

EMERGING ISSUES
IN AGRICULTURAL FINANCE

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No. 112

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INTRODUCTION

Advances in technology have enabled farmers in the United States to achieve continued increases in output per unit of input for several decades. This technological revolution has brought about several significant changes in the structure of agriculture. The substitution of physical capital for labor and the increased use of purchased inputs has created a need for substantially more funds both in the aggregate and on a per farm basis. Technology has also resulted in fewer and larger farming units. Over time, profit margins in agriculture have declined, so farmers have been increasingly dependent upon outside sources of funds.

These trends raise some important questions. First, how can the individual farm operator cope with the rapidly raising capital requirements of farming? What combination of equity capital, credit, leasing, custom hiring and contract farming will enable the farmer to achieve a sufficiently large farm business, given the usual limitation of a fixed equity capital base? Can the family farm as we know it now survive as an economically viable entity in the face of the rapidly increasing capital requirements of farming?

*Presented at the Southern Agricultural Management Research Workgroup Meeting, March 25-27, 1981, Orlando, Florida.

Another perplexing question is can the institutions and individuals that supply farm credit continue to meet the growing demand for funds? The amount of farm debt outstanding in the U.S. farm sector increased by more than six times between 1960 and 1980, and comparable rates of growth are projected for the foreseeable future. Is it possible that some farm lenders will find it increasingly difficult to meet this challenge?

This discussion will first review the historical and current financial characteristics of the agricultural sector and projections as to the future financial health of farming and various types of farms. Then some of the key researchable issues that might be analyzed to assist policymakers, production units and lenders to adjust to this future will be identified. This discussion will emphasize issues in the areas of demand for funds, supply of funds and financial intermediation. Throughout the discussion, one of the key dimensions that will be highlighted is that of distribution--distribution of income, wealth and debt utilization among farmers with different size, tenure and financial characteristics.

HISTORICAL BACKGROUND

Annual Income

Aggregate net farm income, measured in current dollars, moved erratically upward from 12 billion annually in the early 1960's to about 26.1 billion in 1978.¹ Aggregate net farm income reached 31.0 billion dollars in 1979, but declined to approximately \$23-\$25 billion in 1980.² In real terms, aggregate net farm income has stayed constant or actually declined slightly during the last ten years.

The per capita disposable income of farmers has historically been lower than that of the nonfarm population, but has been moving steadily toward

equality in recent years.³ A major reason for this improvement is the nonfarm income earned by the farming sector (Figure 1). In recent years, net income from farm sources has accounted for less than half the total net income of the farm population.

