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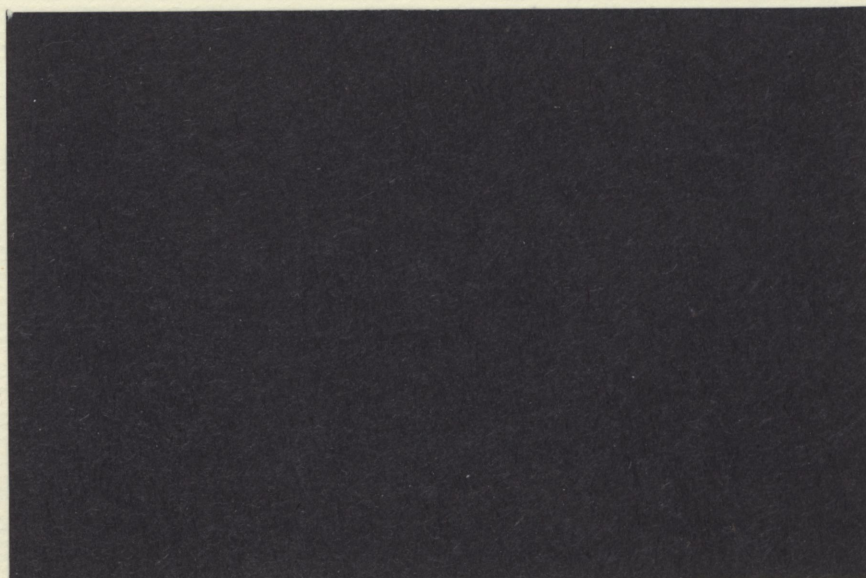
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Food and Agricultural  
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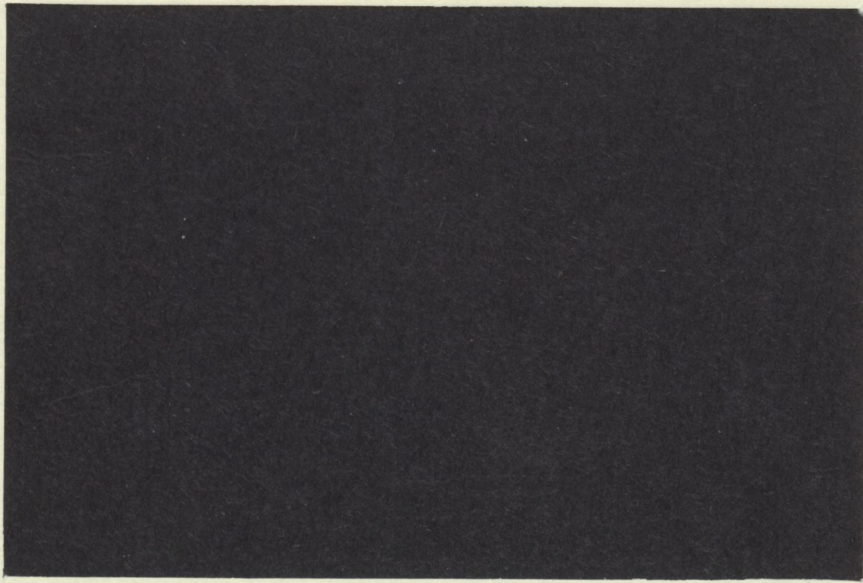
## FAPRI Staff Report

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**Summary Report:**

**Economy-Wide Impacts of the Farm Financial Crisis**

FAPRI Staff Report #9-85 (Revised)  
July 1985

**Contributors**

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## EXECUTIVE SUMMARY

The financial condition of U.S. agriculture is in a state of crisis; and the deterioration will not abate under most of the 1985 Farm Bill options being considered by Congress. Moreover, the financial crisis in agriculture, if not altered by corrective actions alleviating the debt load of highly leveraged farmers, will reach a magnitude sufficient to affect U.S. financial markets and the performance of the national economy.

