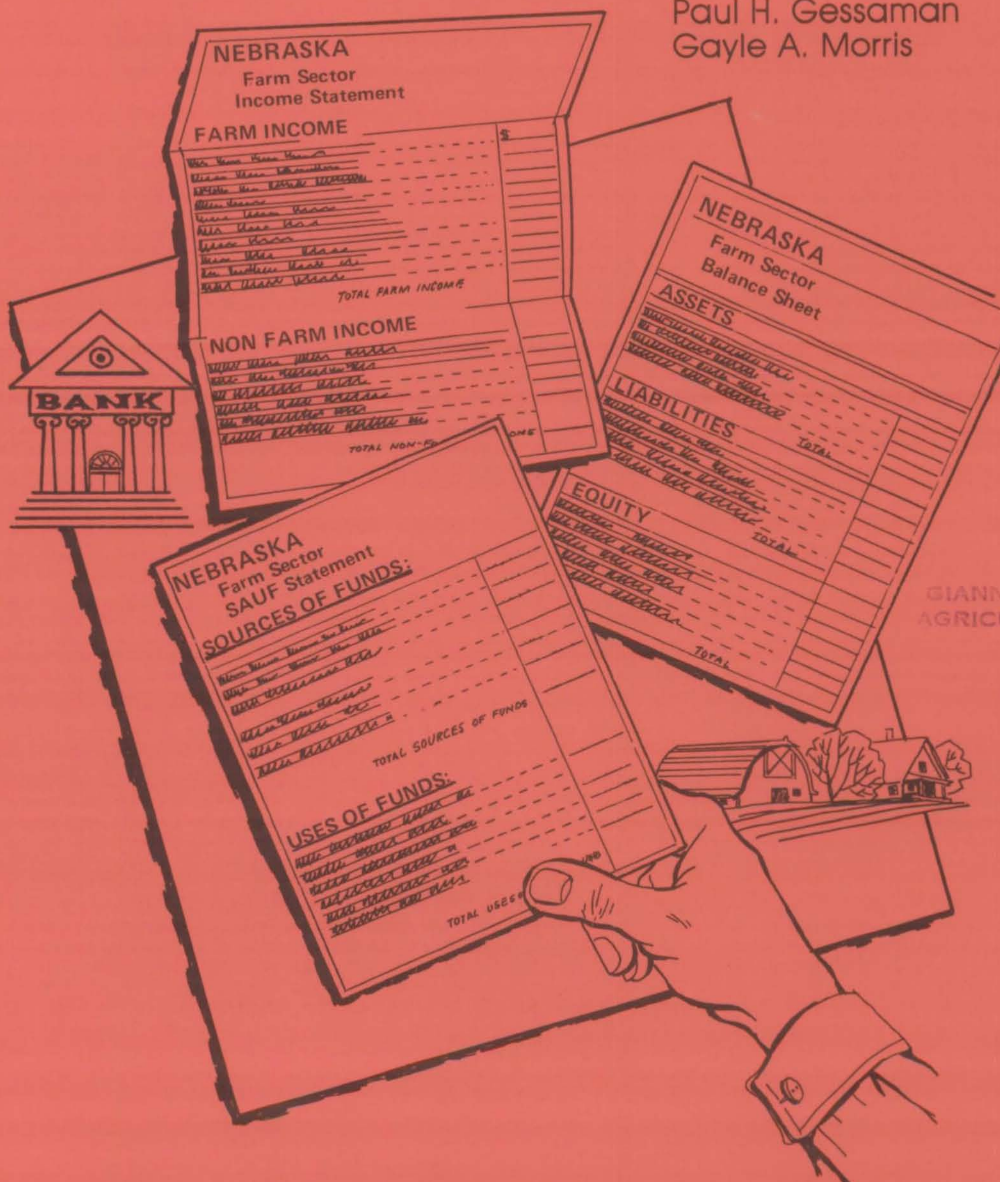
NE

Department of Agricultural Economics

Report No. 131
January, 1983

RECENT AND PROJECTED FINANCIAL CONDITIONS IN NEBRASKA'S FARMING SECTOR

by
Paul H. Gessaman
Gayle A. Morris



The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska—Lincoln
Irvin T. Omtvedt, Director

RECENT AND PROJECTED FINANCIAL CONDITIONS

IN NEBRASKA'S FARMING SECTOR

by

Paul H. Gessaman and Gayle A. Morris

Department of Agricultural Economics
University of Nebraska-Lincoln
Lincoln, NE

Table of Contents

List of Tables

RECENT AND PROJECTED FINANCIAL CONDITIONS IN NEBRASKA'S FARMING SECTOR

by Paul H. Gessaman and Gayle A. Morris

ABSTRACT

Annual aggregate (sector) financial statements for Nebraska's farming sector were compiled for the 1960-80 period. An existing econometric model was updated to reflect sector financial relationships for the 1960-79 period. It was used to project sector financial statements for 1981-83 under alternate sets of assumptions using financial statement entries for 1980 as initial values.

Comparisons of 1975 and 1980 sector financial statements with those projected for 1982 and 1983 provided numerous measures of the deteriorating financial position of the farming sector. Debt increases 1975-80 resulted in a declining sector equity ratio despite large increases in the current dollar value of assets during the period. Equity ratios were projected to decline further in 1982 and 1983 as financial assets were depleted and real estate values declined. Sector net income from farming was projected to continue its 1975-80 decline and be negative in 1982 and 1983. Debt extensions were an increasingly important source of sector liquidity 1975-80 and that trend was projected to continue in 1982-83. Financial stresses in the farming sector were expected to result in rapid modification of management approaches and actual revenue shortfalls and debt levels for 1982 and 1983 are expected to be less than those projected, but undoubtedly will be highly unfavorable.

Major insights drawn from the 21-year sequence of sector financial statements included: (1) Equity liquidation through increased borrowing became a major source of sector liquidity during the period. (2) Financial flows through the sector increased greatly during the period of 21 years, but the purchasing power of sector net income was less at the end of the period than it had been during the early 1960's. (3) The ratio of debt repayments to net farm income was stable during the 1970's and increased three-fold during the 1980's as the sector's debt load increased and debt rollovers became more prevalent. (4) Proprietors' withdrawals for family living, taxes, and nonfarm investments exceeded sector net income in more than one half of the years and the resulting net disinvestment in the farming sector totaled to an estimated $2.9 billion in the 21 years.

