios are projected to decline in the remaining years of the forecast. This gives support to the recommendation for this farm.

F-7. Summary and Recommendation for Dairy Farm

It is clear the dairy farm case has not performed well. From the simulation, it is also clear that the land debt will continue to plague this farm.

Because of this and the fact that the farm is already insolvent, the only alternatives which are feasible are those that liquidate the land debt. In addition, the poor crop production of this farm suggests purchasing feed would be more profitable. This will reduce some risk and uncertainty, but will not guarantee success.

The recommendation for the survival of this farm is:

1. Liquidate land to FmHA at a value equal to the debt it carries.
2. Purchase all feed.
3. Sell unnecessary machinery and equipment.
4. Refinance $200,000 of the remaining debt at 5-1/4% for 20 years.

CHAPTER V

Summary, Conclusions and Suggestions for Further Research

A. Summary

The data provided in Chapter I substantiated the claim that farmers have had to operate in an economy characterized by high interest rates, low commodity prices, falling land values and higher average debt levels during the late 1970's and early 1980's. These factors have contributed to the poor average per farm incomes as reported by the USDA from 1976 through 1983 (Table 4A).

The delinquency rates on operating, real estate and non-real estate loans (Tables 8A-10A) show an increase in the percent of loan volume delinquent in several states over the period of 1982-1984. These are only for U.S. agriculture and do not represent the rest of the economy.

Chapter II established the framework for conducting financial analysis of farm businesses. It explained the composition of the three most important financial statements used to evaluate a farm business. Namely, the balance sheet, income statement and cash flow summary. This chapter also introduced 17 different financial alternatives which can be used to improve profitability and/or reduce debts (Table 2-2).

Several financial ratios which are derived from values on the financial statements were defined regarding ways to measure liquidity, profitability, activity and leverage. A list of the financial ratios with their mathematical formulas and what they describe are given in Table 2-3. These ratios were defined differently in some cases than would normally be found in a financial text book because the data source (Telfarm) does not provide all necessary information.

The data were compiled in Chapter III by farm type to provide the reader with information on how the average highly leveraged (farms with 70% or greater debt levels) cash grain, hog and dairy Telfarm business performed from 1981-1983. These three farm types were chosen above others because they represent the majority of farm types and they are the ones experiencing the most financial stress. Seven potential problems of the average data are listed in Chapter III. The fact that Telfarm is not a double entry accounting system means that only the net cash income part of the cash flow summaries could be analyzed.

Each farm type was analyzed separately. This was done to point out differences unique to a particular enterprise. The separate analyses produced some duplication of effort, but was unavoidable to provide a comprehensive study of each.

Analysis of the average balance sheets in Chapter III showed that total assets increased on cash grain farms, were constant on hog farms and declined on dairy farms over the period of 1981-83. Total liabilities increased over the period on all three farm types.

Owner equity increased on the average highly leveraged cash grain farm because the increases in the estimated values of machinery and real estate were greater than the increase in total liabilities. Since both assets and liabilities increased, it seems reasonable to say that some capital purchases were made over the period.

There was a decline in owner equity on the average highly leveraged hog farm from 1981 to 1983. This happened because no increase in total assets occurred, but total liabilities did increase. Assets saw no increase because declines in the values of livestock and machinery offset all increases in the estimated market value of real estate. Total liabilities increased due to the purchase of at least one farm on a land contract.

Owner equity also declined on the average highly leveraged dairy farm. This occurred because total assets declined, while total liabilities increased. The value of total assets fell because the market values of dairy livestock and machinery declined. Total liabilities

increased as a result of real estate purchased and non-payment of interest on existing debts.

The profitability measured by net farm income before taxes indicated the average cash grain farm produced larger losses, the average hog farm improved and the average dairy farm remained nearly constant.

Highly leveraged cash grain farms experienced greater losses from 1981 to 1983 because of large declines in crop prices during 1982 and because of increased expenses, primarily caused from greater interest expense. The losses generated by highly leveraged hog farms diminished over the period because hog prices increased from 1981 to 1983. Although milk prices declined in the early 1980's, sales and gross income increased from greater milk production. Total expenses also increased due to interest expense, but the total increase in expenses was less than the increase in gross income so losses decreased from 1981 to 1983 on the average dairy farm.

Net cash income was negative two out of three years on cash grain farms, but improved. Hog farms also improved, without experiencing any negative values. The dairy farms produced net cash incomes at constant levels of about $16,300 each year.

This summary is valid only for the farms included in the study. Some of these farms may not even be represented

by the analyses in Chapter III because averages tend to cover up specific strengths and weaknesses. That is why a case study of an actual farm of each type was analyzed from the samples. In doing so, specific financial and/or technical adjustments could be evaluated, given the individual circumstances that prevail on each case farm. The case studies chosen were those whose individual financial statements were similar to the averages for each type.

Chapter IV presents the financial statements of each case farm used in the averages as background for the simulation. Based on the past performance, a microcomputer program developed by Dr. Ralph E. Hepp of Michigan State University was used to simulate each farm's production and financial performance for the next three years. Given the results of the Base Runs, several alternatives were identified and simulated for each farm.

B. Conclusions

B-1. General Causes of Financial Stress

If it is possible to state why the farms in this study have experienced financial difficulties, one would have to say that troubles stem from low commodity prices, high interest rates, land purchases made in the early 1980's and declining land values. Low commodity prices, particularly

crop prices have caused poor farm incomes and cash flows, which have prevented highly leveraged farms from repaying debts. The inability to repay debts has exerted pressure on the ability of these farms to remain solvent.

High interest rates on real estate and non-real estate debt have also hurt farm incomes and cash flows by increasing the total expenses on highly leveraged farms. The problem is compounded when debts grow as a result of converting unpaid interest to principal.

To worsen the problem, farmers who purchased land in the early 1980's (when interest rates were high) have seen the value of land decline in certain instances. This has eroded the owner's equity of such farms by decreasing asset values in relation to liabilities.

B-2. Conclusions on Measuring Financial Performance

Of all the data provided in the financial statements, there are two key figures which can be analyzed to determine the viability of any financial alternative. These are the net farm income after taxes and the net cash flow. In addition, there are six financial ratios to use to summarize the critical information needed to evaluate liquidity, profitability and solvency. Liquidity is best measured by the current ratio. The profitability ratios are return on total assets, return on owner equity and the

operating ratio. The most useful measures of solvency are the debt servicing to gross income and debt ratios.

Net farm income after taxes is the actual amount of money available to the owner. It is useful for projecting the farm's long-run survival. Net cash flow is a short-term measure, indicating the farm's ability to repay debts. As such, it is also useful in measuring liquidity.

The current ratio is probably the best ratio for measuring liquidity because it shows whether or not current liabilities can be paid from current assets. Current ratios less than 1.0 mean current assets are not enough to pay current liabilities. Highly leveraged farms will generally have low current ratios because of debt repayment obligations. This suggests they may need to seek other sources of funds.

Return on total assets is a good profitability measure because it shows operating profits as a percent of total assets. This provides a return that can be compared with returns on other investments to determine acceptable levels of return. Return on owner equity is also helpful in evaluating profitability because it indicates how profitably the owner's funds are used. A third profitability measure to use is the operating ratio (total operating expenses/gross income). It shows the proportion of gross income needed to pay all operating expenses. In some texts

the operating ratio may use total expenses rather than operating expenses.

Debt servicing to gross income is useful for measuring changes in solvency because the higher this ratio is, the less likely the chance of reducing leverage. The most commonly used measure of solvency is the debt ratio. It states total liabilities in relation to total assets. Thereby illustrating the degree of leverage. As the debt ratio increases, the likelihood of financial stress increases. This says that highly leveraged farm businesses will probably experience some degree of financial difficulty.

B-3. Conclusions on Case Farm Alternatives

Each case farm analyzed had a different set of circumstances and degree of leverage. However, the results of the Base Run and various alternatives for each case farm provide information that is applicable to many farms.

a. General Conclusions Drawn from Case Studies:

1. Farmers must deal with their financial problems. Failure to do so results in loss of equity. This study has shown that highly leveraged farms that have not been able to earn income or generate cash flows will experience growth in debts that will result in insolvency within a very short time.

2. Highly leveraged farms that expect their financial difficulties to be solved by higher commodity prices will find that in many cases this is not enough. The Base Run for the cash grain farm showed that even if crop prices increased as forecasted,

financial stress would continue the increase.

3. Farmers who lever their operations, count on increased efficiency and land value appreciation to stay ahead of debt repayment obligations. Historically, this has worked for the most part. However, when land values decline, these farms find that they have asset values associated with land that decreases faster than the debts on the land. This results in debts that are greater than the assets being financed. When this occurs, it becomes almost impossible to survive without write downs on loans, because paying more for an asset than what it is worth cannot be economically justified.

4. Selling land below cost will worsen a farm's financial position because of the loss incurred upon sale. When such sales occur with land that carries debt, the farm not only has a loss of equity but it also must repay the remaining debt. Unless the land can be leased back, it is better to default on the loan than sell it at a loss, because the level of production will decrease without lease back.

5. Many highly leveraged farms need to refinance debts below market interest rates in order to get debt servicing at manageable levels. Refinancing reduces interest expense which increases net income and cash flow. However, refinancing below market interest rates requires borrowing from the FmHA (Farmers Home Administration). If the FmHA is to continue to offer subsidized interest rates to farmers as it has in the past, then farmers will also receive political preference. As with any government agency that provides services to a select group, those groups excluded tend to create opposition.

6. Non-farm income, although it does not improve net farm income, provides an addition to cash flow and owner equity. Non-farm income used to support family living expenses reduces the amount of money

removed from farm sources. Depending on the degree of financial stress and the amount of non-farm income that can be earned, non-farm income may be enough in itself to avoid financial difficulties. Family members other than the operator are better candidates for non-farm income because the operator should be managing the farm full-time. However, crop farmers could be employed off the farm four to six months during the year when the land is idle.

7. Any excess or unproductive assets, whether they be machinery, buildings or land should be sold whenever the sale improves the financial position. This is particularly true if money is owed on such assets. This poses a dilemma because as mentioned above, selling below cost can lead to losses. Depreciable assets like machinery and certain buildings are more likely to elude losses because the cost is recaptured from depreciation and investment tax credit.

8. The need for financial information is imperative if any financial analysis is to be conducted. Without this information, it is impossible to determine a farm's financial position. Given that financial information is available, it must also be accurate. This is especially true for highly leveraged farms. When inaccurate information is reported on the financial statements, as occurred in some of the data used in this analysis, estimates must be used. This tends to bias the results because estimation may or may not represent the actual values being estimated.

9. The use of market values for machinery and equipment, buildings and improvements and land are vital to report an accurate financial position. First of all, these assets make up the bulk of a farm's total asset value. Therefore, overvaluing these assets will overstate owner's equity. Conversely, undervaluing these assets will show up as higher leverage. The same is true of any asset. Secondly, market values reflect the most up-to-date financial

picture. Highly leveraged farms more than others need this accuracy because as market values fall, as they did over the period of this study, insolvency may result. This happened in the dairy case example.

10. This study showed that some farm types have not experienced as much financial stress as others because of prices received for their output. On average, highly leveraged hog farms have performed better than cash grain and dairy farms because hog prices have not fallen as much as crop and milk prices.

b. Alternatives that Should be Considered

Each case alternative was an attempt to improve both net farm income and cash flow. While most of the alternatives were positive action toward achieving the goal of increased income and cash flow, the degree of financial stress prevented many of the alternatives from solving the problems which the cases have. This does not mean that those alternatives should not be considered by other farms with different circumstances.

Non-farm income was shown to improve cash flow and owner equity. It does not increase farm income because it is not generated from farm resources. However, non-farm income does reduce the amount of cash taken out of the business. For farms that produce little farm income and small cash deficits, non-farm income will probably solve their financial problems.