Major results of this summary report, linking a Farm Journal survey and FAPRI farm income projections to farm loan losses and the Wharton Econometric model of the U.S. economy are:

- Farms with debt-to-asset ratios of 40 percent and over hold approximately \$140 billion of the \$210.8 billion total U.S. farm debt. Farms with 40 percent or larger debt-to-asset ratios are likely to experience financial stress.
- The farm-debt situation is especially serious for younger farmers residing in the Central region of the U.S. The average debt-to-asset ratio for these farms is 20 percentage points above the national average.
- The surplus capacity situation for U.S. agriculture makes it unlikely that net farm income can be increased beyond \$20 to \$25 billion without high government cost. Over the period 1987-1990, direct government costs of \$6 to \$7 billion annually will be required to hold these farm income levels. If government support programs were removed, net farm income would likely drop by 40 percent during the subsequent three years.
- Annual principal and interest shortfalls on loan losses with net farm income in the \$15 to \$25 billion range and continued high real interest rates are projected at about \$5 to \$10 billion.
- Liquidation of 10 to 17 percent of farm assets and 35 to 50 percent of the debt would be required to service the remaining debt. This asset liquidation rate is three to four times the volume historically flowing through farm asset markets.
- Under current farm income conditions with preemptive measures to address the farm financial crisis, loan losses resulting from farm bankruptcies would be contained at about \$10 billion and would have relatively small effects on the U.S. economy.
- If current farm income conditions prevail, and no financial assistance measures are initiated, or financial programs are offered but commodity support programs are eliminated, the loan losses could rise sharply to \$20 to \$25 billion.
- Loan losses of \$20 to \$25 billion are expected to increase short term interest rates by 75 to 125 basis points, reduce national employment by 175,000 to 275,000 jobs, reduce total GNP by \$30 to \$50 billion over eight years, and increase the federal debt by \$14 to \$21 billion by 1993.

## Summary Report:

### Economy-Wide Impacts of the Farm Financial Crisis

#### 1. Introduction

Evidence of a serious financial crisis in U.S. agriculture continues to accumulate. Early warnings of this debt/financial crisis have been loan delinquency rate increases, selected rural bank failures, and deteriorating farm balance sheets as indicated by state level surveys. Government data, the Federal Reserve Reports, and the ERS/USDA surveys have confirmed that the farm financial situation is deteriorating. These data and reports, however, were not produced with sufficient lead time to allow effective monitoring of the rapidly deepening farm credit crisis of late 1984 and 1985.

To close the information gap and to assess the extent and magnitude of the farm credit crisis in time for appropriate corrective action, Food and Agricultural Policy Research Institute (FAPRI) joined the Farm Journal magazine in conducting a national survey in December of 1984. The survey was designed to identify the incidence and extent of the farm credit problem at national and regional levels, by farm type and by tenure. With this survey information and farm price and income projections from FAPRI, it was possible to anticipate, under various Farm Bill options, the implications of the farm debt crisis. The magnitude and scope of corrective actions required to deal with the crisis were suggested as well.

The Farm Journal survey confirmed that the farm financial problem was not confined to a few states that had conducted early surveys. In December 1984 the Central and Western regions were worse off than the South and East, but the national average debt conditions were very similar to results of the state

surveys conducted one year earlier and confirmed estimates made by the Federal Reserve. Of the \$211 billion total farm debt, up to \$140 billion is held by farmers experiencing financial stress.

The FAPRI analyses of 1985 Farm Bill options revealed a weak farm income outlook for 1985-1990 under the level of income protection provided by current programs. Very low levels of expected net farm income would result if government supports were to be removed. As net farm income declines, the ability of farmers to service outstanding debt is reduced, leading to more liquidation of land and other assets, and lower land values. These conditions increase the number of farmers who become insolvent and the magnitude of loan losses to lenders.

Concern about the potential impact on financial markets of large loan losses led to the Wharton Econometrics Forecasting Associates analysis, which investigated the macroeconomic consequences of the farm financial situation. The Wharton analysis shows that there are potentially serious consequences of the farm debt crisis on the U.S. economy. These impacts are higher interest rates, higher unemployment, reduced gross national product, fewer housing starts, lower personal income and a larger federal deficit. The Wharton analysis indicates that if preemptive actions are not taken, the loan losses could significantly affect U.S. financial markets. Such outcomes would seriously jeopardize the farm sector and impose important costs for those not directly employed by or involved in agriculture.

The potential negative economy-wide effects of a farm financial crisis and in addition to these the direct adverse impacts on agriculture, call for comprehensive measures to address the problem. Clearly, if farm sector financial failures should rise sharply, actions by the Federal Reserve, the U.S. Treasury, and the U.S. Congress will be required to stabilize farm asset markets and maintain order in the national financial markets. The analyses described below and in the



supporting studies have been developed to give U.S. agriculture and those who determine farm policy, financial market policy, and Federal fiscal policy an opportunity to design corrective actions for the farm financial crisis that are efficient and timely. Early corrective and preventive measures will be less costly than absorbing the impacts of doing nothing or approaching the problem in a reactionary mode. The stakes for agriculture and national economic performance are high.

