

INCIDENCE OF FINANCIAL VIABILITY AND
STRESS AND PROPOSED FINANCIAL
ASSISTANCE ALTERNATIVES FOR
U.S. AND OKLAHOMA FARMS

By

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PREFACE

This study attempts to provide more thorough understanding of farm financial stress and viability in Oklahoma and the United States. The major objective is to analyze distributions of Oklahoma and U.S. farm operators with various financial characteristics and project the impact of various financial assistance programs on their financial viability. Data from the 1986 Farm Finance Survey conducted by the Oklahoma Department of Agriculture in cooperation with the Oklahoma State University Agricultural Economics Department and the 1985 Farm Costs and Returns Survey (FCRS) data collected by the USDA was used to complete this analysis.

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CHAPTER I

INTRODUCTION

Background

Throughout the decade of the 1970's, farmers and ranchers, prompted by rapidly expanding exports, accelerating inflation, and low to negative real interest rates, borrowed heavily to invest in new capital equipment, new production technologies and rapidly inflating farmland (USDA, March, 1985). Nationally, farm debt rose an average of more than 10 percent per year during the 1970's. Land values increased even faster, causing debt/asset (D/A) ratios of the agricultural sector to actually decline, supporting the increased investment and borrowing.

In the early 1980's however, this scenario changed radically. International grain markets weakened, the value of the dollar rose on international markets, inflation declined and real interest rates rose to previously unheard of levels. Commodity prices and incomes fell and values of agricultural land and machinery plummeted. These changes have caused net worths to decline and for producers to have difficulty servicing debt loads assumed in the 1970's.

As is evidenced by extensive popular press coverage and more importantly, by the size of public outlays for agricultural production, research and development, the U.S. public holds the family farm structure as a very dear part of its national heritage. Many individuals project that direct government payments to farmers will equal \$35 billion in 1986. Government payments previously peaked at 9.3 billion in 1983. Even with this huge outlay of federal funds, signs of stress persist as land values continue to decline, record numbers of agricultural banks fail and farm foreclosures continue in record numbers. Even though agricultural producers continue to face financial stress, it is uncertain how long U.S. taxpayers will support such tremendous outlays for agricultural producers.

Problem Statement

The basic short run concern faced by many financially stressed operators in the agricultural sector is that their debt servicing requirements exceed their current repayment capacity. Easy credit policies of the 1970's, facilitated by rising asset values and overall optimism in agriculture helped to increase debt levels of the entire sector. Stress caused by low profitability and/or negative cash flows has been greatly aggravated by massive declines in asset values. This decline has greatly increased numbers of farm loans in high risk categories. Declining asset values have also caused lenders to be unable or unwilling to "roll over" or

renew lines of credit of financially vulnerable operators as they did in the 1970's, greatly increasing numbers of foreclosures and acquired properties. Large increases in the volatility and level of interest rates have also contributed to the level of financial stress. Adding further complexity, 1984 was a record year for net cash farm income, indicating low farm income may not be the single most important factor causing or contributing to financial stress. During the 1980's farmers who are not heavily indebted have had their net incomes fairly well maintained by farm programs while indebted farmers debt servicing requirements have many times absorbed all of their income (USDA, March, 1986).

Interest expense accounted for over 15 percent of total cash farm expenses in 1984 (up from nearly seven percent in 1960) and represents a cause of another aspect of loss of financial viability. Many operators with high levels of debt who are experiencing negative cash flows may benefit from interest rate reductions. While debt guarantees do not necessarily entail a high taxpayer cost, subsidized interest rates must come from a lender or the federal treasury, at least temporarily. A program could be developed whereby the subsidy will be set aside for a certain number of years after which it would be repaid.

If preservation of large numbers of primarily family owned and operated agricultural production units is of national concern, policy makers should assess the current

financial situation and agricultural programs to evaluate their effectiveness in maintaining preferred farm ownership patterns and in achieving objectives in the public interest. Agriculturalists and policy makers should also realize that any industry which, like agriculture, is capital intensive and export sensitive is impacted by high real interest rates and exchange rates. Agricultural producers already receive huge subsidies not received by other small businessmen and financial crisis assistance may increase disparity between sectors. Should further assistance be targeted to agriculture while other industries with similar problems are ignored?

Assuming that assisting financially stressed operators is consistent with national agricultural policy goals, a financial assistance program needs to be developed. A target group needs to be specified and criteria a farmer must meet to receive assistance must be outlined. Finally, a reliable estimate of the costs to taxpayers of the program needs to be determined.

Financial Stress versus Financial Viability

A distinction needs to be made between financial stress and financial viability. Current proposals and public sentiment are more concerned with protecting the viability of farmers than with financial stress. Financial stress is defined here to result due to a loss of equity because of the massive decline in asset values since 1980. Viability

is defined as the ability of a farm operator to continue to manage and operate his farm or ranch as the primary decision maker. A truly viable operation will not be forced by an outside source such as a lender to restructure assets or change production practices. Viability could also be called survivability. Financial stress impacts viability in that farmers with high D/A ratios may be forced to restructure assets and in doing so may negatively impact their productive capacity and efficiency. To minimize the impact of financial stress on individual operators, federal programs need to be directed at protecting current viability while also protecting long run viability of the entire sector. Care should be taken so that policies enacted do not further lengthen or distort the adjustment process causing higher costs or penalties in the future.

Definitions of farm financial stress differ greatly depending on who is developing the definition. Many farmers may only be concerned with whether they can cash flow their current obligations and are only concerned with their balance sheet in so far as it can secure the line of credit they desire. While this is a simplistic statement, many farmers with a life-long commitment to farming, who do not look upon their farm as an investment are not concerned about opportunities foregone because they did not sell their farms in the late 1970's, because they would not sell their farm for any price. Many farmers approaching retirement have seen a large percentage of the net worth on which they

planned to retire, or which they planned to pass to the next generation, evaporate as asset values declined. If declines in asset values is defined to be the major determinant of financial stress, it is felt by all operators since all major segments of agriculture have been affected by these declines.

Lenders not only must be concerned with cash flow, but also must consider the security position of a loan to satisfy their boards of directors and various regulatory agencies. This has caused lenders to be unwilling, because of risky security position, to continue financially backing some operators who have met their debt obligations. Without a line of credit, operators are unable to continue farming and may be forced out of business. This could conceivably occur simply because of asset value declines which are not the fault of the operator. A federal program designed to protect the security position of a lender through loan guarantees in order to maintain credit availability to stressed, but current, operators could protect viability. Relaxing Federal Depository Insurance Corporation (FDIC) and Federal Reserve regulations may also help lenders exercise more forbearance on many loans which are current but potentially highly risky because of poor security position.

Objectives

Much concern, controversy and confusion exists today over the nature, incidence and severity of farm financial stress.

A general objective of this report is to promote increased understanding of current stress, and characterize the types of farmers who are suffering from questionable viability or lack of viability. Extensive discussion and many pages of journal articles have explored options available to alleviate financial stress without projecting actual taxpayer costs of assistance programs or determining characteristics of operators receiving benefits. The discussion herein will address program costs and characterize operators who would receive benefits. In examining financial stress, the D/A ratio has been used extensively to indicate when a farm is experiencing financial stress. Is the D/A ratio of an operation really that important or should other factors be given more careful consideration?

The specific objectives of the researcher are to:

1. Summarize current financial conditions of farmers in Oklahoma and project losses and impacts to the Oklahoma agricultural sector if there is no financial assistance from government sources.
2. Suggest government debt assistance program alternatives for agricultural producers. Identify impacts of assistance programs on projected Oklahoma losses and identify costs and benefits of each alternative.
3. Project impacts of proposed government program alternatives nationally. Identify costs and benefits of a national program.

4. Identify characteristics of farms which contribute significantly to a farm's presence in a certain financial viability category.

CHAPTER II

LITERATURE REVIEW

Current levels of Financial Stress

The 1985 FAPRI report based on the December, 1984, Farm Journal Survey, estimated that loan losses from farm bankruptcies would be contained at \$10 billion (FAPRI, Jolly and Doye). All farm operators with a D/A ratio greater than 0.4 were assumed to be experiencing financial stress. Two-thirds of the \$210 billion (\$140 billion) of agricultural operator debt is held by farmers defined to be experiencing financial stress.

According to the FAPRI report, approximately one-half of outstanding farm debt cannot be fully serviced at current incomes and rates of interest. Annual principal and interest shortfalls are estimated to be \$2 to \$10 billion over the next four years depending on farm income levels and interest rates. Liquidation of 10 to 15 percent of farm assets would be required to service the remaining debt at a liquidation rate 3 to 4 times the historical average. FAPRI analyses also show that increases in farm income do not significantly decrease the extent of financial stress. Reduction in incomes, does however, greatly increase the incidence and severity of financial stress.

FAPRI recommends two major areas which financial policies should be directed:

1. Buy time, i.e. set up debt and asset restructuring over at least a five year period.
2. Encourage investor activity. Maintain farm income levels to create incentives for investors to purchase land and lease it back to existing operators.

From 1984 income and balance sheet data, the Board of Governors of the Federal Reserve Bank estimate that nationwide, 10 percent of operators are "vulnerable", hold 10 percent of assets and 23 percent of total agricultural debt (February, 1986). Another seven percent of operators classified as stressed hold seven percent of assets and 10 percent of total agricultural debt. A cross classification using return on assets, return on equity, amount of equity and D/A ratio was used to categorize operators who sold more than \$40,000 worth of agricultural products annually.

Farmers classed as vulnerable are likely to currently be experiencing financial trouble. Stressed operators are headed for financial trouble unless returns improve or their debt is reduced. Operators classified in "fair" condition could be unable to service debt over the longer term although default appears fairly unlikely. A farmer in "good" position has a favorable combination of returns and equity.

Seventy percent of all operators were classified as being in "good" condition and 13 percent in fair condition.

Nineteen percent of all operators, which are also classified as being in good or fair condition have D/A ratios greater than 0.4. These 19 percent of all operators hold 35 percent of all agricultural debt. Overall, 67 percent of all agricultural debt is held by operators classified as in good or fair position.

Under their "most likely" middle range loan loss scenario, Wharton Econometric Forecasting Associates project two direct impacts on the economy of doing nothing to ease the financial stress which agriculture is now experiencing: (1) Higher short term private interest rates of 75 to 125 basis points due to increased public perception of financial risk. (2) Higher interest rate risk premiums of 40 to 50 basis points in agricultural credit markets (Schink, July, 1985). Longer term effects over the 1985-93 period include retarded investment spending leading to lower productivity and output, reduced jobs and lower personal income. All of these effects would serve to push up the federal deficit by \$14 to \$22 billion by 1993.

USDA results from the 1984 Farm Costs and Returns Survey (FCRS) indicate 214,000 farmers (12.6 percent of all farmers) are facing financial stress because of the dual criteria of a D/A ratio of greater than 40 percent and an inability to meet cash obligations (USDA, July, 1985). Over 50 percent of these farmers have annual sales above \$40,000. Forty-five percent of agricultural operator debt is held by these financially stressed farmers.

Jolly et al., indicate that financial stress can be determined directly by examining four long run characteristics of a farm business: profitability, liquidity, solvency and risk bearing ability (December, 1985). Guidelines or rules of thumb for these indicators are not given. Net cash flow used in their analysis is defined as income over cash farm expenses plus off-farm income less withdrawals for family living, taxes and debt service. D/A ratio and cash flow is used to indicate financial stress and indicate vulnerability to both liquidity and solvency problems.

Lines and Morehart, based on the 1984 FCRS survey conclude that 40 percent of commercial farms and 70 percent of all farm businesses are in serious financial difficulty (July, 1986). This does not imply that these farms will fail in the near future however. Supplementation of farm earnings by off-farm income and unpaid family labor and delaying replacement of depreciable assets will allow some of these farms to survive for an indefinite period. The high estimates of financial stress result from excluding non-farm income and including an expense for depreciation.

Lines and Morehart, using logit procedures on the FCRS survey data, found that financial health of commercial farms was better than that for all farms. Increased size and higher proportions of rented land increased the probability of having good financial health. A limited degree of diversity and proprietorship organization were not

significantly related to financial health on commercial farms but were positively associated on all farms.

A Wisconsin report projected that between 2.5 and 9 percent of Wisconsin farmers will liquidate for financial reasons in 1986 (Barrows et al., 1986). These liquidations will be concentrated among larger, heavily leveraged farmers who rely on farming as a sole or primary source of income. In Wisconsin, 75 percent of farms with negative cash flows had D/A ratios below 0.4, indicating limited financial stress. Five percent of farms with negative cash flows had D/A ratios greater than 1.0. Eighty percent of this latter group had gross sales between \$20,000 and \$200,000.

Harl estimates that 5 to 7 percent of operators holding 10 to 15 percent of farm debt are likely to reach insolvency each year for the next three years (Proposal for Interim Land Ownership). He feels public intervention is necessary to prevent serious economic damage to rural communities.

Fiske et al., perform a multivariate analysis of the relationship between currentness of payments and selected socioeconomic factors obtained from an Ohio farm finance survey. Their first conclusion maintains that farmers having a relatively high percentage of land ownership to total asset ownership are most likely to be delinquent on their loan payments. Factors in their analysis make interpretation of this conclusion questionable. Their second conclusion points out that common use of the 40 percent D/A ratio as threshold criteria to indicate whether

a farm is experiencing financial stress is erroneous. The 40 percent mark was not found to be significant and it was suggested that this "rule of thumb" needs to be adjusted upward.

Joseph and Reinsel perform analysis on FCRS data sorted by both D/A ratio and operating margin. Of 872,000 farm businesses which lost money in 1984, 525,000 had sufficient off-farm income to put them in a positive overall income position. They suggest that due to heterogeneity of farm businesses that a single measure will prove insufficient in identifying farms facing financial problems. Their analysis showed that net operating margin for farm operators in 1984 was not closely correlated with D/A ratio.

In the second annual Successful Farming Index, the highest profit levels were found on farms with between \$400,000 and \$500,000 of sales (Allen, June, 1986). This group also has the highest average D/A ratio (67.8%) in the survey. Allen theorizes that "this category makes debt work for it, not against it." Farms with sales below \$100,000 received the poorest profits. Every group of farms except those with sales below \$100,000 paid federal income taxes, even before non-farm income was included. Poor use of capital is cited as agriculture's main problem.

Federal Program Proposals

In September 1984, FmHA instituted two new programs to deal with farm financial stress called the Farm Credit

initiative (USDA, March, 1986). The debt set-aside program (DSA) allows qualified FmHA borrowers to defer the lesser of \$200,000 or 25 percent of their indebtedness for five years. Requests for set-asides numbered 108,710 by September 30, 1985, but only 14.5 percent of applicants were accepted. Approximately 19 percent were rejected because they failed to meet the positive cash flow requirement.

The debt adjustment program (DAP) was instituted to assist non-FmHA borrowers. The individual farmer's commercial lender was required to agree to write-off a minimum of 10 percent of the interest or principal due on a loan. The amount written off must also allow the borrower to project a positive cash flow. Only 728 applications for the programs were received and only 426 were approved, issuing only \$61.4 million of the \$650 million allocated for the DSA and DAP by September 30, 1985.

According to Harl, the central problem of agriculture since 1980 has been high real interest rates (Proposal for Interim Land Ownership). If agricultural producers are to be stabilized he feels real interest rates must be reduced by 4 to 5 percentage points. He states that federal intervention should not just include the Farm Credit System. Intervention should be targeted to stabilize borrowers which will result in stabilization of lenders. Careful targeting and flexibility should be built into a program to allow market forces to respond efficiently.

Harl's proposal has two major components. Mechanism A would insulate farm assets from current depressed markets mainly by acquiring land. Mechanism B would provide supplemental financing for "buying down" interest rates on farms which will eventually be able to repay the subsidy. The expected cost of the program during the first four years of its operation would be \$6.8 billion.

According to Raup the primary cause of the current financial crisis is overproduction. Guither et al., Knutson and Klinefelter also point to overproduction as the major cause of current financial difficulties. Direct confrontation of this problem through policy measures is recommended to give long term relief to agriculture.

Knutson and Klinefelter argue that credit subsidies, including interest and principal buydowns, and expanded government credit to producers only treat symptoms of current problems. They place foreclosure moratoria, subsidies to lenders and price and income supports into the category of treating symptoms also. They argue that treating symptoms will aggravate current problems and serve to lengthen the current agricultural adjustment. Use of private sector initiatives (lender forbearance, liquidation, foreclosure and bankruptcy), reduced tax benefits, balanced macroeconomic policy, increased regulation of lenders, farmer retraining and relocation programs and development of secondary farm credit markets are suggested as means of treating root causes of the problem.

Bullock claims the basic cause of the farm financial crisis was the expansion of debt far beyond the repayment capacity of farm assets. Bullock estimates that if a 60 percent buydown of interest rates was targeted to those farms with excess debt that could be converted to positive cash flow, 52 percent of financially stressed farms grossing greater than \$50,000 annually could be helped. This amounts to 25 percent of all financially stressed farms and would cost approximately \$2 billion annually. The average subsidy would be \$21,000 per farm. He also estimates farm prices would need to be increased 15 to 560 percent to correct financial problems of all farms with severe financial stress.

Boehlje argues that targeting public assistance to moderate sized farms, temporarily in financial difficulty, may be consistent with long term agricultural policy goals. If normally healthy, but temporarily in trouble, farms are consolidated into other moderate sized units, public assistance may need to be targeted so that credit is available to ease this consolidation. This would be consistent with goals of efficiency, preserving a pluralistic agriculture, flexibility and economic opportunity.

If the farms which are larger than necessary to capture efficiencies of size are able to take advantage of assistance there may be no social advantage to public assistance. Additionally, Boehlje states economic reasoning

does not support assistance to preserve farms which are submarginal even under normal conditions. Such a subsidy would promote inefficiencies in use of resources.

