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**Aggregate Indicators of Financial Conditions in the Farm Sector:
Some New Approaches and Insights**

James Johnson, Stephen Gabriel, and Kenneth Baum

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"Improving statistical measures has been essential as the... agricultural economy reshaped itself in terms of numbers of farms, farm operators, sizes of operation, and degrees of specialization... Published statistics...still largely reflect the former structure... As an accurate accounting system on the number and classification of farms is developed, it is likely to change drastically the concepts of relative income standings of fulltime farmers." (Mayer and Ahalt).

Introduction

The national, regional or hometown farm press tell us that the farm sector has severe financial difficulties--incomes are down, and foreclosures and bankruptcies are up. The degree of financial stress is reported as severe. But which kind and type of farm producers have financial problems? What are their characteristics and how do these characteristics contrast with those of farm producers that do not have financial difficulties? Why are they in trouble? How did this situation occur? Is this a (set of) problem(s) where Government, market, or other type of intervention can make a difference? If so, what are appropriate actions both in the long and short term? Accurate responses to these and similar questions require extensive micro data focused on financial features of farming activities and related households.

A variety of primary and secondary data series are available for trying to answer these type of questions. However, the current agricultural data base is inadequate in many respects. These inadequacies effectively prohibit a full analytical economic analysis in response to these questions and related policy decisionmaking. This situation is particularly apparent when addressing key distributional issues relating to who benefits and who loses, and by how much over time.

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Our national agricultural financial data base which remains wed to the concept of a homogenous farm sector (as one farm) and to the farm business rather than the farm/household as the basic unit of observation. For example, the U.S. Department of Agriculture publishes one set of income and balance sheet estimates. Changes in these indicators are often inappropriately attributed to all types, sizes and locations of farmers, even by many professional economists. Moreover, these aggregate statistics are incorrectly and inappropriately used many times as reliable and accurate barometers of the economic and financial well-being of individual farm producers and the farm sector. Little consideration is given to commodities produced, inputs used, relative changes in prices and resource values, use of debt financing, and other special problems, such as drought, that can affect the financial well-being of farmers. Consequently, given the heterogeneity of today's farm sector, conclusions about the well-being of various types and sizes of farms and other distributional issues are suspect when drawn from aggregate statistics.

Several years ago, Sundquist stated the following:

"The production end of agriculture is becoming increasingly diverse. It includes, on the one hand, a complex set of economic activities ranging from highly integrated factory-type operations in some of the broiler, specialty crop, and some animal product activities. It includes, on the other hand, some farming units producing and marketing food and feed grains in rather traditional though larger-scale operations. Thus, it is difficult to obtain statistics and economic analyses to generalize across this broad range of dissimilar economic activities...there seems to be little merit in speaking of average incomes, average problems, or average "anything" for the roughly 3 million units classified as farms in 1968."

The production, marketing, and financial management characteristics of farmers have evolved as farmers have sought new, creative ways to acquire resources for farming and to increase their wealth and incomes. The production and financial management strategies of individual farm producers will continue to evolve in the future as farmers adjust to the income and financial stress experienced in recent years, current events, and future policy and economic conditions.

Over the last two years, ERS has actively begun reviewing each component of the published income, cost, balance sheet, and productivity accounts for their conceptual consistency and empirical procedures. During the same period, we have also actively reviewed the primary sector surveys conducted by ERS to support our enterprise cost and farm income accounting system. As a result, revisions to

ERS cost and income survey questionnaires, sampling methodology and survey size are being made to provide greater statistical reliability of data on farm producers by type, size, and location of production units, to facilitate disaggregation of national accounts. In addition, the type and amount of financial data for the sector such as farm income and farm assets collected is being substantially enhanced, and we have decided to break with tradition to structure the questionnaires in order to reflect current income and cost concepts and data needs, and to enhance the possibility that the resulting data will relate to future needs as well. This paper, (a) highlights what ERS is doing to enhance the availability of disaggregated data related to enterprise cost and whole farm income and balance sheet estimates (b) provides a disaggregate description of the financial conditions of farm producers as revealed by the revised 1983 Farm Production Expenditure Survey questionnaires, and (c) points out how changes underway will enhance the useability of these kind of data in the future.

USDA Financial Series--Concepts and Data Voids

The quality and usefulness of agricultural data embraces both the conceptual development of data series and the empirical measurement of economic variables. The research community both within and outside the USDA, however, has focused more attention on the latter set of issues, i.e. the potential analytical usefulness of USDA agricultural data to support policy, production, finance, and farm management research. It is the first set of issues, though, that is now our primary concern because once relevant data is collected, measurement problems often become tractable.

Since 1980, ERS has moved toward the implementation of a revised set of national accounts for the farming sector, taking advantage of the conceptual arguments advanced during the previous decade or so (fig. 1). The new accounts are based on "The concept of separating the measurement of the economic viability of the production units of the farm sector from the well-being of the farm operator families" (Smith). A farm production transaction account was developed to measure the income from production establishments so that the value added by the farm production sector could be distributed to the institutions or individuals which control the sector's resources. In this account, residual income is a return to operators. The new accounts provide a better framework for separating the farm business from the farm household. They allow for a more thorough analysis of business conditions and provide an analytical framework to focus on the many types of farms that compose U.S. agriculture.