## 2. The Approach

A straightforward approach was adopted in projecting economy-wide impacts of the farm financial crisis. This approach is best illustrated by the set of questions that guided the research at FAPRI and Wharton.

- What is the debt situation for U.S. agriculture in total and by region, type of farm, and type of farm operator?
- What are the prospects of generating farm income sufficient to service this debt?
- What is the projected level of unserviced and discharged debt, and how is it distributed over time?
- What are the economy-wide implications if no action is taken to counter the impacts of the farm debt losses?

These relatively simple questions were evaluated using the Farm Journal survey, the FAPRI agricultural sector modeling system, FAPRI financial models, and the Wharton long-term model of the U.S. economy.

Results of the research organized by FAPRI to answer these questions are summarized in four reports (listed below) released on July 31, 1985, at a briefing led by Professor Lawrence Klein, Nobel Laureate and Professor of Economics at the University of Pennsylvania. This summary report reviews the analyses presented in the four reports.



- Report #1 - "National Farm Survey on Financial Stress," Farm Journal and FAPRI at the University of Missouri-Columbia and Iowa State University, July 1985.
- Report #2 - "An Analysis of the Variable Loan Repayment Option for the 1985 Farm Bill," FAPRI at the University of Missouri and Iowa State University, July 1985.
- Report #3 - "Farm Income and the Financial Condition of United States Agriculture," FAPRI at Iowa State University, July 1985.
- Report #4 - "Economy-Wide Impacts of Agricultural Sector Loan Losses," Wharton Econometrics Forecasting Associates, July 1985.

### 3. Debt Situation for U.S. Agriculture

Information on this question is drawn from the Farm Journal and supporting surveys now available for states and the United States as a whole. The analysis of this information is presented mainly in Report #1 with additional results provided in Report #3. In the Farm Journal survey, 8,000 owner-operators were randomly selected from a Farm Journal panel containing 1.1 million names. About 1,600 responses were received to a four page mail questionnaire. Of the questionnaires returned, 1,232 were useable for the analysis contained in Reports #1 and #3. Comparing this survey to national probability sample surveys from ERS/USDA indicates that both smaller- and larger-than-average farms were overrepresented, but this limitation of the data was more than offset by its timeliness. Preliminary results were published two months after completion of the survey (Farm Journal, March 1985).

Major results from the analysis of the Farm Journal survey are summarized in Tables 1 and 2. Table 1 contains information on the distribution of U.S. agricultural debt by debt-to-asset ratio. The debt-to-asset ratio measures relative indebtedness and is a simple indicator of financial stress. Generally, farmers with debt-to-asset ratios less than 40 percent are not experiencing severe financial stress. As shown in Table 1:

- The majority of farms are in the low debt-to-asset ratio category. About 69 percent of farms have debt-to-asset ratios of 40 or less and hold only 37 percent of the farm debt.
- Farms in the 40 percent and over debt-to-asset ratio categories composed about 31 percent of the total and held about 63 percent of the farm debt.
- About 27 percent of farm debt is held by the 14 percent of farm operators with debt-to-asset ratios of over 70 percent. Farmers in this category will have a difficult time correcting their financial problems.

In short, much of the outstanding agricultural debt is held by a minority of United States farmers, who are highly leveraged.

Table 2 contains information from the Farm Journal survey on average debt-to-asset ratios by age group and region. As shown in Table 2:

- The national debt to asset ratio is about 26 percent.
- Debt asset ratios are highest in the Central region and lowest in the East.
- Younger farmers have relatively high debt-to-asset ratios. The debt-to-asset ratio of farmers 44 years of age or younger is 10 percentage points above the national average.

#### 4. Net Farm Income Prospects

The FAPRI agricultural sector models have been used during 1985 to evaluate projected outcomes for U.S. agriculture under various options for the 1985 Farm Bill. Two of the options evaluated are the free-market program advanced by the Administration (AAA85) and a variable loan repayment program (VLRP) that contains some of the elements in current proposals put forth by Senate and House members. The Administration program evaluated in March 1985 features loan rates and target prices that adjust to market price levels, and base acreage levels that adjust to actual planted acres. The essential result of the Administration program is that by 1991 the three-year moving average loan rate is the only potential buffer for farm prices and income.