The alternatives that liquidated part of the land with a lease back agreement increased net farm income and cash flow. Alternatives of this natural should lower debt service requirements more than the increase in rent expense. If this can be accomplished, losses that occur in liquidation can possibly be tolerated. The debt ratio is a good indication if such an alternative is beneficial in the long-run.

It was also found in this study that complete land liquidation with lease back would improve financial performance more than a partial land liquidation with lease back. This occurred because complete land liquidation reduced debt servicing much more than partial liquidation. It is important to lease back any land liquidated to maintain the current level of crop production. The results of this study showed that if crops are the main source of income, cutting back on acres farmed will lead to greater financial difficulties in terms of liquidity, profitability and solvency.

The dairy case example made it evident that if crop yields are low, then purchasing feed is probably less costly. In addition, the hog case supported the notion that cash crop corn may not add to profitability. Both of these scenarios suggest that

livestock operations perform as well or better without maintaining crop enterprises if yields are only average at best.

Contrary to what many farmers believe, scaling down farm size may prove to be a better strategy than expanding. The dairy case proved that cash flow can be increased in some instances by reducing the farm's size in terms of land acreage and machinery. The hog farm case showed that it could reduce acres farmed with virtually no change in net income. Therefore, farms should conduct cost/benefit analyses for each enterprise to evaluate the need for changes.

The alternatives that refinanced and restructured debts illustrated that a farm can improve its cash flow if debts can be renegotiated at lower interest rates. Increasing the amount of time to repay loans will have the added benefit of lowering the amount of periodic payments. So far, this has meant refinancing from the FmHA. The FmHA will allow solvent farms that are current borrowers of the Farm Credit Services to refinance a maximum of $200,000 for real estate at 5-1/4%, for up to 40 years. Farms meeting the criteria can also refinance $200,000 of operating money at 7-1/4% for up to seven years. Increasing the term to

repay will reduce periodic debt service requirements, which will increase cash flow.

Implicit in all of the alternatives is the assumption that current levels of productivity and efficiency can be maintained. Because no one can predict what future output levels are going to be, past production must be used as a proxy. This study did not expect the farm operators to be more efficient than they have been in the past, but it also expected them to do as well as they have. Obviously, unforeseen disasters could have adverse effects on the outcomes of the simulation.

It is doubtful that any financial alternative by itself is adequate to increase solvency as much as needed on highly leveraged farms. This is why combinations of different alternatives should be considered. Development of a financial plan that incorporates the most favorable results of single adjustment alternatives will produce better forecasts than any one alternative used in the combination.

A final point to be made on which alternatives to consider is that the alternative or combination of alternatives must be scaled to the degree of financial stress. That is, minor financial problems can be solved without completely restructuring the farm. An

example of a solution to marginal performance would be non-farm income. On the other hand, serious liquidity, profitability and solvency problems necessitate extensive financial/production plans to establish sufficient cash flows and income to reduce debt levels.

c. Alternatives that Worked for Case Studies

The alternatives which were chosen for recommendation in each case farm were designed to produce net farm incomes and positive cash flows in order to reduce debt levels. For review, the alternatives recommended for each case farm were:

- Cash Grain Farm
  1. Liquidate land and lease back at $65 per acre, the 335 acres currently being purchased.
  2. Refinance $200,000 of bank debt from FmHA at 7-1/4% for 7 years.
  3. Increase level of production 25% by increasing acres harvested.
- Hog Farm
  1. Keep at least 162 sows for breeding.
  2. Maintain livestock production at 27.00 cwt. per sow.
  3. Plant and harvest 410 acres of corn, averaging 90 bushels per acre.
  4. Sell excess crop inventories.
  5. Hire one part-time laborer.

o Dairy Farm

1. Liquidate land to FmHA at a value equal to the debt it carries.

2. Purchase all feed.

3. Sell unnecessary machinery and equipment.

4. Refinance $200,000 of the remaining real estate debt at 5-1/4% for 20 years.

The cash grain farm alternative recommended works because it initially reduces total debt by nearly 74% from $808,690 to $212,665. It also takes advantage of the low interest rate of the FmHA which helps improve profitability and liquidity. Lastly, to assure better financial performance in the future, the level of crop production increases 25%. Implementing these changes will also remove the dependency of the farm on higher crop prices over the next two years.

The hog farm Base Run was recommended because it indicated the farm can expect improved profitability, liquidity and solvency by continuing to operate as it has. One reason for this is the farm is not as highly leveraged as its financial records indicate due to the incorrect real estate value in 1983. A second reason is that hog prices are forecasted to increase in the near future. The break-even analysis for this farm also showed that hog prices would not have to increase as much as

forecasted for this farm to continue without experiencing financial stress.

The dairy case recommendation restores solvency to the farm because all land is liquidated and most machinery is sold. To reduce total debt further, the money received from the machinery sale must be used to pay off as much debt as possible. To assist in improved liquidity, a lower interest rate was used on $200,000 of long-term debt. Greater profitability was achieved by purchasing feed, which also reduces risk and uncertainty associated with crop production. The liquidity and profitability improvement lead to lower debt ratios over the forecast, which is evidence of greater solvency.

d. Alternatives that did not Work for Case Studies

The common cause that prevented alternatives from working was the inability to generate earnings and cash flows because of the high amount of debt service in relation to gross income. All unsuccessful alternatives had debt servicing to income ratios greater than 25% and debt ratios greater than 80%. This suggests that when a farm reaches a debt ratio of 80% and debt servicing to income of 25% action should be taken to lower these ratios in order to avoid further financial difficulties.

Assuming that the case farms can maintain productivity and yields as used in the simulation, the only alternatives that resulted in lower cash flows were land sales below cost without lease back. This occurred because of the loss incurred upon sale and because the level of production declined. It was also found that income and solvency would also decline if land is sold without lease back.

C. Suggestions for Further Research

Although the study just completed was quite specific, the alternatives to reduce debt levels through improved profitability may be applied to many farms. A weakness of the study was that in several instances values had to be substituted in the cases because data was either unavailable or reported inaccurately. Another weakness was that no attempt was made at increasing production efficiency. The reason for this is the short time period that these farms have to get their finances in order. Increased efficiency requires time. In some cases years. These farms simply do not have large amounts of time with which to bargain.

Additional research using optimization of inputs, through linear programming would be beneficial in determining how resources could be employed to maximize profitability or minimize costs. For example, adjusting

quantities of livestock and acres of crops may produce results better than those arrived at in this study.

Another possible area for research would be developing financial alternatives which are not currently acceptable. Namely, changing the criteria that the FmHA uses to qualify applicants should be evaluated. For example, increasing the maximum amounts that the FmHA will refinance from $200,000 to a higher amount would facilitate more borrowers. The FmHA may also want to consider loaning to others and not just those farmers who cannot get loans from other sources. This would most likely improve the FmHA's loan portfolio performance.

A third area that needs to be researched deals with the issue of risk preference. How should farmers who lever their operations be evaluated or measured in terms of their risk preference? Do those who prefer high risk perform better than those who do not?

With the number of farm failures expected to increase in 1985, the opportunities for more research are many. Any studies conducted should focus not only on achieving survival in the short-run, but also on the long-term goals of farmers.