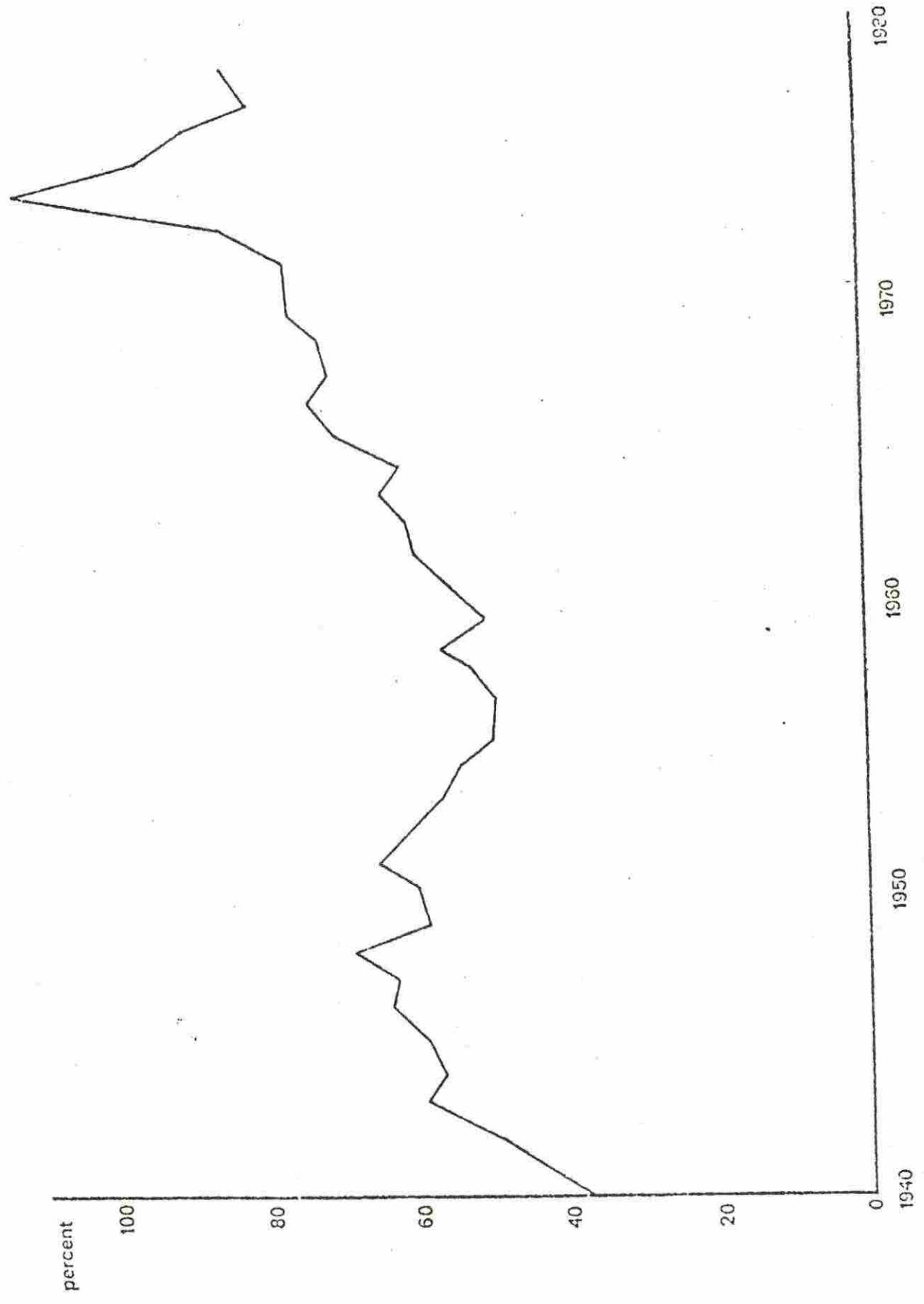
If farms are classified by sales category as in Figure 2, off-farm income as a percent of total net income declines as gross farm sales increase. Also, nonfarm income appears to be from different sources, depending upon the size of farm; nonfarm income comes primarily from labor earnings for small farms, whereas nonfarm income comes from off-farm investments and financial instruments for larger farmers. In both cases, this income provides a source of cash flow for debt servicing.

With the steady decline in the farm population, total net income from all sources per farm has increased more rapidly than the general rate of inflation. For the period 1960-63 average annual net income from all sources per farm operator family was \$5,387 of which \$2,981 or 55% was net farm income. For the period 1975-77 total net income per farm operator family averaged \$15,457 per year with 41% coming from farm sources. Total net income per farm operator family increased by nearly 3 1/2 times while the consumer price index approximately doubled between 1960-63 and 1975-77.⁴ Inflation during the last three years has eroded the real purchasing power of farmers along with most of the U.S. population, but it would appear that, on average farmers and their families are earning reasonable incomes.

Capital Gain

The preceding discussion has concentrated on the annual income flow that accrues in a cash form or in changes in inventory. In addition, farmers have