The VLRP is a stylized option for the 1985 Farm Bill. It reflects a concern voiced in many existing proposals that the move to a free market agriculture requires a transition program to cushion the impact. This program, as applied in the FAPRI analyses, involves a four-year freeze of loan and target prices and of base acreages through the 1989/90 crop year. Diversion and deficiency payments are used to manage supply. The name given the VLRP was coined from a feature of the program that permits participating farmers to pay back the loan at the market price or the loan rate, whichever is lower. With the VLRP the loan rate does not set a de facto floor on market prices. This aspect of the program along with the loan and target prices assures more stable farm incomes but more competitive price levels for U.S. agricultural commodities. Commodity price paths under the VLRP are higher but approximate those under the AAA85 option.

Results of the comparative evaluation of the AAA85 and VLRP options are shown through 1990 in Table 3. For the analysis, general economic conditions in the U.S. and foreign economies were assumed to be similar to those during 1984-85. Evaluation of the VLRP in July 1985 incorporates more recent information reflecting higher commodity stocks and lower exports. Details on these assumptions, the features of the programs and the outcomes for major crop and livestock commodities are provided in Report #2 and a comparison study noted in Table 3. The results of the farm program analysis are:

- Annual net farm incomes remain in the 21 to 27 billion dollar range under the VLRP, near the levels for 1985 obtained under the 1981 program.
- Annual net farm incomes fall to about 14 billion in 1988 under the AAA85 proposal and do not recover to the 20 billion dollar level within the 5-year period of analysis.
- Direct government payments average near 1985 levels under the VLRP and decline in later years, and no payments occur under the AAA85 after 1988.

In general, the FAPRI farm policy analyses do not paint a bright picture for U.S. agriculture. These findings reflect a substantial excess capacity situation in

U.S. agriculture at current loan rates, indicating that high government costs are required to maintain net farm incomes near 1985 levels.

#### 5. Projected Debt Discharge and Loan Loss

Estimates of the level of asset and debt liquidation required to achieve short term financial stability are presented in Report #3. The stability criterion chosen was that the farm businesses be able to service outstanding debt. An allowance for capital replacement or risk reserve was not included. In addition, this analysis estimated the likely volume of loan losses as well as the principal and interest shortfalls that would occur under a range of economic conditions.

Major results from the projected financial analysis for U.S. farm firms are provided in Tables 4 and 5. Table 4 presents estimates of the volume of assets and debt that would have to be liquidated for the remaining debt to be serviced fully. The cash rate of return expresses net cash income as a percentage of the value of gross assets owned by the operator. The recovery rate of capital measures the cash proceeds available for debt reduction following liquidation of an asset. The recovery rate reflects both transaction costs and declines in asset market prices. Estimates of operators selling out were obtained by assuming that operators go out of business when they have a zero or negative equity position after all of their assets were liquidated to retire existing debt. Debt charged off reflects debt remaining after liquidating all assets of these farmers. These charge-offs are losses that must be absorbed by agricultural lenders and other creditors.

Interest and principal shortfalls were estimated at current debt and asset levels (Table 4). The "lower income" case is suggested by the net farm income stream projected by FAPRI for the AAA85 option. The "current income" case corresponds to income streams like that projected for the VLRP option. The "improved



income" case reflects a net farm income in the 30-35 billion range, exceeding that expected under any likely 1985 Farm Bill option.

From Tables 4 and 5, the major conclusions are:

- Approximately one-half of the outstanding farm debt cannot be fully serviced at current income and rates of interest. This figure increases to two-thirds in the lower income case.
- Annual principal and interest shortfalls from farm owner-operators are estimated at \$2 to \$9 billion over the four year evaluation depending on farm income levels and interest rates.
- Seven to seventeen percent of commercial agricultural assets in the United States will need to be liquidated in order to service the remaining outstanding debt; a liquidation rate three to four times the volume historically flowing through farm asset markets.
- For the more likely economic conditions evaluated, approximately 4 to 8 percent of the existing farm debt could be discharged by liquidated farm operations, representing a loss of \$10 to \$20 billion to all agricultural creditors.

Even under current farm income conditions, loan losses could be significant. If farm income falls, as projected under the AAA85, farm financial conditions deteriorate and loan losses increase substantially. This serious potential loss to the financial and agribusiness sectors stimulated interest in the Wharton study of macroeconomic impacts of the financial crisis in U.S. agriculture.

#### 6. Economy-Wide Impacts

The macroeconomic effects of the agricultural loan default were estimated using Wharton's Long-Term Model of the U.S. economy. The Federal Reserve Board, the Administration, and the U.S. Congress are assumed to intervene as the loan defaults occur to insure the stability of the U.S. financial system. This intervention would be reactive rather than preemptive; actions would respond to loan defaults and actual or imminent failures of the affected financial institutions. Preemptive actions, on the other hand, could reduce or eliminate the estimated negative macroeconomic repercussions of the agricultural sector loan default.