Recent and Expected Financial Conditions in Nebraska's Farming Sector

by Paul H. Gessaman and Gayle A. Morris*

Introduction

Research underway in the Department of Agricultural Economics provides insights into financial conditions in Nebraska's farming sector which are not available from other sources.[1] These insights arise from preliminary research results and are subject to revision as the research activity continues.

Objectives of the research included:

1. re-estimation of an existing flow-of-funds model of the Nebraska farming sector using time series data for the 1960-79 period, and
2. projection and analysis of annual aggregate (sector) financial statements for 1982 and 1983.

Despite the high probability that work during the next few months will result in some revisions, the authors decided the preliminary results of work under Objective 2 were of current interest and should be published now.

A brief discussion of recent economic conditions in Nebraska's farming sector provides the background for a summary of the research approach and the report of preliminary research results.

---

* The co-authors are Professor and Research Associate, Department of Agricultural Economics, UN-L. The contributions of Terese Janovec who compiled data series and carried out computer analyses is acknowledged with appreciation.

[1] This research was carried out under Projects 10-081 and 10-087 of the Nebraska Agricultural Experiment Station. It uses a computer simulation model first developed in 1975 and periodically updated since that time. A complete description of the original model is found in Leslie G. Carlow, "Capital in Nebraska Agriculture: Its Formation, Distribution, and Financing (unpublished Ph.D. thesis, Department of Agricultural Economics, University of Nebraska-Lincoln 1975).

Recent Economic Conditions

As was typical throughout the national economy, Nebraska's farming sector experienced unstable product prices, rapid price inflation, relatively high nominal interest rates, and periods of limited credit availability during the 1970s.[2] The rate of increase in agricultural land prices exceeded the rate of general inflation and provided an increasing equity base for the sector's rapidly increasing borrowings. Current (undeflated) dollar volumes of financial flows, total assets, and total liabilities increased rapidly during the decade.

During the 1980 through 1982 period the farming sector has experienced increased financial pressures. Market prices for grains generally have declined or remained constant. Livestock prices have varied from unfavorable to favorable. Production costs have continued to increase, though the rate of increase has been less than was typical of the late 1970s. The general rate of inflation has been reduced. Land prices peaked in 1981 and have declined in 1982, a decline that appears likely to continue in 1983. Credit availability often has been restricted and interest rates have been high. Individual farmers, and the sector as a whole, have responded by deferring purchases of capital items, reducing expenses wherever possible, and increasing efforts to improve marketing. Heavily leveraged or inefficiently operated production units have experienced moderate to severe financial difficulties.

---

[2] Throughout this report the terms, "nominal" and "current," are used to identify dollar amounts or interest rates expressed as actual data for the indicated years (data that have not been adjusted for the effects of inflation). The terms, "constant" and "real," are used to indicate dollar amounts or interest rates that have been adjusted using the Consumer Price Index (Base year 1967 = 100) to remove the effects of inflation.

The Research Approach

At least two approaches can be used to estimate the consequences of recent economic conditions for the farming sector. In one, measures of the financial stresses being experienced by agricultural producers are derived from data on forced sales, operating losses experienced by individual farmers, lenders' foreclosure actions, and comparisons of the income levels of individual firms. In an alternate approach used here, aggregate financial statements (financial statements for the farming sector as a whole) are compiled and analyzed to gain insights into conditions in the sector. These financial statements also provide measures of the financial stresses and strains being experienced by the agricultural operations whose fiscal data are aggregated in the sector financial statements.

Annual aggregate financial statements for the Nebraska farming sector: annual income statements, balance sheets, and sources and uses of funds (SAUF) statements, were compiled for each of the years 1960-1979. These statements were based on agricultural and financial statistics for the farming sector; and provide estimates of financial stocks and flows in current dollars for the respective years.[3] An econometric model of financial relationships in the farming sector was developed using data series for the 1960-79 period. After incorporating historical data for 1980 the model was used to project estimated sector financial statements for the years 1981 through 1983. A flow chart of the model is provided in Figure 1.

---

[3] Income and SAUF statements are for periods of one calendar year. Balance sheets reflect conditions as of the end of the calendar year. The farming sector is defined as the total of all agricultural production units (related agribusiness firms are not included). The aggregate financial statements are estimates of the sum of equivalent statements for all production units (land assets owned by nonfarm landlords are included), if such statements actually existed. Inasmuch as nearly all financial statement entries are estimates calculated from state or national data series compiled for other purposes, entries in the 1975 and 1980 financial statements are referred to here as estimates.