Other program changes have also been implemented to improve our understanding of agriculture. In 1983, ERS revised the cost of production accounts to clarify conceptual problems and eliminate some methodological errors. The revised cost of production budgets now measure cash receipts, cash and economic costs of production, and cash flow measures for enterprises. These budgets provide a basis for determining both the short and long run return to assets used in farm production. These changes also permit ERS to provide conceptually consistent cost and returns and cash flows on a national, regional, and state level for primary crop and livestock enterprises. Although substantial improvements have been made in both the conceptual and empirical preparation of the aggregate indicators, other questions relating to the type of information being delivered as an end product still must be considered because of the diversity in farm size, type, ownership, tenure, location, and commodities produced. The current level of farm operator indebtedness and financial stress reported in the popular press illustrates that aggregate indicators and statistical averages are inadequate in describing economic conditions in the farm sector.

Distributions by type and size of farm using classifications such as the SIC code have become increasingly critical for policy analysis and research, particularly for identifying "commercial" from "small" noncommercial farm operations. Additional analytical effort distinguishing the primary occupations of operators is also needed. Finally, more complex classification efforts must be undertaken to identify where, who, and the extent of perceived problems in the farm sector. For example, traditional corn, wheat, and other crop producers may be extensive users of inputs, such as land, but moderate size farms in terms of sales. Thus, classifying farms based on acreage (resources) used in production could provide a substantially different perspective of agriculture than does the traditional focus on sales classes (Table 1) (Prescott and Baum).

Both data omissions and the level of disaggregation provide difficult measurement problems for the income, cost, and balance sheet accounts developed by ERS (Lins). Specific data that need to be obtained through surveys or developed from existing data for each of the economic accounts are too numerous for discussion in this paper. However, some existing or needed data that could affect the perspective of farm financial conditions are highlighted.

Gross Income. Production, marketing, and price data gathered by the Statistical Reporting Service (SRS), are used to estimate most components of gross farm receipts. Discussions have been initiated with SRS to improve the estimate of specialty commodity marketings that may be very important to a particular state, but not on a national basis. When these "specialty commodities" are aggregated across states, they could have a significant impact on the estimate of income and returns for the subsector.

Table 1. A cross-classification of cash grain farms in the Corn Belt, 1982, 1/

Value of sales	Acreage harvested				Total
	1,000 or more	500-999	180-499	Less than 180	
\$25,000 or more:					
Number of farms	3,943	1,727	5	0	5,674
Percent of total farms	2.91	1.28	0.00	0.00	4.19
Percent of farm by sales class	69.49	30.43	0.08	0.00	
Percent of farm by acreage class	51.13	9.95	0.01	0.00	
\$100,000-\$249,999:					
Number of farms	3,560	12,153	7,047	0	22,760
Percent of total farms	2.63	8.98	5.21	0.00	16.82
Percent of farm by sales class	15.64	53.39	30.96	0.00	
Percent of farms by acreage class	46.17	70.03	12.98	0.00	
\$50,000-\$99,999:					
Number of farms	209	3,247	24,658	2,028	30,141
Percent of total farms	0.15	2.40	18.23	1.50	22.28
Percent of farm by sales class	0.69	10.77	81.81	6.73	
Percent of farms by acreage class	2.71	18.71	45.41	3.63	
\$25,000-\$49,999:					
Number of farms	0	136	15,345	14,607	30,089
Percent of total farms	0.00	0.10	11.34	10.80	22.24
Percent of farm by sales class	0.00	0.45	51.00	48.55	
Percent of farms by acreage class	0.00	0.78	28.26	26.12	
\$10,000-\$24,999:					
Number of farms	0	93	6,656	18,837	25,585
Percent of total farms	0.00	0.07	4.92	13.92	18.91
Percent of farm by sales class	0.00	0.36	26.02	73.62	
Percent of farms by acreage class	0.00	0.53	12.26	33.68	
Less than \$10,000:					
Number of farms	0	0	585	20,452	21,037
Percent of total farms	0.00	0.00	0.43	15.12	15.55
Percent of farm by sales class	0.00	0.00	2.78	97.22	
Percent of farms by acreage class	0.00	0.00	1.08	36.57	
Total:					
Number of farms	7,712	17,354	54,295	55,924	135,286
Percent of total farms	5.70	12.83	40.13	41.34	100.00
Percent of farm by sales class					
Percent of farms by acreage class					

1/ From the Farm Production Expenditure Survey, 1982

Estimates of the value of home consumption are used to develop our income and return estimates for the subsector. Reliable data exist for livestock products consumed on farms where produced. Equally reliable data are not available for vegetables and fruits and current receipts data are questionable. Questions have been added to the 1985 Farm Costs and Returns Survey (FCRS) to obtain estimates of fruit and vegetable consumption.

Estimates of the value of the change in crop inventories are of critical and current concern. Data have not been collected on feed fed on farms where produced for several years and benchmark data are now three years old. Research projects have been developed within ERS to test the reliability of existing data to derive an estimate of feed fed, and questions have also been added to the FCRS in 1985.