The main direct macroeconomic effect of the agricultural sector loan defaults would be an increase in short-term private interest rates due to the public perception of substantially higher risks being associated with financial asset holdings. This perception of increased risk would occur despite prompt action by the financial authorities, such as was the case for the Continental Illinois National Bank. Despite FDIC guarantees for all deposits, outflows became unduly large because of the inherent unease (perceived risk increase) associated with keeping deposits in a potentially failing bank. Although agricultural debt is dispersed among many creditors, the impact of large and widespread defaults on commercial banks and the Farm Credit System is expected to be sufficient to affect national financial markets.

The farm loan defaults have two direct impacts on the U.S. economy:

- Higher short-term interest rates due to the increased public perception of financial asset risk.
- Higher interest rate risk premiums in the agricultural credit market, reflecting the high rate of agricultural sector loan default.

The evaluations of impacts of the farm financial crisis were conducted under the four scenarios defined in Table 6. The VLRP and AAA85 programs together with the analysis in Report #3 yielded differing assumptions on the total loan loss. The extreme case on the high-loss side assumes no income maintenance programs and no financial assistance programs. The scenario with the lowest loan loss is a case where income maintenance programs continue at current levels and preemptive financial assistance programs are in place.

The total losses were distributed across the years 1985-88 using the FAPRI net farm income estimates. Potential loan losses are higher under the "free market" option, due to the lower farm income available to service debt. Short-

term interest rates are expected to respond strongly to the large loan losses in 1987. Specifically, from Figures 1 and 2:

- The public loses confidence in the private financial sector due to loan defaults, leading to a run-up in private short-term interest rates, peaking in 1987 when the loan default rate is highest.
- Longer-term commercial bond rates rise by more moderate amounts than the private short-term rates but remain above baseline levels for a longer period of time.

The major economy-wide impacts are caused by these short term interest rate movements -- 75 to 125 basis points for loan losses in the "middle range" of \$20 to \$25 billion compared with 25 basis points when loan losses are reduced to \$10 billion.

Results of the Wharton evaluation for the middle range of loan losses (\$20 to \$25 billion), relative to the baseline outlook, are illustrated by Figures 3, 4, and 5, for the federal debt, employment, and gross national product, respectively.

The major conclusions of the Wharton analysis are:

- By 1993, the federal debt will be \$13.7 to \$21.5 billion larger.
- In 1989 between 175,000 and 275,000 jobs will be lost in the entire economy.
- In constant 1985 dollars, Gross National Product will be reduced by \$8.6 to \$13.7 billion in 1989. The cumulative losses in real GNP over the 1985-93 period are predicted to be \$30 to \$49 billion.

These impacts are compared in Table 7 with those generated by higher and lower loan loss assumptions. The comparisons suggest a trade-off between the costs of income maintenance and financial assistance programs and the consequences for the economy of ignoring one or both of these preemptive measures. It would be prudent to consider early, comprehensive measures to correct the farm financial crisis rather than to attack it on a piecemeal or crisis-reaction

basis. Clearly, loan losses will not occur at the high end of those evaluated, because countervailing actions will be taken. The question is whether these actions can be less costly if they are managed and coordinated through legislation and administrative initiatives not developed on a reactionary basis.



## References

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Table 1. National Agriculture Debt Distribution Estimated From  
Farm Journal Survey.

Debt/Asset (Percent)	% of Farms	% of National Debt	% of Agricultural Assets
00-10	39.5	2.9	36.8
10-40	29.4	34.2	37.1
40-70	17.5	36.3	18.5
70 Plus	13.6	26.6	7.7
<hr/>			
Actual Levels	1.67 mil.	\$210.8 bil.	\$951.7 bil.

Source: A. Womack, et. al., "National Farm Survey on Financial Stress," FAPRI Staff Report #6-85, July 1985.

Table 2. Agricultural Debt to Asset Ratios by Region and Age Group Estimated from Farm Journal Study.

Region	Age					All Age
	Under 35	35-44	45-54	55-64	Over 65	Groups
	D/A	D/A	D/A	D/A	D/A	D/A
Central	52.1	45.4	38.0	22.5	11.0	34.3
West	31.2	29.6	22.1	25.8	16.7	25.2
South	20.8	37.1	20.8	21.0	4.0	19.7
East	51.4	26.4	21.3	10.7	8.5	20.3
Weighted National Average	35.9	37.3	26.9	22.4	7.4	26.1

Source: R.W. Jolly and D.G. Doye, "Farm Income and the Financial Condition of United States Agriculture," FAPRI Staff Report #8-85, Iowa State University, July 1985.