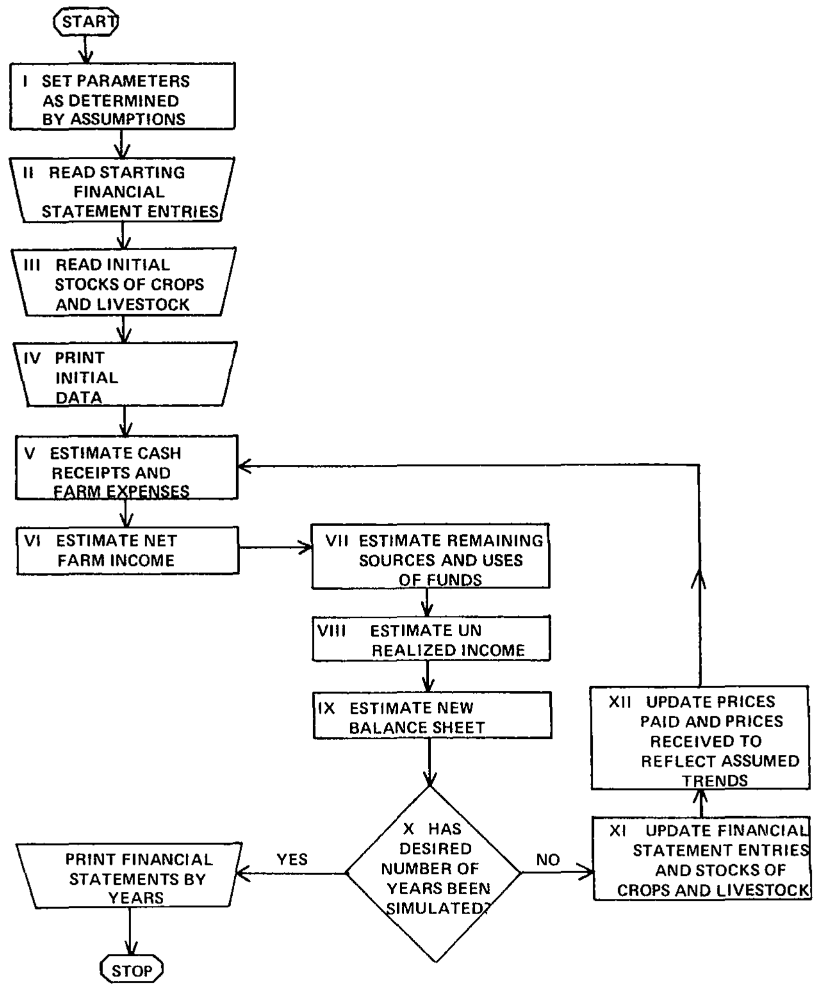


Figure 1. Flow chart of computer program used for projections.[a]

---

[a] The flow-of-funds econometric model contains many estimated equations reflecting relationships between farming sector financial statement entries and: (1) various measures of crop and livestock production, (2) levels of prices paid and prices received by farmers, and (3) a number of related measures of the farming sector. As indicated in the figure, the computer program used in the projections initially reads in data reflecting: (1) the projection assumptions, (2) the base year financial statement entries, and (3) stocks of crops and livestock. Financial statements are projected one year at a time until the final year is completed. The projected financial statements are then printed and the projection run ends.

Projected aggregate financial data for 1982 and 1983 are included in this report. The projections should not be regarded as precise predictions of farming sector data for 1982 and 1983 as the econometric model reflects financial inter-relationships of the base period (1960-79), and those inter-relationships are changing rapidly in response to present economic conditions. The projections do provide useful insights into current conditions and the scope of financial problems in Nebraska's farming sector.

Earlier work related to this research was reported in 1977.[4] Methodology used in that study and in the present continuation of the research is an adaptation of earlier approaches to the measurement of sector financial conditions as developed by Melichar; Lins; Brake and Barry; Penson, Lins and Irwin; and Robinson, Barry and Hopkin (see list of references).

Measures of financial conditions in Nebraska's farming sector as reported here are generally consistent with, but not identical to, current compilations of sector financial statements by Economic Research Service, U.S. Department of Agriculture. Differences in methodology and assumptions used in the analysis preclude identical results.[5]

As is true of all econometric models, the one used here incorporates many assumptions and simplifications. There are two types of assumptions: (1) assumptions that determine the structure of the model, and (2) assumptions that determine the nature of the projections. Two structural assumptions of primary importance are: (1) an implicit assumption that prices paid and prices received by farmers, and the price of real estate assets used in farming, are

---

[4] Paul H. Gessaman and Leslie G. Carlow, Financing Nebraska's Agriculture--Recent Experience and Projections to 1980 and 1985, SB542, Nebraska Agricultural Experiment Station (December 1977).

[5] Economic Research Service reports are included in the series entitled Economic Indicators of the Farm Sector, cited in the list of references.

set outside the sector (i.e., an assumption that the non-agricultural economy dominates the agricultural sector), and (2) an explicit assumption that annual changes in the value of assets owned by farmers can be best recognized as unearned income. In making the projections for 1982 and 1983 it was further assumed that: (1) the general level of prices received for crops and livestock would remain at or near estimated 1981 levels through 1983; (2) the inflation rate as reflected in the consumer price index (CPI) would be 6 percent per year (Projection I), or 10 percent per year (Projection II); and (3) the time sequence of changes in the price of land would be:

Calendar Year	Change in Price of Land
1980	up 10 percent
1981	up 4 percent
1982	down 13 percent
1983	down 8 percent

The value of non-real estate assets was projected as a continuation of the pre-1980 relationship between general price levels and the price of non-real estate assets.

Estimated amounts are reported in all financial statement entries for 1975 and 1980. Similar entries for 1982 and 1983 are projections. All amounts are expressed in current dollars for the respective years.

Balance Sheet

The balance sheet for the farming sector of Nebraska provides annual, aggregate measures of farming sector assets and the claims on those assets. Physical assets include real estate, livestock, crops stored on and off farms, machinery and motor vehicles, household equipment and furnishings. Financial assets include U.S. savings bonds, investments in cooperatives, bank deposits, and currency.

Claims on farming sector assets are divided into liabilities and proprietors' equities. Liabilities are nonfarm claims on farm assets (principally real estate and non-real estate debt).[6] Proprietors' equities are calculated as a residual claim on assets (the amount needed to equate total assets and total claims).

The current dollar value of agricultural sector total assets increased by 82 percent between 1975 and 1980. Projections for 1982 and 1983, as reported in Tables 1 and 2, indicated asset values would decline by approximately 4 percent by the end of 1983 with the decline being somewhat less under a 6 percent annual rate of inflation (Projection I) than with a 10 percent annual inflation rate (Projection II). These projected changes reflected the combined effects of the assumed trends in real estate values and projected increases in the value of non-real estate assets resulting from continued inflation.

In current dollars, total liabilities more than doubled in the 1975-80 period, and were projected to increase rapidly during the 1981-83 period under both projections I and II. Non-real estate debt was projected to increase at a more rapid rate (nearly 50 percent increase) than real estate debt (38 percent increase projected). There was little difference between the amounts indicated in Projections I and II. These projections indicated the continuation and intensification of trends evident in the 1975-80 period. Non-real estate debt as a percent of the total sector debt load increased from 56 percent in 1975 to 61 percent in 1980 and was projected to be 62 percent in 1983.

The current dollar value of proprietor's equities increased by about 75 percent between the end of 1975 and the end of 1980 as land prices moved up

---

[6] Debt within the sector such as borrowing and lending between active farmers is not reflected in the aggregate financial statements.

Table 1. End of Year Balance Sheet of the Nebraska Farming Sector 1975 and 1980 Estimated, and 1982 and 1983 Projected, Assuming a 6 Percent Annual Rate of Inflation.[a]

	Estimated		Projection I 6 Percent Inflation Rate	
	1975	1980	1982	1983
	Millions of Dollars			
Physical Assets:				
Real Estate	17,232	31,482	28,486	26,207
Non-Real Estate	5,534	11,597	13,937	15,660
Financial Assets	1,301	699	450	36
Total Assets	24,067	43,778	42,873	41,903
Liabilities:				
Real Estate	1,721	3,368	4,198	4,670
Non-Real Estate	2,231	5,189	6,611	7,653
Total Liabilities	3,952	8,557	10,809	12,323
Proprietors' Equities	20,115	35,221	32,064	29,580
	Percentages			
Proprietors' Equities as a Percent of Total Assets	84	81	75	71

[a] All amounts are expressed in current dollars for the respective years.