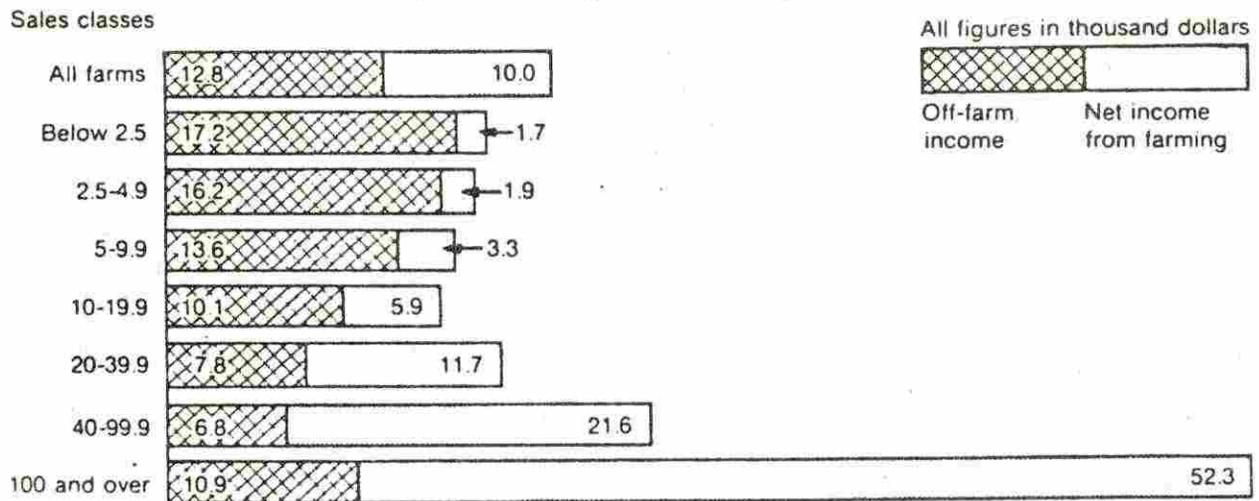
Figure 1: Per capital disposable income of the farm population as a percent of the per capita disposable income of the nonfarm population.



Source: Lins, David, "The Financial Condition of U.S. Agriculture: Past, Present, Implications for the Future," NED Staff Report, USDA, 1979.

Figure 2

Farm and Off-farm Income per Farm Operator Family by Value of Farm Products Sold



1978 data Net income before adjustment for inventory change

Source: Lins, David, "The Financial Condition of U.S. Agriculture: Past, Present, Implications for the Future," NED Staff Report, USDA, 1979.

also accrued a sizable capital gain in recent years. Some have argued that farmers are no different than other investors in evaluating the return from capital investments; they look at both the cash return and the change in asset value much like an investor would evaluate alternative stocks and bonds. Rates of return from annual income have been comparable for investments in common stock and farm production assets since 1960 (see Table 1). Furthermore, the capital gains for farm production assets have far exceeded those for common stocks, resulting in a total return on farm production assets substantially higher than that for stocks or bonds.⁵ In addition, the variability of total returns is lower for farm production assets--the variability in annual income return is higher for farm assets compared to common stock but the variability in return from capital gains or losses is substantially lower for farm production assets.

As to the future, we expect a continuation of the historical trends noted. Nonfarm income will continue to be an important component of the income of farmers, with smaller farmers continuing to contribute labor to the nonfarm sector and larger farmers contributing capital and financial resources. Larger farmers will diversify their asset holdings to include nonfarm financial and business investments. Some of these investments will be integrated into their farming operation as a means of acquiring control of various inputs, while others may involve attempts to diversify asset holdings into other industries and/or geographic regions. For those large and small farmers who utilize debt, nonfarm income will continue to be a source of cash flow for debt servicing.

As to the relationship between annual income flow and capital gains in the agricultural sector, we also see a continuation of current trends in the near future. Holders of agricultural assets have historically been willing to accept

Table 1. Annual rate of return on total investment in common stocks, long-term government bonds and in farm production assets. (Current market valuation of assets)