Conceptual research activities have been initiated to review the gross receipts account to determine if income sources have been inadvertently omitted. For example, interest paid on machinery and real estate is treated as an expense, but the sale of machinery is not treated as an income flow. Similarly, wages paid family members are counted as farm expenses but are not also counted as farm income. This accounting procedure is probably correct for the farm firm but clearly raises questions of whether the farm household well-being is accurately measured. With the introduction of IRA's and other such accounts in recent years, this issue is becoming even more important when trying to understand differences between farm business and farm household well-being.

Expenses. Several conceptual problems remain unresolved with the estimation of particular expense items. Part of this problem has also been lack of proper data. As a partial response, ERS redesigned and enlarged its annual survey of Farm Production Expenditures in 1983 and again in 1984 to provide statistically reliable estimates of expense items, at the national level, except for depreciation. Major conceptual issues include: the need to separate livestock purchased for capital accounts from livestock purchased for resale to prevent overstating production expenses and understating capital expenditures; and to separate leases for operating and capital inputs.

Interest paid estimates are now derived from institutional data. These estimates are based on the collateral provided and source of loan, but not the purpose of the loan. The accounts need to identify both short-term production loans from longer terms loans and the farm versus household share of loans. To the extent that interest charges for loans using farm collateral used for non-farm purposes are included in expense estimates, interest expenses are overstated and net income understated. Recent research activity

has shown that interest expense data from IRS records for farm purposes by farm operators is similar to estimated interest for farming purposes based on the FPES. The 1982 Agricultural Census asked farmers for the amount of interest paid on farm business loans. Preliminary tabulations of Census data also indicate that interest expenses may be overstated using our present methodology based on lenders data. Understandably, we have begun collection of the necessary data to more fully research this area empirically. For example, questions on total debt were added last year, and in the 1985 FCRS, we are expanding the finance section to gather data about interest paid and also about debt outstanding by source. These data should substantially improve both our farm income and balance sheet accounts.

Farmers also paid \$12.1 billion in wages and perquisites to hired labor in 1982. Of this amount, about \$3 billion was paid to family members other than the operator. In 1983, farmers paid 10.3 billion of which 2.0 billion went to family members. Should this payment be included as sector income as well as expenses? As pointed out above, this raises again the conceptual need to consider the relationship between farms and the household(s) associated with the business.

There is evidence that total labor expense may not be correctly calculated for our balance sheet accounts. As Melichar has recently illustrated, imputed returns to operators carried in the balance sheet is likely understated because the number of unpaid operator labor hours is understated. Our own research project on labor hours in agriculture began over two years ago. It suggests similar problems. The significance, of course, is if the imputed operator returns are understated, the estimate of returns to resources included in the financial accounts are overstated. Moreover, if labor hours are understated, labor productivity in agriculture is also overstated. To test these empirical issues, we have added detailed farm operator and family labor questions to our 1985 surveys.

Finally, purchased but unused inputs, such as fuel, seeds, fertilizers, and feed are not presently estimated. To the extent that inputs are purchased but not consumed, income and balance sheet accounts are again incorrectly estimated. Data are now being collected in the FCRS to develop an inventory estimate of these unused inputs. Data are also being collected to improve estimates of marketing, machine hire, and customwork expenses. These expense items were not important when the present income accounts were initially developed, but are far more significant in today's farm sector.

Costs and Balance Sheet. Additional data are also needed to improve the cost of production (COP) and balance sheet estimates. Specialized farm COP surveys have been used since 1974 to determine rates of application, machinery operations, buildings and other technical information which are combined with price data from other sources to develop crop and livestock budgets. Since these commodity specific surveys are taken every 4 to 5 years, cost of production budgets are updated between surveys only for changes in input prices and yields. Labor, fuel, lubrication, and repair costs are derived from machinery operations using engineering relationships derived in the 1960's. Ideally, data should be collected to update enterprise cost items annually based on a combination of quantity and price changes instead of only input price changes. In the balance sheet, separating livestock types so that animals used to produce for sale rather than to be for sale themselves can be included in capital accounts rather than production accounts will improve estimates. Two additional data collection activities to improve the balance sheet include (1) developing purchased input inventory information mentioned above, and (2) obtaining data to more clearly allocate financial assets between the farm household and the farm business.

Survey Approaches to Obtaining Data for the Economic Indicator Series

In recent years ERS conducted two national surveys: the Farm Production Expenditures Survey (FPES) and the Cost of Production Survey (COPS). The FPES is a probability based whole farm survey used to collect total farm expenses and receipts data for preparing national economic indicator and performance measure series. The COPS collected enterprise specific technical data on farms known to produce the selected commodities. Since COP operators were selected to provide data for an average acre, cow, hog, etc., these farms were selected on a probability proportional to the acreage or size (PPS) of the selected enterprises. Thus, the type and size of farm statistics could only be obtained for the respondent farms and not for the farm sector. Although similar types of information were gathered from both surveys, the COPS data could not be used to supplement the FPES and the FPES could not be used to context COPS data because of this difference in sampling methods. Thus, much information was irrelevant from the perspective of either survey. From a distributional analysis perspective, two problems needed to be addressed. First, the entire sample size was too small; second, only a portion of the total farm business survey data collected was actually available for reliable type and size of farm economic analysis.