Lines and Morehart maintain that:

tightly targeted assistance will: (1) only address part of the problem and (2) result in a proliferation of costly programs that may reward poor and/or part-time managers that may not warrant, need or desire assistance. A broad spectrum approach will (1) have high unacceptable public cost (2) encourage over investment in agriculture and (3) result in over production, low incomes and poor financial health.

Education of farmers is cited as being necessary to better understand and cope with economic realities are the policy programs suggested to alleviate current stress.

Past Credit Policy Approaches

In 1933 the U.S. Congress passed the Emergency Farm Mortgage Act which created the Federal Farm Mortgage Corporation (Murray, 1941). Its major function was to make Land Bank Commissioner (LBC) loans. This program, according to Murray, was "both ingenious and effective". The law provided for refinancing through the Land Bank Commissioner located in Washington D.C., who had general supervision of the Federal Land Bank.

The law amended the appraisal formula by adding the word "normal". This change allowed appraisers to value real estate at a value higher than that which existed during the then current depressed conditions. This modification did not cause large losses to the program because land values appreciated measurably during the 1940's.

The LBC made both first and second mortgage loans up to 75 percent of "normal" value at a time when the Federal Land Bank (FLB) was restricted to loaning an amount of 50 percent of market value plus 20 percent of the value of improvements. An appraiser from the Farm Credit Administration would make an appraisal and loan recommendation which then could be acted upon by the FLB and LBC. Part of the loan could be made by the FLB under a first mortgage position and part by the commissioner in a second mortgage position. If the FLB chose not to participate in the loan, the LBC would make the full loan in a first mortgage position. If a borrower had his loan with a private bank, the LBC loan would be presented to the private bank to be accepted or rejected.

The loans were made for a 13 year period in which principal payments were deferred the first three years. In the remaining ten years a ten percent principal payment was to be made. The ten year amortization of the principal portion of the loan proved to be too short resulting in a change in the law in 1939 which allowed the loans to be reamortized for a longer period.

The Federal Farm Mortgage Corporation (FFMC) was formed to finance the LBC loans and buy FLB bonds which the FLB had trouble selling at the time. Congress gave the LBC \$200 million to initiate the program and to serve as capital. The U.S. Government fully and unconditionally guaranteed the

bonds which virtually placed them on par with government bonds.

When the LBC loans were first made in 1933, all had a contract interest rate of five percent. In 1937 Congress reduced the interest rate on Commissioner loans to four percent and in 1940 reduced it to 3.5 percent. The average loan rate at that time on similar loans was 5.4 percent.

In 1934 alone, 306,000 LBC loans were made. The FLB, in its first eight years of operation, made nearly 300,000 loans, indicating the size and demand for the program. During the first eight years of its operation, 557,000 loans amounting to \$1,030 million were made by the LBC. According to R.I. Nowell (1947), actual losses on Commissioner loans averaged 0.83 percent of reserves annually. In its first 30 years of operation, FLB losses averaged 0.5 percent of reserves.

This author has been unable to find any comprehensive review of the Land Bank Commissioner program. The only critique made by Murray was that the initial repayment period of the loans was too short. Nowell, a representative of Aetna, who had to compete with the Federal Land Bank and Land Bank Commissioner, commented that the artificially low interest rate used by the LBC from 1933 to June of 1947 gave the FLB an unfair advantage over private lending sources. He further states that Commissioner money had been used freely by the FLB as a device for making bigger loans and outbidding conservative lenders. At the end of June 1946,

53 percent of all loans made by the Farm Credit System were joint Commissioner and Land Bank loans or first mortgage Commissioner loans.

Although it has not been determined if foreclosures currently being initiated are unnecessary, foreclosure moratoriums recently enacted by judges and elected officials indicate that individuals believe they are in some way excessive. One program initiated in the 1930's, which proved to be effective in slowing the foreclosure process and which could be used as an alternative to moratoria, was that of a County Conciliatory Committee (Falconer, 1934). Current mediation laws enacted in many states are similar to this program. The appointed County Conciliatory Committee heard the circumstances of a loan case from both the farmer and the creditor:

The major desire of these committees were to dispose of a case as quickly as possible. Their aim was to prevent a case from reaching foreclosure and to adjust debt so the farm owner would have a reasonable chance to pay out (Falconer, 1934, pg. 297).

The governor of a state usually appointed a State Committee which would then appoint county committees. The county committees were characteristically comprised of a banker, a retired farmer, two active farmers, an attorney and a real estate agent. After the committee had heard both sides of a dispute they suggested a plan of action to allow the farmer and lender to settle the problem. Although the boards were not given any absolute power (they were purely advisory), the influence of public opinion usually caused

both parties to follow the committee's recommendations. Common recommendations were to postpone foreclosure, extend mortgages, forgive delinquent interest, reduce mortgage balances, reduce the interest rate and turn over property to the lender.

An advantage of this type of mediation was that it could be used by all types of creditors, including private individuals and merchants, as well as private banks and the Farm Credit System. At the end of 1934 over 6,000 cases came before Ohio committees, 1,265 cases came before 39 Wisconsin committees and Iowa had several county boards which each considered over 100 cases. As of December, 1933, Nebraska had reported few cases and Illinois committees had only recently been organized. The Governor of the Farm Credit Administration went so far as to request that all State Governors appoint conciliatory committees. The literature is again silent concerning a comprehensive review of the impacts of the actions of these committees.

CHAPTER III

OVERVIEW OF CURRENT FINANCIAL CONDITIONS

Asset Values and Rents

Since 1933, agricultural land values in the United States, with the exception of only a few years, increased annually until 1981 (USDA, August, 1985). From 1973-1981, land values throughout the U.S. increased an average of 198 percent, or at an annual compounded rate in excess of 10 percent per year. Increases in individual states ranged from 97 percent in Oregon to 359 percent in Minnesota. Generally, increases were greatest in the Midwest and smallest in the South, West, and Northeast.

From 1981 to 1986, land values declined over 49 percent in Illinois, Indiana, Ohio, Nebraska, Minnesota and Iowa while the average decline nationwide was 29 percent (USDA, June, 1986). The average value of U.S. farmland was \$596 in 1986, below that of 1979. The real value of farmland has declined even more. The 1986 indexed real values are equal to those of the mid 1960's. In real terms, all of the huge real increase in wealth brought about by the boom period of the 1970's has been lost. The Midwest experienced the greatest increase in land value and subsequently suffered the greatest decline.

Net investment in machinery, equipment, and buildings tripled during the 1970's but fell by 25 percent from 1981 to 1985 (USDA, March, 1986). Net worth, in nominal terms, for the entire sector has fallen from \$833 billion in 1980 to \$605 billion in 1985, a level approximately equal to 1977 and indicating a loss of 25 percent of peak values.

Rents declined in most states reporting estimates in 1985 and 1986 (USDA, August, 1985, and June, 1986). Land values declined more than rents causing rent-to-value ratios to rise substantially in the Corn Belt, Lake States and Northern Plains. The largest decline in rents occurred in Nebraska and Iowa where they fell 20 percent and 12 percent respectively in 1985. Melichar states that lower land prices represent a major long-term adjustment to a revised farm outlook of lower returns than those experienced in the early 1970's, rather than a temporary phenomena caused by financial stress (Melichar, April 24, 1986).

Agricultural Debt

During the 1970's farm debt expanded very rapidly, from \$49 billion to \$154 billion, or by 228 percent (Bullock, 1985). During the same period, net farm income or repayment capacity increased by only 52 percent. Farm asset values increased at a rate higher than debt increased in the 1970's causing the overall D/A ratio of the agricultural sector to actually decline (USDA, March, 1985). Since 1982, the level of farm debt has declined absolutely, by 0.6 percent from

its peak of \$203 billion in 82-83, and down another 1.8 percent to \$199 billion in 83-84. Preliminary estimates show overall debt is expected to fall slightly in 84-85 (by 0.1%), and is forecast to fall by 0.7 percent in 85-86 (USDA, March, 1986).

Total real estate debt for 1985 was estimated at \$99 billion, down from \$102.9 billion in 1984. This is the second consecutive yearly decline and the largest decline in real estate debt since 1944.

As is shown by Table 1, in 1984, 81.1 percent of all U.S. farms had D/A ratios less than 0.4 and held 38.1 percent of total farm debt. Conversely, 15.9 percent of all farms had D/A ratios from 0.4 to 1.0 and held 48.8 percent of the \$120.2 billion in operator debt in 1984. The remaining three percent of all farms were technically insolvent and held 13.1 percent of all debt. Part time farmers (those with annual sales below \$40,000) with D/A ratios less than 0.4 comprised 54.8 percent of all farms and held 8.1 percent of all farm debt. Forty-three percent of family farms, defined as those farms with \$40,000 to \$500,000 of sales each year, accounted for seven percent of all farms and held 31 percent of all farm debt. Commercial farms with D/A ratios less than 0.4 comprised 26.3 percent of all farms and held 30 percent of all farm debt.

Overall, part-time farms accounted for 62.2 percent of all farms and held 16.8 percent of all farm debt. Family farms accounted for 35.9 percent of all farms and held 66.2

TABLE I

U.S. FARMS AND FARM OPERATOR DEBT BY D/A RATIO, CASH-
FLOW STATUS AND SALES, JANUARY, 1985.*

Cash-Flow Status and Farm Size	D/A Ratio			Total All Farms
	≤ 0.4	0.4 to 1.0	≥ 1.0	
Farms with Positive Cash-Flows				
Percent of Farms				
All	43.3	5.5	.8	49.6
> \$500,000	.8	.2	.1	
\$40,000 to \$499,999	16.7	3.3	.5	
< \$40,000	25.8	2.0	.2	
Percent of Debt				
All	19.7	14.1	2.4	36.2
> \$500,000	3.1	3.4	.7	
\$40,000 to \$499,999	13.2	9.2	1.3	
< \$40,000	3.4	1.5	.4	

Farms with Negative Cash-Flows				
Percent of Farms				
All	37.8	10.4	2.2	50.4
> \$500,000	.4	.3	.1	
\$40,000 to \$499,999	8.4	6.0	1.0	
< \$40,000	29.0	4.1	1.1	
Percent of Debt				
All	18.4	34.7	10.7	63.8
> \$500,000	2.2	4.6	3.0	
\$40,000 to \$499,999	11.5	25.1	5.9	
< \$40,000	4.7	5.0	1.8	

Total All Farms				
Percent of Farms	81.1	15.9	3.0	100.0
Percent of Debt	38.1	48.8	13.1	100.0

* Based on the 1984 Farm Costs and Returns Survey Estimate of 1.694 million farms. Farm operator debt for farm purposes based on the the survey estimate of \$120.2 billion.

percent of all farm debt. Large farms, those with more than \$500,000 in sales per year, accounted for 1.9 percent of all farms and held 17 percent of all operator debt.

In 1950, the agricultural sector debt to net farm income ratio was less than one (USDA, January, 1986). By 1960 the ratio had risen to two and by 1970, to three. By 1982 the ratio was in excess of ten to one. In other words, the sector held \$10 of debt for every \$1 of net farm income.

Net Cash Flow

Table 1 shows that 49.6 percent of all farms had positive total net cash flows in 1984 and held 36.2 percent of all operator debt (USDA, March, 1986). Conversely, 50.4 percent of all farms had negative cash flows and held 63.8 percent of all operator debt.

Eighty percent of all farm firms had D/A ratios less than 0.4 and 46.6 percent of these farms also had negative cash flows. Two-thirds of farms with D/A ratios greater than 0.4 experienced negative cash flows. Forty-three percent of family farms, which comprised seven percent of all farms, had negative cash flows in 1984. Commodity prices would need to increase an average of 32 percent to restore positive cash flows to family farms (USDA, March, 1985). Three percent of farms were technically insolvent but 25 percent of these had positive cash flows (USDA, March, 1986).

Crop and livestock farms basically show financial stress in equal proportions in 1984 of 10-15 percent. 25 percent of dairy farms show financial stress. Crop production expenses decreased by 3 to 5 percent in 1985 from a peak in 1984 and are forecast to fall again in 1986. Receipts dropped 1 to 3 percent in 1985 and are forecast to fall 3 to 7 percent in 1986, offsetting the decrease in input expenses.

In 1984 net farm income reached a record \$34.5 billion. In 1985 it fell 20 percent and fell to \$25 billion in 1986. More recent publications estimate net farm income will rise by eight percent in 1987 (USDA, March, 1987).

Agricultural Lending

In 1984, 67.3 percent of FmHA borrowers had negative cash flows and held 77 percent of FmHA's outstanding debt (USDA, March, 1985). Of all Farm Credit System borrowers 53.6 percent had negative cash flows and held 64.6 percent of the Farm Credit System's outstanding debt. Similar to the Farm Credit System, 53.1 percent of commercial bank borrowers suffered from negative cash flows and held 65.4 percent of their outstanding debt in 1985.

As of September 30, 1985, 20.8 percent of FmHA's loan volume, amounting to \$5.8 billion, was delinquent. Their total delinquency five years earlier was \$721.7 million. Mid-year FmHA loan delinquencies increased from 16.7 percent of loan volume in 1980 to 36.3 percent of loan volume in

1985. In the late 1970's, modification of qualifications and FmHA loan program directives contributed to FmHA's increase in outstanding farm loans from \$5.5 billion to \$24.1 billion with a corresponding market share increase from 5.4 percent in 1977 to nearly 12 percent in 1982 (Duncan, 1986).

Delinquent production loans at commercial banks rose to nine percent in June of 1985, up 2.4 percentage points from a year earlier. Total delinquent loans in agricultural banks accounted for 6.7 percent of loan volume compared to 4.6 percent delinquent loans in small non-agricultural banks in 1986. "Small" non-agricultural banks are those banks with less than \$500 million in assets which are not classified as agricultural banks by the Federal Reserve Board. Any bank with 17 percent or greater of its loan volume made up of agricultural loans is currently defined as being an "agricultural bank".

Agricultural production loans comprised only 2.9 percent of all loans in the banking system on September 30, 1985, but accounted for 5.7 percent of delinquencies and 7.8 percent of non-performing loans (Board of Governors, February, 1986).

In 1985, net loan charge-offs of agricultural banks was more than double charge-offs of non-agricultural banks (USDA, March, 1985). Annual provisions for loan losses in agricultural banks are also nearly double provisions in small non-agricultural banks.

Agricultural banks accounted for nearly 40 percent of the 1,055 banks on the "problem list" published by the FDIC in October, 1985. This is a four-fold increase for agricultural banks since 1983. Additionally, these banks are concentrated in 11 Midwestern states. Agricultural bank failures increased from 15.9 percent of all failures in 1983 to 59.5 percent in 1985. Agricultural banks have historically comprised 35 percent of all banks.

In 1985 the Farm Credit System suffered a net loss of \$2.689 billion compared with \$373 million of net income in 1984 (1985 Report to Investors). Non-accrual loans increased from \$1.838 billion on December 31, 1984 to \$5.323 billion on December 31, 1985. Acquired property increased from \$505 million in 1984 to \$928 million in 1985. Allowances for loan losses increased to \$3.190 billion on December 31, 1985 from \$1.326 billion in 1984. Net charge offs were \$1.105 billion in 1985 versus \$427 million in 1984.

The Federal Land Bank's share of the loss was \$2.212 billion compared to a net income of \$206,660 in 1984. The Federal Intermediate Credit Banks lost \$541,351 in 1985 compared to a \$32,924 net income in 1984.

Interest Rates

Interest payments on the farm debt in 1984 were slightly over \$20 billion compared with \$3.2 billion in 1970 and \$1.2 billion in 1960 (USDA, January, 1986). In 1960, interest

was 4.4 percent of total operating expenses and by 1984 had grown to 15.1 percent of operating expenses. Interest expense was the fastest growing expense in the 1970's and has now begun to decline (USDA, March, 1986). 53 percent of the increase in interest expense since the early 1970's has come from expanded debt.

The October 1979 change in the Federal Reserve System policy of targeting monetary growth and letting interest rates fluctuate has caused interest rates to become much more volatile than they were previously. The huge increase in debt of the agricultural sector assumed under low and stable interest rates during the 1970's caused many operators to be very vulnerable to this policy change.

From 1970 until 1980, when agricultural debt more than tripled, real interest rates varied from two percent to a negative 1.5 percent (USDA, March, 1985). In 1981, real interest rates jumped to over eight percent and have basically remained at that level through 1985. The prime rate increased from around seven percent in 1977 to over 20 percent in 1981 (Federal Reserve, August, 1980; December, 1981; February, 1983; February, 1986; March, 1987). The prime rate fell below 11 percent in 1983 and rose to 13 percent in 1984. During 1985 the prime rate fell to 9.5 percent and fell further, to 7.5 percent by December of 1986.

The average interest rate on agricultural loans from 1910 until 1974 stayed basically steady between 4.5 percent and

6.5 percent (Ag Finance Databook, July, 1985). After 1975 the interest rate on all agricultural loans increased until the average interest rate peaked at 18.5 percent in 1981. The average rate decreased to 13.6 percent in 1983 and rose to 14.2 percent in 1984. The average rate decreased to 13.1 percent by mid-1985 and was projected by the USDA to fall further in 1986.

Summary

In summary, the economic condition of agriculture has declined in absolute terms and relative to most other sectors since 1981 (USDA, March, 1986). The real value of farm assets have declined by nearly one-half since 1981, causing a loss of approximately \$250 billion in equity from the farm sector by April of 1985. During 1985, net farm income declined 20 percent from its record peak the year before and is projected to drop another eight percent in 1986 by the USDA. Recent estimates project that net farm income will increase by eight percent in 1987 (USDA, March, 1987). Real net cash incomes of the sector are projected to continue to decline as they have since 1979.