Table 2. End of Year Balance Sheet of the Nebraska Farming Sector 1975 and 1980 Estimated, and 1982 and 1983 Projected, Assuming a 10 Percent Annual Rate of Inflation.[a]

	Estimated		Projection II 10 Percent Inflation Rate	
	1975	1980	1982	1983
	Millions of Dollars			
Physical Assets:				
Real Estate	17,232	31,482	28,486	26,207
Non-Real Estate	5,534	11,597	13,820	15,509
Financial Assets	1,301	699	16	- 641
Total Assets	24,067	43,778	42,304	41,075
Liabilities:				
Real Estate	1,721	3,368	4,179	4,633
Non-Real Estate	2,231	5,189	6,655	7,753
Total Liabilities	3,952	8,557	10,834	12,386
Proprietors' Equities	20,115	35,221	31,470	28,689
	Percentages			
Proprietors' Equities as a Percent of Total Assets	84	81	74	70

[a] All amounts are expressed in current dollars for the respective years.

rapidly. At the same time liabilities increased rapidly and the proportion of total assets represented by proprietor's equities declined from 84 to 81 percent. Projections indicated the current dollar value of proprietor's equities would decline about 16 percent 1980-83 due to the combined effects of decreases in the value of land assets and increases in outstanding debt. In Projections I and II, the 1983 equity percentages were 71 and 70 percent of assets, respectively.

Balance sheet ratios presented in Table 3 provide measures of farming sector solvency and additional indications of changes in the sector's equity position. The leverage ratio (total debt divided by total equity) was .20 in 1975 and .24 in 1980 indicating one dollar of debt for each four plus dollars of equity in 1980. The projected leverage ratios for 1982 and 1983 were .34 and .42 under Projection I (6 percent annual rate of inflation), and .34 and .43 under Projection II (10 percent annual rate of inflation). Non-real estate debt ratios indicated increased reliance was placed on short term debt financing in the 1975-80 period and the trend was projected to continue through 1983. This ratio was estimated as .40 in 1975, .45 in 1980 and was projected to be about .50 in 1983 under both Projection I and Projection II. Trends in the total debt to total assets ratio and the real estate debt to real estate assets ratio were consistent with the trends in leverage ratios and non-real estate debt ratios.

Income Statement

The income statement reports annual income and expense flows for the agricultural sector of Nebraska. Total net income for the farming sector is reported as the sum of: (1) net farm income (gross receipts less gross

Table 3. Balance Sheet Ratios of the Nebraska Farming Sector, 1975 and 1980 Estimated, 1982 and 1983 Projected.

Ratios	Estimated		Projection I 6 Percent Inflation Rate		Projection II 10 Percent Inflation Rate	
	1975	1980	1982	1983	1982	1983
	Ratios					
Total Debt to Total Equity	.20	.24	.34	.42	.34	.43
Total Debt to Total Assets	.16	.20	.25	.29	.26	.30
Non-Real Estate Debt to Non-Real Estate Assets	.40	.45	.47	.49	.48	.50
Real Estate Debt to Real Estate Assets	.10	.11	.15	.18	.15	.18

expenses plus or minus the sum of depreciation expense and inventory change), (2) net nonfarm income, and (3) unrealized income.[7]

Comparisons of estimates for 1975 and 1980 as reported in Tables 4 and 5 indicate farm operating expenses expressed in current dollars were twice as large in 1980. Gross farm income in current dollars increased by 57 percent over those five years. The net result of these changes was a 42 percent decline in 1980 cash farm income from the 1975 level. Net farm income was reduced from $824 million in 1975 to $346 million in 1980, a 58 percent decline. Income from nonfarm sources plus unrealized income (appreciation in real estate value contributed the largest share of unrealized income) offset a large part of the decline in cash farm income and resulted in total net sector income in 1980 being nearly 85 percent of the 1975 amount.

Projections for 1982 and 1983 indicated large operating losses (negative net farm income) as gross farm expenses were projected to be larger than gross farm income. The negative effects of inflation were illustrated by the larger operating losses indicated under Projection II (10 percent inflation rate).[8] Declines in the projected value of real estate resulted in large negative amounts in the unearned income category and the rapid erosion of equity reported in the balance sheets (Tables 1 and 2). Nonfarm income was projected to increase,[9] a projection that almost certainly is too optimistic when

---

7 The three components of unrealized income are: (1) gross rental value of farm dwellings; (2) the value of products consumed on the farm; and (3) changes in the value of farm real estate.

8 The negative 1983 level of cash farm income under Projection II was 76 percent larger in magnitude than that projected for 1983 under the 6 percent inflation rate of Projection I.

9 The projection equation for nonfarm income uses the Consumer Price Index and time as principal explanatory variables. Thus, nonfarm income was projected to increase in 1982 and 1983 as the reduction in employment was not included in the projection process.

Table 4. Income Statement of the Nebraska Farming Sector 1975 and 1980 Estimated, 1982 and 1983 Projected, and Selected Ratios; Assuming a 6 Percent Annual Rate of Inflation.[a]

Item	Estimated 1975	Estimated 1980	Projection I 6 Percent Inflation Rate 1982	Projection I 6 Percent Inflation Rate 1983
	Millions of Dollars			
Gross Farm Income	3,931	6,158	6,048	6,177
Gross Farm Expenses	2,740	5,462	6,514	7,157
Cash Farm Income	1,191	696	- 466	- 980
Sum of Depreciation and Inventory Change	- 367	- 350	4	- 80
Net Farm Income	824	346	- 462	- 1,060
Nonfarm Income	512	767	908	934
Unrealized Income[b]	3,686	3,129	- 4,058	- 2,077
Change RE Value	3,552	2,862	- 4,256	- 2,278
Total Net Sector Income	5,022	4,242	- 3,612	- 2,203
	Ratio			
Gross Farm Operating Expenses to Gross Farm Income	.70	.89	1.08	1.16

[a] All amounts are expressed in current dollars for the respective years.