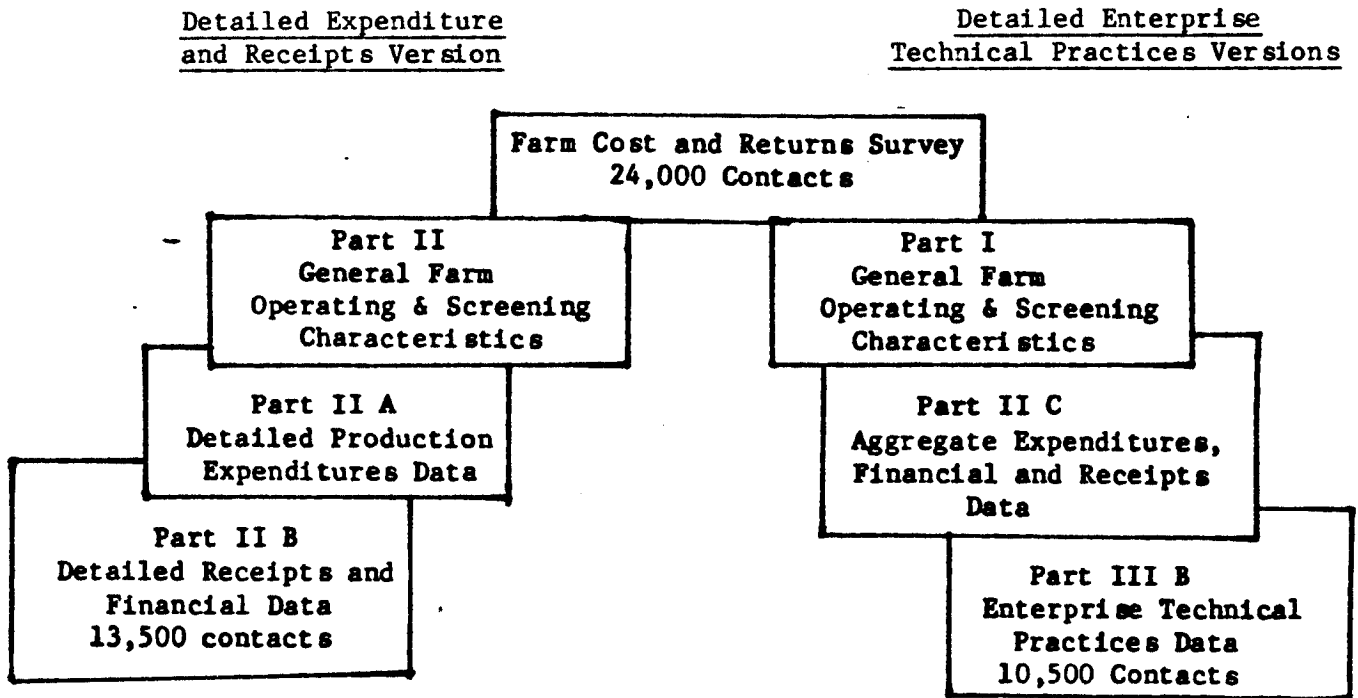
To provide consistent data on farm operator and landlord expenses for producing agricultural commodities, an annual Farm Production Expenditure survey has been jointly conducted by ERS and SRS since 1971. For the 1982 and 1983 calendar years, the FPES was redesigned to provide farm operator occupation, production, capital expenditure, Government program participation, interest paid, aggregate asset and debt, and expanded crop and livestock sales data. These data have been used to develop an estimate of farmers' cash operating balances and debt positions based on specifications of size, farm type, and region. The primary focus of this survey has continued to be the development of reliable and accurate national estimates of production expenses.

During the last year, ERS and SRS have been working jointly towards merging the two surveys into a probability based Farm Cost and Returns Survey. This survey will provide an integrated data system so that COP, farm, industry, and national economic indicator and performance measures can be developed (figure 2). A historical perspective of revisions in these surveys is presented in figure 3.

The Farm Costs and Returns Survey is an integrated whole farm and commodity specific survey that completely allows subsampling for specific detailed (technical or critical problem) information. The FCRS is expected to be given significant annual funding for a sample size of 25,000 to 30,000 list and area frame contacts annually. Since the survey is probability based and would have a large sample, distributional analysis of operating costs, returns, and financial characteristics can be easily conducted by size and type of farm by major producing regions.

The first part of the survey will be the same for each respondent and include land use and crop acreages and yields, farm organization characteristics. In the second part of each questionnaire, each farm respondent would be asked for information on farm data including: whole farm expenses by type or category; livestock inventory, sales, purchases, and feed use; crop receipts, and inventory. The FCRS will also contain questions to gather data on off-farm income, principal occupation of the operator, hours of labor supplied the business, and firm debts and assets. This is an expansion of the financial data collection effort initiated last year and will provide an integrated perspective of the farm's cash flow, balance sheet, and off-farm income situation. Part III represents the modular sections that will be used to obtain specific detailed technical practices used in the preparation of COP budgets and other farm/household related information.

Figure 2. The Farm Costs and Returns Survey: FY '85



Part I. Screening and general farm operating characteristics.