Commercial banks and the Farm Credit System have suffered huge increases in losses and delinquency rates as is evidenced by substantial increases in foreclosures and acquired property holdings over the past few years. The rapid rise in interest rates during the late 1970's and early 1980's left many producers vulnerable to financial

risk. Substantial declines in interest rates have helped to relieve some pressure, but interest rates still remain at high levels in real terms.

CHAPTER IV

ANALYSIS

Introduction

Several methods and combinations of methods of providing assistance to farmers with questionable viability are investigated in this section. The major options investigated are: (1) interest rate subsidies, (2) federal "warehousing" of agricultural land, and (3) expanded federal credit institution activities, possibly in forms of direct lending and/or guarantees. Principal reductions or buydowns are given little consideration for reasons indicated later.

Usefulness or appropriateness of all of these measures can be questioned because easy credit policies and strong competition among lenders for market share during the 1970's may have over-supplied credit to agriculture. A tendency during the 1970's to make loan decisions based on appreciating asset values instead of profitability was complicated by changes in FmHA directives which caused private lenders to aggressively seek to expand or at least maintain their market share. Initiation of new federal credit programs and expansion of current programs could

continue to distort credit markets which have possibly caused credit to agriculture to be oversupplied in the past. Programs which simply exchange one type of debt for another will do little to stabilize a sector which is currently overleveraged. A program of direct write-offs of debt, while very costly and inequitable, would seemingly contribute the most toward putting stressed operators on more solid financial ground if current depressed prices levels turn out to be the norm. If depressed price levels persist for over five years, programs which delay repayment obligations may only serve to postpone finding real solutions to current stress to the future when costs of facing the problem may be much higher. Increased federal involvement through guarantees serves to distort the risk structure in agricultural finance, possibly causing borrower and lenders to believe high levels of lending are acceptable because of implicit or explicit federal guarantees.

On the other hand, some professionals feel that targeted assistance may be consistent with long run agricultural policy goals, provided diversity in the structure of agriculture is enhanced or maintained. Assistance may also be warranted if it is targeted to promote efficiency in production and not subsidize inefficiency. To correct the high level of financial instability in agriculture today, asset transfer markets may be unable to function to allow necessary financial restructuring. Federal assistance in this restructuring could reduce hardship felt not only by

producers but also by rural communities. If current conditions do not persist for more than three to five years, programs which delay obligations and smooth current stress by reducing or spreading out the numbers of operators leaving farming and thereby protecting viability of rural communities, could be very valuable.

Other sections in this analysis attempt to develop a set of classifying variables which could be used to identify or describe farms with questionable financial viability. Stepwise linear regression, discriminant analysis and logit procedures were used to investigate this area.

Other topics which help to explain and identify different financial characteristics of the Oklahoma and U.S. agricultural sector are also related. This information is included to provide a more complete understanding of financial stress and implications of certain policy responses and alternative solutions.

Assumptions for Analysis

In determining potential losses to farmers and agricultural lenders due to the farm financial crisis, several assumptions must be made. In simple terms, a viable operation must be solvent (D/A ratio ≥ 1.0) and making financial progress by meeting all financial obligations in the long run. This means that all interest, principal, depreciation (capital consumption allowance) and family living must be paid either from farm sources or other

sources in the long run. The following assumptions are used in computing costs and benefits of proposed programs in the short run:

1. Family living requirements are assigned a value of \$15,000. This figure is above poverty levels and represents an austere budget on which a family receiving federal aid could be expected to live. Median non-metropolitan income in 1983 was \$20,938. This figure, adjusted by implicit net rental value of the farm dwelling and income tax adjustments, reduces estimated minimum farm family living needs to \$12,950 for the average farm family, according to Duncan and Harrington (page 3).

2. A 60 percent residual liquidation value is attributed to assets sold. Many times a "forced" or "sheriff's" sale is not an arms length transaction and may be associated with very high transaction costs. Neighboring farmers are often reluctant to bid on foreclosed properties resulting in sales prices which are well below market levels. Legal fees and other expenses charged by a lender forcing a sale are paid before sales proceeds can be used to retire debt. Penalty interest charged by the Farm Credit System and other lending institutions once a loan becomes delinquent is also paid before debt can be retired. Far less than market value is thereby often available to retire outstanding debt.

3. Income from all sources is used in projecting a farm's total income. On many farms in many areas, use of off-farm income to supplement farm earnings is a way of life. Nationally, in 1984, 54 percent of farmers total income was received from non-farm sources, indicating its importance (USDA, January, 1986). Further, to be a viable and sustainable business, farm income together with off-farm income must at least provide family living requirements without worsening the financial position of the farm. If farmers are to receive federal assistance, it is not unreasonable to expect them to exhaust all personal revenue sources before receiving assistance.

4. Capital consumption allowances are not included. In recent years, as production agriculture adjusted to decreased levels of demand and lower prices, farm incomes have not been able to replace and/or form capital in firms where financial viability is questionable. Given the seriousness and potentially short run nature of the current financial slump, capital replacement could be foregone for a few years.

While this may underestimate costs or levels of loss currently, more prosperous conditions in the future will hopefully provide for replacement. The capital structure of agriculture is undergoing a major restructuring process as depreciation exceeds new expenditures, leading to a possibly necessary lowering of capital investment to increase efficiency and decrease costs (USDA, AIB 495, May 1986). These adjustments will hopefully prepare U.S. agricultural producers to compete more effectively in world markets in the future.

5. It is assumed that payment of all expenses and providing for family living take precedence over payment of interest and principal obligations. Farmers generally make withdrawals from farm accounts during the year to meet family living needs and pay operating expenses. Consequently, at the end of the year or payment period, income remaining is used for debt service. Interest is generally paid first and the remainder is used for principal reduction. Any unpaid interest increases principal obligations for the following year or payment period.

Current Financial Condition of Oklahoma Farmers and Ranchers

The Oklahoma Farm Survey, completed by the Oklahoma Department of Agriculture in cooperation with the Department of Agricultural Economics at Oklahoma State University was the source of the data used in this study. This survey was sent to 2,955 Oklahoma farmers and ranchers (Plaxico et al.). The total number of complete surveys which provided all the information needed for this analysis was 602.

Table II gives a breakdown of Oklahoma operators by total residual income and D/A ratio. Percent of total Oklahoma operators, debt and assets in each category is given. Total residual income (TRI) is defined as gross income from all sources less all operating expenses (including interest).

TABLE II
 DISTRIBUTION OF OKLAHOMA FARM OPERATORS BY
 TOTAL RESIDUAL INCOME AND D/A RATIO*

Total Residual Income	No Debt	Debt/Asset Ratio			ALL
		<0.4	0.4-0.7	>0.7	
≤ #0					
% of Operators	2.16	1.33	1.00	1.00	5.48
% of Assets	1.47	3.05	1.11	1.52	7.15
% of Debt	-	2.25	2.73	7.99	12.98
D/A ratio	-	.16	.54	1.16	.40
#1 - \$14,999					
% of Operators	13.79	7.31	1.16	.50	22.76
% of Assets	7.61	4.04	.64	.42	12.70
% of Debt	-	1.91	1.64	2.62	6.17
D/A ratio	-	.10	.57	1.39	.11
#15,000 to \$29,999					
% of Operators	10.30	6.64	1.00	1.16	19.10
% of Assets	6.64	5.59	.62	.36	13.21
% of Debt	-	3.14	1.43	1.63	6.20
D/A ratio	-	.12	.51	1.00	.10
#30,000 to \$49,999					
% of Operators	7.81	6.98	2.99	3.16	20.93
% of Assets	5.21	6.36	2.53	1.83	15.93
% of Debt	-	4.52	6.11	7.75	18.39
D/A ratio	-	.16	.53	.94	.25
≥ \$50,000					
% of Operators	10.47	12.79	5.32	3.16	31.73
% of Assets	14.16	24.00	7.48	5.37	51.01
% of Debt	-	17.97	17.28	21.01	56.27
D/A ratio	-	.17	.51	.86	.25
ALL					
% of Operators	44.52	35.05	11.46	8.97	100.00
% of Assets	35.08	43.05	12.38	9.49	100.00
% of Debt	-	29.80	29.20	41.00	100.00
D/A ratio	-	.15	.52	.95	.22

* Based on the 1985 Farm Finance Survey conducted by the Oklahoma Department of Agriculture. Number of Oklahoma Farmers was estimated at 71,000, total farm assets at \$25.4 billion and value of operator debt at \$5.6 billion.

Assuming income from all sources to farmers is available for debt service, 12.3 percent of Oklahoma farms could be faced with some sort of forced sales action in 1986. This is the total percent of Oklahoma farms which have a TRI below \$15,000 after debt service and hold some debt. These farms hold 10.8 percent of Oklahoma farm assets and 19.1 percent of Oklahoma farm debt. If these farms were forced into some degree of liquidation, a loss of 5.3 percent or \$299 million of Oklahoma farm debt would result. The 5.3 percent was calculated by determining the total asset and total debt value of all the farms in a certain TRI and debt/asset category. Sixty percent of asset value was assumed to be available for debt retirement from a forced sales action. Total debt was then subtracted to give the amount of uncollectible debt. All of the uncollectible debt (5.3 percent) comes from operators who have D/A ratios greater than 0.7.

If the above farms were not foreclosed upon, a \$198 million principal and interest shortfall to Oklahoma lenders could result. This figure is the total debt service shortfall of all farms with less than \$15,000 TRI. Detailed statistics used to calculate this shortfall can be found in Table X. A 12 percent interest rate and 8.6 percent principal repayment rate is also assumed.

Another 7.5 percent of Oklahoma operators have a TRI over \$15,000 and a D/A ratio exceeding 0.7. While many of these operators are insolvent, they are keeping their payment

obligations current and are expected to remain current in the future. If these operators were forced to take some sort of sales action because of their high risk D/A ratios, another 7.6 percent of Oklahoma farm assets and 30.4 percent of farm debt could be affected. This liquidation would cause another 9.8 percent or \$550 million in uncollectible Oklahoma debt to be absorbed by lenders and farmers. A 60 percent residual value of assets sold to retire debt was again assumed to project the loss. Since these operators are current, no principal or interest shortfall is expected on these loans if they are not liquidated.

Proposed Assistance Programs

The following section is an attempt to analyze the effects of various levels of interest rate subsidies and debt write-offs on the viability of Oklahoma farmers. Effects of these programs on distributions of operators, debts and assets in certain total residual income (TRI) categories is examined to evaluate impacts of these programs. Impacts are measured by numbers of operators assisted, dollars of loss faced by lenders and farmers following assistance, and costs of alternative subsidies and programs. Total residual income is defined as total income from all sources, both farm and non-farm, less all production expenses including interest. Total residual income can be used for family living expenses, taxes, principal reduction and/or capital acquisitions.

In developing an assistance program, determination of eligibility criteria for program benefits needs to be done carefully. In order for a farm to be eligible for assistance in this analysis it is required that, following an interest subsidy, a TRI of \$15,000 must be provided for family living expenses from all sources, after all other cash commitments are met (including interest payments). This viability requirement is imposed because there is little justification for spending federal money on farms which will never become self-supporting as a result of financial assistance.

Volume and cost of interest rate subsidies could likely be reduced if private banks or lending agencies were required to refer all accounts to the program and match part of the interest subsidy. A participation requirement should decrease abuse of the system by inducing the private sector to screen out accounts which do not need assistance.

As an index to compare costs of proposed programs, government payments to Oklahoma farmers have ranged from approximately \$35 million in 1980 to \$365 million in 1983 (USDA, September, 1984).

Impact of Interest Rate Subsidies on the
Distribution of Oklahoma Farmers
in Various TRI Categories

Interest rate subsidies are often cited as an obvious method to assist financially troubled farmers. Table III

gives a summary of the impacts of several levels of interest rate subsidies and debt write-offs on distributions of operators and debt in various TRI and D/A categories. Various subsidies are applied to the debt of each individual farm and then the changes in distributions of farms in various TRI categories are identified. This analysis examines the effect of various interest rate subsidies and debt write-offs in moving operators which are in non-viable TRI categories below \$15,000 to viable TRI categories above \$15,000.

The percent of Oklahoma farms column in Table III gives the percentage of Oklahoma farms which fall in a TRI category below \$15,000. The level of debt controlled by these farms is given by the percent of Oklahoma debt column. The value of uncollectible debt column lists an estimate of uncollectible Oklahoma debt if all the farms with a TRI below \$15,000 were forced to liquidate.

The first line lists estimates of percent of Oklahoma farms, debt held by these farms and the potential volume of uncollectible debt following liquidation for a "do nothing" strategy. Following lines illustrate the impact of various subsidy levels and debt write-offs on the percent of operators, debts and assets in TRI categories below \$15,000 following a one time subsidy and/or debt write-off. The percentages in Table III do not include farms with greater than \$15,000 TRI before an interest rate subsidy or write-off because these farms are able to pay all operating

TABLE III
 SUMMARY OF INTEREST RATE SUBSIDIES AND DEBT
 WRITEDOWN OPTIONS ON OKLAHOMA FARMS

Subsidy Option (IR or WO)/1	Percent of OK Farms/2	Percent of OK Debt/3	Value of Uncollectible Debt (%) /4	Value of Debt Written Off/5
Do nothing	28.24	19.15	\$299 M (5.3)	
3% IR	27.91	16.93	\$230 M (4.1)	
6% IR	26.42	9.44	\$ 83 M (1.5)	
8% IR	26.02	8.31	\$ 83 M (1.5)	
11% IR	25.58	6.62	\$ 31 M (0.6)	
14% IR	24.92	5.88	\$ 31 M (0.6)	
6% IR and 25% WO	26.08	8.31	\$ 83 M (1.5)	\$38.3 M
8% IR and 25 % WO	26.08	8.31	\$ 83 M (1.5)	\$38.3 M

- 1/ Interest Rate Subsidy (IR); Principal Write-off (WO)
 2/ Percent of Oklahoma farms with a TRI \leq \$15,000
 3/ Percent of Oklahoma farm debt held by farmers with a TRI
 \leq \$15,000
 4/ Dollar shortfall resulting from a total liquidation of
 Oklahoma farm operators with a TRI \leq \$15,000, in millions of
 dollars. The percent of total Oklahoma farm debt which this
 figure represents is given in parenthesis. The 60% residual
 value for liquidated assets was used to reduce liability
 level before the shortfall was totalled.
 5/Total dollar volume of debt written-off.

expenses including interest and make a family living allowance of \$15,000.

Table IV gives actual distributions of Oklahoma farm operators by NCFI, TRI and D/A ratio found by the Oklahoma Farm Finance Survey. Table V gives the percentage distribution of farms in each TRI category after the various subsidy or write-off is applied.

Interpretations and Recommendations

This analysis illustrates that although numbers of farms assisted is relatively small in percentage terms, uncollectible debt losses and levels of debt in categories below \$15,000 is impacted extensively by the subsidies. This indicates that debt servicing problems in Oklahoma are concentrated on a few farms. The small number of farms moved into viable TRI categories may indicate that interest rate subsidies themselves cannot provide the total financial relief that many farmers need.