APPENDICES

APPENDIX A

SECONDARY DATA FOR CHAPTER 1

Figure 1: WHEAT

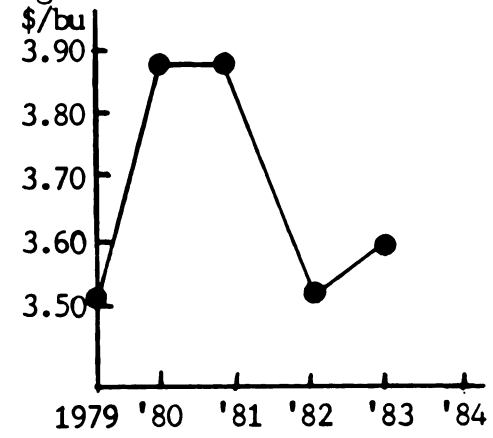

Figure 2: CORN

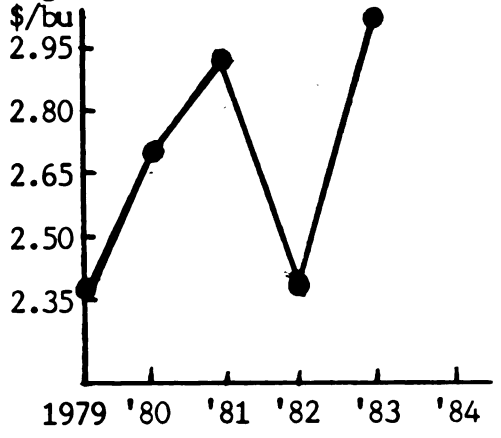

Figure 3: HAY

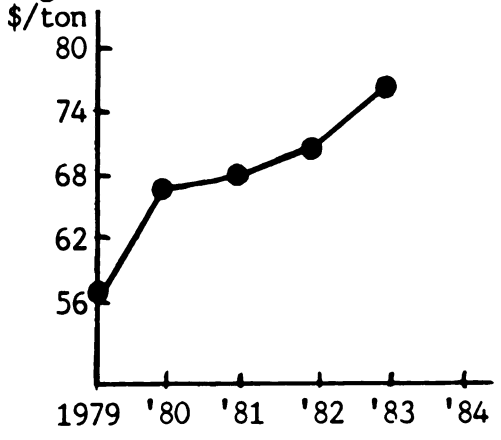

Figure 4: SOYBEANS

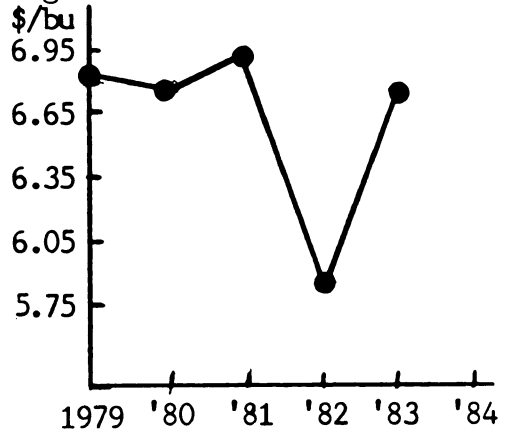

Figure 5: DRY BEANS

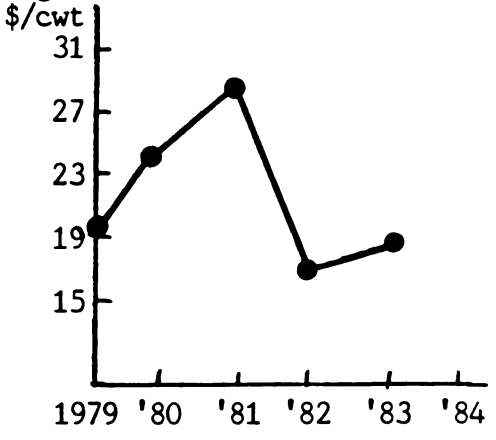

Figure 6: BEEF

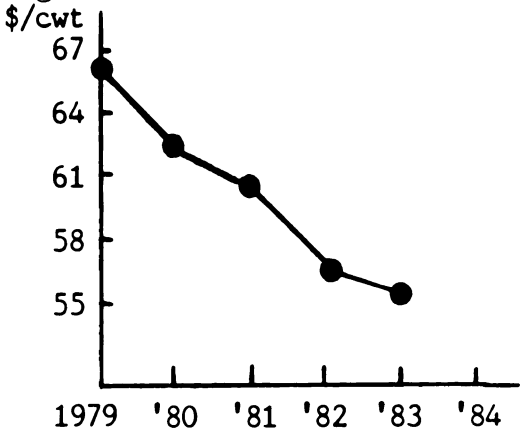

Figure 7: CALVES

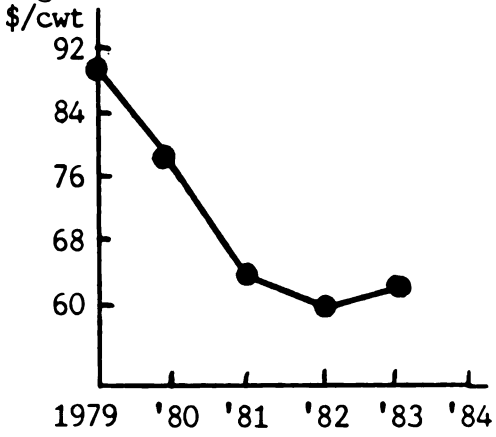

Figure 8: HOGS

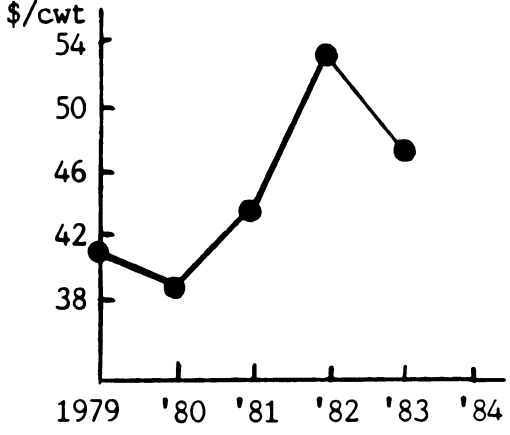

Figure 9: Lambs

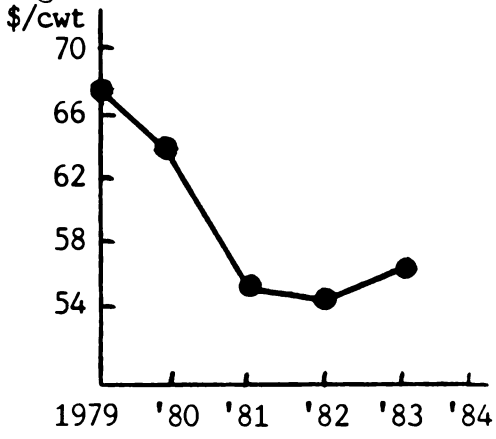

Figure 10: ALL MILK

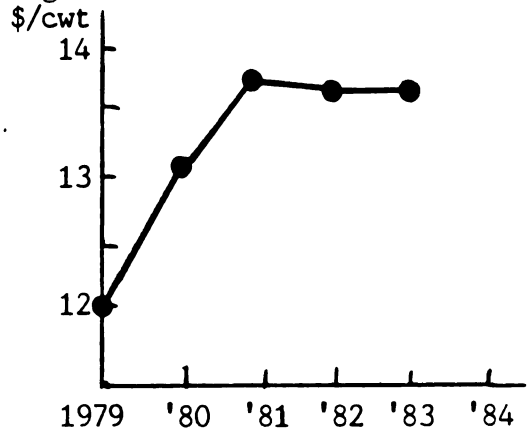

Figure 11: MILK, Mfr. GRADE

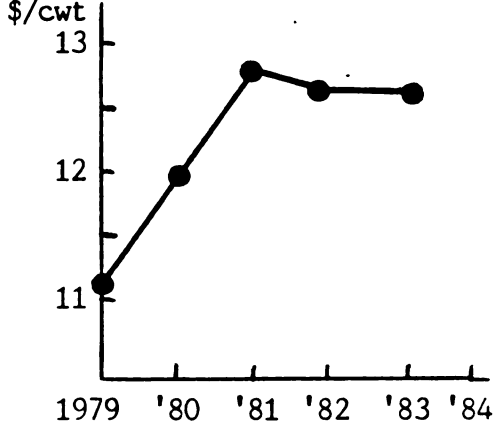

TABLE 1A: Prices Received by Farmers, Selected Commodities, U.S. Average.

	1979	1980	1981	1982	1983
CROPS					
All Wheat ($/bu)	3.51	3.88	3.88	3.52	3.59
Corn ($/bu)	2.36	2.70	2.92	2.37	2.99
All Hay, baled ($/ton)	56.30	67.00	67.76	69.17	75.13
Soybeans ($/bu)	6.86	6.75	6.92	5.78	6.73
Dry Edible Beans ($/cwt)	19.60	24.80	28.60	16.82	18.22
LIVESTOCK					
Beef Cattle ($/cwt)	66.30	62.50	60.80	56.97	55.83
Calves ($/cwt)	89.70	77.50	64.00	60.18	62.18
Hogs ($/cwt)	41.30	38.90	43.40	52.78	47.02
Lambs ($/cwt)	67.10	63.50	54.90	54.55	55.48
All Milk ($/cwt)	12.00	13.10	13.80	13.59	13.57
Milk, Mrf. Grade ($/cwt)	11.10	12.00	12.75	12.66	12.63

Source: Agricultural Outlook, December 1982 and 1984.

TABLE 2A: Value of U.S. Exports (Agricultural, Nonagricultural), October - September 1968-84.

YEAR	Agricultural	Nonagricultural	Total
		-- MILLION DOLLARS --	
1968	6,331	26,426	32,757
1969	5,751	29,637	35,388
1970	6,958	34,337	41,295
1971	7,955	35,928	43,883
1972	8,242	36,633	44,875
1973	14,984	47,749	62,743
1974	21,559	69,423	90,982
1975	21,817	83,178	104,995
1976	22,742	89,047	111,789
1977	23,974	95,144	119,118
1978	27,289	104,270	131,599
1979	31,979	135,839	167,818
1980	40,481	169,846	210,327
1981	43,780	185,423	229,203
1982	39,095	176,310	215,405
1983	34,769	159,373	194,142
1984	38,027	170,014	208,041

Source: USDA, ERS. Foreign Agricultural Trade of the United States. (FATUS). Fiscal Year 1984, Supplement, p. 43.

TABLE 3A: Farm Real Estate Value $/Acre, Selected States, 1967-1985

Year	Michigan	Minnesota	Indiana	Iowa	Illinois	Wisconsin
1967	$ 275	$ 189	$ 394	$ 350	$ 446	$ 181
1968	294	202	417	370	466	190
1969	317	216	420	389	487	209
1970	326	226	406	392	490	232
1971	332	231	422	392	494	255
1972	370	243	435	414	522	274
1973	444	269	494	466	567	328
1974	521	339	592	597	720	389
1975	553	429	720	719	846	434
1976	609	529	888	920	1062	496
1977	778	672	1188	1259	1458	598
1978	877	761	1357	1331	1625	718
1979	975	901	1589	1550	1858	856
1980	1082	1061	1833	1811	2013	980
1981	1232	1231	1972	1941	2133	1105
1982	1192	1197	1715	1802	1940	1073
1983	1109	1065	1492	1568	1727	1019
1984	1109	990	1477	1396	1692	958

Source: "Farm Real Estate Market Developments - Outlook and Situations Report," Various Issues, ERS, USDA.

TABLE 4A: Per Farm Net Income, Selected States, 1976-83.

State	1976	1977	1978	1979	1980	1981	1982	1983
				— DOLLARS —				
Michigan	5,700	7,434	7,061	7,876	6,731	7,711	6,712	5,431
Minnesota	5,806	13,353	13,566	13,900	11,454	14,462	9,627	7,202
Indiana	11,111	8,065	9,296	11,106	6,789	7,629	5,609	-1,545
Iowa	7,291	8,065	16,791	13,610	7,029	17,680	7,376	-1,891
Illinois	13,414	14,032	13,064	18,827	4,865	17,676	8,989	-5,845
Wisconsin	6,784	11,258	10,420	15,240	15,337	15,672	13,200	11,050
U.S.	8,061	8,071	11,350	13,259	8,731	12,723	9,306	6,793

Source: Economic Indicators of the Farm Sector, State Income and Balance Sheet Statistics, 1983. (ECIFS 3-4).

TABLE 5A: Farm Income Statistics, 1975-1983

YEAR	NOMINAL NET FARM INCOME	DEFLATED NET FARM INCOME 1/
	-- BILLION DOLLARS --	
1975	25.6	20.4
1976	20.1	15.2
1977	19.8	14.1
1978	27.7	18.4
1979	32.3	19.7
1980	21.2	11.9
1981	31.0	15.9
1982	22.3	10.8
1983	16.1	7.5

1/ Deflated by the GNP implicit price deflator, 1972=100

Source: USDA, ERS. Farm Income Statistics. Agriculture Outlook. December, 1984.

TABLE 6A: Total Farm Debt 1971-85*

YEAR	REAL ESTATE DEBT	NON-REAL ESTATE DEBT	TOTAL DEBT
	-- MILLION DOLLARS --		
1971	30,346	24,138	54,484
1972	32,192	27,376	59,568
1973	35,094	29,758	64,852
1974	39,527	33,804	73,331
1975	44,637	37,006	81,643
1976	49,603	41,927	91,530
1977	55,157	48,727	103,884
1978	63,307	59,436	122,743
1979	71,413	69,401	140,814
1980	85,421	80,382	165,803
1981	95,513	86,443	181,956
1982	105,565	96,118	201,683
1983	109,507	106,812	216,319
1984	111,635	103,044	214,679
1985	110,854	101,275	212,129

*1985 Preliminary

Source: USDA, ERS. Agricultural Finance - Outlook and Situation Report. (AFO-25), December 1984, p. 21.

TABLE 7A: Average Short-run Cash Availability and Needs by Sales Class and Debt/Asset Ratio, 1983.

Debt/Asset Ratio of 0-40%

Sales Class	Cash Available	Cash Needs	Surplus or (deficit)
Less than $10,000	$ 16,508	$21,210	$ (4,702)
$10,000-24,999	14,642	21,465	(6,823)
$25,000-49,999	14,313	22,101	(7,788)
$50,000-99,999	22,895	23,232	(1,336)
$100,000-249,999	39,644	25,247	14,397
$250,000-499,999	72,551	30,612	50,956
Over $500,000	179,280	38,796	140,484

Debt/Asset Ratio of 40-70%

Sales Class	Cash Available	Cash Needs	Surplus or (deficit)
Less than $10,000	$ 8,920	$23,523	$(14,603)
$10,000-24,999	2,270	24,674	(22,404)
$25,000-49,999	4,952	26,009	(21,057)
$50,000-99,999	9,386	30,830	(22,443)
$100,000-249,999	30,421	35,261	(4,840)
$250,000-499,999	49,234	42,012	7,222
Over $500,000	80,516	73,538	6,978

Debt/Asset Ratio of Over 70%

Sales Class	Cash Available	Cash Needs	Surplus or (deficit)
Less than $10,000	$ 12,219	$23,588	$(11,369)
$10,000-24,999	(3,390)	26,745	(30,135)
$25,000-49,999	3,542	28,232	(24,690)
$50,000-99,999	10,678	31,285	(21,606)
$100,000-249,999	15,251	36,843	(21,592)
$250,000-499,999	41,776	47,296	(5,510)
Over $500,000	24,153	80,608	(56,456)

Source: USDA, ERS. Current Financial Condition of Farmers and Farm Lenders, Agricultural Information Bulletin #490. p. 10.

TABLE 8A: Production Credit Association Delinquency Rates

	% of borrowers delinquent on December 31			% of loan volume delinquent on December 31		
	1982	1983	1984	1982	1983	1984
Michigan	2.0	1.8	2.2	2.2	2.0	2.7
Minnesota	2.1	2.8	2.8	2.1	2.7	3.0
North Dakota	2.9	3.1	3.6	2.3	3.2	4.1
Wisconsin	2.1	2.1	2.6	2.4	2.1	2.8

Source: Farm Credit Update for Policymakers, Farm Credit Services, March 1985.