[b] Unrealized income is the sum of: (1) rental value of farm buildings, (2) value of farm products consumed by farm households, and (3) change in real estate value.

NOTE: Projections of Cash Farm Income and Net Farm Income reported in this table reflect the projection to 1982 and 1983 of expenditure patterns typical of the 1970s. As such, they provide measures of financial pressures and incentives for changes in management approaches, but are not predictions of actual 1982 and 1983 farming sector income levels.

Table 5. Income Statement of the Nebraska Farming Sector 1975 and 1980 Estimated, and 1982 and 1983 Projected, and Selected Ratios; Assuming a 10 Percent Annual Rate of Inflation.[a]

Item	Estimated 1975	Estimated 1980	Projection II 10 Percent Inflation Rate 1982	Projection II 10 Percent Inflation Rate 1983
	------------Millions of Dollars---------------			
Gross Farm Income	3,931	6,158	6,048	6,177
Gross Farm Expenses	2,740	5,462	6,954	7,900
Cash Farm Income	1,191	696	- 906	- 1,723
Sum of Depreciation and Inventory Change	- 367	- 350	2	- 86
Net Farm Income	824	346	- 904	- 1,809
Nonfarm Income	512	767	795	751
Unrealized Income[b]	3,686	3,129	- 4,066	- 2,088
Change in RE Value	3,552	2,862	- 4,256	- 2,278
Total Net Sector Income	5,022	4,242	- 4,175	- 3,146
	--------------------Ratio---------------------			
Gross Farm Operating Expenses to Gross Farm Income	.70	.89	1.15	1.28

[a] All amounts are expressed in current dollars for the respective years.

[a] Unrealized income is the sum of: (1) rental value of farm buildings, (2) value of farm products consumed by farm households, and (3) change in real estate value.

NOTE: Projections of Cash Farm Income and Net Farm Income reported in this table reflect the projection to 1982 and 1983 of expenditure patterns typical of the 1970s. As such, they provide measures of financial pressures and incentives for changes in management approaches, but are not predictions of actual 1982 and 1983 farming sector income levels.

consideration is taken of the 16 percent reduction in manufacturing employment reported during calendar year 1982.[10]

The estimated and projected sector income statements provide additional measures of the extent of financial stress placed on the farming sector. Actions taken by farmers (e.g., deferral of reinvestment in capital assets and reduction of operating expenses) will almost certainly result in cash farm income levels less negative than those in the projections. At the same time, the farmland price levels assumed as bases for these projections reflect current and expected conditions. When income data for 1982 and 1983 become available, it appears that they will show the farming sector experienced operating losses, declines in asset values and erosion of equity positions during 1982 and 1983.

Sources and Uses of Funds Statement

Sources and uses of funds statements (SAUF statements) for the farming sector of Nebraska provide annual measures of sector financial flows. Cash receipts from farm marketings and government payments, real estate debt extended, non-real estate debt extended, nonfarm income, real estate sales by active farmers, and beginning financial assets are principal components of the sources of funds total. Uses of funds are estimated in seven categories, and in total: (1) farm operating expenses, (2) capital expenditures, (3) real estate debt repaid, (4) non-real estate debt repaid, (5) real estate purchases by active farmers, (6) ending financial assets, and (7) proprietors' withdrawals (estimated as the residual amount needed to equate total uses of funds with the sources of funds total).

---

[10] Business in Nebraska, Monthly Newsletter of the Bureau of Business Research, University of Nebraska-Lincoln, Vol. 62, No. 13, p2.

As reported in Tables 6 and 7, the current dollar amounts of financial flows through the farming sector increased dramatically between 1975 and 1980. The 1980 total of $18,565 million represented a 97 percent increase over total sector financial flows in 1975. The importance of non-real estate debt extensions as a source of sector liquidity was evident in the 152 percent increase between 1975 and 1980 in funds from this source. In the same period, real estate debt extensions increased from $401 million to $713 million, a 78 percent increase, while real estate debt repaid was estimated to decline from $278 million in 1975 to $180 million in 1980 (a 35 percent decline).

Projections to 1982 and 1983 illustrated the consequences for the farming sector of continued inflation and unfavorable cost-price relationships. Non-real estate debt extensions were projected to steadily increase with the 1983 levels projected to be 40 percent (Projection I) or 56 percent (Projection II) greater than the 1980 level. Repayments of non-real estate debt also were projected to increase over the same period by roughly equivalent percentages. These projections reflected continuation of historic patterns of debt repayment from new debt extensions (the rolling over of short term debt).

The pattern of debt extensions exceeding debt repayments indicates continuation of the long standing practice of partially liquidating appreciation in the value of farming sector assets through increased borrowing (equity liquidation). Equity liquidations were estimated at $366 million in 1975, an amount equal to 31 percent of cash farm income or 44 percent of the $824 million net farm income. This $366 million amount was approximately 18 percent of liquidity net of farm operating expenses.[11] In 1980, cash farm income was estimated at $696 million and non-farm income was estimated to be $767

---

[11] Liquidity net of farm operating expenses is the sum of cash farm income, nonfarm income, and the excess of debt extensions over debt repayments.

Table 6. Sources and Uses of Funds Statement of the Nebraska Farming Sector 1975 and 1980 Estimated, and 1982 and 1983 Projected, Assuming a 6 Percent Annual Rate of Inflation.[a]

Item	Estimated		Projection I 6 Percent Inflation Rate	
	1975	1980	1982	1983
	------------Millions of Dollars------------			
Cash Receipts[b]	3,931	6,158	6,048	6,177
RE Debt Extended	401	713	999	937
Non-RE Debt Extended	3,859	9,743	12,153	13,679
Nonfarm Income	512	767	908	934
RE Sales by Farmers	66	165	468	407
Beginning Financial Assets	678	1,019	777	450
Total Sources of Funds	9,447	18,565	21,353	22,584
Farm Operating Expenses	2,740	5,462	6,515	7,157
Capital Expenditures	516	938	1,234	1,352
RE Debt Repaid	278	180	513	464
Non-RE Debt Repaid	3,616	9,056	11,262	12,637
RE Purchases by Farmers	145	372	866	754
Ending Financial Assets	1,301	699	450	36
Proprietors' Withdrawals[c]	851	1,858	513	184
Total Uses of Funds	9,447	18,565	21,353	22,584
Excess of Debt Extensions Over Debt Repayments	366	1,220	1,377	1,515

[a] All amounts are expressed in current dollars for the respective years.