Over 92 percent of Oklahoma farms with TRI below \$15,000 are also in the gross farm income category below \$100,000. These farms comprise 25 percent of all Oklahoma farms. Only 3.6 percent of Oklahoma farms have gross farm incomes above \$100,000 and also receive less than \$15,000 TRI. Analysis provided later on U.S. data shows a very small percentage of operators unable to meet debt service obligations have sales above \$100,000. This could indicate that insufficient cash flow and unserviceable debt problems exist mainly, possibly

TABLE IV
 DISTRIBUTION OF OKLAHOMA FARM OPERATIONS
 BY D/A RATIO, NCFI AND TRI

NCFI Category	No Debt	Debt/Asset Ratio			All
		<0.4	0.4-0.7	>0.7	
< \$0	8.14	7.64	2.33	2.16	20.27
\$1 - \$14,999	23.92	13.79	2.66	2.16	42.52
\$15,000 - \$29,999	6.31	4.98	1.99	1.83	15.12
≥ \$30,000	6.15	8.64	4.49	2.82	22.09
All	44.52	35.05	11.46	8.97	100.00
TRI					
Category					
< \$0	2.16	1.33	1.00	1.00	5.48
\$1 - \$14,999	13.79	7.31	1.16	.50	22.76
\$15,000 - \$29,999	10.30	6.64	1.00	1.16	19.10
\$30,000 - \$49,999	7.81	6.98	2.99	3.16	20.93
≥ \$50,000	10.47	12.79	5.32	3.16	31.73
All	44.52	35.05	11.46	8.97	100.00

TABLE V
 DISTRIBUTION OF OKLAHOMA FARM OPERATIONS BY D/A
 RATIO AND TRI FOLLOWING INTEREST RATE
 SUBSIDIES OR DEBT WRITEOFF

TRI Category	No Debt	Debt/Asset Ratio			All
		<0.4	0.4-0.7	>0.7	
3 % Interest Rate Subsidy					
≤ \$0	2.16	1.16	.83	1.00	5.15
\$1 - \$14,999	13.79	7.48	1.33	.17	22.76
\$15,000 - \$29,999	10.30	5.98	.66	1.33	18.27
\$30,000 - \$49,999	7.81	7.14	2.49	2.49	19.93
≥ \$50,000	10.47	13.29	6.15	3.99	33.89
All	44.52	35.05	11.46	8.97	100.00
6 % Interest Rate Subsidy					
≤ \$0	2.16	1.16	.50	.66	4.49
\$1 - \$14,999	13.79	6.98	1.16	.00	21.93
\$15,000 - \$29,999	10.30	5.81	.66	1.33	17.94
\$30,000 - \$49,999	7.81	7.14	2.82	1.83	19.60
≥ \$50,000	10.47	13.95	6.31	5.15	35.88
All	44.52	35.05	11.46	8.97	100.00
8 % Interest Rate Subsidy					
≤ \$0	2.16	1.00	.50	.50	4.15
\$1 - \$14,999	13.79	6.98	1.00	.17	21.93
\$15,000 - \$29,999	10.30	4.66	.78	.13	12.21
\$30,000 - \$49,999	7.91	6.64	2.33	1.66	18.44
≥ \$50,000	10.47	14.45	6.81	5.98	37.71
All	44.52	35.05	11.46	8.97	100.00
11 % Interest Rate Subsidy					
≤ \$0	2.16	.83	.50	.33	3.82
\$1 - \$14,999	13.79	6.98	.83	.17	21.76
\$15,000 - \$29,999	10.30	5.48	.66	.83	17.28
\$30,000 - \$49,999	7.81	7.31	1.99	1.16	18.27
≥ \$50,000	10.47	14.45	7.48	6.48	38.87
All	44.52	35.05	11.46	8.97	100.00

TABLE V (continued)

TRI Category	No Debt	Debt/Asset Ratio			All
		<0.4	0.4-0.7	>0.7	
14 % Interest Rate Subsidy					
≤ \$0	2.16	.83	.17	.33	3.49
\$1 - \$14,999	13.79	6.48	1.00	.17	21.43
\$15,000 - \$29,999	10.30	5.32	.66	.50	16.78
\$30,000 - \$49,999	7.81	7.48	1.83	1.33	18.44
≥ \$50,000	10.47	14.95	7.81	6.64	39.87
All	44.52	35.05	11.46	8.97	100.00
25% Debt Write-off and 6% Interest Rate Subsidy					
≤ \$0	2.16	1.00	.50	.66	4.32
\$1 - \$14,999	13.79	6.98	1.00	.00	21.76
\$15,000 - \$29,999	10.30	5.98	.83	.66	17.77
\$30,000 - \$49,999	7.81	6.81	2.33	1.99	18.94
≥ \$50,000	10.47	14.29	6.81	5.65	37.21
All	44.52	35.05	11.46	8.97	100.00
25 % Debt Write-off and 8% Interest Rate Subsidy					
≤ \$0	2.16	1.00	.50	.50	4.15
\$1 - \$14,999	13.79	6.98	1.00	.17	21.93
\$15,000 - \$29,999	10.30	5.32	.83	.66	17.11
\$30,000 - \$49,999	7.81	7.31	1.83	1.66	18.60
≥ \$50,000	10.47	14.45	7.31	5.98	38.21
All	44.52	35.05	11.46	8.97	100.00

by "choice" on part-time, non-commercial farming operations.

Interest Rate Subsidies Needed to Correct
Debt Service Shortfalls

This analysis is approached with a slightly different perspective than the preceding analysis. Whereas the preceding analysis examined impacts of a certain subsidy or write-off on distributions of farms, assets and debts in non-viable TRI categories, the following analysis determines levels of subsidies by sales or TRI and D/A category needed to correct interest and principal payment shortfalls of stressed operators.

United States Data

Table VI, using data from the USDA 1985 FCRS survey, gives detailed information on cash balance levels, interest rate subsidies and other information concerning U.S. farms by sales and D/A ratio. The interest shortfall percent and principal shortfall percent lines are the percent of the interest and principal payments respectively which are not paid by the average farm. Principal payments are assumed to be 8.6 percent of total debt. The average interest rate charged in each category is that used in each category in the FCRS survey as reported in AIB #495(USDA, July, 1985). A negative cash balance indicates the amount of debt service which is not paid by an average farm in each category. Positive cash balances indicate all debt service is paid and

TABLE VI*

PER FARM INTEREST AND PRINCIPAL SHORTFALLS BY
TOTAL SALES AND D/A CATEGORY (U.S.)

D/A Ratio	0.4 to 0.7	0.7 to 1.0	≥ 1.0
<hr/>			
Total Sales Category	≥ \$500,000		
Percent of Farms	.38	.16	.11
Number of Farms	6417	2611	1827
Gross Farm Income	\$1,052,746	\$1,163,965	\$1,455,370
Government Payments	\$ 36,353	\$ 50,596	\$ 55,118
Off-Farm Income	\$ 9,178	\$ 5,330	\$ 27,963
Income from all Sources	\$1,098,277	\$1,219,891	\$1,538,411
Farm Expenses excl. Interest	\$ 886,317	\$919,499	\$1,280,246
Family Living Allow.	\$ 15,000	\$ 15,000	\$ 15,000
Total Cash Avail. for Debt Service	\$196,960	\$285,392	\$ 243,165
Interest Payment	\$119,051	\$121,006	\$ 201,989
Principal Payment	\$ 85,075	\$103,455	\$ 205,607
Cash Balance	\$- 7,166	\$ 60,931	\$-164,431
Interest Shortfall	\$ 0	\$ 0	\$ 0
Interest Shortfall %	0%	0%	0%
Principal Shortfall %	8%	0%	80%
Interest Rate Reduction Required	0%	0%	0%
Total Assets	\$1,895,790	\$1,485,297	\$1,516,403
Total Liabilities	\$989,239	\$1,202,968	\$2,390,776
% of Farms with ≤ \$0 Cash Balance	97%	37%	24%

TABLE VI (continued)

D/A Ratio	0.4 to 0.7	0.7 to 1.0	≥ 1.0
Total Sales Category \$250,000 to \$499,999			
Percent of Farms	.97	.37	.24
Number of Farms	16184	6118	3993
Gross Farm Income	\$310,423	\$319,549	\$287,014
Government Payments	\$ 23,097	\$ 17,508	\$ 17,801
Off-Farm Income	\$ 6,997	\$ 4,048	\$ 15,570
Income from all Sources	\$340,517	\$341,105	\$320,385
Farm Expenses excl. Interest	\$245,603	\$261,740	\$236,002
Family Living Allow.	\$ 15,000	\$ 15,000	\$ 15,000
Total Cash Avail. for Debt Service	\$ 79,914	\$ 64,365	\$ 69,383
Interest Payment	\$ 51,923	\$ 54,621	\$ 48,912
Principal Payment	\$ 37,291	\$ 47,596	\$ 48,667
Cash Balance	\$- 9,300	\$-37,852	\$-28,196
Interest Shortfall	\$ 0	\$ 0	\$ 0
Interest Shortfall %	0%	0%	0%
Principal Shortfall %	25%	80%	58%
Interest Rate Reduction Required	0%	0%	0%
Total Assets	\$826,339	\$686,191	\$411,779
Total Liabilities	\$433,622	\$553,443	\$565,901
% of Farms with ≤ \$0 Cash Balance	47%	69%	60%

TABLE VI (continued)

D/A Ratio	0.4 to 0.7	0.7 to 1.0	>1.0
Total Sales Category	\$100,000 to \$249,999		
Percent of Farms	2.84	1.05	.62
Number of Farms	47,411	17,583	10,391
Gross Farm Income	\$144,865	\$137,228	\$130,859
Government Payments	\$ 10,515	\$ 10,450	\$ 16,396
Off-Farm Income	\$ 8,058	\$ 8,044	\$ 4,156
Income from all Sources	\$163,438	\$155,722	\$151,411
Farm Expenses excl. Interest	\$111,411	\$116,417	\$117,400
Family Living Allow	\$ 15,000	\$ 15,000	\$ 15,000
Total Cash Avail. for Debt Service	\$ 37,027	\$ 24,305	\$ 19,011
Interest Payment	\$ 29,140	\$ 33,539	\$ 34,292
Principal Payment	\$ 23,352	\$ 29,545	\$ 30,434
Cash Balance	\$-15,465	\$-38,779	\$-45,715
Interest Shortfall	\$ 0	\$ 9,234	\$ 15,281
Interest Shortfall %	0%	28%	45%
Principal Shortfall %	66%	100%	100%
Interest Rate Reduction Required	0%	2.7%	4.3%
Total Assets	\$515,204	\$427,610	\$250,953
Total Liabilities	\$271,539	\$343,546	\$353,886
% of Farms with \leq \$0 Cash Balance	57%	71%	69%

TABLE VI (continued)

D/A Ratio	0.4 to 0.7	0.7 to 1.0	>1.0
Total Sales Category	\$40,000 to \$99,999		
Percent of Farms	3.07	1.11	.84
Number of Farms	51,285	18,450	13,982
Gross Farm Income	\$63,221	\$ 56,735	\$ 56,078
Government Payments	\$ 5,649	\$ 6,845	\$ 6,664
Off-Farm Income	\$ 7,767	\$ 7,464	\$ 9,333
Income from all Sources	\$ 76,637	\$ 70,944	\$ 72,075
Farm Expenses excl. Interest	\$ 58,564	\$ 55,503	\$ 61,043
Family Living Allo.	\$ 15,000	\$ 15,000	\$ 15,000
Total Cash Avail. for Debt Service	\$ 3,073	\$ 441	\$- 3,968
Interest Payment	\$ 16,022	\$ 16,837	\$ 15,057
Principal Payment	\$ 12,948	\$ 17,202	\$ 16,878
Cash Balance	\$-25,897	\$-33,598	\$-35,903
Interest Shortfall	\$ 12,949	\$ 16,396	\$ 15,057
Interest Shortfall %	81%	97%	100%
Principal Shortfall %	100%	100%	100%
Interest Rate Reduction Required	8.6%	8.2%	7.7%
Total Assets	\$282,566	\$236,299	\$143,610
Total Liabilities	\$150,557	\$200,025	\$196,261
% of Farms with \leq \$0 Cash Balance	70%	85%	76%

*Based on the USDA, 1985 FCRS data.

income is available for increasing family living or for capital formation. Table VII is a summary of potential interest rate subsidy costs necessary to meet the interest payments of U.S. producers in various sales and D/A categories.

Table VI shows, using data from the USDA 1985 FCRS survey, that incidence of inability to meet interest payments is not found, on the average, on farms with cash sales greater than \$250,000 (USDA, July, 1985). The interest shortfall line is the dollar amount of interest not paid.

Only 1.17 percent of all U.S. farms have sales between \$100,000 and \$250,000 and are unable to meet their interest payments (USDA, July, 1985). This number (1.17) is the sum of the products which were calculated by multiplying the percent of operators in each category by the percent of farms with zero or negative cash balances. As is shown by Table VI and Table VII, depending on D/A category, a 2.7 to 4.3 percent interest rate subsidy costing \$321.2 million is needed by the farms in the \$100,000 to \$250,000 sales category to meet their interest obligations. An average subsidy of \$11,480 would be paid to each of the farms in this category. Average per farm direct government payments for this category was \$13,084 and average farm size in acres was 1,431 in 1984. Note that after both direct government payments and an interest subsidy totaling \$24,564, no income remains to pay any principal obligations. Thus, no progress

TABLE VII

SUMMARY OF POTENTIAL COSTS OF AN INTEREST
RATE SUBSIDY FOR U.S. FARM PRODUCERS*

Sales Category	Debt/Asset Ratio			ALL
	0.4-0.7	0.7-1.0	>1.0	
(Millions of Dollars)				
≥ \$500,000	0.0	0.0	0.0	0.0
\$250,000 to \$499,999	0.0	0.0	0.0	0.0
\$100,000 to \$249,999	0.0	\$162.4	\$158.8	\$ 321.2
\$40,000 to \$99,999	\$664.1	\$302.5	\$210.5	\$1177.1
Total	\$664.1	\$464.9	\$369.3	\$1498.3
Average Subsidy Per Farm			\$13,843	

* Calculated by multiplying the average interest subsidy per farm in Table VI by the number of farms in that category.

is being made by these operators in reducing their future debt service obligations.

Slightly more farms in the \$40,000 to \$100,000 sales category require assistance. Only 3.7 percent of all farms have sales in this category and cannot pay their interest obligations. These operators need a 7.7 to 8.6 percent interest subsidy costing \$1.177 billion. Note that an 8.6 percent subsidy is equal to the interest rate that the USDA estimates these operators are paying. The average per farm subsidy payment would be \$14,061. As a comparison, average per farm direct government payments were \$5,487 and the average farm size was 1,007 acres in 1984. Note that after these subsidies, these operators are unable to make any reduction in principal obligations and many are unable to even pay all of their other operating expenses. Therefore, this interest subsidy does little to stabilize the financial condition of these operators. It simply relieves pressure until the next interest payment must be made.

The total interest rate subsidy needed for all U.S. farms with sales above \$40,000 to meet their interest payments in 1984 was nearly \$1.5 billion. This figure also represents the level of interest shortfalls possibly faced by lenders. Note that principal payment shortfalls are much more prevalent than are interest payment shortfalls.

Subsidies were not figured for farms with sales below \$40,000 because they are not widely considered to be commercial farms. On the average, all U.S. farms in all D/A

categories with sales below \$40,000 were unable to pay total production expenses let alone pay debt service requirements.

Of all U.S. farms, 1.1 percent have sales above \$250,000 and are unable to meet all of their principal obligations (Table VI). Another 2.8 percent of all farms have sales of \$100,000 to \$250,000 and are unable to meet their principal obligations. A maximum of 3.73 percent of all farms have sales between \$40,000 and \$99,999 and are unable to make any principal payments on their loans. On the average, farms with sales between \$40,000 and \$250,000 are not making financial progress because they are unable to pay 100 percent of interest obligations, let alone make principal payments. Therefore, the financial condition of these farms is worsening as unpaid interest increases principal balances for the next payment period.

Table VIII provides a summary of the dollar amount of debt service (both principal and interest) shortfalls on U.S. farms. The percent of total column gives the percent of total debt service which could not be paid by the operator. Table IX provides a summary of the dollar amounts of debt which need to be written off to enable U.S. farmers to make all of their debt service payments. The percent of total column is the percent of total debt on the average farm in that category which would need to be written off to enable the farm operator to pay principal and interest obligations. Note that percentage shortfalls increase tremendously as sales category decreases and D/A increases.

TABLE VIII

SUMMARY OF TOTAL DEBT SERVICE SHORTFALLS ON
U.S. FARMS BY D/A RATIO AND SALES /1

Sales Category	0.4 to 0.7		0.7 to 1.0		> 1.0	
	Total Shrtfl/2	% of Total/3	Total Shrtfl	% of Total	Total Shrtfl	% of Total
	(Dollars per farm)					
> \$500,000	\$ 7,166	4%	-	-	\$164,431	40%
\$250,000 - \$499,999	\$ 9,300	10%	\$37,852	37%	\$ 28,196	29%
\$100,000 - \$249,999	\$15,465	30%	\$38,779	61%	\$ 45,715	71%
\$ 40,000 - \$ 99,999	\$25,897	89%	\$33,598	99%	\$ 31,935	100%

1/Based on the USDA, 1985 FCRS data.

2/Dollars of debt service (principal and interest) not paid by a particular farm operation.

3/Percentage of the total debt service payment which is not paid.

TABLE IX
 PRINCIPAL WRITEDOWN REQUIRED SO ALL DEBT
 SERVICE ON U.S. FARMS CAN BE PAID
 BY D/A RATIO AND SALES

Sales Category	< 0.4		0.4 to 0.7		>0.7	
	Dollar Wrtwn	% of Debt	Dollar Wrtwn	% of Debt	Dollar Wrtwn	% of Debt
	(Dollars per farm)*					
> \$500,000	\$ 34,786	4%	-	-	\$967,241	41%
\$250,000 - \$499,999	\$ 45,211	10%	\$205,717	37%	\$163,930	29%
\$100,000 - \$249,999	\$ 80,130	30%	\$210,755	61%	\$249,809	71%
\$ 40,000 - \$ 99,999	\$134,880	89%	\$192,635	99%	\$196,261	100%

* These values were calculated by dividing the dollar shortfall in Table VIII by the interest rate plus the principal repayment rate.

Oklahoma Data

United States data were only available sorted by total sales category and D/A ratio. When the Oklahoma data were sorted by total sales and D/A ratio, average cash balance levels in each sales and D/A category were high enough that no interest payment shortfalls were detected. It is therefore expected that sorting USDA data by TRI would identify more operators in need of assistance. Sorting the Oklahoma data by TRI category was necessary to find any group of farms which had negative average cash balances and were therefore unable to meet their interest payments in 1985. In all of the following cases an interest rate of 12 percent and principal repayment rate of 8.6 percent is assumed.

When the Oklahoma survey was sorted by TRI, the average subsidy needed by farms with negative TRI was \$35,160 (Table X). The total subsidy needed to meet interest payments for these farms with negative or zero TRI was \$83.1 million. Table XI gives a summary of these potential subsidy costs. This represents nearly 100 percent of all interest paid by these farms. This category contains 3.3 percent of Oklahoma farms. Average direct government payments to these farms was \$3,376 in 1985.