TABLE 9A: Federal Land Bank Delinquency Rates

	% of borrowers delinquent on December 31			% of loan volume delinquent on December 31		
	1982	1983	1984	1982	1983	1984
Michigan	4.4	3.0	3.7	.3	.2	.8
Minnesota	3.8	3.7	4.9	.4	.5	.8
North Dakota	3.8	3.7	4.8	.5	.5	1.7
Wisconsin	5.2	5.1	6.3	.3	.3	.8

Source: Farm Credit Update for Policymakers, Farm Credit Services, March 1985.

TABLE 10A: Commercial Banks Farm Non-Real Estate Loan Delinquency Rates

	% of loan volume delinquent on December 31		
	1982	1983	1984
Michigan	2.6	3.1	3.8
Minnesota	3.4	3.5	4.3
North Dakota	4.9	5.5	5.4
Wisconsin	3.7	3.9	4.6
United States - total	3.8	3.7	3.8

Source: Melichar, Emanuel, Agricultural Banking Experience, 1984, March 22, 1985.

APPENDIX B

BASE RUN FOR CASH GRAIN FARM CASE

APPENDIX B

CAPITAL/PROFIT PLAN

DEVELOPED BY: RALPH E. HEPP
EXTENSION ECONOMIST
DEPARTMENT OF AGRICULTURAL ECONOMICS
MICHIGAN STATE UNIVERSITY

PLAN DEVELOPED FOR

NAME: CASH GRAIN FARM CASE BASE RUN
ADDRESS:
CITY:
STATE:
ZIP CODE:

FIRST PLANNING YEAR: 1985

TABLE 1. ENTERPRISE LIST FOR THE FARM

A. FEEDER LIVESTOCK
1.
2.

B. BREEDING LIVESTOCK
1.
2.

C. CROPS
1. CORN
2. WHEAT
3. SUGAR BEETS
4.
5. SOYBEANS
6.
7.
8.

PRESS: {ALT}{M}

TABLE 2. BEGINNING NET WORTH STATEMENT

***** ASSETS *****				VALUE
CURRENT ASSETS:				
CASH				$1,000
ACCOUNTS RECEIVABLE				$0
CROP INVENTORY:				
KIND	QUANTITY	UNIT	$/UNIT	
CORN	0	BU.	$2.65	$0
WHEAT	0	BU.	$3.38	$0
SUGAR BEETS	680	TON	$10.00	$6,800
	0	CWT.		$0
SOYBEANS	13000	BU.	$5.83	$75,790
				$0
				$0
				$0
TOTAL CROP INVENTORY				$82,590
FEEDER LIVESTOCK INV.:				
KIND	QUANTITY	UNIT	$/UNIT	
		HEAD		$0
		HEAD		$0
TOTAL FEEDER LIVESTOCK				$0
TOTAL CURRENT ASSETS				$83,590
FIXED ASSETS:				
BREEDING LIVESTOCK INV.:				
KIND	QUANTITY	UNIT	$/UNIT	
		HEAD		$0
		HEAD		$0
TOTAL BREEDING LIVESTOCK				$0

KIND	COST BASIS	ACCUMULATED DEPREC.	BOOK VALUE	MARKET VALUE
MARKETABLE SECURITIES			$0	
MACHINERY	$174,997	$132,137	$42,860	$200,000
BUILDINGS & IMPROVEMENTS	$102,722	$49,026	$53,696	$79,227
LAND	$441,830	$0	$441,830	$651,908
OTHER	$62,150		$62,150	$87,564
TOTAL FIXED ASSETS				$1,018,699
TOTAL ASSETS				$1,102,289

***** LIABILITIES *****

LENDER	SECURITY	INTEREST RATE	TERM IN YEARS	PRINCIPAL BALANCE
BANKS		12.00%	5.0	$211,543
MERCHANTS & DEALERS	EQUIPMET	15.00%	3.0	$1,122
INDIVIDUALS	LAND	10.00%	30.0	$438,960
F.L.B.	LAND	13.00%	30.0	$157,065
TOTAL LIABILITIES				$808,690
OWNER EQUITY				$293,599

TABLE 3. ANNUAL PLANNING DATA FOR FEEDER LIVESTOCK

PLANNING YEAR >>>>>>>>>>>>>	1985	1986	1987
FEEDER LIVESTOCK ENTERPRISE >>>>>			
NUMBER OF HEAD:			
PUCHASED			
SOLD			
ENDING INVENTORY			
PRICE PER HEAD:			
PURCHASED			
SOLD			
ENDING INVENTORY			
LIVESTOCK EXPENSES PER HEAD			
OUTPUT VALUES:			
BEGINNING INVENTORY	$0	$0	$0
PURCHASED	$0	$0	$0
SALES	$0	$0	$0
ENDING INVENTORY	$0	$0	$0
CHANGE IN INVENTORY	$0	$0	$0
LIVESTOCK EXPENSES	$0	$0	$0
FEEDER LIVESTOCK ENTERPRISE >>>>>			
NUMBER OF HEAD:			
PUCHASED			
SOLD			
ENDING INVENTORY			
PRICE PER HEAD:			
PURCHASED			
SOLD			
ENDING INVENTORY			
LIVESTOCK EXPENSES PER HEAD			
OUTPUT VALUES:			
BEGINNING INVENTORY	$0	$0	$0
PURCHASED	$0	$0	$0
SALES	$0	$0	$0
ENDING INVENTORY	$0	$0	$0
CHANGE IN INVENTORY	$0	$0	$0
LIVESTOCK EXPENSES	$0	$0	$0

TABLE 4. ANNUAL PLANNING DATA FOR BREEDING LIVESTOCK

PLANNING YEAR >>>>>>>>>>>>>	1985	1986	1987
BREEDING LIVESTOCK ENTERPRISE >>>>>			
NUMBER OF BREEDING ANIMALS:			
PRODUCING OUTPUT			
ON ENDING INVENTORY			
PRIMARY OUTPUT:			
QUANTITY PER HEAD			
PRICE PER UNIT			
OTHER INCOME PER HEAD			
CAPITAL GAIN INCOME PER HEAD			
LIVESTOCK EXPENSES PER HEAD			
OUTPUT VALUES:			
BEGINNING INVENTORY	$0	$0	$0
SALES PRIMARY OUTPUT	$0	$0	$0
SALES OTHER OUTPUT	$0	$0	$0
ENDING INVENTORY	$0	$0	$0
CHANGE IN INVENTORY	$0	$0	$0
LIVESTOCK EXPENSES	$0	$0	$0
BREEDING LIVESTOCK ENTERPRISE >>>>>			
NUMBER OF BREEDING ANIMALS:			
PRODUCING OUTPUT			
ON ENDING INVENTORY			
PRIMARY OUTPUT:			
QUANTITY PER HEAD			
PRICE PER UNIT			
OTHER INCOME PER HEAD			
CAPITAL GAIN INCOME PER HEAD			
LIVESTOCK EXPENSES PER HEAD			
OUTPUT VALUES:			
BEGINNING INVENTORY	$0	$0	$0
SALES PRIMARY OUTPUT	$0	$0	$0
SALES OTHER OUTPUT	$0	$0	$0
ENDING INVENTORY	$0	$0	$0
CHANGE IN INVENTORY	$0	$0	$0
LIVESTOCK EXPENSES	$0	$0	$0

TABLE 5. ANNUAL PLANNING DATA FOR CROPS

PLANNING YEAR >>>>>>>>>>>>>		1985	1986	1987
CROP		ACRES HARVESTED		
CORN		300	300	300
WHEAT		135	135	135
SUGAR BEETS		50	50	50
SOYBEANS		365	365	365
TOTAL CROP ACRES		850	850	850
CROP ACRES OWNED		335	335	335
CROP ACRES TO LEASE		515	515	515
CROP		YIELD PER ACRE		
CORN		100.0	100.0	100.0
WHEAT		70.0	70.0	70.0
SUGAR BEETS		21.0	21.0	21.0
SOYBEANS		37.0	37.0	37.0
**********		LIVESTOCK NUMBERS		**********
A. FEEDER LIVESTOCK				
	1.	0	0	0
	2.	0	0	0
B. BREEDING LIVESTOCK				
	1.	0	0	0
	2.	0	0	0
C. CROPS		CROP PRODUCTION		**********
	1. CORN	30000	30000	30000
	2. WHEAT	9450	9450	9450
	3. SUGAR BEETS	1050	1050	1050
	4.	0	0	0
	5. SOYBEANS	13505	13505	13505
	6.	0	0	0
	7.	0	0	0
	8.	0	0	0
CROP		QUANTITY TO FEED		
CORN				
WHEAT				
SUGAR BEETS				
SOYBEANS				
CROP		QUANTITY TO SELL		
CORN		30000	30000	30000
WHEAT		9450	9450	9450
SUGAR BEETS		1050	1050	1050
SOYBEANS		13505	13505	13505

CROP	QUANTITY TO PURCHASE
CORN	
WHEAT	
SUGAR BEETS	
SOYBEANS	

CROP	QUANTITY ON ENDING INVENTORY		
CORN	0	0	0
WHEAT	0	0	0
SUGAR BEETS	680	680	680
	0	0	0
SOYBEANS	13000	13000	13000
	0	0	0
	0	0	0
	0	0	0

CROP	PRICE PER UNIT SOLD		
CORN	$2.47	$2.81	$2.92
WHEAT	$3.15	$3.51	$3.65
SUGAR BEETS	$29.00	$30.00	$31.00
SOYBEANS	$5.69	$7.25	$8.22

CROP	PRICE PER UNIT PURCHASED
CORN	
WHEAT	
SUGAR BEETS	
SOYBEANS	

CROP	CROP EXPENSES PER ACRE		
CORN	$79	$79	$79
WHEAT	$48	$48	$48
SUGAR BEETS	$155	$155	$155
SOYBEANS	$66	$66	$66

OUTPUT VALUES:			
BEGINNING INVENTORY	$82,590	$82,590	$82,590
PURCHASES	$0	$0	$0
SALES	$211,161	$246,881	$265,654
ENDING INVENTORY	$82,590	$82,590	$82,590
CHANGE IN INVENTORY	$0	$0	$0
CROP EXPENSES	$62,020	$62,020	$62,020

TABLE 6. ANNUAL LABOR REQUIREMENTS

ENTERPRISE	LABOR/ENT.	1985	1986	1987
		0	0	0
		0	0	0
		0	0	0
		0	0	0
CORN	5.6	1680	1680	1680
WHEAT	2.3	311	311	311
SUGAR BEETS	12.0	600	600	600
		0	0	0
SOYBEANS	3.1	1132	1132	1132
		0	0	0
		0	0	0
		0	0	0
TOTAL LABOR HOURS NEEDED		3722	3722	3722
TOTAL LABOR HOURS AVAILABLE		3623	3623	3623

TABLE 7. ANNUAL CAPITAL PURCHASES AND LOAN DATA

	1985	1986	1987
3-YEAR PROPERTY:			
AMOUNT PURCHASED			
YEARS TO REPAY LOAN			
INTEREST RATE ON LOAN			
5-YEAR PROPERTY:			
AMOUNT PURCHASED			
YEARS TO REPAY LOAN			
INTEREST RATE ON LOAN			
18-YEAR PROPERTY:			
AMOUNT PURCHASED			
YEARS TO REPAY LOAN			
INTEREST RATE ON LOAN			
LAND NON-DEPRECIABLE:			
AMOUNT PURCHASED			
YEARS TO REPAY LOAN			
INTEREST RATE ON LOAN			