Year	Annual income return			Capital gain or loss return ^{a/}				Total return		
	Common stock	Long-term U.S. bonds	Farm production assets	Common stock	Long-term U.S. bonds	Farm production assets	Common stock	Long-term U.S. bonds	Farm production assets	
Annual Average	5.85	2.61	4.94	14.58	.94	N.A.	20.43	3.55	N.A.	
1950-54	3.94	3.38	3.16	14.99	-2.78	N.A.	18.93	.60	N.A.	
1955-59	3.20	4.00	3.68	8.79	-.23	3.69	11.99	3.77	7.37	
1960-64	3.18	5.01	4.46	5.54	-5.19	5.74	8.72	-.16	10.20	
1965-69										
Annual	3.83	6.59	4.37	-14.94	-6.20	3.94	-11.11	.39	8.31	
1970	3.14	5.74	4.26	18.11	11.95	7.91	21.25	17.69	12.17	
1971	2.84	5.63	5.86	11.10	1.45	12.80	13.94	7.08	18.66	
1972	3.06	6.30	10.29	-1.62	-8.60	22.38	1.44	-2.30	32.67	
1973	4.47	6.99	6.46	-22.88	-8.52	8.62	7.11	-1.53	15.08	
1974	4.31	6.98	5.55	2.80	.14	12.43	23.54	7.12	17.98	
1975	3.77	6.78	3.75	19.77	2.95	14.47	0.81	9.73	18.22	
1976	4.56	7.06	3.42	-3.75	-3.97	8.27	3.17	3.09	11.69	
1977	5.28	7.89	4.73	-2.11	-10.51	13.05	7.78	-2.62	17.78	
1978	5.46	8.74	5.10	2.32	-9.43	15.53	4.95	-0.69	20.63	
1979b/	4.07	6.87	5.38	.88	-3.07	11.94	4.95	3.80	17.32	
1970-79										
Coefficient of variation ^{c/}	21.5	25.6 ^{c/}	52.3	280.6	192.4	62.9	151.7	184.5	49.7	

a/ Capital gains reflect primarily unrealized capital gains or losses. For long-term bonds one could achieve the annual income return by holding the bond to maturity. However, opportunity losses would occur if interest rates are rising over the time period the bond is held.

b/ Preliminary.

c/ Compute over the 1960-1979 period only because of missing data.

Source: Lins, David, "The Financial Condition of U.S. Agriculture: Past, Present, Implications for the Future," NED Staff Report, USDA, 1979.

a portion of their income in the form of capital gain, and we expect this attitude to continue. In fact, some dimensions of public policy, particularly tax policy, may in fact encourage the conversion of ordinary income into capital gains. Thus, debt servicing will continue to be a problem for some farmers because of the relatively low rate of cash return on farm assets.

The increased volatility of annual cash income experienced in recent years will also be a continuing characteristic of the agricultural sector. Real income of farmers will continue to grow, more from a combination of fewer and larger farms along with growing nonfarm income than from growth in aggregate income from farming. Thus, farmers will continue to improve their income position compared to the nonfarm sector, but income of farmers will be much more volatile than incomes of most firms and individuals in the nonfarm sector.

Debt Use

Today, borrowed funds are considered the lifeblood of production agriculture. Some reasons for the dramatic increase in dependence on credit include:

- o Loan funds have been relatively plentiful and inexpensive, until recently.
- o Farm production expenses have increased sharply (from \$19 billion in 1950 to \$131 billion in 1980) as input prices have risen, production has expanded, and the share of production inputs purchased rather than provided on the farm increased.
- o As a result, cash expenses have increased as a percentage of gross farm receipts (from about 60 percent in 1950 to over 80 percent today).
- o Following from the above developments, net farm income has been a declining share of farm receipts, thus reducing the capability of farmers to fund cash expenses with internal savings. At the same time farmers now purchase most of their consumption needs, just as nonfarmers do, further reducing internal cash flows available for covering production costs.

Thus farmers are heavily addicted to a steady flow of borrowed funds to finance their production activities. Ownership costs have also risen as land prices and cost of machinery and other capital needs have increased dramatically. Many farmers have borrowed heavily to increase the size of their farming operations to realize economies of size or simply to increase income.

Farm sector debt increased from \$12 billion in 1950 to an estimated \$158 billion on January 1, 1980. The aggregate value of farm assets has also grown dramatically, especially in the last decade. The ratio of debts to assets doubled between the late 1940's and 1960's and stabilized in the 16 to 17 percent range in 1970's. On small farms (sales of \$2,500 or less) that ratio is only about 5 percent, but it increases for larger farms and is more than 20 percent for farms with sales of more than \$100,000. Of course, for many larger and growth-oriented farms the debt-to-asset ratio is much larger. The operations of these largest farms are most sensitive to costs of debt servicing, changes in interest rates, and fluctuations of cash flow.

The fact that the use of borrowed funds has grown more rapidly than net farm income implies an increasing debt-carrying burden. The ratio of debt outstanding to net farm income rose considerably during the 1960's and 1970's. During the 1960's and early 1970's, debt outstanding was two to three times higher than net farm income. In the late 1970's, that ratio was in the four-to-one and five-to-one range.