[b] Cash receipts include cash receipts from farm marketings and government payments.

[c] Proprietors' withdrawals are the total of FICA and income tax payments plus withdrawals for family consumption expenditures and nonfarm investments.

Table 7. Sources and Uses of Funds Statement of the Nebraska Farming Sector 1975 and 1980 Estimated, and 1982 and 1983 Projected, Assuming a 10 Percent Annual Rate of Inflation.[a]

Item	Estimated		Projection II 10 Percent Inflation Rate	
	1975	1980	1982	1983
	------------Millions of Dollars------------			
Cash Receipts[b]	3,931	6,158	6,048	6,177
RE Debt Extended	401	713	946	891
Non-RE Debt Extended	3,859	9,743	13,013	15,166
Nonfarm Income	512	767	795	751
RE Sales by Farmers	66	165	468	407
Beginning Financial Assets	678	1,019	566	16
Total Sources of Funds	9,447	18,565	21,836	23,408
Farm Operating Expenses	2,740	5,462	6,954	7,900
Capital Expenditures	516	938	1,240	1,364
RE Debt Repaid	278	180	481	438
Non-RE Debt Repaid	3,616	9,056	12,092	14,068
RE Purchases by Farmers	145	372	866	754
Ending Financial Assets	1,301	699	16	- 641
Proprietors' Withdrawals[c]	851	1,858	187	- 475
Total Uses of Funds	9,447	18,565	21,836	23,408
Excess of Debt Extensions Over Debt Repayments	366	1,220	1,386	1,551

[a] All amounts are expressed in current dollars for the respective years.

[b] Cash receipts include cash receipts from farm marketings and government payments.

[c] Proprietors' withdrawals are the total of FICA and income tax payments plus withdrawals for family consumption expenditures and nonfarm investments.

million. Equity liquidation through increased borrowings by the sector totaled $1,220 million which made it the dominant source of net sector liquidity in that year (45 percent of liquidity net of farm operating expenses). The excess of debt extensions over debt repayments was projected to increase in 1982 and 1983 under both projections. Cash farm income was projected to be negative in those years making nonfarm income and equity liquidation through increased borrowings the principal sources of liquidity.

Increased borrowing sustained proprietors' withdrawals of $1,858 million in 1980, an increase of 118 percent over the 1975 level. Projections indicated this level of withdrawal could not be sustained in the adverse price-cost conditions of the early 1980's. The model projected reduced liquidity in 1982 and 1983 that would result in increased asset liquidation and the need for substantial infusions of outside capital (negative withdrawals) if the structure of the sector was to be maintained.

Ratios of major components of the sources and uses of funds statement provide additional measures of financial trends in the farming sector. The ratio of cash receipts to total sources of funds (total financial flows through the sector) declined from .42 in 1975 to .33 in 1980. Both projections indicated the ratio would decline further in 1982 and 1983 with somewhat more than one-fourth of total financial flows through the sector projected to come from cash receipts in those years. The importance of non-real estate debt extensions is illustrated by the ratio of that component to total sources of funds (.41 in 1975 and .52 in 1980). Projections to 1982 and 1983 indicated the ratio would increase, reflecting the projected expansion of reliance on debt extensions as the main source of farming sector liquidity.

Insights from the Time Series of Sector Financial Statements

The time series of estimated sector financial statements developed in this research contains 21 estimated annual balance sheets, income statements, and SAUF statements. Projected statements for 1981, 1982, and 1983 have been developed. For ease of exposition, the previous discussion focused on comparisons and insights drawn from estimated statements for 1975 and 1980, and from two alternate sets of projected statements for 1982 and 1983.

This section of the paper presents insights drawn from the entire time series of estimated statements. Where it improves the discussion or presentation of information, some additional information is drawn from the projected statements. The financial statements are not presented as the volume of information is too large to make such presentation feasible.

The Balance Sheet

For more than a decade, there has been continuing discussion and expressions of concern over the farming sector's debt load. While the total acreage in farms remained relatively constant, current dollar amounts of outstanding real estate debt increased from about $373 million in 1960 to $1.14 billion in 1970 to $3.4 billion in 1980. Despite this rapid increase in outstanding real estate debt, the ratio of real estate debt to real estate assets remained relatively constant, as land prices increased rapidly. The ratio was 0.085 in 1960. It increased to 0.150 in 1970 and declined to 0.108 in 1980 as land values increased during the 1970s more rapidly than did the level of outstanding debt (the current dollar value of real estate assets increased from $7.5 billion in 1970 to $31.5 billion in 1980). In constant 1967 dollars, outstanding real estate debt increased from $1.0 billion in 1970 to $1.4 billion in 1980 while the value of real estate assets increased from \$6.5 billion to \$12.9 billion for the same years.

Growth of non-real estate debt was less rapid than was growth in real estate debt though the dollar amounts were larger. In current dollars, it increased from \$810 million in 1960 to \$1.49 billion in 1970 and \$5.2 billion in 1980. The current dollar value of non-real estate assets increased from \$2.32 billion to \$3.48 billion to \$11.6 billion in these same years. The ratio of non-real estate debt to non-real estate assets was 0.349 in 1960, 0.428 in 1970, and 0.448 in 1980. In the 21-year period, the sophistication and horsepower of farm machinery and motor vehicles increased dramatically, resulting in substantial change in the nature of the non-real estate assets represented by these data.

The combined effects of these changes occuring over the 21-year period resulted in the current dollar value of real estate and non-real estate assets plus financial assets used by the farming sector increasing from \$7.13 billion in 1960 to \$43.8 billion in 1980. In the same period, outstanding debt increased from \$1.16 billion to \$8.56 billion. Thus, the current dollar value of assets used by the farming sector increased by a factor of about 6.1 while the sector debt load increased by a factor of about 7.4 (from \$1.16 billion to \$8.56 billion). Over the period of 21 years, proprietors' equities increased by \$29 billion in current dollar value, while the ratio of total debt to total equity increased from 0.195 to 0.243. If projected conditions for 1982 and 1983 did materialize, declines in land values combined with expense increases greater than income increases would result in this ratio deteriorating to 0.42 by the end of 1983.