Table 3. Farm Income and Government Payments Under the Administration (AAA85) and Variable Loan Repayment (VLRP) Programs.

	Date	Program	1983*	1984*	1985	1986	1987	1988	1989	1990
(\$ billion)										
Direct Government Payments	July 1985	VLRP	9.30	8.00	5.90	6.20	6.30	5.90	5.80	6.00
	Mar. 1985	AAA85	9.30	8.00	5.12	4.75	3.26	0.47	0	0
Net Farm Income	July 1985	VLRP	16.40	35.30	23.70	24.70	27.40	26.10	23.80	21.60
	Mar. 1985	AAA85	16.40	35.30	24.63	21.13	16.50	13.50	15.78	16.25

Sources: VLRP- "An Analysis of the Variable Loan Repayment Option for the 1985 Farm Bill," FAPRI Staff Report #7-85, University of Missouri, Columbia and Iowa State University, July 1985.

AAA85- "The Administration Proposal for the 1985 Farm Bill: An Evaluation and Analysis," FAPRI Staff Report #3-85, University of Missouri-Columbia and Iowa State University, March 1985.

\*Actual USDA figures.



Table 4. Annual Interest and Principal Payment Shortfalls with Current Debt and Asset Levels, United States.

	Current Income <sup>1/</sup>	Lower Income <sup>2/</sup>	Improved Income <sup>3/</sup>
Interest (\$ billion)	1.12	3.22	0.26
Principal (\$ billion)	3.68	5.64	1.89
Total (\$ billion)	4.80	8.86	2.15
% debt not fully serviced	52.9	65.3	29.5
% debt with interest not fully paid	21.7	44.5	7.8

<sup>1/</sup> Cash returns of 7.5 percent on capital, mean interest rate of 10 percent.

<sup>2/</sup> Cash returns of 6.5 percent, interest rate of 12 percent.

<sup>3/</sup> Cash returns of 8.5 percent, interest of 8 percent.

Table 5. Estimated Asset Liquidation Required to Service Remaining Debt, United States.

	Current Income <sup>1/</sup>	Lower Income <sup>2/</sup>	Improved Income <sup>3/</sup>
	%	%	%
Assets liquidated	9.9	16.8	6.6
Debt liquidated	34.0	48.0	25.6
Debt charged-off	3.9	8.5	2.1
Operators selling out	8.1	14.6	5.2

<sup>1/</sup> Cash returns of 7.5 percent on capital, capital recovery rate of 85 percent.

<sup>2/</sup> Cash returns of 6.5 percent, capital recovery rate of 65 percent.

<sup>3/</sup> Cash returns of 8.5 percent, capital recovery rate of 100 percent.

Table 6. Financial Impacts of Agricultural Sector Loan Losses Under Four Scenarios.

Program, Loan Loss and Interest Rate Effects	Year			
	1985	1986	1987	1988
<b>Hard Landing (Free Market Income Levels)</b>				
<u>Large Loss (\$50 billion, No Financial Assist)</u>				
Loss Pattern (Billions \$)	2	10	33	5
Short-Term Rate Increase (Basis Points)*	10	60	275	125
<u>Medium Loss (\$25 billion, With Financial Assist)</u>				
Loss Pattern (Billions \$)	2	4	16.5	2.5
Short-Term Rate Increase (Basis Points)*	10	25	125	75
<b>Soft Landing (Current Income Levels)</b>				
<u>Medium Loss (\$20 billion, No Financial Assist)</u>				
Loss Pattern (Billions \$)	2	4	12	2
Short-Term Rate Increase (Basis Points)*	10	20	75	40
<u>Small Loss (\$10 billion, With Financial Assist)</u>				
Loss Pattern (Billion \$)	2	2	5	1
Short-Term Rate Increase (Basis Points)*	10	10	25	10

\*This is the increase for the private short-term (6 month commercial paper) rate. Government sector interest rates were unchanged between the default scenarios and the baselines.

Table 7. Key Macroeconomic Impacts of Agricultural Sector Loan Losses.

Economic Variable	Loan Loss Scenario			
	Free Market Income		Current Income	
	No Assist \$50 billion	Assist \$25 billion	No Assist \$20 billion	Assist \$10 billion
Federal Debt Increase (Billion \$, 1993)	\$42.2	\$21.5	\$13.7	\$5.1
Real GNP Decrease (Billion 1985\$, 1985-93)	-\$96.7	-\$49.0	-\$30.9	-\$12.2
Employment Decrease (Thousands, 1989)	-560.	-275.	-175.	-64.