In recent years, debt repayment burdens, interest costs, and access to loan funds have become sensitive public policy issues. Farmers will pay over \$16 billion in interest charges in 1980. This represents 12 percent of all farm production expenses. Increases in interest charges have contributed significantly to rising costs of production in recent years. Agriculture has

just come through a year of record high interest rates. In a number of states, concentrated along the Northern and Western edges of the Corn Belt, commercial banks, especially country banks, have come through two years of high loan-to-deposit ratios, culminating in severe liquidity problems in the Winter and Spring of 1980. In districts where commercial banks were unable to meet farm lending needs, the banks of the Farm Credit System grew at phenomenal rates. In 1979, the Farmers Home Administration, the lender of last resort, loaned farmers a record \$7.7 billion. These developments occurred despite the fact that 1979 was the second best farm income year on record.

FUTURE CREDIT NEEDS

Aggregate Projections

A recent USDA study focused on likely credit needs and problems in the 1980's.⁶ The detailed results of this study will soon be available.

Highlights include:

- o Farm production expenses will more than double by 1990. Funds needed to finance annual farm production expenses could increase by more than \$200 billion over the next 10 years compared with about \$134 billion in total farm production expenses in 1980. Most of the additional funds will have to be borrowed, although there are expected to be some innovations in equity financing.
- o Farm sector debt, which increased from \$12 billion in 1950 to an estimated \$158 billion in 1980, could be about \$600 billion by the end of the decade. However, asset values in farm businesses are expected to rise to over \$3 trillion and the ratio of debts to asset values will not be significantly higher than the 16 or 17 percent range of recent years.
- o Competition for loan funds will remain strong. Agriculture will remain competitive and will be able to attract its fair share of funds. Farm prices and incomes should begin to rise strongly by the middle of the decade, increasing the ability of farmers to compete for production and investment funds.

- o Land prices will likely increase rapidly, especially in the latter half of the decade. This will increase the wealth of landowners but will also increase the difficulty of getting started in farming, especially for those having no other source of income to subsidize the beginning years. The added wealth of existing landowners, combined with tax advantages, will enable them to outbid other would-be land buyers and thus continue the trend to fewer and larger farms. Higher land prices also greatly increase the flow of debt funds needed simply to refinance the ownership of land, generally into the hands of fewer and fewer owners.

Disaggregate Projections

The aggregate projections presented above were disaggregated by economic class and enterprise type to obtain a perspective on the future capital and credit requirements of various types of farms. Such distributional data are important in understanding the future financial structure of the farm production sector as well as in evaluating the types of farms that may need special financial assistance.

Projections of the distributions of total per-farm assets, liabilities, and proprietors' equities by sales class and on a per-farm basis for 1980, 1985, and 1990 are summarized in Table 2 along with estimates for 1970 as developed by Hottel and Reinsel.⁷ Class IA farms are expected to control 33.5 percent of total assets in 1980 and 42.6 percent of total assets by 1990.⁸ These farms will likely hold 40.5 percent of the debt in 1980 and are projected to hold 49.2 percent in 1990. The proportion of total proprietors' equities held by Class IA farms may increase from 31.9 percent in 1980 to 41.1 percent in 1990.

The proportion of total U.S. assets, equity and debt controlled by Class IB farms are also projected to increase during the decade of the Eighties. However, these rates of increase are much lower than those exhibited by Class IA farms. As a group, Class IA and IB farms increase their share of assets and

Table 2 -
 Projected Distribution of Total and Per Farm Assets, Liabilities and Proprietors' Equities by Economic Class for the Baseline Scenario