TABLE 8. ANNUAL INCOME/EXPENSE ITEMS

***** INCOME *****		1985	1986	1987
OTHER FARM INCOME		$13,693	$13,693	$13,693
NON-FARM INCOME		$275	$275	$275
***** EXPENSES *****				
LABOR:				
HIRED LABOR		$495	$495	$495
FAMILY LABOR DRAW		$18,115	$18,115	$18,115
TOTAL LABOR		$18,610	$18,610	$18,610
MACHINERY & IMPROVEMENTS:				
REPAIRS, MAINTENANCE		$13,704	$16,500	$16,750
CUSTOM HIRE & LEASE		$7,500	$7,500	$7,500
STORAGE, WAREHOUSING	PAST			
INSURANCE	YEAR	$923	$923	$923
FUEL, OIL & GREASE	----	$12,170	$12,170	$12,170
DEPR. MACHINERY	$20,767	$20,767	$20,767	$20,767
DEPR. IMPROVEMENTS	$8,914	$8,914	$8,914	$8,914
TOTAL MACH. & IMP.		$63,978	$66,774	$67,024
OVERHEAD:				
PROPERTY TAXES		$11,322	$11,322	$11,322
UTILITIES		$3,057	$3,057	$3,057
INTEREST		$89,868	$85,487	$80,584
LAND LEASE		$33,475	$33,475	$33,475
MISCELLANEOUS		$1,821	$1,821	$1,821
TOTAL OVERHEAD		$139,543	$135,162	$130,259

	1985	1986	1987
NUMBER OF TAXABLE PARTNERS	1	1	1

DESCRIPTION OF PLAN:

NAME: CASH GRAIN FARM CASE BASE RUN
ADDRESS:
CITY:
STATE:
ZIP CODE:

TABLE 9. PROJECTED INCOME STATEMENT

PLANNING YEAR >>>>>>>>>>	1985	1986	1987
***** INCOME *****			
SALES:			
CASH CROPS	$211,161	$246,881	$265,654
FEEDER LIVESTOCK	$0	$0	$0
LIVESTOCK PRODUCTS	$0	$0	$0
OTHER FARM INCOME	$13,693	$13,693	$13,693
TOTAL SALES	$224,854	$260,574	$279,347
COST OF FEEDERS/CROPS PURCH.	$0	$0	$0
CHANGE IN INVENTORY	$0	$0	$0
GROSS INCOME	$224,854	$260,574	$279,347
***** EXPENSES *****			
LABOR	$18,610	$18,610	$18,610
MACHINERY & IMPROVEMENTS	$63,978	$66,774	$67,024
CROP	$62,020	$62,020	$62,020
LIVESTOCK	$0	$0	$0
OVERHEAD	$139,543	$135,162	$130,259
TOTAL EXPENSES	$284,151	$282,566	$277,913
***** NET *****			
NET CASH INCOME	($29,616)	$7,689	$31,115
NET EARNINGS	($59,297)	($21,992)	$1,434
SELF-EMPLOYMENT TAXES	$0	$0	$2,737
INCOME TAXES	$0	$0	$2,430
NET EARNINGS AFTER TAXES	($59,297)	($21,992)	($3,733)
***** NON-FARM *****			
NON-FARM INCOME	$275	$275	$275

TABLE 10. CASH FLOW RECONCILIATION STATEMENT

BEGINNING CASH BALANCE	$1,000	$0	$0
NET CASH FROM OPERATIONS	($29,616)	$7,689	$25,948
NET CASH FROM NON-FARM	$275	$275	$275
MONEY BORROWED	$0	$0	$0
PRINCIPAL PAYMENTS	$36,826	$106,374	$144,521
CAPITAL PURCHASES	$0	$0	$0
NET CASH FLOW	($65,167)	($98,411)	($118,298)
SURPLUS TO CASH	$0	$0	$0
DEFICIT TO OPERATING LOAN	$65,167	$98,411	$118,298

TABLE 11. PROJECTED NET WORTH STATEMENT

BEGINNING OF YEAR >>>>>>>>>	1985	1986	1987	1988
***** ASSETS *****				
CURRENT ASSETS:				
CASH	$1,000	$0	$0	$0
ACCOUNTS RECEIVABLE	$0	$0	$0	$0
CROP INVENTORY	$82,590	$82,590	$82,590	$82,590
FEEDER LIVESTOCK INV.	$0	$0	$0	$0
TOTAL CURRENT ASSETS	$83,590	$82,590	$82,590	$82,590
FIXED ASSETS:				
MARKETABLE SECURITIES	$0	$0	$0	$0
BREEDING LIVESTOCK	$0	$0	$0	$0
MACHINERY AT COST	$174,997	$174,997	$174,997	$174,997
LESS:ACC. MACHINERY DEPR.	$132,137	$152,904	$173,671	$194,438
BUILDINGS AT COST	$102,722	$102,722	$102,722	$102,722
LESS:ACC. BUILDING DEPR.	$49,026	$57,940	$66,854	$75,768
LAND	$651,908	$651,908	$651,908	$651,908
OTHER	$87,564	$87,564	$87,564	$87,564
TOTAL FIXED ASSETS	$836,028	$806,347	$776,666	$746,985
TOTAL ASSETS	$919,618	$888,937	$859,256	$829,575
***** LIABILITIES *****				
CURRENT LIABILITIES:				
PRINC. DUE EXIST. LOANS	$36,826	$41,207	$46,110	$51,107
PRINC. DUE NEW LOANS		$0	$0	$0
OPERATING LOAN		$65,167	$98,411	$118,298
TOTAL CURRENT LIABIL.	$36,826	$106,374	$144,521	$169,405
LONG-TERM LIABILITIES:				
EXISTING LOANS	$771,864	$730,657	$684,546	$633,439
NEW LOANS		$0	$0	$0
TOTAL LONG-TERM LIABIL.	$771,864	$730,657	$684,546	$633,439
TOTAL LIABILITIES	$808,690	$837,031	$829,067	$802,844
OWNER EQUITY	$110,928	$51,906	$30,189	$26,731

TABLE 12. PROJECTED FINANCIAL PERFORMANCE

PLANNING YEAR >>>>>>>>>>>	1985	1986	1987	
CASH POSITION:				
NET CASH FROM OPERATIONS	($29,616)	$7,689	$25,948	
NET CASH FLOW	($65,167)	($98,411)	($118,298)	
PROFITABILITY:				
NET EARNINGS AFTER TAXES	($59,297)	($21,992)	($3,733)	
FAMILY LABOR DRAW	$18,115	$18,115	$18,115	
RETURN ON TOTAL ASSETS	3.38%	7.26%	9.10%	
RETURN ON OWNER EQUITY	-72.83%	-53.58%	-13.12%	
FINANCIAL PROGRESS:				
CHANGE IN OWNER EQUITY	($59,022)	($21,717)	($3,458)	
OPERATING PERCENTAGES:				
TOTAL EXPENSES/INC.	126.37%	108.44%	99.49%	
EARNINGS AFTER TAX/INC.	-26.37%	-8.44%	-1.34%	
DEBT SERVICING/INC.	56.35%	73.63%	80.58%	
BEGINNING OF YEAR >>>>>>>>	1985	1986	1987	1988
LIQUIDITY:				
WORKING CAPITAL	$46,764	($23,784)	($61,931)	($86,815)
CURRENT RATIO	2.27	0.78	0.57	0.49
ACID TEST RATIO	0.03	0.00	0.00	0.00
CURRENT DEBT/TOTAL DEBT	4.55%	12.71%	17.43%	21.10%
SOLVENCY:				
NET CAPITAL RATIO	1.14	1.06	1.04	1.03
EQUITY TO ASSET RATIO	0.12	0.06	0.04	0.03
DEBT TO ASSET RATIO	0.88	0.94	0.96	0.97

APPENDIX C

BASE RUN FOR HOG FARM CASE

APPENDIX C

CAPITAL/PROFIT PLAN

DEVELOPED BY: RALPH E. HEPP
EXTENSION ECONOMIST
DEPARTMENT OF AGRICULTURAL ECONOMICS
MICHIGAN STATE UNIVERSITY

PLAN DEVELOPED FOR

NAME: HOG FARM CASE BASE RUN
ADDRESS:
CITY:
STATE:
ZIP CODE:

FIRST PLANNING YEAR: 1985

TABLE 1. ENTERPRISE LIST FOR THE FARM

A. FEEDER LIVESTOCK
1.
2.

B. BREEDING LIVESTOCK
1. SOWS
2.

C. CROPS
1. CORN
2. OATS
3. HAY
4. PASTURE
5.
6.
7.
8.

PRESS: {ALT}{M}

TABLE 2. BEGINNING NET WORTH STATEMENT

***** ASSETS *****				VALUE
CURRENT ASSETS:				
CASH				$1,000
ACCOUNTS RECEIVABLE				$0
CROP INVENTORY:				
KIND	QUANTITY	UNIT	$/UNIT	
CORN	16667	BU.	$2.65	$44,168
OATS	1233	BU.	$2.00	$2,466
HAY	10	TON	$50.00	$500
PASTURE	10	ACRE	$24.00	$240
				$0
				$0
				$0
				$0
TOTAL CROP INVENTORY				$47,374
FEEDER LIVESTOCK INV.:				
KIND	QUANTITY	UNIT	$/UNIT	
		HEAD		$0
		HEAD		$0
TOTAL FEEDER LIVESTOCK				$0
TOTAL CURRENT ASSETS				$48,374
FIXED ASSETS:				
BREEDING LIVESTOCK INV.:				
KIND	QUANTITY	UNIT	$/UNIT	
SOWS	162	HEAD	$352.22	$57,060
		HEAD		$0
TOTAL BREEDING LIVESTOCK				$57,060

KIND	COST BASIS	ACCUMULATED DEPREC.	BOOK VALUE	MARKET VALUE
MARKETABLE SECURITIES			$0	
MACHINERY	$162,350	$70,548	$91,802	$92,500
BUILDINGS & IMPROVEMENTS	$66,682	$11,471	$55,211	$55,211
LAND	$0	$0	$0	$269,391
OTHER	$0	$0	$0	$80,960
TOTAL FIXED ASSETS				$555,122
TOTAL ASSETS				$603,495

***** LIABILITIES *****

LENDER	SECURITY	INTEREST RATE	TERM IN YEARS	PRINCIPAL BALANCE
P.C.A.	PERSONAL	13.00%	5.0	$19,000
Fm.H.A.	LIVESTK.	10.25%	7.0	$43,500
Fm.H.A.	LAND	7.25%	30.0	$43,500
F.L.B.	LAND	13.00%	30.0	$108,760
INDIVIDUALS	LAND	10.00%	30.0	$147,000
OTHER	PERSONAL	15.00%	7.0	$4,686
TOTAL LIABILITIES				$366,446
OWNER EQUITY				$237,049

TABLE 3. ANNUAL PLANNING DATA FOR FEEDER LIVESTOCK

PLANNING YEAR >>>>>>>>>>>>>	1985	1986	1987
FEEDER LIVESTOCK ENTERPRISE >>>>>			
NUMBER OF HEAD:			
PUCHASED			
SOLD			
ENDING INVENTORY			
PRICE PER HEAD:			
PURCHASED			
SOLD			
ENDING INVENTORY			
LIVESTOCK EXPENSES PER HEAD			
OUTPUT VALUES:			
BEGINNING INVENTORY	$0	$0	$0
PURCHASED	$0	$0	$0
SALES	$0	$0	$0
ENDING INVENTORY	$0	$0	$0
CHANGE IN INVENTORY	$0	$0	$0
LIVESTOCK EXPENSES	$0	$0	$0
FEEDER LIVESTOCK ENTERPRISE >>>>>			
NUMBER OF HEAD:			
PUCHASED			
SOLD			
ENDING INVENTORY			
PRICE PER HEAD:			
PURCHASED			
SOLD			
ENDING INVENTORY			
LIVESTOCK EXPENSES PER HEAD			
OUTPUT VALUES:			
BEGINNING INVENTORY	$0	$0	$0
PURCHASED	$0	$0	$0
SALES	$0	$0	$0
ENDING INVENTORY	$0	$0	$0
CHANGE IN INVENTORY	$0	$0	$0
LIVESTOCK EXPENSES	$0	$0	$0