- Land use
- Crop acreages, yields, etc.
- Farm business and financial organization

Part II: Farm Production Expenditure, Receipts and Financial Data including items such as:

- Whole farm expenses by type or category
- Livestock inventory, sales, purchases
- Crop receipts, inventory, etc.
- The farm business balance sheet

Part III: Modular Sections for Specific Detail to be used for

- A. Detailed Information Needs for Special and Key Variables and Data Items Relating to Production Activities and Whole Farm Expenses
- B. Data on Particular Types or Categories of Farm Organizational Characteristics and Technical Practices used in Crop and Livestock Production

Figure 3. A SUMMARY OF THE CONCEPTUAL AND METHODOLOGICAL
DEVELOPMENT OF THE FPES AND COPS TOWARDS AN INTEGRATED FARM COSTS
AND RETURNS SURVEY

PRE FY 1982

FPES

Basic whole farm expense
and income data system
from national survey.

COPS

Basic technical data from
national survey. For selected
commodities on a multi-year
rotation.

FY 1982 and 1983

Enhancements for receipts by
commodities. More detail on
farm capital flows, overhead,
etc. Initial movement towards
selected items for COPS.

Change in crops survey approach.
More emphasis placed on crop
storage and rotation patterns.
Change to regional survey
concept for all crops.

FY 1984

Improved detail on production
items by farm type and by farm
by farm type and size for
research related income and
production cost.

Completion of survey concept
begun in 1983.

FY 1985

Continued detail enhancement of
changes begun in 1984.

Change sample design concept
to allow an integrated survey
to increase number of
observations available for
state and regional cost
estimation. Redesign survey
questionnaire to allow for
classification by farm type.
Develop structural approach
for machine input items and
allow for the continuing
monitoring of major variable
cost items.

The entire data set can then be expanded and related to the farm sector. Because of the replicate subsampling procedures used in the FCRS, based on preselection and known probabilities, the availability of this detailed data could provide information on particular types or categories of farm/household organizational characteristics, farm program participating behavior, operating or technical practices, and financial organization. This entire data set can then be related to the size and type of farm business by region from an enterprise, farm, industry, or sector perspective.

FPES Financial Data from 1983: Use and Interpretation

The financial data discussed in this section are based on the revised FPES conducted for 1983, to enhance the data base used to estimate the economic indicators of the farm sector. Nearly 24,000 farms and ranches were contacted in February and March of 1984 during this survey. For survey purposes, a farm was defined as any establishment producing agricultural commodities with annual sales of \$1,000 or more. Types of establishments are listed in the Federal Standard Industrial Code (SIC) for agricultural production of crops and livestock. The contact sample was selected from a list frame sample of operators of farms and ranches, and an area frame sample. In the area frame sample, the farmland base is divided into square mile area sampling units with a known probability of selection. Operators residing in these area samples were given expansion factors based on the sampling design developed by the Statistical Reporting Service. After accounting for the percentages of survey contacts, completions, refusals, inaccessible, nonfarms, and other noncompletions (duplicates or overlaps) the 1984 response rate was about 52 percent. Of the farmers contacted, the outright refusal rate was about 30 percent.

Because of the sample size and the low overall completion rate for the 1983 FPES, readers should use caution when interpreting the related farm financial data included in this paper and reported elsewhere. Even so, as Prescott and Baum have noted, these survey data are important for three reasons. First, the Farm Production Expenditure Survey is a national farm sector survey conducted annually by the Economic Research Service (ERS) and Statistical Reporting Service (SRS) and is the only national source of establishment data comprehensive enough to analyze farm expenses, returns, and financial data, by region, size, and type of farm. The survey data contain specific location, acreage, returns, expense, and finance data by individual operating unit. Second, the data are obtained through a probability sample where each farm operation is selected with a known probability and expansion factor. A probability sample is necessary if statistical properties of the data are to be estimated or are of analytical value for two reasons.

First, each sample farm then represents other similar farms, and second, standard error estimates may be constructed for various measures of farm expenses, although specialized computational procedures must be followed. Third, because the survey is done on an annual basis, data from this survey can be correlated with current events or used to update specific economic indicators and performance measures for policy or disciplinary research and analysis.

The FPES Financial Data: Describing the Financial Condition of Farmers, January 1, 1984

The amount of financial leverage that an operator can support depends primarily on the income and production characteristics of the farm and its debt/asset ratio and nonfarm cash flows available to service farm related loans. As the level of returns to assets falls, the debt-servicing capacity of the farm also falls. In addition, as the returns to assets become more variable (risky) sound business management usually reduces the firm's financial leverage since financial leverage acts to enhance the variability of returns to equity.

The level of cash income per farm varies considerably by farm type and size. Different levels of income can be used to indicate different optimal capacity to service debt and the degree to which financial stress might be occurring for different sizes and types of farms. In 1983, farms generating the highest average farm income per farm included vegetables and melon, horticultural specialty, cotton, dairy, and poultry and egg farms with \$92,040, \$68,156, \$63,658, \$48,338, and \$41,200 respectively. Farm types with much lower levels of average cash income include tobacco (\$6,663), other field crops (\$15,538), cash grain (\$22,510), fruit and tree nut (\$21,643), general crop farms (\$17,718), cattle, hogs, and sheep (\$3,599), and general livestock (\$15,868). Although the distribution of income within each type of farming differs, the average cash income figure serves as a general index of debt servicing capacity and provides a useful perspective in considering financial stress by type of farm.