Figure 1  
Middle Range of Short Term Interest Rate Impacts

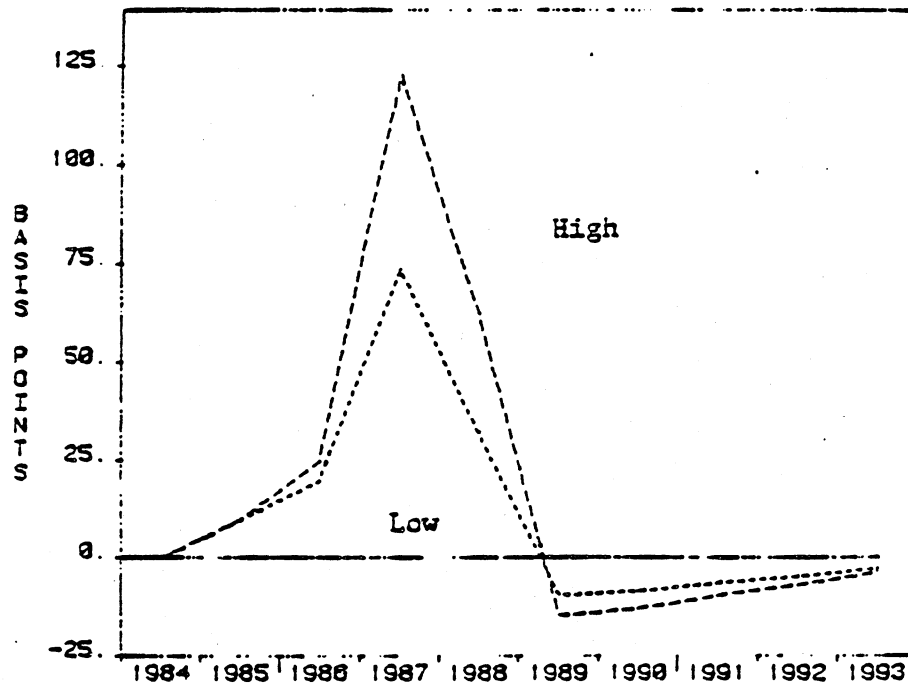


Figure 2  
Middle Range of Long Term Interest Rate Impacts

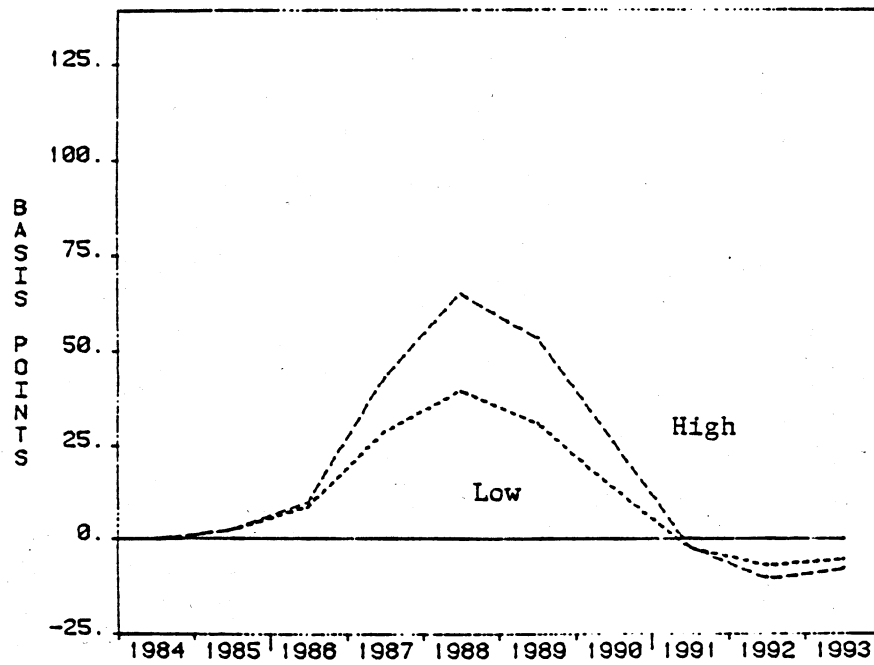


Figure 3