The Income Statement

Income statement components valued in current dollars fluctuated rather widely over the 21-year period. Some overall trends were evident. The current dollar value of gross farm income increased slowly until 1972-74 when it nearly doubled in two years. Gross farm operating expenses not adjusted for depreciation cost and inventory change increased from a low of $796.4 million in 1960 to a high of $5.46 billion in 1980. Gross farm operating expenses increased each year with the increases most rapid in the years after 1972. Cash farm income, the net of gross farm income and gross operating expenses ranged from a low of $415.3 million in 1962 to a high of $1.37 billion in 1974. Subsequent to 1974 it declined to a low of $696 million in 1980. Projections to 1983 indicated cash farm income would be negative in that year if the pre-1980 production arrangements were continued through 1983.

Net farm income provides the most reliable economic measure of returns from farming as it reflects depreciation costs and changes in inventories in addition to the combined effects of gross receipts and gross farm expenses. Sector net farm income was estimated to vary from a high of $955 million in 1973 to a low of $232 million in 1976 (both measured in current dollars).

When allowance is made for price level changes, the purchasing power of net farm income was less at the end of the 21-year period than it had been in the early years of the period. Comparisons of the real purchasing power of three-year averages of net farm income expressed in 1967 dollars indicate the 1960-62 average real value of net farm income was $366.9 million. The 1973-75 average was $494.1 million in real dollars, and the similar average for 1978-80 was $334.7 million. Without question the purchasing power of the farming sector's net income was less at the end of the 21 years for which financial statements have been compiled than it was in the early 1960's.

Nonfarm income steadily increased in importance as a source of farming sector income and was estimated to exceed net farm income (both are measured in current dollars) for the first time in 1974. In only one subsequent year, 1975, was nonfarm income estimated to be less than net farm income. Nonfarm income has become a major source of farming sector liquidity.

Unrealized income includes the gross rental value of farm dwellings, the value of farm commodities consumed by farm families, and changes in real estate values. Of these, the change in real estate values was clearly the dominant component during most of the 21 year period, 1960-80. Rapid increases in land values made possible the liquidation of asset appreciation without serious loss of equity, and partial asset liquidation through increased borrowing became a principal source of sector liquidity.

The SAUF Statments

SAUF statements provide a comprehensive overview of funds passing through the farming sector during each calendar year. Modifications in the flows of funds over time indicate the types of changes that are occurring.

In both nominal (current dollar) and real (constant dollar) amounts, the volume of monetary flows through the sector has increased during the 21 years. In current dollars, sources and uses of funds (total funding of the sector) were $3.35 billion in 1960, increased to $6.57 billion in 1970 and to $18.6 billion in 1980. When measured in constant 1967 dollars (using the Consumer Price Index, as the deflator), these amounts are: $3.76 billion in 1960, $5.66 billion in 1970, and $7.62 billion in 1980. In current dollars, financial flows through the sector increased about 5.6 times in the 21 years. In constant dollar terms, these flows doubled.

Cash receipts from farm marketings and debt extensions were the principal sources of funds, providing up to 85 percent of sector liquidity. The two largest claims on the sector's financial flows were farm operating expenses and debt repayments. These uses required as much as 80 percent of total sector funds.

Additional time series data from SAUF statements were compiled for five-year intervals of the 1961-80 period and are presented in Table 8. The ratio of loan extensions to loan repayments was relatively stable during the decade of the 1960s, but increased rapidly in the 1970s. It was 1.06 in the 1961-65 period and increased to 1.13 in the 1976-80 period ($1.13 in loans extended for each $1.00 repaid) as farmers and lenders rapidly expanded the level of outstanding debt. Debt extensions exceeded debt repayments in 18 of the 20 years.

The ratio of debt repayments to net farm income also was relatively stable in the 1970s and increased in the 1980s.[12] The nearly threefold increase of this ratio from a value of 5.9 in 1961-65 to 15.2 in 1976-80 ($15.20 in debt repayments for each $1.00 of net farm income) provides evidence of the large increase in debt relative to net returns from farming that occurred as borrowing increased and returns declined. The high level of repayment reflects the prevalence of rolling-over debt (repaying past debt with new borrowings). Average yearly net increases in debt increased sevenfold between the first and the last interval.

Proprietors' withdrawals exceeded total net income (net farm income plus net nonfarm income) in 12 of the 20 years 1961-80. In the remaining eight years, the surplus of total net income over proprietors' withdrawals offset only a portion of the excess withdrawals of other years. For the entire 20-year period, proprietors' withdrawals exceeded total net income by

---

[12] Net farm income is calculated as the net amount of gross farm receipts less gross farm expenses including depreciation plus or minus inventory adjustment.

Table 8. Selected Indicators from the Nebraska Farming Sector Sources and Uses of Funds Statements for Five-year Time Intervals within the 1961-1980 Period.

Indicator	Time Intervals 1961-65	1966-70	1971-75	1976-80
Ratio for interval of loan extensions to loan repayments	1.06	1.05	1.07	1.13
Ratio for interval of debt repayments to net farm income	5.9	5.4	6.8	15.2
Average yearly net increase in debt ($ million)	121	145	273	847
Number of years in interval with proprietors' withdrawals exceeding total of net farm income and net nonfarm income	3	2	4	3
Excess for interval of proprietors' withdrawals over the total of net farm income and net nonfarm income ($ million)	154	107	468	2169

about \$2.9 billion with 75 percent of the excess accruing in the last five years (1976-80). Income and social security taxes, family living, nonfarm investments, and repayment of nonfarm debts are major uses for proprietors' withdrawals.

Summary Comments

The research reported here provides measures of the extent of financial stress being experienced in Nebraska's farming sector. Conditions in 1980 showed marked deterioration in the farming sector financial situation from conditions in the sector in 1975. Projections for 1982 and 1983 provided alternate scenarios of severe financial pressures with the projected negative conditions more severe under the 10 percent inflation rate of Projection II than under the 6 percent inflation rate of Projection I.

Aggregate sector financial statements provided the information on the financial condition of the Nebraska farming sector. Summary comments based on this research effort are:

-- Projected changes in the composition of total assets reduced the liquidity position of the farming sector in the early 1980s. Liquid assets (i.e., financial assets) represented an increasingly smaller share of total assets in both the base period, 1975-80, and in the projections for 1982 and 1983.