It should be noted from Table X that the farmers in the TRI categories below \$0 are, after the interest subsidies averaging \$35,160 per farm, unable to provide for family living requirements and pay all other farm expenses. Even

TABLE X

INTEREST AND PRINCIPAL SHORTFALLS BY
TRI AND D/A CATEGORY (OK)

D/A Ratio	< 0.4	0.4 to 0.7	> 0.7
<hr/>			
Total Residual Income Category	≤ \$0		
Percent of Farms	1.33	1.00	1.00
Number of Farms	944	710	710
Gross Farm Income	\$120,360	\$ 71,094	\$369,521
Government Payments	\$ 3,462	\$ 7,500	\$ 5,277
Off-Farm Income	\$ 9,090	\$ 5,710	\$ 22,180
Income from all Sources	\$132,912	\$ 84,304	\$396,978
Farm Expenses excl. Interest	\$141,586	\$ 80,456	\$376,502
Family Living Allow.	\$ 15,000	\$ 15,000	\$ 15,000
Total Cash Avail. for Debt Service	\$-23,674	\$-11,152	\$ 5,476
Interest Payment	\$ 15,976	\$ 25,810	\$ 75,492
Principal Payment	\$ 11,449	\$ 18,497	\$ 54,103
Cash Balance	\$-51,099	\$-55,459	\$-124,119
Interest Shortfall	\$ 15,976	\$ 25,810	\$ 70,016
Interest Shortfall %	100%	100%	92.7%
Principal Shortfall %	100%	100%	100%
Interest Rate Reduction Required	12%	12%	11.1%
Total Assets	\$817,426	\$396,229	\$ 542,846
Total Liabilities	\$133,135	\$215,086	\$ 629,102

TABLE X (continued)

D/A Ratio	<0.4	0.4 to 0.7	>0.7
Total Residual Income Category \$1 to \$14,999			
Percent of Farms	7.31	1.16	.50
Number of Farms	5195	824	355
Gross Farm Income	\$ 19,846	\$ 57,925	\$ 52,268
Government Payments	\$ 908	\$ 2,241	\$ 207
Off-Farm Income	\$ 5,195	\$ 5,457	\$ 7,425
Income from all Sources	\$ 25,949	\$ 65,623	\$ 59,900
Farm Expenses excl. Interest	\$ 15,998	\$ 46,282	\$ 1,440
Family Living Allow.	\$ 15,000	\$ 15,000	\$ 15,000
Total Cash Avail. for Debt Service	\$ -5,049	\$ 4,341	\$ 43,460
Interest Payment	\$ 2,464	\$ 13,305	\$ 49,442
Principal Payment	\$ 1,766	\$ 9,535	\$ 35,433
Cash Balance	\$- 9,279	\$-18,499	\$-41,415
Interest Shortfall	\$ 2,464	\$ 8,964	\$ 5,982
Interest Shortfall %	100%	67%	12%
Principal Shortfall %	100%	100%	100%
Interest Rate Reduction Required	12.0%	8.1%	1.5%
Total Assets	\$197,057	\$194,516	\$296,619
Total Liabilities	\$ 20,536	\$110,876	\$412,015

TABLE X (continued)

D/A Ratio	<0.4	0.4 to 0.7	>0.7
Total Residual Income Category \$15,000 to \$29,999			
Percent of Farms	6.64	1.00	1.16
Number of Farms	4714	710	824
Gross Farm Income	\$ 35,666	\$ 24,175	\$ 51,014
Government Payments	\$ 1,618	\$ 3,483	\$ 1,500
Off-Farm Income	\$ 17,139	\$ 17,150	\$ 3,943
Income from all Sources	\$ 54,423	\$ 44,808	\$ 56,457
Farm Expenses excl. Interest	\$ 25,906	\$ 5,453	\$ 22,474
Family Living Allow.	\$ 15,000	\$ 15,000	\$ 15,000
Total Cash Avail. for Debt Service	\$ 13,517	\$ 24,355	\$ 18,983
Interest Payment	\$ 4,445	\$ 13,547	\$ 13,169
Principal Payment	\$ 3,186	\$ 9,709	\$ 9,438
Cash Balance	\$ 5,886	\$ 1,099	\$ -3,624
Interest Shortfall	\$ 0	\$ 0	\$ 0
Interest Shortfall %	0%	0%	0%
Principal Shortfall %	0%	0%	38%
Interest Rate Reduction Required	0%	0%	0%
Total Assets	\$299,634	\$221,994	\$ 109,714
Total Liabilities	\$ 37,044	\$112,892	\$ 109,743

TABLE X (continued)

D/A Ratio	<0.4	0.4 to 0.7	>0.7
<hr/>			
Total Residual Income Category	\$30,000 to \$49,999		
Percent of Farms	6.98	2.99	3.16
Number of Farms	4956	2123	2244
Gross Farm Income	\$ 33,206	\$ 69,758	\$ 48,841
Government Payments	\$ 2,682	\$ 7,855	\$ 2,339
Off-Farm Income	\$ 26,329	\$ 18,738	\$ 33,738
Income from all Sources	\$ 62,217	\$ 96,351	\$ 84,918
Farm Expenses excl. Interest	\$ 16,855	\$ 36,330	\$ 20,061
Family Living Allo.	\$ 15,000	\$ 15,000	\$ 15,000
Total Cash Avail. for Debt Service	\$ 30,360	\$ 45,021	\$ 49,857
Interest Payment	\$ 6,107	\$ 19,254	\$ 23,122
Principal Payment	\$ 4,376	\$ 13,767	\$ 16,571
Cash Balance	\$ 19,879	\$ 11,968	\$ 10,164
Interest Shortfall	\$ 0	\$ 0	\$ 0
Interest Shortfall %	0%	0%	0%
Principal Shortfall %	0%	0%	0%
Interest Rate Reduction Required	0%	0%	0%
Total Assets	\$324,669	\$301,809	\$206,074
Total Liabilities	\$ 50,889	\$160,451	\$192,685

TABLE X (continued)

D/A Ratio	<0.4	0.4 to 0.7	>0.7
Total Residual Income Category \geq \$50,000			
Percent of Farms	12.79	5.32	3.16
Number of Farms	9081	3777	2244
Gross Farm Income	\$111,960	\$140,905	\$225,409
Government Payments	\$ 10,125	\$ 12,350	\$ 16,792
Off-Farm Income	\$ 47,974	\$ 44,518	\$ 54,522
Income from all Sources	\$170,059	\$197,773	\$296,723
Farm Expenses excl. Interest	\$ 58,935	\$ 61,052	\$112,173
Family Living Allow.	\$ 15,000	\$ 15,000	\$ 15,000
Total Cash Avail. for Debt Service	\$ 96,124	\$121,721	\$169,550
Interest Payment	\$ 13,234	\$ 30,617	\$ 62,703
Principal Payment	\$ 9,485	\$ 21,942	\$ 44,937
Cash Balance	\$ 73,396	\$ 69,162	\$ 61,910
Interest Shortfall	\$ 0	\$ 0	\$ 0
Interest Shortfall %	0%	0%	0%
Principal Shortfall %	0%	0%	0%
Interest Rate Reduction Required	0%	0%	0%
Total Assets	\$668,240	\$500,996	\$605,749
Total Liabilities	\$110,285	\$255,143	\$522,525

TABLE XI
 SUMMARY OF POTENTIAL COSTS OF AN INTEREST
 RATE SUBSIDY FOR OKLAHOMA PRODUCERS*

Residual Income Category	Debt/Asset Ratio			ALL
	<0.4	0.4 - 0.7	>0.7	
(Millions of Dollars)				
< \$0	\$15.1	\$18.3	\$49.7	\$ 83.1
\$1 to \$14,999	\$12.8	\$ 7.4	\$ 2.1	\$ 22.3
\$15,000 to \$29,999	0.0	0.0	0.0	0.0
\$30,000 to \$49,999	0.0	0.0	0.0	0.0
≥ \$50,000	0.0	0.0	0.0	0.0
Total	\$27.9	\$25.7	\$51.8	\$105.2
Average Subsidy Per Farm			\$12,045	

* Calculated by multiplying the average interest subsidy per farm in Table X by the number of farms in that category.

with all of their interest payments forgiven or paid by a subsidy, in addition to direct government payments, farmers in these categories are unable to make progress in reducing their principal obligations. They consequently show no ability to eventually correct their situation of excessive debt. Rather, they are unable to pay expenses other than interest and their family living needs. This will cause principal obligations to increase as operating funds advanced are inadvertently used to pay family living expenses and are not repaid each year.

The subsidy cost for farms in the \$1 to \$15,000 income category was \$22.3 million and represents nearly 54 percent of total interest obligations of this category. An average interest rate subsidy of 10.9 percentage points was required and would average \$3,501 per farm. This category contains 9.0 percent of Oklahoma farms. Average per farm direct government payments for these farms was \$688 in 1985.

Table X illustrates that if all of the interest expenses of farmers in the \$1 to \$15,000 TRI category were paid by a subsidy, these farmers would be able to make some progress on reducing their principal obligations. Before the subsidy, no principal payments can be made. Operators in this residual income category are only able to make principal payments equaling 4.6 percent of their total liabilities after an interest rate subsidy pays all interest payments.

No interest shortfalls were found, on the average, in any

TRI category above \$15,000. Operators in all D/A categories with a TRI above \$15,000 are able to meet all of their principal and interest obligations without any subsidies with one exception. Farms with a D/A ratio above 0.7 in the \$15,000 to \$30,000 TRI category are making principal payments equal to 5.3 percent of their total debt.

Table XII provides a summary of the dollar amount of debt service (both principal and interest) shortfalls on Oklahoma farms. The percent of total column gives the percent of total debt service which could not be paid by the operator. Table XIII provides a summary of the dollar amounts of debt which need to be written off to enable Oklahoma farmers to make all of their debt service payments. The percent of total column is the percent of total debt on the average farm in that category which would need to be written off to enable the farm operator to pay principal and interest obligations.

Conclusions

This analysis illustrates, by the small percentage of operators needing assistance and by the large subsidies needed by these operators while their neighbors need no subsidies, coupled with the size of direct government payments, that problems of those financially stressed in the agricultural sector go deeper than excessive debt. Inability of regression and other analysis discussed herein to identify measurable variables to explain incidence of

TABLE XII

SUMMARY OF TOTAL DEBT SERVICE SHORTFALLS ON
OKLAHOMA FARMS BY D/A RATIO AND TRI

TRI Category	Debt/Asset Ratio					
	< 0.4		0.4 to 0.7		>0.7	
	Total	% of	Total	% of	Total	% of
	Shrtfl	Total	Shrtfl	Total	Shrtfl	Total
(Dollars per farm)						
< \$0	\$27,425	100%	\$44,307	100%	\$124,119	96%
\$1 -						
\$14,999	\$ 4,320	100%	\$18,499	81%	\$ 41,415	49%
\$15,000 -						
\$29,999	-	-	-	-	\$ 3,624	16%
≥ \$30,000	-	-	-	-	-	-

TABLE XIII

PRINCIPAL WRITEDOWN REQUIRED SO ALL DEBT
SERVICE ON OKLAHOMA FARMS CAN BE
PAID BY D/A RATIO AND TRI

TRI Category	Debt/Asset Ratio					
	< 0.4		0.4 to 0.7		>0.7	
	Dollar	% of	Dollar	% of	Dollar	% of
	Wrtwn	Debt	Wrtwn	Debt	Wrtwn	Debt
(Dollars per farm)						
< \$0	\$133,135	100%	\$215,086	100%	\$602,519	96%
\$1 -						
\$14,999	\$ 20,536	100%	\$ 89,801	81%	\$201,044	49%
\$15,000 -						
\$29,999	-	-	-	-	\$ 17,592	16%
≥ \$30,000	-	-	-	-	-	-

financial stress further points to the need to identify causes in addition to excessive debt to fully explain current financial distress.

This analysis also indicates that TRI or even total sales is a more reliable indicator of financial viability than is D/A ratio. Percentage interest rate subsidies needed by a particular operator change much more between a TRI or sales category than they do within a TRI or sales category as D/A ratio changes. Absolute dollar level of a subsidy needed increases as D/A ratio increases, to greater extent because of actual increases in dollar levels of debt, rather than because of an increase in subsidy needed as a percentage of total debt.

Debt Guarantee

By increasing uncertainty and instability since the early 1970's, macro-economic and agricultural policies have contributed to stress felt by operators with high D/A ratios who also have high repayment ability. It may be reasonable to assume that public programs should be initiated to help alleviate some stress which public policies may have inadvertently caused (Tweeten and Pongtanakorn). Declines in asset values have placed many operators in D/A positions which lenders consider to be highly risky. This has caused lenders to pressure operators by restricting credit flow, requiring additional collateral or mortgages or by requiring some type of asset restructuring or sale. These types of

requirements could cause profitability and efficiency declines which could lead to eventual liquidation of a formerly viable operator. A debt guarantee would provide relief to these operators by ensuring that they continue to receive credit needed to operate their farms without forcing asset restructuring which could impede efficiency or decrease profitability.

Tables XIV and XV give summaries of the potential volume of two guarantee programs which include farms in D/A categories greater than 0.7, sales greater than \$40,000 and all TRI categories. The total volume column of Table XIV and XV is the expected volume of a guarantee program which would guarantee all of the debt of U.S. and Oklahoma operators with a D/A ratio greater than 0.7. The total volume to 0.7 D/A column is the expected volume of a guarantee which would only guarantee the debt of the operators found in the previous column down to the level where the farmer's D/A ratio is equal to 0.7. The second approach has a much lower potential cost and potential exposure to the guaranteeing agency. Such a limited guarantee could induce the lender to take a more active role and interest in a guaranteed loan through active attention and financial counseling and not simply turn a 'problem' over to the government agency.

In Table XIV and XV, an '*' indicates the categories of operators which are proposed to be eligible for the loan guarantee. The guarantee is proposed to assist operators in

TABLE XIV
 POTENTIAL VOLUME OF A DEBT GUARANTEE PROGRAM
 FOR U.S. PRODUCERS BY SALES
 CATEGORY AND D/A RATIO

Sales Category	D/A Ratio		Total Volume to 0.7 D/A/2	Total Volume /2
	0.7 - 1.0 /1	>1.0 /1		
> \$500,000				
# of Operators	2,611*	1,827*		
Total Assets (TA)	1,485,297	1,516,403		
Total Debt	1,202,968	2,390,776		
70 % of TA	1,039,708	1,061,482		
Guarantee Required			2.855	7.509
\$250,000 to \$499,999				
# of Operators	6,118*	3,993*		
Total Assets (TA)	686,191	411,779		
Total Debt	553,443	565,901		
70 % of TA	73,109	277,656		
Guarantee Required			1.556	5.646
\$100,000 to \$249,999				
# of Operators	17,583*	10,391*		
Total Assets (TA)	427,610	250,953		
Total Debt	343,546	353,886		
70 % of TA	299,327	175,667		
Guarantee Required			2.641	9.811
\$ 40,000 to \$ 99,999				
# of Operators	18,450	13,982		
Total Assets (TA)	236,299	143,610		
Total Debt	200,025	196,261		
70 % of TA	165,409	100,527		
Guarantee Required			1.980	6.435
Total Potential \$ Volume of Guarantees			\$9.032	\$29.401

/1 Average per farm values.

/2 Aggregate totals in billions of dollars.

TABLE XV
 POTENTIAL VOLUME OF A DEBT GUARANTEE PROGRAM
 FOR OKLAHOMA PRODUCERS BY TRI
 CATEGORY AND D/A RATIO

TRI Category	D/A Ratio		Total Volume to 0.7 D/A/2	Total Volume /2
	0.4 - 0.7 /1	>0.7 /1		
<u>< \$0</u>				
# of Operators	710	710		
Total Assets (TA)	396,229	542,846		
Total Debt	215,086	629,102		
70 % of TA	277,360	379,992		
Guarantee Required (per farm)	(249,110)		176.9	446.7
<u>\$1 to 14,999</u>				
# of Operators	824	355*		
Total Assets (TA)	194,516	296,619		
Total Debt	110,876	412,015		
70 % of TA	136,161	207,633		
Guarantee Required (per farm)	(204,382)		72.6	146.3
<u>\$15,000 to \$29,999</u>				
# of Operators	710	824*		
Total Assets (TA)	221,994	109,714		
Total Debt	112,892	109,743		
70 % of TA	155,396	76,800		
Guarantee Required (per farm)	(30,704)		25.3	84.2
<u>\$30,000 to \$49,999</u>				
# of Operators	2,123	2,244*		
Total Assets (TA)	201,809	206,074		
Total Debt	160,451	192,685		
70 % of TA	211,266	144,252		
Guarantee Required (per farm)	(48,433)		108.7	432.4
<u>> \$50,000</u>				
# of Operators	3,777	2,244*		
Total Assets (TA)	500,966	605,749		
Total Debt	255,143	522,525		
70 % of TA	350,676	424,024		
Guarantee Required (per farm)	(98,501)		221.0	1172.5
Total Potential \$ Volume of Guarantees			\$604.5	\$2282.1

/1 Average per farm values.

/2 Aggregate totals in millions of dollars.

high sales and TRI categories who have high D/A ratios. In this way shifting of losses from the private to the public sector by guaranteeing operators lacking repayment ability is less likely to occur. If payment of all expenses is achieved by operators in the \$1 to \$15,000 TRI category and \$100,000 to \$249,999 sales category following a modest interest rate subsidy these operators would also be eligible for a guarantee. Alternatively the guarantee could also assist these operators if repayment ability is demonstrated following asset restructuring through private sale or purchase by an asset purchasing entity. The major purpose of this program is to ensure credit flow to operators with high repayment ability who also have high D/A ratios.

Total assets and total liabilities in these tables are the average assets or liabilities of a farm in a particular category. The 70 percent of total assets line provides values representing the maximum amount of debt a farm can carry and have a D/A ratio of 0.7 percent or less. Subtracting this figure from total liabilities gives the amount of liabilities which must be guaranteed so that all debt in excess of a 0.7 D/A ratio is included in the program. Since nearly 12 percent of all agricultural lending is done by FmHA, these estimates could be reduced by 12 percent or more to represent new volume for a federal loan guarantee program.

While data in Table XV are presented for Oklahoma operators in the 0.4 - 0.7 D/A categories, these operators

are not included in the projected volume of the program because it is assumed that levels of equity on these farms are high enough so that a guarantee is not needed to reduce lender risk in order to maintain needed credit flow.

No write-off of debt by the lender is included here as a program requirement because an equivalent amount of assistance provided by a lender in the form of an interest rate subsidy has a greater impact on the viability of a farm and its ability to meet its cash flow obligations in the short run. A large, federally sponsored, debt write-off is an equity transfer accruing to a stressed operator and would provide the greatest benefit to the operator and lender if liquidation were imminent. This could potentially create much abuse of the program if a federal program shared in the costs of principal reductions.