	-----1970-----		-----1980-----		-----1985-----		-----1990-----	
	Total (\$ Billia)	Percent of Total Farm	Total (\$ Billia)	Percent of Total Farm	Total (\$ Billia)	Percent of Total Farm	Total (\$ Billia)	Percent of Total Farm
All Classes								
Assets	226.9	100.0	884.3	100.0	1,554.0	100.0	2,983.7	100.0
Liabilities	41.9	100.0	170.8	100.0	324.5	100.0	572.9	100.0
Proprietors' Equity	185.0	100.0	713.5	100.0	1,229.5	100.0	2,410.8	100.0
Per Farm	126		543		974		1,875	
Class III-V								
Assets	--	37.7	--	18.9	--	12.5	--	8.3
Liabilities	--	28.9	--	13.7	--	8.7	--	5.3
Proprietors' Equities	--	39.3	--	20.0	--	13.5	--	8.9
Per Farm	70		213		344		606	
Class II								
Assets	--	24.2	--	19.6	--	18.9	--	18.0
Liabilities	--	22.9	--	17.0	--	15.9	--	14.9
Proprietors' Equities	--	24.5	--	20.3	--	19.7	--	18.7
Per Farm	160		474		755		1,312	
Class IB								
Assets	--	20.7	--	28.0	--	30.0	--	31.1
Liabilities	--	23.4	--	28.8	--	30.0	--	30.6
Proprietors' Equities	--	20.1	--	27.8	--	30.0	--	31.3
Per Farm	264		781		1,246		2,164	
Class IA								
Assets	--	17.4	--	33.5	--	38.6	--	42.6
Liabilities	--	23.8	--	40.5	--	45.4	--	49.2
Proprietors' Equities	--	16.1	--	31.9	--	36.8	--	41.1
Per Farm	727		2,154		3,433		5,964	
Per Farm	180		502		843		1,321	
Per Farm	547		1,652		2,590		4,643	

equity from about 60 percent to 72 percent and liabilities from about 70 percent to about 80 percent from 1980 to 1990.

The proportions of total assets, liabilities, and proprietors' equities held by Class II and Class III-V farms are projected to decline during the decade of the Eighties. Total assets controlled by Class II farms decline from 19.6 percent in 1980 to 18.0 percent in 1990, while for Class III-V farms the decline during the time period is from 18.9 percent to 8.3 percent of total U.S. farm assets. The proportion of total liabilities declines from 17.0 percent to 14.9 percent for Class II farms and 13.7 to 5.3 percent for Class III-V farms during the decade. The proportion of total U.S. farm equities for these classes of farms is expected to be reduced by almost 50 percent.

The per-farm projections of Table 2 indicate that assets are projected to increase approximately 279 percent for all classes of farms from 1980 to 1990.⁹ Per-farm liabilities are projected to increase by approximately 267 percent and proprietors' equities by approximately 282 percent. By 1990, Class IA farms are projected to control \$5.96 million of assets and have \$1.32 million of debt and \$4.64 million of equities. Class III-V farms may average \$606,000 of assets, \$81,000 of debt and \$525,000 of equities.

Table 3 summarizes the projected debt to asset ratios by economic class-enterprise type cross-classification and the estimated ratios for 1970 from Hottel and Reinsel. Consistent with the aggregate projections presented earlier, the debt-to-asset ratio for all types of Class IA farms increases from 23 percent in 1980 to 25 percent in 1985 and then decreases to 22 percent in 1990; for Class III-V farms, the ratio increases from 14 percent in 1980 to 15 percent in 1985 and then declines to 13 percent in 1990. With respect to type of farm within the Class IA size category, the debt-to-asset ratio is highest

Table 3. Projected Debt to Asset Ratios by Economic Class and Enterprise Type Cross-Classification for the Baseline Scenario

Year	Class	Percent												
		Cash Grain	Tobacco	Cotton	Other	Poultry	Dairy	Other Livestock	Ranch	General	Miscellaneous	Vegetable	Fruit and Nut Farms	
1970	III-V	12	12	12	19	20	19	18	9	16	13	9	13	16
	II	14	14	11	19	29	25	19	13	18	14	13	19	18
	IB	15	16	12	21	28	27	25	16	22	20	17	27	21
	IA	16	25	19	26	37	28	33	20	20	35	17	20	25
1980	III-V	12	11	12	19	18	15	16	9	15	12	9	19	14
	II	13	13	10	18	27	23	18	12	17	14	12	18	17
	IB	14	15	11	20	26	25	24	15	21	20	16	26	20
	IA	15	24	18	25	35	27	31	19	20	33	16	19	23
1985	III-V	13	12	13	20	19	16	17	9	16	12	9	20	15
	II	14	14	11	19	28	24	19	12	17	14	13	19	18
	IB	15	16	12	21	27	26	25	16	22	20	17	27	21
	IA	16	25	19	26	36	29	32	20	20	35	17	20	25
1990	III-V	11	11	12	18	17	15	16	8	14	11	8	18	13
	II	13	13	10	17	26	22	17	11	16	13	12	17	16
	IB	14	14	11	19	25	24	23	14	20	18	15	24	19
	IA	15	23	17	23	33	26	29	18	18	31	15	18	22