-- Farming sector financial statements for 1975 and 1980 indicated increases in the current dollar value of farm operating expenses were more rapid than were increases in farm marketings. By 1980, debt extensions were the dominant source of funds for the sector. This increased borrowing occurred at a time when asset values were rapidly increasing. The ratio of total debt to total equity increased from .20 in 1975 to .24 in 1980 as total liabilities increased by 117 percent and total asset values increased by 75 percent in these five years.

-- Non-real estate debt extended was projected to contribute the largest share of total sector funding in 1982 and 1983. Non-real estate debt repaid was projected to be the largest user of sector funds during those years. Partial liquidation of the value of farm assets through increased borrowing was estimated to be the dominant source of farm sector liquidity in 1980, and was projected to retain that dominant position in 1982 and 1983.

-- Decreases in farmland values occuring in 1982 and expected in 1983 raise questions about the continued ability of producers to liquidate assets through increased borrowing. If assets do not appreciate in value in the near future, the ability of the sector to maintain liquidity through increased borrowing will be greatly reduced. Producing units that are heavily leveraged may find continued operation to be impossible due to their inability to acquire needed funding.

Insights From the Research

The compilation, analysis, and projection of aggregate financial statements for Nebraska's farming sector provides a basis for insights not available from other sources. Discussions of the historic and projected financial statements have called attention to the trends and changes over time in financial statement components. Principal insights derived from this research include:

-- <u>As is true of other portions of the U.S. economy, Nebraska's agricultural sector has gained wealth and lost financial flexibility from the past 15 years of moderate to rapid inflation</u>. For about ten years, the market value of assets increased at a rate equal to or greater than the rate of inflation. Responses to the resulting increased wealth and borrowing capacity included the liquidation of asset appreciation through steadily increased borrowing.

As the purchasing power of net income from farm and nonfarm sources was reduced by inflation and lower farm commodity prices, increased borrowing became a major source of sector liquidity. Reliance on borrowing increased rapidly during the last half of the 1970s, but has not been sustainable since 1980.

-- The "money intensity" of agriculture increased throughout the period for which sector financial statements have been compiled. In 1975 about $8 of funds flowed through the farming sector for each dollar of cash farm income (gross receipts minus gross operating expenses). By 1980, when the current dollar level of cash farm income was approximately 60 percent of the 1975 level, the flow of funds per dollar of cash farm income was more than three times the 1975 level (almost $27 in 1980 vs. $8 in 1975).

-- If the trends of increased borrowing and increased money intensity of production are to continue at rates comparable to those of the late 1970's, asset appreciation also must continue and levels of net income must increase. Sector net income declined throughout the late 1970s and was projected to be even less in 1982 and 1983 as price levels of farm products remained relatively constant and costs of production increased. Land price declines in 1982 and expected declines in 1983 have brought asset appreciation to a temporary end. The resulting financial re-orientation taking place within the sector is, and will be in the near future, a management challenge of over-riding importance to farmers.

-- The financial consequences of conditions described here vary widely as Nebraska's farming sector includes operating units with a wide range of physical and financial characteristics. Sector financial trends and conditions identified in this research indicate financial pressures are and will be particularly severe for producing units that: (a) are engaged in intensive (and expensive) cropping practices sustained by borrowed funds, or (b) are heavily leveraged with recently acquired debt at relatively high interest rates, or (c) are practicing a level of financial and business management that prevents lenders from continuing or expanding current credit availability. Financial pressures are much less for producing units that: (a) are self-financed or nearly self-financed, or (b) have well-managed livestock enterprises, or (c) are engaged in less intensive forms of crop production that allow deferral of expenses and/or capital expenditures.

Implications

Financial aspects of Nebraska's farming sector have undergone rapid evolution and change during the years since 1960. Present conditions of prices for products, costs of production, and changes in asset values do not support continuation of the patterns of change typical of the 1960s and 1970s. Some portions of the farming sector are currently experiencing severe financial adversity with no present evidence that these conditions will improve in the near future.

The foremost short term need of the farming sector is for commodity price levels that will sustain operating costs and debt service on the sector's relatively heavy outstanding debt balances. In the longer term, the sector needs adequate product prices, a more stable economic environment in which to operate, and improved financial and business management approaches that will increase the capability of farm operators to deal with adversity. Only the last of these is fully within the control of farm operators, and it merits the highest level of their attention. The other two conditions can be addressed much less directly though they are of primary importance to the long run welfare of Nebraska's farming sector.

Lenders' responses to current conditions in the farming sector will determine the ability of heavily leveraged producing units to survive. While lenders will continue to make their decisions on a case-by-case basis, the economic environment in which these decisions occur will be less optimistic than was true in previous decades. Lenders and borrowers face many difficult decisions in coming months. The economic reality, made even more evident by the research reported here, is that the patterns of ever increasing borrowing and expenditures typical of the 1970s cannot be sustained in the near future.

References

Brake, J.R., and P.J. Barry. 1971. Flow-of-funds social accounts for the farm sector: comment. Am J of Agric Econ 53:665-68.

Economic Indicators of the Farm Sector, Economic Research Service, United States Department of Agriculture, a series of yearly publications on aggregate social accounts for agriculture initiated in 1980.

Gessaman, P.H. and L.G. Carlow. 1977. Financing Nebraska's agriculture--recent experience and projections to 1980 and 1985. Nebraska Agricultural Experiment Station, Station Bulletin 542.

Lins, D.A. 1973. A simulation model of farm sector social accounts with projections to 1980. Economic Research Service, U.S. Dep of Agric, Tech Bull No. 1486.

Melichar, 1970. The farm business sector in the national flow of funds accounts. Reprint from the 1970 Proc of the Bus and Econ Stat Section, Am Stat Assoc.

Penson, J.B. Jr., D.A. Lins and G.B. Irwin. 1971. Flow-of-funds social accounts for the farm sector. Am J of Agric Econ 53:1-7.

Penson, J.B. Jr., D.A. Lins and G.B. Irwin. 1971. Flow-of-funds social accounts for the farm sector: reply. Am J of Agric Econ 53:668-69.

Pursell, Donald E., The impact of the 1980-82 recession upon employment in Nebraska's manufacturing sector, Business In Nebraska Vol. 62, No. 13, December 1982.

Robison, L.J., P.J. Barry and J.A. Hopkin. 1973. Cash flows and financing in Texas agriculture. Southern J of Agric Econ: 187-192.