The following example illustrates the difference in costs and benefits of an interest rate subsidy and debt write-off. A \$100,000 loan and an interest rate of 10 percent is assumed. The proposed write-off is also 10 percent.

Debt write-off of 10 percent by lender

$$\$100,000 \times 10\% = \$10,000$$

New interest expense to borrower

$$\$90,000 \times 10\% = \$9,000$$

$$\text{cost to lender} = \$10,000 \text{ (one time)}$$

$$\text{benefit to borrower} = \$1,000 \text{ (per year)}$$

Interest rate subsidy of 2 percent

$$\$100,000 \times 2\% = \$2,000$$

New interest expense to borrower

$$\$100,000 \times 8\% = \$8,000$$

$$\text{cost to lender} = \$2,000 \text{ (per year)}$$

$$\text{benefit to borrower} = \$2,000 \text{ (per year)}$$

Increased benefit to borrower	100%
Decreased cost to lender	500%

An interest rate write-down by a lender has a lower initial lender cost and provides more financial stabilization to the borrower currently, when it is needed the most. Interest rate subsidies should also be a more attractive option to lenders since this assistance can be recognized gradually out of earnings rather than as a debt write-off which must come out of capital. A requirement for the lender to provide an interest rate write-down to accompany a loan guarantee for a specified number of years, or for as long as the guarantee is in effect may be preferred to a requirement that the lender decrease the principal balance of a loan given that an interest rate subsidy would not remain in effect indefinitely.

The above example only compares benefits to the lender and borrower in the year in which the adjustment takes place. The size of the write-off and number of years an interest rate subsidy is in effect would greatly impact which option would be preferred over a long period.

Conclusion

Extensive demand for a debt guarantee program is likely and, in Oklahoma, could include up to 8.0 percent of Oklahoma farms and one-third of Oklahoma farm debt. Over 19 percent of U.S. debt held by 2.6 percent of U.S. farmers could also be guaranteed. A guarantee program would

potentially cost taxpayers little other than administration costs if farms are required to project positive cash flow under current depressed conditions to be eligible. Strict enforcement of this requirement would make default and additional costs unlikely. This program could be justified in that it may be needed to guarantee credit flow to Oklahoma's most efficient farmers who may also have high leverage positions and may face restricted credit availability due to asset value declines which are beyond their control.

A debt guarantee program has several advantages to both the agricultural sector and the general public, given that some type of assistance will transpire. Guidelines which require a certain level of TRI following asset restructuring, interest rate subsidy, or loan restructuring will help to contain costs of this program due to borrower default. Guarantees targeted to efficient producers in high D/A and TRI or sales categories helps to promote and sustain efficiency in the sector. Voluntary and/or required interest rate subsidies granted by a lender after a guarantee could further help to stabilize operators.

If actual guidelines are written for a guarantee program, the debt adjustment program, administered by the FmHA in 1984, needs to be reviewed to identify factors and guidelines which caused minimal utilization of this program. This consideration, in addition to cost containment need to be addressed to make a debt guarantee a viable portion of an

assistance package, should one be developed.

Asset Purchasing Entity

In a "normal" year, only 2 to 4 percent of farm real estate assets are transferred indicating how illiquid the agricultural land market can be (Jolly and Doye). Seventy-five percent of the assets on the average farm in the U.S. are real estate assets, further frustrating attempts by farmers to regain financial stability by restructuring their balance sheets (U.S. General Accounting Office, March, 1985). In 1984, 13.7 percent of Oklahoma farm assets are real estate assets which were held by farmers with a D/A ratio above 0.7 or by farmers with some debt and a TRI below \$15,000. These farms hold 49.5 percent of Oklahoma farm debt. Asset restructuring through some degree of liquidation on these farms is needed or will likely be needed in the future.

The 13.7 percent of real estate assets cited earlier does not include all of the 2 to 4 percent of operators who, in a normal year, discontinue farming for health, retirement or other non-financial reasons. In light of this psychological, if not actual, pressure on real estate values, it is not surprising that these values would drop an average of 60 percent in some states over the past five years. Harl feels that enough assets will be liquidated so that public intervention will be necessary to prevent economic damage to rural communities (Proposal for Interim

Land Ownership). The debt guarantee which was discussed earlier could reduce the level of real estate asset sales needed to 8.1 percent of Oklahoma farm assets.

For reasons cited above, many individuals have suggested that a federal program be initiated to increase liquidity in the agricultural real estate market and to support market values through purchase of real estate assets. Harl proposes an Agricultural Finance Corporation (AFC), which would function to provide a mechanism to purchase assets, primarily land, which are subject to foreclosure or bankruptcy, being held in inventory by lenders, or are being held by farmers unable to service debt. The AFC could be chartered similar to the Commodity Credit Corporation. Such proposed programs would provide an alternative buyer and could help reduce the tendency for land values to overreact downward. These alternatives would also help alleviate downward pressure on machinery and other asset prices since real estate transfers could more effectively meet restructuring requirements. In this way a farmer could retain the 'tools' (machinery and equipment) he needs to continue farming by renting or leasing real estate assets.

The total value of real estate assets held by Oklahoma farmers which have TRI below \$15,000 and some debt is \$2.05 billion and represents 8.1 percent of Oklahoma farm assets (Table XVI). This could represent a lower bound for the estimated value of real estate that an asset purchasing entity would acquire in Oklahoma. A 20 percent downpayment

TABLE XVI
 POTENTIAL VOLUME FOR AN ASSET PURCHASING
 ENTITY IN OKLAHOMA BY D/A AND TRI

TRI	D/A Ratio			ALL
	<0.4	0.4 to 0.7	>0.7	
(Millions of Dollars)				
<u>< \$0</u>				
Real Estate Value	\$ 578.7	\$ 211.0	\$ 289.1	\$1,078.8
20 % Down-payment	\$ 115.7	\$ 42.2	\$ 58.0	\$ 215.9
Yearly Int. Payment	\$ 55.6	\$ 20.2	\$ 27.8	\$ 103.6
Yearly Prin. Payment	\$ 39.8	\$ 14.6	\$ 19.9	\$ 74.3
<u>\$ 1 to \$14,999</u>				
Real Estate Value	\$ 767.2	\$ 120.2	\$ 79.0	\$ 966.4
20 % Down-payment	\$ 153.4	\$ 24.0	\$ 15.8	\$ 193.2
Yearly Int. Payment	\$ 73.7	\$ 11.5	\$ 7.6	\$ 92.9
Yearly Prin. Payment	\$ 52.8	\$ 8.2	\$ 5.4	\$ 66.4
<u>\$15,000 to \$29,999</u>				
Real Estate Value	\$1059.4	\$ 118.2	\$ 67.8	\$1,245.4
20 % Down-payment	\$ 211.9	\$ 23.6	\$ 13.6	\$ 249.1
Yearly Int. Payment	\$ 101.7	\$ 11.3	\$ 6.5	\$ 119.5
Yearly Prin. Payment	\$ 72.9	\$ 8.1	\$ 4.7	\$ 85.7
<u>\$30,000 to \$49,999</u>				
Real Estate Value	\$1206.8	\$ 480.6	\$ 346.8	\$2,034.2
20 % Down-payment	\$ 241.4	\$ 96.1	\$ 69.4	\$ 406.9
Yearly Int. Payment	\$ 115.9	\$ 46.1	\$ 33.3	\$ 195.3
Yearly Prin. Payment	\$ 83.0	\$ 33.1	\$ 23.9	\$ 140.0

TABLE XVI (continued)

TRI	D/A Ratio			
	<0.4	0.4 to 0.7	>0.7	ALL
<u>> \$50,000</u>				
Real Estate Value	\$4551.2	\$1419.2	\$1019.5	\$6,989.9
20 % Down-payment	\$ 910.2	\$ 283.8	\$ 203.9	\$1,398.0
Yearly Int. Payment	\$ 436.9	\$ 136.2	\$ 97.9	\$ 671.0
Yearly Prin. Payment	\$ 313.1	\$ 97.6	\$ 70.1	\$ 480.9
<u>All</u>				
Real Estate Value	\$8163.3	\$2349.2	\$1802.2	\$12,314.7
20 % Down-payment	\$1632.6	\$ 469.7	\$ 360.7	\$2,463.1
Yearly Int. Payment	\$ 783.8	\$ 225.3	\$ 173.1	\$1,182.3
Yearly Prin. Payment	\$ 561.6	\$ 161.5	\$ 124.0	\$ 847.3

on the \$2.05 billion of Oklahoma real estate would be \$409 million. The remaining debt service obligations, assuming repayment schedules comparable to current schedules, would be \$141 million principal and \$197 million interest for the first year. These obligations would continue until the properties are paid off, sold or repurchased by the original owner. Farms in high TRI categories which may be under pressure to sell assets because of a high D/A ratio are envisioned to be assisted by a guarantee program and are not included in this estimate. Property held by lenders and individuals wishing to restructure could also be eligible for purchase by an asset purchasing entity.

U.S. data indicates that \$78.6 billion of U.S. real estate could be eligible for the program (Table XVII). This is the real estate value of all farms with a D/A ratio above 0.4 and a sales level between \$40,000 and \$249,999. A 20 percent downpayment would be \$15.7 billion. Principal and interest payments would be \$6.8 billion and \$8.0 billion respectively next year assuming payment rates in the July, 1985 AIB #495 (USDA, July, 1985).

If the program were to simply pay a 20 percent downpayment to current owners who have an equity position in a property (possibly after a principal reduction from the lender because of the decreased risk associated with guaranteed payment) and then take over debt service obligations currently in effect, direct costs of the program could be spread over several years. In many instances, a

TABLE XVII
 POTENTIAL VOLUME FOR AN ASSET PURCHASING
 ENTITY BY D/A AND SALES (U.S.)

Sales	D/A Ratio			
	0.7 To 1.0	> 1.0	ALL	
(Billions of Dollars)				
<u>> \$500,000</u>				
Real Estate Value	\$ 5.475	\$ 3.933	\$ 9.408	
20 % Down-payment	\$ 1.095	\$.787	\$ 1.882	
Yearly Int. Payment	\$.460	\$.395	\$.855	
Yearly Prin. Payment	\$.471	\$.338	\$.809	
<u>\$250,000 to \$499,999</u>				
Real Estate Value	\$ 5.938	\$ 2.313	\$ 8.251	
20 % Down-payment	\$ 1.188	\$.463	\$ 1.651	
Yearly Int. Payment	\$.581	\$.199	\$.780	
Yearly Prin. Payment	\$.511	\$.199	\$.710	
	<u>0.4 to 0.7</u>	<u>0.7 to 1.0</u>	<u>>1.0</u>	
<u>\$100,000 to 249,999</u>				
Real Estate Value	\$34.625	\$10.642	\$ 3.702	\$48.969
20 % Down-payment	\$ 6.925	\$ 2.128	\$.740	\$ 9.793
Yearly Int. Payment	\$ 3.705	\$ 1.043	\$.359	\$ 5.107
Yearly Prin. Payment	\$ 2.978	\$.915	\$.318	\$ 4.211
<u>\$40,000 to \$99,999</u>				
Real Estate Value	\$20.513	\$ 6.246	\$ 2.853	\$29.612
20 % Down-payment	\$ 4.103	\$ 1.249	\$.571	\$ 5.923
Yearly Int. Payment	\$ 2.174	\$.525	\$.220	\$ 2.919
Yearly Prin. Payment	\$ 1.764	\$.537	\$.245	\$ 2.546

TABLE XVII (continued)

Sales	D/A Ratio			ALL
	0.4 to 0.7	0.7 to 1.0	>1.0	
<u>ALL</u>				
Real Estate Value	\$55.138	\$28.301	\$12.801	\$96.240
20 % Down-payment	\$11.028	\$ 5.660	\$ 2.561	\$19.249
Yearly Int. Payment	\$ 5.879	\$ 2.609	\$ 1.173	\$ 9.667
Yearly Prin. Payment	\$ 4.742	\$ 2.434	\$ 1.100	\$ 8.276

simple assumption of payment obligations (possibly after a principal reduction raised by the farmer because of a negative equity position) in exchange for title to the property may be appropriate. Having flexibility built into such a program could increase program effectiveness and decrease program costs as purchase agreements were tailored to a borrower's needs within some guidelines surrounding market value determination.

Determining if properties should be appraised at current market values or at a "normal" value, such as was done by the Land Bank Commissioner program in the 1930's, is also an issue. The higher appraised, or "normal", value would provide more relief to operators and failing lending institutions but could serve to transfer private sector losses to the public sector, an effect which may not be desirable. Setting prices at a "normal" market value could potentially raise barriers to entry for young or expanding commercial farmers. Depending on how properties are transferred back to the private sector, the program could also have destabilizing effects when properties are resold if excessive amounts of land are liquidated in a short period. A large real estate inventory held by the federal government could also have a psychologically depressing effect on asset markets since farmers and investors will know a large amount of government acquired properties will be liquidated at a certain time at a price that could set the market price for the entire real estate market in a

locality.

Appropriations necessary to fund an assistance project of this magnitude could potentially be raised on bond markets. If a certain life in number of years is specified by such a program, including a time period of orderly liquidation of properties to private individuals, bonds could be sold with similar maturities to the program. A type of formula which relates bond payoff to real estate market values at maturity could help reduce potential costs to taxpayers and spread some risk of the program to the bond purchaser. If real estate values increased the bond holder would share in that increase; if real estate values fall, the bond holder would share in a certain percentage of that loss thereby reducing the potential costs of the program to taxpayers.

A benefit which could be an aside to the objectives contained here is that land acquired by an asset purchasing entity could be idled to a conservation use i.e. planted to a cover crop such as native grasses, and removed from production. This could be part of a supply management and resource conservation effort to reduce massive U.S. grain stocks and protect fertility.

Conclusions

Lins et al. feel an asset purchasing entity is no longer needed because of a contention that land values have stabilized (Programs to Alter Lender Risks). Given the large decline in land values throughout much of the corn

belt and wheat producing states from February of 1985 and February of 1986, it is not clear that a decline will not be experienced again in 1986-1987. Nearly all literature addressing farm financial stress has indicated that a very high degree of asset and liability restructuring is still pending since very little of the necessary restructuring has occurred. Real estate assets still need to be sold into a market for cash, where current market conditions and uncertainty do not make that cash readily available. A general lack of farmer confidence in the future of agriculture and in the ability of farm programs to alleviate financial stress would also make a turnaround in the real estate value slide unlikely.

Without further declines in asset values, the final costs of this program could be negative. In other words, if current market prices are paid for properties and if rent is collected from these properties until they are resold, upward appreciation in land values in the future could repay all costs of the program. Given potential assistance levels and levels of government program payments to agricultural producers, collection of a profit by the public sector on one segment of this program is not unreasonable. A sharing of risk in real estate value changes with bond holders could help to decrease risk to the purchasing agency and decrease costs of the program given negative real estate value changes occur.

If the agricultural economy does not rebound in the near

future this program will have the greatest impact on alleviating financial stress in the long run, ie. reducing loss of net worth, than will any other program. If economic conditions do not improve, other program segments are not likely to provide long term relief to financially stressed operators and rural communities. If depressed economic conditions continue, support of asset values over an extended period could greatly ease the transition of unviable operators to non-farm employment and protect the viability of rural communities as a whole.

Coordinated Financial Assistance

In order, as a first priority, to minimize public outlays and risk to a government assistance program, and to maximize the possible benefit of funds committed to financial assistance, a combination of assistance options should be implemented to best achieve objectives of each sector involved, ie. reasonable stabilization of the financial condition of largest number of operators at lowest taxpayer cost and with minimum interference of long run fundamentals. An assistance package would thereby seem to be the most logical program to initiate. This approach would be consistent with the triage approach suggested by Paarlberg in which farm operators should be divided into categories dependant on their chances of survival (Paarlberg, 1986). The three categories he related were: (1) those mortally wounded and unable to survive (TRI less than or equal to

\$0), (2) those who with help could survive (TRI \$1-\$15,000), and (3) those who could at least for a time survive without help (TRI greater than \$15,000). Even with such tailor made assistance available, note that the farms in categories which as a whole are less efficient would receive the most assistance. Table XVIII summarizes by D/A ratio, sales and TRI category, how eligibility for particular parts of an assistance package could be determined.

If a farmer is current with his debt obligations, (in particular a majority of farmers with TRI greater than \$15,000 or with sales above \$250,000 who have a D/A ratio greater than 0.7) and is not in not need of an interest rate subsidy, receipt of a debt guarantee would preclude need of an asset purchasing entity. This would ensure that operators in high D/A, sales, and TRI categories, (those in greater than \$15,000 TRI (OK) and \$250,000 sales (US)) who are the most efficient operators, will not have credit necessary to operate their farms restricted because of asset value declines which are beyond their control. It is possible that operators in these categories may have difficulty in meeting interest payments and could benefit from a limited interest rate subsidy (2% - 4%) also.