As a general rule, a 40 percent debt/asset ratio yields rates of return to equity which are low to negative. Debt/asset ratios over 70 percent almost always result in negative rates of return. Only very high earnings and/or very low average interest rates will provide positive rates of return if the business's debt/asset ratio is above 70 percent with present interest rates. To address the issue of financial stress in agriculture, in this respect debt/asset ratio levels are used to provide primary evidence. However, the debt to asset ratio is an inadequate indicator of stress and is used primarily because more complete

farm cash flows and the cash flows for the related households are not yet available. The authors recognize that the latter measures would serve as more adequate indicators for evaluating stress.

Farm Operators Under Financial Stress by Sales Class

Very highly leveraged farmers are concentrated in the highest sales classes (table 2). Over 15 percent of the farmers with sales of \$500,000 or more have debt/asset ratios of 70 percent or more. The percent of operators with very high financial leverage in the \$250,000 to \$499,999 and \$100,000 to \$249,999 sales classes is 12.6 percent and 9.2 percent, respectively. In the smaller sales classes, the percentage of very high leverage farmers dropped considerably.

A similar pattern emerges if the focus is broadened to include farmers with debt/asset ratios of 40 percent or above. Roughly 30 percent of the sector's farms with sales of at least \$100,000 have debt/asset ratios of 40 percent or more. While these farmers represent only about 5 percent of total farms, they account for roughly 23 percent of cash receipts and 24 percent of production expenses. Hence, reduction in purchased (capital) inputs made by these highly to very highly leveraged operators over the next few years to improve cash flows could have a substantial impact on the agribusiness sector.

The amount of farm debt owed by highly to very highly leveraged operators is distributed fairly evenly across the standard sales classes used in this report. But the \$500,000 and over sales class has a greater concentration of debt among highly and very highly leveraged farmers--30.1 percent in the 70-percent plus and 60.3 percent in the 40 percent plus debt/asset ratio categories (table 3).

Farm Operators Under Financial Stress by Type of Farm

Of all farm operators 6.6 percent had debt/asset ratios of 70 percent or greater at the beginning of 1984, almost double the percentage of farmers which fell into this leverage category four years earlier. Over 17 percent of all farm operators had debt/asset ratios which were 40 percent or above on January 1, 1984. In 1980 the percentage was 12.2 percent. Higher farm debt and lower asset values in many regions of the country pushed many farm businesses into higher leverage situations. These statistics suggest that between 15 and 20 percent of all farmers are facing financial stress that will require decisive steps to sell some assets to cancel debt or restructure debt to improve cash flow and profitability. One to two-thirds of these farmers, are likely experiencing severe financial stress such as failing to make interest payments or loan principal payments as scheduled.

Table 2--Distribution of Farm Operators, Debt, and Assets by Sales Class and Debt/Asset Ratio, January 1, 1984

Sales Class	Very high leverage	High to very high leverage
	debt/asset ratio over 70 percent)	leverage debt/asset ratio over 40 percent)
	----- Percent of Total Operators -----	
\$500,000 and over	15.3	32.7
\$250,000 to \$499,999	12.6	31.6
\$100,000 to \$249,999	9.2	27.3
\$50,000 to \$99,999	8.7	23.4
\$25,000 to \$49,999	7.9	17.6
\$10,000 to \$24,999	4.0	11.9
Under \$10,000	4.5	12.6
	----- Percent of Debt -----	
\$500,000 and over	30.1	60.3
\$250,000 to \$499,999	23.8	52.5
\$100,000 to \$249,999	20.4	56.4
\$50,000 to \$99,999	21.9	57.2
\$25,000 to \$49,999	28.5	52.8
\$10,000 to \$24,999	23.5	53.1
Under \$10,000	21.2	58.1
	----- Percent of Assets -----	
\$500,000 and over	5.5	16.4
\$250,000 to \$499,999	5.9	19.5
\$100,000 to \$249,999	4.3	18.6
\$50,000 to \$99,999	4.1	16.9
\$25,000 to \$49,999	3.7	10.0
\$10,000 to \$24,999	1.8	6.4
Under \$10,000	1.5	7.4

Table 3. Distribution of Farm Operators by Farm Type and Debt/Asset Ratio Class, January 1, 1980 and 1984

Farm type	Very high leverage (debt/asset ratio 70 percent or more)			High to very high leverage (debt/asset ratio 40 percent or more)		
	1980	1984	percent change	1980	1984	percent change
Cash grain	4.2	7.6	81	15.6	21.8	40
Field crops	4.0	8.9	123	13.3	20.7	56
Vegetable and melon	5.0	6.3	26	13.6	24.1	77
Fruit and tree nut	1.9	4.0	111	7.8	11.7	50
Nursery	4.8	0	-	14.2	21.7	53
General crop	2.4	4.6	92	9.6	11.3	18
General livestock	2.7	7.1	163	9.9	17.7	79
Dairy	2.2	8.7	295	13.3	26.5	99
Poultry	5.6	17.7	216	19.4	35.6	84
All farms	3.4	6.6	94	12.2	17.7	45

The degree of financial difficulty varies by type of farm (table 4). Poultry, field crops, and dairy farms showed the highest concentration of farmers in the very high debt/asset ratio category (70 percent or higher), with 17.7 percent, 8.9 percent, and 8.7 percent, respectively. However, these farmers are also earning the highest net cash incomes per dollar of sales on average in the farm sector, tobacco and other field crop farms excepted.