TABLE 4. ANNUAL PLANNING DATA FOR BREEDING LIVESTOCK

PLANNING YEAR >>>>>>>>>>>>>	1985	1986	1987
BREEDING LIVESTOCK ENTERPRISE >>>>> SOWS			
NUMBER OF BREEDING ANIMALS:			
PRODUCING OUTPUT	162	162	162
ON ENDING INVENTORY	162	162	162
PRIMARY OUTPUT:			
QUANTITY PER HEAD	27.00	27.00	27.00
PRICE PER UNIT	$46.70	$48.19	$58.73
OTHER INCOME PER HEAD	$68.97	$71.17	$86.74
CAPITAL GAIN INCOME PER HEAD	$69	$71	$87
LIVESTOCK EXPENSES PER HEAD	$343	$393	$443
OUTPUT VALUES:			
BEGINNING INVENTORY	$57,060	$57,060	$57,060
SALES PRIMARY OUTPUT	$204,266	$210,783	$256,885
SALES OTHER OUTPUT	$11,173	$11,530	$14,052
ENDING INVENTORY	$57,060	$57,060	$57,060
CHANGE IN INVENTORY	$0	$0	$0
LIVESTOCK EXPENSES	$55,566	$63,666	$71,766
BREEDING LIVESTOCK ENTERPRISE >>>>>			
NUMBER OF BREEDING ANIMALS:			
PRODUCING OUTPUT			
ON ENDING INVENTORY			
PRIMARY OUTPUT:			
QUANTITY PER HEAD			
PRICE PER UNIT			
OTHER INCOME PER HEAD			
CAPITAL GAIN INCOME PER HEAD			
LIVESTOCK EXPENSES PER HEAD			
OUTPUT VALUES:			
BEGINNING INVENTORY	$0	$0	$0
SALES PRIMARY OUTPUT	$0	$0	$0
SALES OTHER OUTPUT	$0	$0	$0
ENDING INVENTORY	$0	$0	$0
CHANGE IN INVENTORY	$0	$0	$0
LIVESTOCK EXPENSES	$0	$0	$0

TABLE 5. ANNUAL PLANNING DATA FOR CROPS

PLANNING YEAR >>>>>>>>>>>>		1985	1986	1987
CROP		ACRES HARVESTED		
CORN		410	410	410
OATS				
HAY				
PASTURE		10	10	10
TOTAL CROP ACRES		420	420	420
CROP ACRES OWNED		146	146	146
CROP ACRES TO LEASE		274	274	274
CROP		YIELD PER ACRE		
CORN		90.0	90.0	90.0
OATS		60.0	60.0	60.0
HAY		2.0	2.0	2.0
PASTURE		1.0	1.0	1.0
**********		LIVESTOCK NUMBERS		**********
A. FEEDER LIVESTOCK				
	1.	0	0	0
	2.	0	0	0
B. BREEDING LIVESTOCK				
	1. SOWS	162	162	162
	2.	0	0	0
C. CROPS		CROP PRODUCTION		**********
	1. CORN	36900	36900	36900
	2. OATS	0	0	0
	3. HAY	0	0	0
	4. PASTURE	10	10	10
	5.	0	0	0
	6.	0	0	0
	7.	0	0	0
	8.	0	0	0
CROP		QUANTITY TO FEED		
CORN		31590	31590	31590
OATS				
HAY				
PASTURE		10	10	10
CROP		QUANTITY TO SELL		
CORN		5310	5310	5310
OATS		1233		
HAY		10		
PASTURE				

CROP	QUANTITY TO PURCHASE
CORN	9658
OATS	
HAY	
PASTURE	

CROP	QUANTITY ON ENDING INVENTORY		
CORN	26325	26325	26325
OATS	0	0	0
HAY	0	0	0
PASTURE	10	10	10
	0	0	0
	0	0	0
	0	0	0
	0	0	0

CROP	PRICE PER UNIT SOLD		
CORN	$2.47	$2.81	$2.92
OATS	$2.00		
HAY	$70.00		
PASTURE			

CROP	PRICE PER UNIT PURCHASED
CORN	$2.67
OATS	
HAY	
PASTURE	

CROP	CROP EXPENSES PER ACRE		
CORN	$77	$77	$77
OATS			
HAY			
PASTURE	$8	$8	$8

OUTPUT VALUES:			
BEGINNING INVENTORY	$47,374	$70,001	$70,001
PURCHASES	$25,787	$0	$0
SALES	$16,282	$14,921	$15,505
ENDING INVENTORY	$70,001	$70,001	$70,001
CHANGE IN INVENTORY	$22,628	$0	$0
CROP EXPENSES	$31,650	$31,650	$31,650

TABLE 6. ANNUAL LABOR REQUIREMENTS

ENTERPRISE	LABOR/ENT.	1985	1986	1987
		0	0	0
		0	0	0
SOWS	28.0	4536	4536	4536
		0	0	0
CORN	5.6	2296	2296	2296
OATS		0	0	0
HAY		0	0	0
PASTURE	1.0	10	10	10
		0	0	0
		0	0	0
		0	0	0
		0	0	0
TOTAL LABOR HOURS NEEDED		6842	6842	6842
TOTAL LABOR HOURS AVAILABLE		5642	5642	5642

TABLE 7. ANNUAL CAPITAL PURCHASES AND LOAN DATA

	1985	1986	1987
3-YEAR PROPERTY:			
AMOUNT PURCHASED			
YEARS TO REPAY LOAN			
INTEREST RATE ON LOAN			
5-YEAR PROPERTY:			
AMOUNT PURCHASED			
YEARS TO REPAY LOAN			
INTEREST RATE ON LOAN			
18-YEAR PROPERTY:			
AMOUNT PURCHASED			
YEARS TO REPAY LOAN			
INTEREST RATE ON LOAN			
LAND NON-DEPRECIABLE:			
AMOUNT PURCHASED			
YEARS TO REPAY LOAN			
INTEREST RATE ON LOAN			

TABLE 8. ANNUAL INCOME/EXPENSE ITEMS

***** INCOME *****		1985	1986	1987
OTHER FARM INCOME		$0	$0	$0
NON-FARM INCOME		$0	$0	$0
***** EXPENSES *****				
LABOR:				
HIRED LABOR		$6,000	$6,000	$6,000
FAMILY LABOR DRAW		$15,000	$15,000	$15,000
TOTAL LABOR		$21,000	$21,000	$21,000
MACHINERY & IMPROVEMENTS:				
REPAIRS, MAINTENANCE		$8,707	$9,836	$10,956
CUSTOM HIRE & LEASE		$918	$918	$918
STORAGE, WAREHOUSING	PAST			
INSURANCE	YEAR	$1,238	$1,238	$1,238
FUEL, OIL & GREASE	----	$8,410	$8,410	$8,410
DEPR. MACHINERY	$14,335	$14,335	$14,335	$14,335
DEPR. IMPROVEMENTS	$4,246	$4,246	$4,246	$4,246
TOTAL MACH. & IMP.		$37,854	$38,983	$40,103
OVERHEAD:				
PROPERTY TAXES		$3,471	$3,471	$3,471
UTILITIES		$1,378	$1,378	$1,378
INTEREST		$39,624	$38,544	$37,339
LAND LEASE		$13,426	$13,426	$13,426
MISCELLANEOUS		$2,383	$2,382	$2,382
TOTAL OVERHEAD		$60,282	$59,201	$57,996

	1985	1986	1987
NUMBER OF TAXABLE PARTNERS	1	1	1

DESCRIPTION OF PLAN:

NAME: HOG FARM CASE BASE RUN
ADDRESS:
CITY:
STATE:
ZIP CODE:

TABLE 9. PROJECTED INCOME STATEMENT

PLANNING YEAR >>>>>>>>>>	1985	1986	1987
***** INCOME *****			
SALES:			
CASH CROPS	$16,282	$14,921	$15,505
FEEDER LIVESTOCK	$0	$0	$0
LIVESTOCK PRODUCTS	$215,439	$222,313	$270,937
OTHER FARM INCOME	$0	$0	$0
TOTAL SALES	$231,721	$237,234	$286,442
COST OF FEEDERS/CROPS PURCH.	$25,787	$0	$0
CHANGE IN INVENTORY	$22,628	$0	$0
GROSS INCOME	$228,561	$237,234	$286,442
***** EXPENSES *****			
LABOR	$21,000	$21,000	$21,000
MACHINERY & IMPROVEMENTS	$37,854	$38,983	$40,103
CROP	$31,650	$31,650	$31,650
LIVESTOCK	$55,566	$63,666	$71,766
OVERHEAD	$60,282	$59,201	$57,996
TOTAL EXPENSES	$206,352	$214,500	$222,515
***** NET *****			
NET CASH INCOME	$18,163	$41,315	$82,508
NET EARNINGS	$22,209	$22,734	$63,927
SELF-EMPLOYMENT TAXES	$477	$3,672	$9,077
INCOME TAXES	$95	$4,687	$19,228
NET EARNINGS AFTER TAXES	$21,638	$14,375	$35,622
***** NON-FARM *****			
NON-FARM INCOME	$0	$0	$0

TABLE 10. CASH FLOW RECONCILIATION STATEMENT

BEGINNING CASH BALANCE	$1,000	$8,981	$31,246
NET CASH FROM OPERATIONS	$17,591	$32,956	$54,203
NET CASH FROM NON-FARM	$0	$0	$0
MONEY BORROWED	$0	$0	$0
PRINCIPAL PAYMENTS	$9,610	$10,691	$11,896
CAPITAL PURCHASES	$0	$0	$0
NET CASH FLOW	$8,981	$31,246	$73,554
SURPLUS TO CASH	$8,981	$31,246	$73,554
DEFICIT TO OPERATING LOAN	$0	$0	$0

TABLE 11. PROJECTED NET WORTH STATEMENT

BEGINNING OF YEAR >>>>>>>>>	1985	1986	1987	1988
***** ASSETS *****				
CURRENT ASSETS:				
CASH	$1,000	$8,981	$31,246	$73,554
ACCOUNTS RECEIVABLE	$0	$0	$0	$0
CROP INVENTORY	$47,374	$70,001	$70,001	$70,001
FEEDER LIVESTOCK INV.	$0	$0	$0	$0
TOTAL CURRENT ASSETS	$48,374	$78,982	$101,247	$143,555
FIXED ASSETS:				
MARKETABLE SECURITIES	$0	$0	$0	$0
BREEDING LIVESTOCK	$57,060	$57,060	$57,060	$57,060
MACHINERY AT COST	$162,350	$162,350	$162,350	$162,350
LESS:ACC. MACHINERY DEPR.	$70,548	$84,883	$99,218	$113,553
BUILDINGS AT COST	$66,682	$66,682	$66,682	$66,682
LESS:ACC. BUILDING DEPR.	$11,471	$15,717	$19,963	$24,209
LAND	$269,391	$269,391	$269,391	$269,391
OTHER	$80,960	$80,960	$80,960	$80,960
TOTAL FIXED ASSETS	$554,424	$535,843	$517,262	$498,681
TOTAL ASSETS	$602,797	$614,825	$618,509	$642,235
***** LIABILITIES *****				
CURRENT LIABILITIES:				
PRINC. DUE EXIST. LOANS	$9,610	$10,691	$11,896	$13,240
PRINC. DUE NEW LOANS		$0	$0	$0
OPERATING LOAN		$0	$0	$0
TOTAL CURRENT LIABIL.	$9,610	$10,691	$11,896	$13,240
LONG-TERM LIABILITIES:				
EXISTING LOANS	$356,836	$346,145	$334,249	$321,009
NEW LOANS		$0	$0	$0
TOTAL LONG-TERM LIABIL.	$356,836	$346,145	$334,249	$321,009
TOTAL LIABILITIES	$366,446	$356,836	$346,145	$334,249
OWNER EQUITY	$236,351	$257,989	$272,364	$307,986