Middle Range of Cumulated Federal Debt Impacts

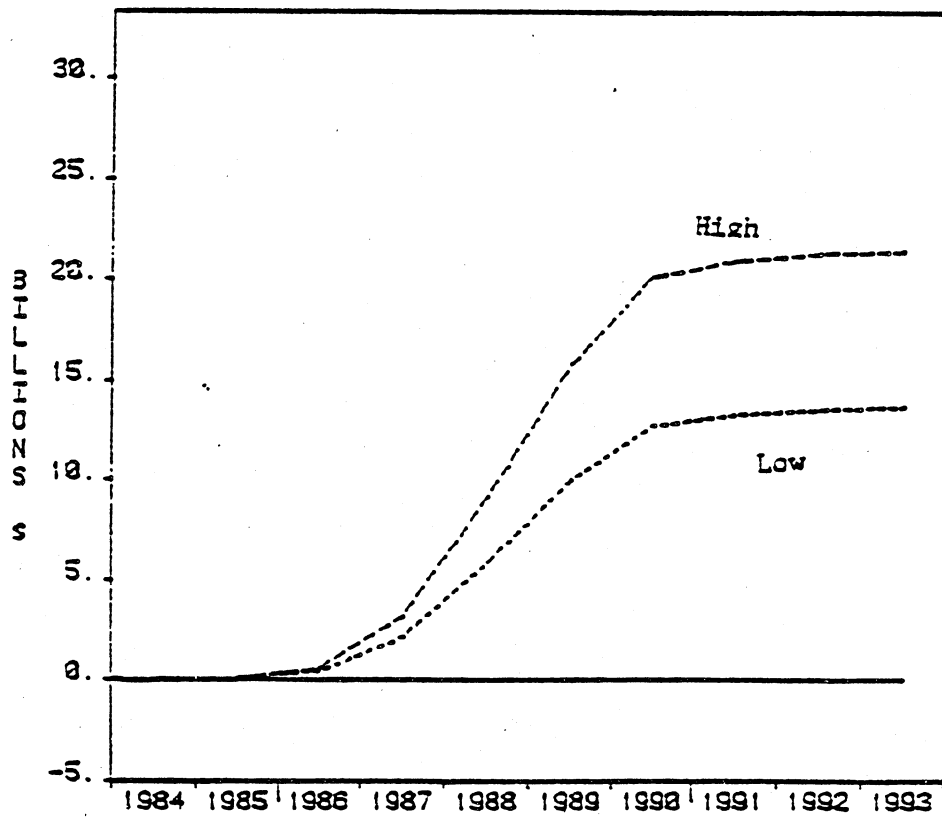




Figure 4  
Middle Range of U.S. Employment Impacts

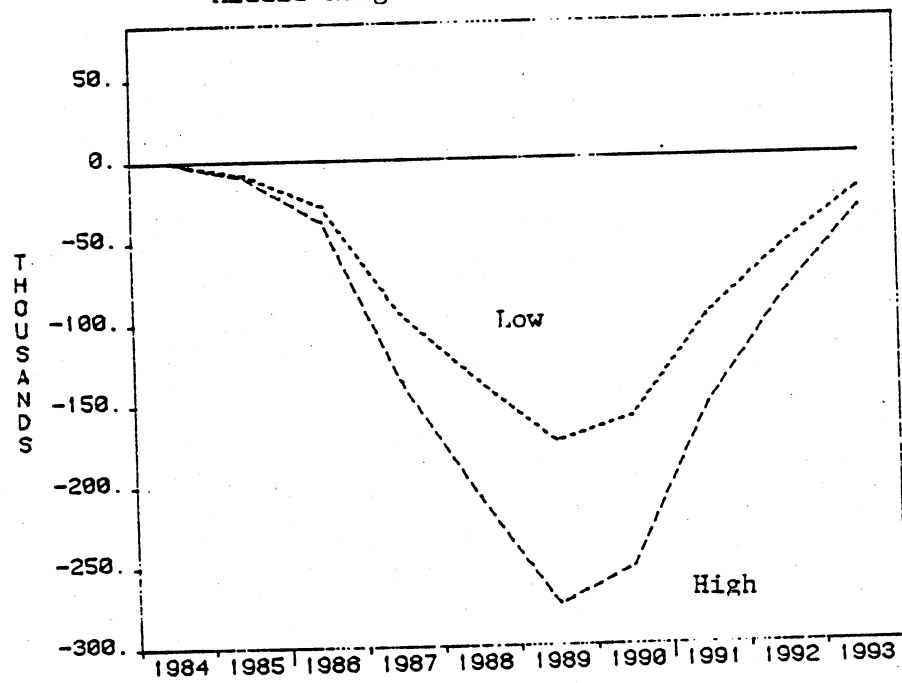


Figure 5  
Middle Range of Real GNP Impacts