These farms may not be in as difficult a financial position as other farms with a slightly lower concentration of high and very high leverage operators. For example, cash grain farms had only 7.6 percent, and general livestock farms (cattle, hogs, and sheep) had 7.1 percent of their numbers, in the very high leverage classification. But, the average net cash income for these farms is substantially less than that of poultry, cotton, and dairy farmers.

Farms with the lowest concentration of very highly leveraged operators include general crop farms, fruit and tree nut farms, and nurseries, with 4.6, 4.0, and zero percent of all operators carrying very high debt/asset ratios.

If high leverage operators (defined as having a debt/asset ratio above 40 percent), are selected from the survey data, a broader group of financially troubled businesses are included. Poultry, dairy, and vegetable and melon farms have the highest concentration of high and very high leverage operators, with 35.6 percent, 26.5 percent, and 24.1 percent, respectively. Again, the income characteristics of these farms suggest that they can support higher debt ratios than other types of farms. That is not to say that high to very highly leveraged farmers in these categories are not experiencing financial difficulty. It does suggest, however, that the degree of difficulty may not be as critical for these farms long run survival as for lower cash income farmers with comparable degrees of financial leverage.

Almost 22 percent of all cash grain farmers had debt-asset ratios over 40 percent. This ranks cash grain farmers just below vegetable and melon farms in concentration of high to very highly leveraged operators. Given the lower net cash incomes received by cash grain farmers in recent years, this data suggests these farms may be experiencing the most difficult degree of financial stress.

Although general livestock farms have a relatively low ranking in terms of percentage of farmers with debt/asset ratios over 40 percent, 17.7 percent, the relatively poor income performance of these farms over the past few years suggests a continuing relatively high financial stress. Meanwhile, fruit and tree nut farms and general crop farms had the lowest concentration of high to very

Table 4--Distribution of Farm Operators, Debt, and Assets by Farm Type and Debt/Asset Ratio, January 1, 1984

Region	Very high leverage (debt/asset ratio over 70 percent)	High to very high leverage (debt/asset ratio over 40 percent)
	----- Percent of Operators -----	
Cash grain	7.6	21.8
Field crops	8.9	20.7
Vegetable and melon	6.3	24.1
Fruit and tree nuts	4.0	11.7
Nursery	0.0	21.7
General crop	4.6	11.3
General livestock	7.1	17.7
Dairy	8.7	26.5
Poultry	17.7	35.6
Other livestock	9.1	21.7
All farms	6.6	17.7
	----- Percent of Debt -----	
Cash grain	20.8	54.2
Field crops	31.4	58.8
Vegetable and melon	34.6	61.8
Fruit and tree nuts	17.5	35.3
Nursery	0.0	35.9
General crop	25.9	52.8
General livestock	23.1	55.2
Dairy	26.4	63.3
Poultry	52.9	81.0
Other livestock	10.3	59.2
All farms	23.7	56.2
	----- Percent of Assets -----	
Cash grain	4.5	18.7
Field crops	6.1	16.8
Vegetable and melon	6.0	18.1
Fruit and tree nuts	2.0	5.9
Nursery	0.0	2.5
General crop	1.9	6.5
General livestock	3.8	13.3
Dairy	6.9	25.0
Poultry	10.4	23.0
Other livestock	1.0	12.1
All farms	3.9	14.5

highly leveraged operators, with 11.7 percent and 11.3 percent, respectively.

Over 56 percent of all farm debt is owed by farmers with debt/asset ratios of 40 percent or more. Most of these farmers are undergoing some degree of financial stress and will have difficulty servicing their debt over the next few years. If so, it is likely that many farm lenders will continue experiencing problems with their agricultural portfolios. Types of farms that deviate substantially from this outlook include fruit and tree nut farms and nurseries, with 35.3 percent and 35.9 percent of the debt on these farms owed by high to very highly leveraged operators, respectively. By contrast, 81.1 percent and 63.3 percent of the debt on poultry and dairy farms, respectively, is owed by high to very highly leveraged operators.

Although almost 25 percent of all farm debt is owed by very highly leveraged operators, fruit and tree nut, other livestock, and nursery farms have a lower percentage of debt owed by very highly leveraged farmers. Poultry farms, vegetable and melon farms, and field crop farms with high to very high leverage owe considerably higher debt.

Farm Operators Under Financial Stress by Region

The highest concentration of very highly leveraged farm operators appears in the Mountain States, Northern Plains, Lake States, and Southeast (table 5). The regions with the lowest percentage of farmers with very high debt/asset ratios are the Northeast (3.9 percent), Appalachia (4.8 percent), and the Pacific States (5.5 percent).

If we consider both high and very high leverage farmers, the ranking changes somewhat. However, the Lake States and the Northern Plains remain on the top of the list, with 22.5 percent and 22.3 percent of the farmers in those regions carrying debt ratios over 40 percent. The Appalachian and Delta States had the lowest concentration of farmers in the high to very highly leveraged category--12.0 percent and 14.0 percent, respectively.