TABLE 12. PROJECTED FINANCIAL PERFORMANCE

PLANNING YEAR >>>>>>>>>>>>	1985	1986	1987	
CASH POSITION:				
NET CASH FROM OPERATIONS	$17,591	$32,956	$54,203	
NET CASH FLOW	$8,981	$31,246	$73,554	
PROFITABILITY:				
NET EARNINGS AFTER TAXES	$21,638	$14,375	$35,622	
FAMILY LABOR DRAW	$15,000	$15,000	$15,000	
RETURN ON TOTAL ASSETS	10.06%	8.58%	11.57%	
RETURN ON OWNER EQUITY	8.75%	5.42%	12.28%	
FINANCIAL PROGRESS:				
CHANGE IN OWNER EQUITY	$21,638	$14,375	$35,622	
OPERATING PERCENTAGES:				
TOTAL EXPENSES/INC.	90.28%	90.42%	77.68%	
EARNINGS AFTER TAX/INC.	9.47%	6.06%	12.44%	
DEBT SERVICING/INC.	21.54%	20.75%	17.19%	

BEGINNING OF YEAR >>>>>>>>	1985	1986	1987	1988
LIQUIDITY:				
WORKING CAPITAL	$38,763	$68,291	$89,352	$130,315
CURRENT RATIO	5.03	7.39	8.51	10.84
ACID TEST RATIO	0.10	0.84	2.63	5.56
CURRENT DEBT/TOTAL DEBT	2.62%	3.00%	3.44%	3.96%
SOLVENCY:				
NET CAPITAL RATIO	1.64	1.72	1.79	1.92
EQUITY TO ASSET RATIO	0.39	0.42	0.44	0.48
DEBT TO ASSET RATIO	0.61	0.58	0.56	0.52

APPENDIX D

BASE RUN FOR DAIRY FARM CASE

APPENDIX D

CAPITAL/PROFIT PLAN

DEVELOPED BY: RALPH E. HEPP
EXTENSION ECONOMIST
DEPARTMENT OF AGRICULTURAL ECONOMICS
MICHIGAN STATE UNIVERSITY

PLAN DEVELOPED FOR

NAME: DAIRY FARM CASE BASE RUN
ADDRESS:
CITY:
STATE:
ZIP CODE:

FIRST PLANNING YEAR: 1985

TABLE 1. ENTERPRISE LIST FOR THE FARM

A.	FEEDER LIVESTOCK	
	1.	
	2.	
B.	BREEDING LIVESTOCK	
	1.	DAIRY
	2.	
C.	CROPS	
	1.	CORN
	2.	CORN SILAGE
	3.	HAY
	4.	
	5.	
	6.	
	7.	
	8.	

PRESS: {ALT}{M}

TABLE 2. BEGINNING NET WORTH STATEMENT

***** ASSETS *****				VALUE
CURRENT ASSETS:				
CASH				$0
ACCOUNTS RECEIVABLE				$8,288
CROP INVENTORY:				
KIND	QUANTITY	UNIT	$/UNIT	
CORN	2000	BU.	$2.65	$5,300
CORN SILAGE	100	TON	$20.00	$2,000
HAY	600	TON	$50.00	$30,000
				$0
				$0
				$0
				$0
				$0
TOTAL CROP INVENTORY				$37,300
FEEDER LIVESTOCK INV.:				
KIND	QUANTITY	UNIT	$/UNIT	
		HEAD		$0
		HEAD		$0
TOTAL FEEDER LIVESTOCK				$0
TOTAL CURRENT ASSETS				$45,588
FIXED ASSETS:				
BREEDING LIVESTOCK INV.:				
KIND	QUANTITY	UNIT	$/UNIT	
DAIRY	112	HEAD	$1,465.00	$164,080
		HEAD		$0
TOTAL BREEDING LIVESTOCK				$164,080

KIND	COST BASIS	ACCUMULATED DEPREC.	BOOK VALUE	MARKET VALUE
MARKETABLE SECURITIES			$0	
MACHINERY	$316,435	$214,611	$101,824	$200,000
BUILDINGS & IMPROVEMENTS	$222,689	$98,876	$123,813	$123,813
LAND	$0	$0	$0	$216,299
OTHER	$77,888	$0	$77,888	$77,888
TOTAL FIXED ASSETS				$782,080
TOTAL ASSETS				$827,668

***** LIABILITIES *****

LENDER	SECURITY	INTEREST RATE	TERM IN YEARS	PRINCIPAL BALANCE
ACCOUNTS PAYABLE	NONE	18.00%	1.0	$33,805
BANKS	PERSONAL	12.00%	5.0	$27,729
FmHA	BLDGS & IMP	7.25%	20.0	$386,530
FmHA	LAND	7.25%	30.0	$364,403
INDIVIDUAL	LAND	10.00%	30.0	$97,418
OTHER	PERSONAL	13.00%	5.0	$12,390
TOTAL LIABILITIES				$922,275
OWNER EQUITY				($94,607)

TABLE 3. ANNUAL PLANNING DATA FOR FEEDER LIVESTOCK

PLANNING YEAR >>>>>>>>>>>>>	1985	1986	1987
FEEDER LIVESTOCK ENTERPRISE >>>>>			
NUMBER OF HEAD:			
PUCHASED			
SOLD			
ENDING INVENTORY			
PRICE PER HEAD:			
PURCHASED			
SOLD			
ENDING INVENTORY			
LIVESTOCK EXPENSES PER HEAD			
OUTPUT VALUES:			
BEGINNING INVENTORY	$0	$0	$0
PURCHASED	$0	$0	$0
SALES	$0	$0	$0
ENDING INVENTORY	$0	$0	$0
CHANGE IN INVENTORY	$0	$0	$0
LIVESTOCK EXPENSES	$0	$0	$0
FEEDER LIVESTOCK ENTERPRISE >>>>>			
NUMBER OF HEAD:			
PUCHASED			
SOLD			
ENDING INVENTORY			
PRICE PER HEAD:			
PURCHASED			
SOLD			
ENDING INVENTORY			
LIVESTOCK EXPENSES PER HEAD			
OUTPUT VALUES:			
BEGINNING INVENTORY	$0	$0	$0
PURCHASED	$0	$0	$0
SALES	$0	$0	$0
ENDING INVENTORY	$0	$0	$0
CHANGE IN INVENTORY	$0	$0	$0
LIVESTOCK EXPENSES	$0	$0	$0

TABLE 4. ANNUAL PLANNING DATA FOR BREEDING LIVESTOCK

PLANNING YEAR >>>>>>>>>>>>>	1985	1986	1987
BREEDING LIVESTOCK ENTERPRISE >>>>>	DAIRY		
NUMBER OF BREEDING ANIMALS:			
PRODUCING OUTPUT	112	112	112
ON ENDING INVENTORY	112	112	112
PRIMARY OUTPUT:			
QUANTITY PER HEAD	141.00	141.00	141.00
PRICE PER UNIT	$12.87	$12.50	$12.95
OTHER INCOME PER HEAD	$211.24	$244.62	$289.80
CAPITAL GAIN INCOME PER HEAD	$171	$197	$233
LIVESTOCK EXPENSES PER HEAD	$407	$456	$506
OUTPUT VALUES:			
BEGINNING INVENTORY	$164,080	$164,080	$164,080
SALES PRIMARY OUTPUT	$203,243	$197,400	$204,506
SALES OTHER OUTPUT	$23,659	$27,397	$32,458
ENDING INVENTORY	$164,080	$164,080	$164,080
CHANGE IN INVENTORY	$0	$0	$0
LIVESTOCK EXPENSES	$45,584	$51,072	$56,672
BREEDING LIVESTOCK ENTERPRISE >>>>>			
NUMBER OF BREEDING ANIMALS:			
PRODUCING OUTPUT			
ON ENDING INVENTORY			
PRIMARY OUTPUT:			
QUANTITY PER HEAD			
PRICE PER UNIT			
OTHER INCOME PER HEAD			
CAPITAL GAIN INCOME PER HEAD			
LIVESTOCK EXPENSES PER HEAD			
OUTPUT VALUES:			
BEGINNING INVENTORY	$0	$0	$0
SALES PRIMARY OUTPUT	$0	$0	$0
SALES OTHER OUTPUT	$0	$0	$0
ENDING INVENTORY	$0	$0	$0
CHANGE IN INVENTORY	$0	$0	$0
LIVESTOCK EXPENSES	$0	$0	$0

TABLE 5. ANNUAL PLANNING DATA FOR CROPS

PLANNING YEAR >>>>>>>>>>>>>	1985	1986	1987
CROP	ACRES HARVESTED		
CORN	200	200	200
CORN SILAGE	103	103	103
HAY	202	202	202
TOTAL CROP ACRES	505	505	505
CROP ACRES OWNED	232	232	232
CROP ACRES TO LEASE	273	273	273
CROP	YIELD PER ACRE		
CORN	80.0	80.0	80.0
CORN SILAGE	10.0	10.0	10.0
HAY	4.0	4.0	4.0

		**********	LIVESTOCK NUMBERS	**********
A. FEEDER LIVESTOCK				
	1.	0	0	0
	2.	0	0	0
B. BREEDING LIVESTOCK				
	1. DAIRY	112	112	112
	2.	0	0	0
C. CROPS			CROP PRODUCTION	**********
	1. CORN	16000	16000	16000
	2. CORN SILAGE	1030	1030	1030
	3. HAY	808	808	808
	4.	0	0	0
	5.	0	0	0
	6.	0	0	0
	7.	0	0	0
	8.	0	0	0

CROP		QUANTITY TO FEED	
CORN	13877	12320	12320
CORN SILAGE	272	1030	1030
HAY	935	806	806

CROP		QUANTITY TO SELL	
CORN	3639	3600	3600
CORN SILAGE			
HAY	67		

CROP	QUANTITY TO PURCHASE
CORN	9783
CORN SILAGE	
HAY	

CROP	QUANTITY ON ENDING INVENTORY		
CORN	10267	10347	10427
CORN SILAGE	858	858	858
HAY	406	408	410
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0

CROP	PRICE PER UNIT SOLD		
CORN	$2.47	$2.81	$2.92
CORN SILAGE			
HAY	$50.00		

CROP	PRICE PER UNIT PURCHASED
CORN	$2.67
CORN SILAGE	
HAY	

CROP	CROP EXPENSES PER ACRE		
CORN	$68	$68	$68
CORN SILAGE	$65	$65	$65
HAY	$46	$46	$46

OUTPUT VALUES:			
BEGINNING INVENTORY	$37,300	$64,668	$64,980
PURCHASES	$26,121	$0	$0
SALES	$12,338	$10,116	$10,512
ENDING INVENTORY	$64,668	$64,980	$65,292
CHANGE IN INVENTORY	$27,368	$312	$312
CROP EXPENSES	$29,587	$29,587	$29,587

TABLE 6. ANNUAL LABOR REQUIREMENTS

ENTERPRISE	LABOR/ENT.	1985	1986	1987
		0	0	0
		0	0	0
DAIRY	55.1	6171	6171	6171
		0	0	0
CORN	5.7	1140	1140	1140
CORN SILAGE	8.1	834	834	834
HAY	8.7	1757	1757	1757
		0	0	0
		0	0	0
		0	0	0
		0	0	0
		0	0	0
TOTAL LABOR HOURS NEEDED		9903	9903	9903
TOTAL LABOR HOURS AVAILABLE		9892	9892	9892

TABLE 7. ANNUAL CAPITAL PURCHASES AND LOAN DATA

	1985	1986	1987
3-YEAR PROPERTY:			
AMOUNT PURCHASED			
YEARS TO REPAY LOAN			
INTEREST RATE ON LOAN			
5-YEAR PROPERTY:			
AMOUNT PURCHASED			
YEARS TO REPAY LOAN			
INTEREST RATE ON LOAN			
18-YEAR PROPERTY:			
AMOUNT PURCHASED			
YEARS TO REPAY LOAN			
INTEREST RATE ON LOAN			
LAND NON-DEPRECIABLE:			
AMOUNT PURCHASED			
YEARS TO REPAY LOAN			
INTEREST RATE ON LOAN			