All three options, interest rate subsidies, guarantees and purchase of assets are needed by some operators, specifically those in the \$100,000 to \$249,999 sales (US) and \$1 to \$15,000 TRI (OK), to stabilize them and make them

TABLE XVIII
 CHARACTERISTICS OF FARM OPERATORS ELIGIBLE FOR
 PROPOSED FINANCIAL ASSISTANCE PROGRAMS

<u>U.S. Data</u>	
<u>Sales Category</u>	
≥ \$500,000	Guarantee debt above 0.7 D/A ratio.
\$250,000 to \$500,000	Guarantee debt above 0.7 D/A ratio.
\$100,000 to \$249,999	Guarantee debt above 0.7 D/A ratio only in conjunction with a 3 to 5 percent interest subsidy. Allow for asset purchase by a federal entity.
\$40,000 to \$99,000	Guarantee debt above 0.7 D/A ratio only in conjunction with a total interest rate subsidy (7% to 9%). Allow for asset purchase by a federal entity.
 <u>Oklahoma Data</u>	
<u>TRI Category</u>	
< \$0	Guarantee debt above 0.7 D/A ratio only in conjunction with a 12 percent interest subsidy. Allow for asset purchase by a federal entity.
\$1 to \$15,000	Guarantee debt above 0.7 D/A ratio only in conjunction with an interest subsidy in excess of 2 percent (2% to 9%). Allow for asset purchase by a federal entity.
\$15,000 to \$30,000	Guarantee debt above 0.7 D/A ratio. Eligibility for interest rate subsidy also possible.
\$30,000 to \$50,000	Guarantee debt above 0.7 D/A ratio.
≥ \$50,000	Guarantee debt above 0.7 D/A ratio.

financially viable. These operators have a questionable future but, on the average, can pay all of their expenses excluding interest. In order to make progress on principal reduction after an interest rate subsidy, some asset restructuring may be needed so these operators would also make use of the asset purchasing entity. Depending on the outcome of restructuring and the amount of interest rate subsidy needed, these operators may also need a loan guarantee to take advantage of lower interest rates and possibly continue receiving operating credit.

Operations in TRI categories below \$0 and sales categories below \$99,999 are, on the average, unable to make any principal payments or pay all other obligations after an interest rate subsidy pays all interest costs. Therefore, an interest rate subsidy is not effectively spent because it will not stabilize the farm operation. Guaranteeing the debt of such an operator would ensure a loss or collection problem for the guaranteeing agency. The only option which would help stabilize the borrower, (possibly by easing the transition to non-farm employment) provide relief to the sector and be responsible to the taxpayer would be that of acquisition of the farmer's assets by an asset purchasing entity. A more important consideration in this case could be the benefit to the whole rural community which an asset purchasing entity would provide. Such action would help to remove downward pressure on real estate values and thereby help to stabilize other viable operators which do not need

debt guarantees if real estate values remain stable. This option will help to clear problem accounts from records of lending institutions and allow them to pass on benefits of lowered losses to other borrowers through lowered interest rates, thereby increasing overall stability to the entire sector. If an interest subsidy was provided to the operators in the lowest TRI and sales categories to correct interest payment deficiencies, 40 to 53 percent of the debt of operators with less than \$99,999 of sales needs to be written off to allow these operators to make progress on principal reduction.

Table XIX gives the potential cost or volume of each program in each of the various D/A and sales or TRI categories without specific targeting. Table XX gives potential program cost or volume in each D/A and TRI category for which a particular type of assistance is proposed, if assistance were provided in a package approach. Table XX also gives the number and percentages of farms in each category which would receive a particular combination of assistance in Oklahoma.

Conclusions

Use of an 'assistance package' approach would be beneficial because higher use of guarantees creates less need for asset sales and thereby less demand for an asset purchasing entity. Use of an asset purchasing entity causes less need for interest rate subsidies. Use of guarantees

TABLE XIX
 SUMMARY OF TOTAL POTENTIAL COSTS OR VOLUME
 OF ASSISTANCE PROGRAM OPTIONS BY
 D/A RATIO, SALES OR TRI

	Interest Rate Subsidy	\$ of Debt Guaranteed	\$ of Debt Guaranteed to 0.7 D/A	Asset Purchasing Entity
U.S. Data (in billions of dollars)				
Sales Category				
> \$500,000	\$ -	\$7.509	\$2.855	\$ 4.657
\$250,000 - \$499,999	\$ -	\$5.646	\$1.556	\$ 5.485
\$100,000 - \$249,999	\$.321	\$9.811	\$2.641	\$ 29.846
\$ 40,000 - \$ 99,999	\$1.177	\$6.435	\$1.980	\$ 21.836
Oklahoma Data (in millions of dollars)				
TRI Category				
< \$0	\$ 83.1	\$446.7	\$176.9	\$1,078.8
\$1 - \$14,999	\$ 22.1	\$146.3	\$ 72.6	\$ 966.4
\$15,000 - \$29,999	-	\$ 84.2	\$ 25.3	\$1,245.4
\$30,000 - \$49,999	-	\$432.4	\$108.7	\$2,034.2
≥ \$50,000	-	\$1,172.5	\$221.0	\$6,989.9

TABLE XX
SUMMARY OF COSTS AND VOLUME OF TARGETED FINANCIAL
ASSISTANCE OPTIONS IN OKLAHOMA
BY D/A RATIO AND TRI

D/A Ratio	TRI Category		
	< \$0	\$1 to \$14,999	> \$15,000
No Debt			
# of OK Farms	1,534	9,791	20,292
% of OK Farms	2.16	13.79	28.58
Cost of Interest			
Rate Subsidy	-	-	-
Volume of Debt			
Guarante to .7	-	-	-
Volume of Asset			
Purchase	-	-	-

≤ 0.4			
# of OK Farms	944	5191	18,751
% of OK Farms	1.33	7.31	26.41
Cost of Interest			
Rate Subsidy	-	\$12.8 M	-
Volume of Debt			
Guarante to .7	-	-	-
Volume of Asset			
Purchase	\$578.7 M	\$767.2 M	-

0.4 to 0.7			
# of OK Farms	710	824	6,610
% of OK Farms	1.00	1.16	9.31
Cost of Interest			
Rate Subsidy	-	\$7.4 M	-
Volume of Debt			
Guarante to .7	-	-	-
Volume of Asset			
Purchase	\$211.0 M	\$120.2 M	-

≥ 0.7			
# of OK Farms	710	355	5,311
% of OK Farms	1.00	.50	7.48
Cost of Interest			
Rate Subsidy	-	\$ 2.1 M	-
Volume of Debt			
Guarante to .7	-	\$72.6 M	\$355.0 M
Volume of Asset			
Purchase	\$289.1 M	\$79.0 M	-

TABLE XX (Continued)

D/A Ratio	TRI Category		
	< \$0	\$1 to \$14,999	> \$15,000
All			
# of OK Farms	3898	16,161	50,964
% of OK Farms	5.49	22.76	71.8
Cost of Interest			
Rate Subsidy	-	\$22.3 M	-
Volume of Debt			
Guarante to .7	-	\$72.6 M	\$355.0 M
Volume of Asset			
Purchase	\$1078.8 M	\$966.4 M	-

and the asset purchasing entity help to ensure money spent on interest subsidies is effective. In this way it is more likely that the benefits to the sector per dollar of assistance provided would be maximized.

Given that a large degree of diversity exists among agricultural producers today, a financial assistance program should be designed to take this diversity into account. The degree of financial assistance needed by operators in different sales and TRI categories varies greatly. In order to provide assistance where it is needed and have responsible spending of assistance dollars, specific types of assistance need to be targeted to producers with specific financial characteristics. In this way the program will promote the diversity which is assumed to be desired in agriculture and can promote efficiency in the sector as a whole.

Table XVIII gives a summary of what type of assistance is proposed for each category of sales or TRI and D/A ratio. Number of operators assisted and potential costs and volume of a proposed program segment is given by Table XX.

Analysis of Efficiency Ratios

To indicate possible differences in managerial ability and efficiency of farms in the different NCFI and D/A categories, ratios of total cash farm expenses/gross farm income (TFE/GFI) and Net Cash Farm Income/Gross Farm Income (NCFI/GFI) were calculated for all farms in the Oklahoma

survey.

Table XXI shows that on the average, for Oklahoma farms, the higher the D/A ratio and NCFI category, the fewer expenses incurred for each dollar of GFI received. This indicates that on the average, the higher the NCFI category and D/A ratio, the fewer dollars of TFE used to generate a dollar of GFI. Closer analysis shows that TFE/GFI does not increase within every NCFI category as D/A increases, thereby not allowing a simple generalization to be made concerning efficiency and D/A ratio. For those farms with NCFI less than zero the ratio does decline markedly as D/A increases, indicating that on farms with serious cash shortfalls, those with more debt are relatively more efficient.

The TFE/GFI does however, decline consistently for all D/A categories as NCFI increases. This indicates that those farms receiving higher NCFI, in every leverage category, are more efficient, incurring less expenses for each dollar of GFI than those receiving lower NCFI. These farms not only have greater dollars of sales, but more of their sales dollars end up as profit.

Average results of the NCFI/GFI ratio shown in Table XXII indicate the mirror image of the TFE/GFI ratios. The higher the NCFI category and D/A ratio the greater the percent of GFI which becomes NCFI. Closer analysis again shows that a simple generalization concerning how NCFI/GFI changes as D/A changes in each NCFI category is not possible. Nationally,

TABLE XXI

TOTAL EXPENSES/GROSS FARM INCOME ON OKLAHOMA
FARMS BY D/A RATIO AND NCFI

NCFI Category	No Debt	Debt/Asset Ratio			All
		<0.4	0.4 - 0.7	>0.7	
< \$0	3.76	1.77	1.59	1.35	2.94
\$1 - \$14,999	.58	.67	.64	.76	.62
\$15,000 - \$29,999	.48	.55	.58	.64	.53
≥ \$30,000	.39	.47	.55	.49	.47
All	1.09	.84	.78	.77	.94

TABLE XXII

NET CASH FARM INCOME/GROSS FARM INCOME ON
OKLAHOMA FARMS BY D/A RATIO AND NCFI

NCFI Category	No Debt	Debt/Asset Ratio			All
		<0.4	0.4 - 0.7	>0.7	
< \$0	-2.67	-.77	-.59	-.35	-1.47
\$1 - \$14,999	.42	.33	.36	.24	.38
\$15,000 - \$29,999	.52	.45	.42	.44	.47
≥ \$30,000	.61	.53	.45	.51	.53
All	-.09	.16	.22	.23	.06

in 1983 and 1984, the average of this ratio for all U.S. farms was .1 and .198 respectively.

NCFI/GFI does increase in each D/A ratio category as NCFI category is increased. This again shows that farms receiving higher NCFI convert more of their sales and income dollars into profits, indicating either greater efficiency, managerial ability or both. A consistent trend does not exist as D/A ratio increases however. As D/A ratio increases, NCFI/GFI increases or decreases depending on the NCFI category.

This analysis seems to indicate that farms do not significantly differ in efficiency depending on D/A ratio. Significant differences in efficiency do however become apparent between farms in different NCFI categories.

Interpretation and Recommendations

Harl comments that throughout history, as agriculture has developed, it has been able to allow transfer of capital and labor to other sectors because of increased efficiency (The People and the Institutions). He contends that the large number of current farm failures is not a continuation of this trend toward greater efficiency. If emotional appeals and pro-family farm sentiment are put aside, Oklahoma data simply does not support this contention. Nearly all farmers facing questionable viability because of highly negative cash flows are not stabilized if they received all of their borrowed capital at zero percent

interest. This section leads one to the conclusion that the underlying problem causing questionable viability is lack of managerial effectiveness in controlling expenses or lack of ability to effectively discriminate between profitable and unprofitable enterprises. The current transition would then definitely be a continuation of the long term process of transferring human resources and capital out of agriculture with resultant increased sector efficiency. This also helps to explain lack of compassion among farmers for those who are facing foreclosures or debt restructuring.

Previous analysis illustrates that farms in the lowest NCFI categories are those which need government assistance the most to enhance their viability. These are the farms which need interest subsidies, debt write-downs or asset purchase in order to survive. Criteria related before indicate that government assistance is in the public interest if efficiency is enhanced or maintained. It therefore seemingly would not be in the public interest to provide assistance to these least efficient of Oklahoma farms which need assistance the most to remain in operation.

Since the highly leveraged farms ($D/A > 0.4$) in the highest NCFI categories are the most efficient in using the least amount of resources to produce (lowest GFE/GFI), a federal program securing the debt of highly leveraged farms in high NCFI categories to guarantee flow of credit to these operations would meet the public objectives of promoting efficiency in the agricultural industry. The farms with

greater than \$15,000 NCFI account for 16.1 percent of Oklahoma farms, 17.6 percent of Oklahoma assets, and 52.2 percent of Oklahoma operator debt.

One issue in this analysis which has yet to be addressed and which will not be addressed here is: Is evidence of negative cash flows and poor management ability a long run characteristic of farms facing stress or has reduced management effectiveness been caused by emotional stress or trauma which has resulted from financial stress? Has financial stress caused incredible costs in human terms which have led to mental fatigue and mental breakdowns which have in turn caused deterioration of management ability and ultimately loss of financial viability?

Categorization of Oklahoma Farms by Socio-Economic Variables

In the course of this research project, much time and effort was devoted towards attempting to identify a set of variables which would characterize farms facing limited levels of financial viability. Linear regression, discriminant analysis, and logit procedures were pursued to develop a set of socio-economic variables which would characterize stressed Oklahoma farms. A summary of these results is given in Appendix A.

In the event that no conclusion is a conclusion, this effort was successful. The range of characteristics of financially stressed Oklahoma farms is so extensive, that a

significant set of variables characterizing these farms was not found.

One variable which was not related to the financial viability of Oklahoma farms was D/A ratio. Other studies (Lines and Morehart, Fisk et al., and Joseph and Reinsel) trying to identify certain characteristics of a farm operation contributing to some measure of financial stress or viability have either ignored D/A ratio or also attributed financial stress or vigor to other characteristics. This degree of heterogeneity among farm operations with limited viability, indicates the success of a business is highly dependant on some combination of entrepreneurial, management and decision making abilities of an individual operator which are highly difficult to identify or quantify. Attempting to identify why one farmer is successful and another is not is comparable to explaining why Lee Iacocca is Chief Executive Officer of Chrysler and why someone who attended the same grade school and high school classes with him may be working on Chrysler's assembly line.

Failure of research efforts to identify D/A ratio as significant in indicating degree of financial viability does indicate a heavy reliance on this ratio by volumes of literature to explain financial viability is questionable. Care should be taken that D/A ratio be used in conjunction with other variables to give a more accurate assessment of operators which are facing financial hardship.

The Board of Governors of the Federal Reserve System use a cross-classification system which uses return on assets, return on equity, amount of equity and D/A ratio to measure financial stress (February, 1986). Although its authors use it to indicate financial stress, this classification is likely the most comprehensive method of predicting long run viability of a farming operation. A drawback of this method is that it can be very complicated and using it to administer a federal program could be quite time consuming.

The USDA has begun to base the degree of financial stress on both cash flow and D/A ratio (USDA, July, 1985). D/A ratio is used to indicate overall financial soundness and cash flow measures the farms ability to meet cash obligations.

CHAPTER V

SUMMARY AND CONCLUSIONS

The 1985 Farm Costs and Returns Survey (FCRS) data were used in estimating costs and benefits of programs for U.S. producers. The Oklahoma farm finance survey, done by the Oklahoma Department of Agriculture in cooperation with the Department of Agricultural Economics at Oklahoma State University in January of 1986, was the source of data used to complete financial analysis of Oklahoma farm operators.

In a recent article, Paarlberg compared the classification which is needed for U.S. farmers to "triage" used in World War I. The three groups he related were: (1) the mortally wounded and which will die anyway, (2) those, who with help could survive, and (3) those who could at least for a time survive without help (November, 1986). In this analysis, farmers with TRI below \$0 are considered to be mortally wounded. Those who with help could survive have a TRI between \$1 and \$15,000. Those with a TRI above \$15,000 could survive for the time being without help. Farmers in each of these three categories have different financial assistance needs and given budget restrictions for an assistance program, the benefit to the sector can be

maximized by targeting specific types of assistance to each group.

If stabilizing agricultural producers and maintaining diversity and efficiency among those who produce the products purchased by consumers are goals of assistance programs, assistance should be targeted to those who produce the majority, variety, and quality of U.S. agricultural products enjoyed by consumers. The farmers who actually produce a majority of agricultural products are those which the news media seems to popularly classify as large and/or corporate farms. U.S Policy Makers need to determine if the 'family farm' they and their constituents wish to save is characterized by a nice frame house, wooden barn, milk cow, large garden, small tractor, and a few sheep, chickens and pigs; or, do we need to assist the farmer with a few thousand acres, a large machinery investment, steel buildings and a house in town? The first farm has a high level of romantic and sentimental appeal, the second describes the reality of modern 'family farming' which can actually support a family and feed the people of the U.S. and many other countries.

This report was designed to address the following objectives. The ensuing discussion relates a summary of conclusions for each.

1. Summarize current financial conditions of farmers in Oklahoma and project losses and impacts to the Oklahoma

agricultural sector if there is no financial assistance from government sources.

2. Suggest government debt assistance program alternatives for agricultural producers. Identify impacts of assistance programs on projected Oklahoma losses and identify costs and benefits of each alternative.

3. Project impacts of proposed government program alternatives nationally. Identify costs and benefits of a national program.

4. Identify characteristics of farms which contribute significantly to a farm's presence in a certain financial viability category.

Objective One

If Oklahoma farm operators were divided up into the three triage categories suggested by Paarlberg, 3.7 percent of Oklahoma farmers who hold 13.4 percent of Oklahoma farm debt are mortally wounded and will not be able to survive. These farms would primarily make use of an asset purchasing program. Another 9.2 percent of Oklahoma farms, who with help could survive hold 7.2 percent of Oklahoma farm debt and would use the bulk of a financial assistance package. Another 42.1 percent of Oklahoma farms hold 79 percent of Oklahoma farm debt and will survive without help, at least for the time being. Debt guarantees would be the major type of assistance used by these farms. The remaining 45 percent of Oklahoma farms hold no debt. The profitability problems

of these operators with low TRI need to be solved through education and improved farming practices, not financial assistance. Further detail of debt and asset distributions of Oklahoma farmers is given in Table II. Table III shows that with no financial assistance, \$331 million or 6.1 percent of Oklahoma debt is uncollectible if all operators with a TRI below \$15,000 and a D/A greater than 0.4 were forced to liquidate. A summary of potential costs of an interest rate subsidy program for Oklahoma producers is given in Table XI. Table XIII shows that debt write-offs required so that all debt service can be paid ranges from 100 percent on farms with less than \$0 TRI to 16 percent on farms with a \$15,000 to \$30,000 TRI and a D/A ratio greater than 0.7.