Reasons for the various regions' ranking are not intuitively clear. Recent developments in farmland markets provide only a partial explanation. It is likely that the large drop in farmland values in the Lake States and the Northern Plains contributed to the higher concentrations of farmers in high leveraged situations. But while land values were relatively stable in most of the Mountain States, this region ranks high in its concentration of high leveraged farmers. Possibly the importance of the livestock industry in this region may explain the relatively high ranking

Table 5--Distribution of Farm Operators, Debt, and Assets by Region and Debt/Asset Ratio, January 1, 1984

Region	Very high leverage (debt/asset ratio over 70 percent)	High to very high leverage (debt/asset ratio over 40 percent)
----- Percent of Operators -----		
Northeast	3.9	19.8
Lake States	8.0	22.5
Corn Belt	5.9	17.8
Northern Plains	8.4	22.3
Appalachian	4.8	12.0
Southeast	7.9	15.0
Delta States	6.5	14.4
Southern Plains	6.9	15.9
Mountain	9.1	19.2
Pacific	5.5	15.8
United States	6.6	17.7
----- Percent of Debt -----		
Northeast	17.9	58.6
Lake States	26.5	63.3
Corn Belt	15.6	51.6
Northern Plains	25.9	60.2
Appalachian	25.6	49.7
Southeast	35.6	63.9
Delta States	38.0	64.6
Southern Plains	27.3	52.1
Mountain	24.3	52.7
Pacific	22.5	51.6
United States	23.7	56.2
----- Percent of Assets -----		
Northeast	2.8	15.0
Lake States	5.8	20.3
Corn Belt	3.1	16.7
Northern Plains	5.5	20.0
Appalachian	3.1	9.1
Southeast	4.3	11.0
Delta States	5.1	12.5
Southern Plains	3.1	8.5
Mountain	4.2	14.1
Pacific	2.8	10.7
United States	3.9	14.5

of the Mountain States. Several years of drought in the Southeast probably contributed to this region's large percentage of farmers with high to very high leverage.

The distribution of farm debt differs markedly from that of operators. Like the type of farm distributions, debt is more highly concentrated in the high leveraged categories than farm operators. This again suggests that farm lenders may also face a difficult financial situation, particularly lenders whose portfolio is dominated by agriculture. Although the Delta States and the Southeast rank low in terms of the percentage of farmers with debt/asset ratios above 40 percent, these regions rank first and second in terms of percent of debt owed by these farm operators. About 64 percent of the farm debt in those regions is owed by high to very highly leveraged farmers. Over 63 percent of the debt in the Lake States falls in this category is owed by high to very highly leveraged farm operators.

The Delta and Southeast also have the highest percentage of debt owed by very high leverage farmers, 38.0 percent and 35.6 percent, respectively. The Corn Belt and the Northeast have the least amount of debt owed by farmers with very high debt-asset ratios, with 15.6 percent and 17.0 percent, respectively. Apparently, a fairly small number of farmers carry very high debt loads in the Delta and Southeast.

Almost 4 percent of all farm assets are owned by very highly leveraged farmers. But, over 14 percent are owned by farmers that are considered to be either in high or very high leverage positions. The Lake States and the Northern Plains have the highest percentage of assets in both leverage categories--both with about 5.5 percent in the 70 percent plus and about 20 percent in the 40 percent plus. The percentages in the other regions range from 2.8 percent in the Northeast and Pacific to 5.1 percent in the Delta States for the very high leverage category and 8.5 percent in the Southern Plains to 16.7 percent in the Corn Belt for farmers in the high to very highly leveraged classes.

The principal implication is that a significant percentage of the farm assets in many regions of the country is owned by high to very highly leveraged farmers, many of whom will likely be under pressure to sell assets to reduce debt and improve cash flow. This situation suggests that continued softness in asset markets in agriculture, primarily farmland, machinery, and equipment, will continue over the next several years.

Summary

Survey data, obtained through direct interviews with farm operators, and with a known probability can be used to prepare a disaggregate perspective for financial analysis. Most farm economic data published in the Economic Indicators of the Farm Sector series cover the Nation, individual States, or economic sales classes. The Census of Agriculture, a population survey, provides additional published data by farm type based on SIC classifications based on the value of sales.

Because of the heterogenous nature of the farm sector and of farms within sales classes, aggregate data are difficult to use in assessing how changes in input or output levels, price levels, technology, or policy changes may affect different types, sizes, and locations of farms, or asset ownership. Primary whole farm and probability based survey data will help provide some of the flexibility needed to address these, as well as other policy and research concerns related to farm production, finance, and economic well-being.

At present, the primary constraint for continued development of disaggregate economic information is one of sample size. A sample of 24,000 farmers will provide many reliable national and regional estimates, but when the data are further disaggregated by state or other interim to provide a more micro-perspective, the likelihood of thin data for specific sizes and types of farms increases. Thus, the statistics contained in this report should be used cautiously as measures of farm financial conditions until the sample is sufficiently increased in future surveys. The Farm Costs and Returns Survey, to be conducted in early 1985, is an example of a data set which will provide information that can be used to further develop a more disaggregated perspective of economic indicators and performance measures by size and type of farm at the national and regional level.

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