TABLE 8. ANNUAL INCOME/EXPENSE ITEMS

***** INCOME *****		1985	1986	1987
OTHER FARM INCOME		$6,458	$6,458	$6,458
NON-FARM INCOME		$2,675	$2,675	$2,675
***** EXPENSES *****				
LABOR:				
HIRED LABOR		$23,560	$23,560	$23,560
FAMILY LABOR DRAW		$12,000	$12,000	$12,000
TOTAL LABOR		$35,560	$35,560	$35,560
MACHINERY & IMPROVEMENTS:				
REPAIRS, MAINTENANCE		$17,456	$17,456	$17,456
CUSTOM HIRE & LEASE		$650	$650	$650
STORAGE, WAREHOUSING	PAST			
INSURANCE	YEAR	$2,540	$2,540	$2,540
FUEL, OIL & GREASE	----	$14,529	$14,529	$14,529
DEPR. MACHINERY	$29,184	$29,184	$29,184	$29,184
DEPR. IMPROVEMENTS	$10,919	$10,919	$10,919	$10,919
TOTAL MACH. & IMP.		$75,278	$75,278	$75,278
OVERHEAD:				
PROPERTY TAXES		$6,458	$6,458	$6,458
UTILITIES		$6,616	$6,616	$6,616
INTEREST		$75,208	$67,359	$65,426
LAND LEASE		$4,425	$4,425	$4,425
MISCELLANEOUS		$2,372	$2,372	$2,372
TOTAL OVERHEAD		$95,079	$87,230	$85,297

	1985	1986	1987
NUMBER OF TAXABLE PARTNERS	1	1	1

DESCRIPTION OF PLAN:

NAME: DAIRY FARM CASE BASE RUN
ADDRESS:
CITY:
STATE:
ZIP CODE:

TABLE 9. PROJECTED INCOME STATEMENT

PLANNING YEAR >>>>>>>>>>	1985	1986	1987
***** INCOME *****			
SALES:			
CASH CROPS	$12,338	$10,116	$10,512
FEEDER LIVESTOCK	$0	$0	$0
LIVESTOCK PRODUCTS	$226,902	$224,797	$236,964
OTHER FARM INCOME	$6,458	$6,458	$6,458
TOTAL SALES	$245,698	$241,371	$253,934
COST OF FEEDERS/CROPS PURCH.	$26,121	$0	$0
CHANGE IN INVENTORY	$27,368	$312	$312
GROSS INCOME	$246,945	$241,683	$254,246
*** EXPENSES *****			
LABOR	$35,560	$35,560	$35,560
MACHINERY & IMPROVEMENTS	$75,278	$75,278	$75,278
CROP	$29,587	$29,587	$29,587
LIVESTOCK	$45,584	$51,072	$56,672
OVERHEAD	$95,079	$87,230	$85,297
TOTAL EXPENSES	$281,088	$278,727	$282,394
***** NET *****			
NET CASH INCOME	($21,407)	$2,748	$11,643
NET EARNINGS	($34,142)	($37,043)	($28,148)
SELF-EMPLOYMENT TAXES	$0	$0	$0
INCOME TAXES	$0	$0	$0
NET EARNINGS AFTER TAXES	($34,142)	($37,043)	($28,148)
***** NON-FARM *****			
NON-FARM INCOME	$2,675	$2,675	$2,675

TABLE 10. CASH FLOW RECONCILIATION STATEMENT

BEGINNING CASH BALANCE	$0	$0	$0
NET CASH FROM OPERATIONS	($21,407)	$2,748	$11,643
NET CASH FROM NON-FARM	$2,675	$2,675	$2,675
MONEY BORROWED	$0	$0	$0
PRINCIPAL PAYMENTS	$53,536	$93,763	$111,767
CAPITAL PURCHASES	$0	$0	$0
NET CASH FLOW	($72,268)	($88,340)	($97,449)
SURPLUS TO CASH	$0	$0	$0
DEFICIT TO OPERATING LOAN	$72,268	$88,340	$97,449

TABLE 11. PROJECTED NET WORTH STATEMENT

BEGINNING OF YEAR >>>>>>>>>	1985	1986	1987	1988
***** ASSETS *****				
CURRENT ASSETS:				
CASH	$0	$0	$0	$0
ACCOUNTS RECEIVABLE	$8,288	$8,288	$8,288	$8,288
CROP INVENTORY	$37,300	$64,668	$64,980	$65,292
FEEDER LIVESTOCK INV.	$0	$0	$0	$0
TOTAL CURRENT ASSETS	$45,588	$72,956	$73,268	$73,580
FIXED ASSETS:				
MARKETABLE SECURITIES	$0	$0	$0	$0
BREEDING LIVESTOCK	$164,080	$164,080	$164,080	$164,080
MACHINERY AT COST	$316,435	$316,435	$316,435	$316,435
LESS:ACC. MACHINERY DEPR.	$214,611	$243,795	$272,979	$302,163
BUILDINGS AT COST	$222,689	$222,689	$222,689	$222,689
LESS:ACC. BUILDING DEPR.	$98,876	$109,795	$120,714	$131,633
LAND	$216,299	$216,299	$216,299	$216,299
OTHER	$77,888	$77,888	$77,888	$77,888
TOTAL FIXED ASSETS	$683,904	$643,801	$603,698	$563,595
TOTAL ASSETS	$729,492	$716,757	$676,966	$637,175
***** LIABILITIES *****				
CURRENT LIABILITIES:				
PRINC. DUE EXIST. LOANS	$53,536	$21,495	$23,428	$25,546
PRINC. DUE NEW LOANS		$0	$0	$0
OPERATING LOAN		$72,268	$88,340	$97,449
TOTAL CURRENT LIABIL.	$53,536	$93,763	$111,767	$122,996
LONG-TERM LIABILITIES:				
EXISTING LOANS	$868,739	$847,244	$823,817	$798,270
NEW LOANS		$0	$0	$0
TOTAL LONG-TERM LIABIL.	$868,739	$847,244	$823,817	$798,270
TOTAL LIABILITIES	$922,275	$941,007	$935,584	$921,266
OWNER EQUITY	($192,783)	($224,250)	($258,618)	($284,091)

TABLE 12. PROJECTED FINANCIAL PERFORMANCE

PLANNING YEAR >>>>>>>>>>>	1985	1986	1987
CASH POSITION:			
NET CASH FROM OPERATIONS	($21,407)	$2,748	$11,643
NET CASH FLOW	($72,268)	($88,340)	($97,449)
PROFITABILITY:			
NET EARNINGS AFTER TAXES	($34,142)	($37,043)	($28,148)
FAMILY LABOR DRAW	$12,000	$12,000	$12,000
RETURN ON TOTAL ASSETS	5.68%	4.35%	5.67%
RETURN ON OWNER EQUITY	16.37%	15.34%	10.37%
FINANCIAL PROGRESS:			
CHANGE IN OWNER EQUITY	($31,467)	($34,368)	($25,473)
OPERATING PERCENTAGES:			
TOTAL EXPENSES/INC.	113.83%	115.33%	111.07%
EARNINGS AFTER TAX/INC.	-13.83%	-15.33%	-11.07%
DEBT SERVICING/INC.	52.13%	66.67%	69.69%

BEGINNING OF YEAR >>>>>>>>	1985	1986	1987	1988
LIQUIDITY:				
WORKING CAPITAL	($7,948)	($20,807)	($38,500)	($49,416)
CURRENT RATIO	0.85	0.78	0.66	0.60
ACID TEST RATIO	0.15	0.09	0.07	0.07
CURRENT DEBT/TOTAL DEBT	5.80%	9.96%	11.95%	13.35%
SOLVENCY:				
NET CAPITAL RATIO	0.79	0.76	0.72	0.69
EQUITY TO ASSET RATIO	-0.26	-0.31	-0.38	-0.45
DEBT TO ASSET RATIO	1.26	1.31	1.38	1.45

BIBLIOGRAPHY

BIBLIOGRAPHY

1. _____. "Farmers Up In Arms." U.S. News and World Report. 11 March 1985. p. 22.

2. United States Department of Agriculture. Economic Research Service. Agricultural Finance Outlook and Situation. December 1983. p. 13.

3. United States Department of Agriculture. Economic Research Service. Agricultural Finance Outlook and Situation. December 1983. p. 14.

4. United States Department of Agriculture. Economic Research Service. Farm Real Estate Market Developments - Outlook and Situations Report. Various Issues.

5. United States Department of Agriculture. Economic Research Service. The Current Financial Condition of Farmers and Farm Lenders. Agricultural Information Bulletin No. 490, p. vii.

6. United States Department of Agriculture. Economic Indicators of the Farm Sector State Income and Balance Sheet Statistics, 1983. (ECIFS 3-4). p. 91.

7. United States Department of Agriculture. Economic Research Service. Farm Income Statistics. Agriculture Outlook. December 1984. p. 32.

8. United States Department of Agriculture. Economic Research Service. The Current Financial Condition of Farmers and Farm Lenders. Agricultural Information Bulletin No. 490. p. 2.

9. Brealey, R. and S. Myers. Principles of Corporate Finance. New York: McGraw-Hill Book Company. 2nd ed., 1984. p. 173.

10. United States Department of Agriculture. Economic Research Service. The Current Financial Condition of Farmers and Farm Lenders. Agricultural Information Bulletin No. 490. p. 8.

11. Hepp, Ralph E. and Sermin D. Hardesty. Financial Situation in Michigan Agriculture. Agricultural Economics Staff Paper Number 85-21, Michigan State University, East Lansing, Michigan, 1985. p. 8.

12. Proctor, Mark and Sherrill B. Nott. Net Worth, Cash Flows and Ratios on Telfarmers, 1980. Agricultural Economics Report Number 391, Michigan State University, East Lansing, Michigan, June 1982. p. 1.

13. Spiller, Earl A., Jr. Financial Accounting: Basis Concepts. Richard D. Irwin, Inc. 3rd ed., 1977. p. 34.

14. Harsh, S. B., L. J. Connor and G. D. Schwab. Managing the Farm Business. Prentice-Hall, Inc., Englewood Cliffs, N.J., 1981. p. 80.

15. Harsh, S. B., L. J. Connor and G. D. Schwab. Managing the Farm Business. Prentice-Hall, Inc., Englewood Cliffs, N.J., 1981. p. 85.

16. Hepp, Ralph E. and Sermin D. Hardesty. Financial Situation in Michigan Agriculture. Agricultural Economics Staff Paper Number 85-21, Michigan State University, East Lansing, Michigan, 1985. p. 8.

17. Brealey R. and S. Myers. Principles of Corporate Finance. New York: McGraw-Hill Company. 2nd ed., 1984. p. 588.

18. Nott, S. B., G. D. Schwab, M. P. Kelsey, J. H. Hilker and A. E. Shapley. Estimated Crop and Livestock Budgets for Michigan, 1984. Agricultural Economics Report Number 446, Michigan State University, East Lansing, Michigan, February 1984. Various pages.

19. Hilker, J. and J. Ferris. American Association of Agricultural Economics Annual Outlook Survey, 1985. Agricultural Economics Staff Paper Number 85-52, Michigan State University, East Lansing, Michigan, 1985. Various pages.

20. Brick, J. R. Commercial Banking. Systems Publications, Inc., Haslett, Michigan, 1984. p. 75.

21. Nott, S. B. and V. L. Brodek. Business Analysis Summary for Specialized Michigan Dairy Farms, 1984 Telfarm Data. Agricultural Economics Report Number 472. Michigan State University, East Lansing, Michigan, August 1985. p. 25.