Objective Two

The 3.7 percent of Oklahoma operators which are found in the TRI category less than \$0 using Paarlberg's description, are considered to be mortally wounded and, after a 100 percent interest rate subsidy or debt write-off, are unable to pay all operating expenses. No purpose would be served in committing federal funds to stabilize these operators when they cannot fully pay production costs. Purchase of the real estate assets controlled by these farms by a federally sponsored agency (4.6 percent of Oklahoma farm assets valued at \$1,177.4 million) could serve to protect asset values of other operators, clear delinquent accounts

from agricultural banks and protect the viability of rural communities.

It is proposed that the 9.2 percent of Oklahoma farm operators, who with help could survive, in the \$0 to \$15,000 TRI category would be eligible for a full assistance package. Ideally, flexibility should be built into the program to allow a plan, each of which may have a unique combination of interest rate subsidies, debt guarantees and asset purchases, to be developed for each farm operation seeking assistance from this category. Lender and borrower concessions (such as principal reductions by the lender or borrower) which are not necessarily a part of a federal program could also be negotiated to help ensure success of a reorganization plan. An interest rate subsidy for this TRI category could reach \$21.9 million, a debt guarantee \$75 million and an asset purchase \$219.7 million.

Additional assistance is only proposed in the form of a debt guarantee for 7.7 percent of Oklahoma farm operators with greater than \$15,000 TRI and a D/A ratio greater than 0.7. The volume of a guarantee in this category could reach \$286.5 million. No assistance is proposed for operators with a TRI above \$15,000 and a D/A ratio below .7. In practice, some exception could be made to this criteria depending on certain circumstances of a particular farm or farm family. In limited cases, an interest rate subsidy could be given to farms with TRI above, but close to \$15,000.

The primary purpose for providing guarantees for this group of operators with a TRI above \$15,000 is to ensure credit flow needed to keep these efficient and profitable farms operating. Restriction of credit flow to these operators because of a D/A ratio which has been moved into a risky category due to asset value declines could force these operators which have been shown to be among Oklahoma's most efficient to sell assets or make other decisions which could reduce profitability or efficiency and eventually cause total liquidation. Guarantees of farms in this category would take some pressure off of asset markets by possibly reducing or eliminating restructuring needs of many operators.

An additional consideration indicated by FAPRI analysis is that increases in income do not significantly increase viability, but decreases in income cause viability to decline significantly. This would suggest that maintenance of income at 1984 levels is needed to prevent further deterioration of viability and to prevent failure of a financial assistance program such as the one outlined here.

A summary of costs and volume estimates of these programs and the number of Oklahoma operators assisted by each is given in Table XX.

Alternative Considerations. Interest subsidies result in huge wealth transfers for a small number of operators and raise many questions concerning equity issues among farmers and between farmers and other small businessmen. Such

transfers could possibly put efficient operators who do not require assistance at a relative disadvantage. Alternatively, a farm can simply be viewed as a small business which in general have not received assistance in the past during economic downturns as have agricultural businesses.

Individual or lender/borrower specific plans may present the best alternative to help alleviate current stress. Mandatory mediation laws in some states have required borrowers and lenders to meet to discuss proposals in order to exhaust other possibilities before a farm can be partially or totally liquidated. Changes in FDIC and Comptroller regulations which could allow a lender to act with more forbearance on troubled loans could meet major reorganization requirements of viable commercial farms with no taxpayer cost. Recent regulation changes allow amortization of loan losses over a ten year period and allow use of more liberal policies to declare an agricultural or energy bank insolvent.

Recent changes in bankruptcy law introducing chapter 12 provides another alternative to allow farm operators to restructure. This new option may help accelerate the pace of financial adjustments needed by the farm sector but could cause lending institutions to suffer unmanageable losses. The conservation reserve has also provided some relief, especially in marginal farming areas.

Agriculture, which is currently overcapitalized and plagued by overproduction, is being held in this condition partly because of huge farm program expenditures. Continued infusion of funds into agriculture by Federal programs may only continue to distort the risk and return structure of agriculture. Given that huge sums of capital are being directed out of other sectors which may be more productive than the agricultural sector, can additional transfers from other sectors be justified?

Objective Three

Because of the form of the availability of financial data on U.S. farms, the portion of this analysis dealing with U.S. operators is not entirely comparable to Oklahoma data. Interest rate subsidies, are not needed on the average on U.S. farms in sales categories above \$250,000. Only farms with less than \$100,000 sales and which were also insolvent could not pay all expenses other than interest. After an interest payment subsidy of 80 percent or greater, only minimal principal reduction is achieved on farms with less than \$100,000 in sales. Farms with sales between \$100,000 and \$249,999 are also only able to make minimal progress on principal reduction after an interest rate subsidy of up to 4.3 percentage points. Difficulty in paying full principal payments does exist in sales categories above \$250,000 but progress can be made by these operators in debt reduction.

Table IX gives a detailed breakdown of the average dollars of debt and percentage of total debt which needs to be written off in each sales category so the farm is able to project a positive cash flow.

Objective Four

This objective was pursued by combining results of several parts of this analysis and by applying several analytical procedures including discriminant analysis, stepwise linear regression and logit procedures. These procedures were used to attempt to identify a set of variables which characterize financially stressed farms. None of these procedures produced results which developed, to any satisfactory degree, a set of variables which adequately explained the incidence of limited financial viability. It is therefore concluded that an adequate set of discriminating variables can not be developed to characterize farms with limited financial viability. Modern U.S. production agriculture, and the farms with limited financial viability in particular, are simply too heterogeneous to easily categorize. Variables which are not easily quantified such as, personal initiative, decision making ability, managerial or time management skills are hypothesized to more fully explain the incidence of limited financial viability.

While level of debt is important, many farms with extremely high D/A ratios have positive cash flows. FCRS

data for 1984 indicates that 25 percent of technically insolvent operators have positive cash flows. Wide differences exist in profitability between all farms and among farms in similar type or sales categories. Oklahoma survey data indicates many farms which have NCFI greater than \$30,000 could support D/A ratios up to 1.6 and farms with NCFI less than \$15,000 are unable to support D/A ratios above 0.4. This evidence illustrates that the simple use of D/A is an inadequate in identifying limited financial viability and financial stress in agriculture. In Oklahoma, assistance level required to stabilize a operator varied much more depending on TRI than D/A ratio. D/A ratio needs to be used inconjunction with other financial measures to indicate financial stress.

Summary

Nearly all financial assistance options explored here address a short term issue, that of minimizing the numbers of farmers which must leave farming in the near future because of financial stress. Knutson and Klinefelter illustrate that programs such as interest rate subsidies, loan guarantees, write-offs and asset acquisition only treat symptoms of current problems. Duncan comments that:

...agriculture's future will likely be characterized by less inflation...and a fuller integration of the industry into the international market place... Because of these factors, the fate of agriculture will be predicated less on what is done to resolve financial stress and the constant tinkering of commodity program details than on how policy makers

choose to deal with the broad range of macro-economic and trade issues (1985, page 26).

He also comments that the changes in FmHA program directives which caused the market share of FmHA to increase from 5.4 percent of total agricultural lending in 1977 to 12 percent in 1982 would appear to have greatly contributed to the level of adjustment needed today. This increase in Federal lending which contributed to the overleveraging of the agricultural sector raises questions concerning the value of expanding Federal credit programs at this time. Duncan, a member of the Farm Credit Administration Board, fails to make any comment concerning the emphasis which the FCS placed on market share through their employee promotion system which stressed growth in account volume and its impact on the growth in the farm sector's use of credit.

This report has centered on exploration of costs and benefits of short term assistance to financially stressed farm operators. It is recognized that these proposals will not resolve underlying fundamentals which have contributed to financial stress by contributing to huge overproduction and overcapitalization in production agriculture. Rather, these proposals may only serve to complicate these problems. To resolve these long range concerns, policy makers need to come to terms with these problems and make the difficult decisions necessary to correct them and allow a viable agricultural production sector to emerge in the future.

The types of assistance programs detailed here will protect the viability of farmers which can currently pay all of their expenses including interest and make some progress on debt reduction. If the agricultural economy remains depressed or deteriorates further, spillover benefits of package assistance described here will help maintain the viability of efficient and profitable operators not currently needing assistance. If the current depressed agricultural economy and associated low commodity prices continue for more than a few years, proposed programs are not likely to provide a long-run solution to limited financial viability. Continuation of low commodity prices will cause financial assistance programs to simply delay the day of reckoning for many producers.

Current 'modes of thought' concerning 'standard' methods of farming may need to be changed among producers to cope with world economic situation different from that which was experienced during the 1970's. Those facing financial stress now need, or needed in the past, education concerning measurement of production efficiency and especially education concerning financial analysis by individual enterprise in an operation. This type of analysis needs to be used immediately by stressed operators to determine which enterprises are efficient and profitable and which need to be improved or eliminated. According to Richard Krumme, editor of Successful Farming Magazine, too many operators facing financial difficulty have no plan to change or

improve the profitability of their operation. Why should these operators be given federal funds to continue to farm unprofitably?

The change in economic climate from the 1970's to the 1980's has contributed to financial stress and subsequent lack of viability in the agricultural economy by catching many operators in a vulnerable financial risk situation. Even though this change caught many unaware, farmers may not have fully comprehended the ramifications of debt financing on their financial viability in years of low profitability at the time they assumed high levels of debt. They also may not fully realize the impact of direct government payments on their incomes and how a change in the farm program may impact their debt repayment ability. All of these factors indicate a need to improve education of farmers to increase awareness of financial risk considerations connected with debt financing. Many have no realization of the type of risk position the loans they request and receive place the assets in which they have invested their entire life's work. Education to improve this perception is needed.

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APPENDIX A

LINEAR REGRESSION ANALYSIS

Introduction

The purpose of estimating a multiple linear regression equation on several variables in the Oklahoma farm survey is to identify certain factors which relate significantly to certain measures of farm financial health. Through this analysis it is hoped that characteristics can be identified which significantly explain variation in important dependant variables on which farms are commonly classified. The stepwise linear regression program in SAS was used to perform this analysis.

Regression of Net Farm Income

Parameters included in the multiple linear regression on net farm income (NFI) which were significant, were highly significant. Net farm income is defined as gross farm income minus total cash expenses including debt service. Four out of six parameters were significant to beyond the .0001 level.

In the opinion of the researcher, the Equation (1) provides the best explanation of variability in net farm income (T-values appear in parenthesis).

$$\text{NFI} = 6360.16 + .391\text{NW} + .409\text{TD} + 1.959\text{PMT} - .132\text{M\&I} -$$

$$(-3.12) \quad (10.36) \quad (4.41) \quad (12.47) \quad (-2.57)$$

$$2.332\text{RTA} + 10,767.522\text{D/A} \quad (1)$$

$$(-3.09) \quad (8.99) \quad \text{R-square } .476$$

Net worth (NW); Total assets - total debt in \$.

Direct government payments (PMT); Sum of direct government payments reported by each farm operator in \$.

Mineral and investment income (M&I); Income received from royalties, investments and savings accounts in \$.

Rented acres (RTA); Total number of acres reported rented.

Total Debt (TD); Total debt of each operation in \$.

Maximum serviceable D/A ratio (D/A); Maximum serviceable debt level/total assets.

Net farm Income (NFI); Gross income minus total expenses in \$.

Net worth, debt level, and direct government payments were significantly positively related to net farm income. A ratio of maximum level of serviceable debt for a certain farm, divided by total assets of the farm was also significantly positively related to NFI (this parameter is explained later). Income from minerals and investments was significantly negatively related to NFI. This type of income could likely be treated as an endowment paid monthly or yearly to the operator regardless of how hard he works. Since this royalty money is available the farmer may work fewer hours, farm his land less intensively or be less concerned about controlling expenses since farm income is not required to support the operator's family.

Finding number of acres of rented ground to be significantly negatively related to NFI was surprising. Farmers are either paying rents which are so high that renting is unprofitable or farmers with low net incomes are renting ground to improve their cash flows. Farmers who rent large number of acres may have operations which outstrip their management ability and are thereby inefficient.

Positive relation of net worth and total debt indicate in total that the higher the level of assets controlled the higher the NFI level. This also shows that there is a positive return to borrowed funds on some farms. Indicating increasing debt levels are not necessarily associated with low or negative cash flows. The returns to borrowed funds is higher than the return to net worth. Thus when averaged across farms debt is either applied to more profitable uses or in general is used more intensively than is owner equity.

Direct government payments are significantly related to NFI because in a simplistic sense, they increase NFI without any corresponding increase in costs. It is also interesting to note the coefficient on the PMT term. Nearly \$2 of government payments are needed to raise NFI by \$1.

The maximum serviceable level of debt for a given farm divided by total assets was included as a proxy to account for variation due to apparent differences in managerial ability of different operators. Mail-in surveys

are not able to measure management ability directly and of several ratios proposed to account for such managerial differences, this ratio proved to be the most significant. Residual farm income before debt service was divided by .18 to give the maximum level of debt which could be serviced from farm sources (.13 interest rate plus .05 repayment rate on principal). This maximum debt level divided by total assets gives the maximum D/A ratio the farm could support. This ratio relates income level and level of serviceable debt to the value of assets on the farm producing that income. Very high ratios indicate that assets are very productive. Thus, farms with a high maximum serviceable D/A ratio can support more debt. In a like regression on NFI which included actual D/A ratio but excluded net worth and debt (Equation V, Table XXIII), D/A was not significantly related to NFI.

Other attempts at estimating an equation were also performed. A summary of these attempts is given in Table XXIII. Variables in equation VI were chosen because stepwise discriminant analysis indicated that they had significant discriminating characteristics.

TABLE XXIII
SUMMARY OF LINEAR REGRESSION RESULTS

Vari- ble*	Equations					
	I	II	III	IV	V	VI
R2	.4114	.4776	.5015	.3996	.4053	.3924
B0	8431.83 (.90)	-5482.77 (-.60)	-10152.66 (-1.12)	9956.41 (.94)	46.75 (.02)	5816.77 (.75)
NW	.0355 (8.75)	.0391 (10.13)	.0394 (10.17)		.0344 (8.67)	.0316 (8.13)
TD	.0441 (4.36)	.0407 (4.24)	.0402 (4.23)		.0452 (4.60)	.0347 (3.55)
DA1	4679.16 (1.03)	4419.06 (1.03)	5454.55 (1.28)	2720.52 (0.58)		
DA2	312.40 (0.08)	2150.37 (0.58)	2845.43 (0.77)	3485.04 (0.85)		
TF1	-1056.54 (-0.25)	-974.99 (-0.24)	-2009.85 (-0.50)	-4169.59 (-0.95)		
TF2	-1889.55 (-0.51)	1752.51 (0.49)	2484.34 (0.71)	5883.09 (1.54)		
TF3	18102.98 (1.32)	10969.80 (0.84)	9346.10 (0.73)	9322.01 (0.66)		19858.90 (1.40)
W&S	-0.038 (-0.43)	-0.021 (-0.25)	-0.021 (-0.24)	-0.085 (-0.87)		
M&I	-0.153 (-2.73)	-0.131 (-2.49)	-0.128 (-2.45)	0.009 (0.15)	-0.153 (-2.84)	
RTA	-2.595 (-3.72)	-2.460 (-3.18)	-2.427 (-3.19)	-1.247 (-1.52)	-2.382 (-2.97)	
PMT	2.310 (12.22)	1.957 (11.80)	1.896 (11.54)	2.466 (14.78)	2.193 (13.33)	2.137 (13.04)
AGE	-146.67 (-1.00)	-59.65 (-0.46)	-39.98 (-0.30)	-200.03 (-1.34)		125.91 (1.00)
TDA		10658.42 (8.57)	13289.14 (6.99)	10946.59 (4.89)		

TABLE XXIII (continued)

Variable*	Equations					
	I	II	III	IV	V	VI
PRFT			916.54 (1.06)	1769.65 (1.85)		
D/A				-7834.93 (-1.40)		
MD/A				170.46 (0.22)		

* NFI is the dependant variable (NFI = Gross Farm sales - gross cash expenses).

R²; R-square.

BO; Intercept

NW; Networth = Total Assets - Total Debt in \$.

TD; Total debt in \$.

DA1; 0,1 variable 1 for western Oklahoma 0 for central and eastern.

DA2; 0,1 variable for central Oklahoma 0 for western and eastern.

TF1; 0,1 variable for Farmtype of wheat (if \geq 70% of gross farm receipts were received from wheat) 0 if otherwise.

TF2; 0,1 variable for Farmtype of cattle (if \geq 70% of gross farm receipts were received from cattle) 0 if otherwise.

TF3; 0,1 variable for Farmtype of dairy (if \geq 70% of gross farm receipts were received from dairy) 0 if otherwise.

W&S; Off-farm wages and salaries in \$/year.

M&I; Mineral and investment income in \$/year.

RTA; Number of rented acres.

Age; Age of operator.

TDA; Maximum debt/asset ratio a operation could support with farm income assuming a 13% interest rate and 5% principal repayment rate.

PRFT; Gross farm sales/total cash operating expenses.

MD/A; Maximum debt/asset ratio an operation could support with net income from all sources (farm and off-farm) assuming a 13% interest rate and 5% principal repayment rate.

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