for poultry farms (35 percent) and lowest for cash grain farms (15 percent) in 1980; the ratios for these farms are projected to be 33 percent and 15 percent, respectively, in 1990. Note that in general, cash grain, cotton, ranch, general, vegetable, and fruit and nut farms have lower debt-to-asset ratios than the other enterprise types, particularly in the case of Class IA farms. These lower debt-to-asset ratios may be due in part to the differences in asset composition of the different types of farms. Those farms with lower ratios in general include enterprises that are more dependent on a land base which has been and is projected to continue appreciating in value. In contrast, the debt-to-asset ratios are, and are projected to remain, relatively high for the intensive livestock operations including poultry, dairy, and other livestock farms.

The disaggregated projections provide insight into the future financial characteristics and health of the agricultural sector. In particular, the higher debt-to-asset ratios in 1985 (Table 3) compared to 1980 suggest higher financial risk and thus more vulnerability to price and yield variability. As in 1980, larger farms will continue to be more highly leveraged in 1985 than smaller farms; Class IA farms are projected to have a debt-to-asset ratio of 25 percent in 1985 compared to 23 percent in 1980, whereas Class III-V farms have a projected ratio of 15 percent in 1985 compared to 14 percent in 1980. By 1990, debt-to-asset ratios are projected to decline for all sizes and types of farms compared to 1985; in fact, 1990 ratios are projected to be slightly lower than those in 1980.

Higher debt-to-asset ratios will be exhibited by larger livestock farms in particular, with Class IA poultry farms having a debt-to-asset ratio of 36 percent in 1985 and Class IA livestock farms a ratio of 32 percent. In

contrast, the debt-to-asset ratio for Class IA land based farms (for example, cash grain and cotton farms and livestock ranches) are projected to increase from 1980 to 1985, but will remain substantially lower than the ratios for specialized livestock operations. Thus, large livestock farms may be the most vulnerable to production and price instability in the future because of higher leverage, an asset structure that includes a large portion of specialized, low-liquidity assets, and the fact that purchased inputs comprise a large portion of total inputs. In contrast, larger land based farms are projected to have lower leverage which results in such farms being less vulnerable to price and yield instability.

The disaggregate projections suggest that Class IA farms will be using approximately \$1,321,000 of debt per farm and, in total, account for almost 50 percent of the total debt in U.S. agriculture by the end of the decade. The implications for the various lending institutions of these debt requirements for larger farms are not altogether clear. It may become increasingly difficult, however, for lenders such as commercial banks, that must comply with per-customer legal lending limits and are dependent to a large degree on local deposits, to service those farms dominating the industry. Furthermore, unless such lending institutions expand their funding and equity bases dramatically, the per-farm credit demands of the larger farms will make it necessary to serve fewer customers with larger risk exposure, thus resulting in a higher risk loan portfolio.

The disaggregate projections also have geographic implications. The concentration of poultry, tobacco, and cotton farms in the Southeast and the higher projected leveraged positions of these farms by 1985 would suggest that the agriculture of the Southeast will be more vulnerable to price and yield

instability compared to other regions. In contrast, the Eastern Corn Belt, Plains, Mountain, and Western states that are dominated by crop production and land based agriculture will not be as vulnerable to changing economic and environmental conditions.

Finally, the disaggregate projections suggest substantial concentration of the equity or wealth in agriculture by 1990, particularly on farms that hold a large proportion of real estate. For example, Class IA cash grain farms are projected to have an average equity of \$7,258,000 by 1990, and Class IA ranches will have \$11,876,000 of equity by this same year. By 1990, 41.1 percent of the total equity in U.S. agriculture will be in Class IA farms compared to 31.9 percent in 1980. As might be expected, the proportion of total equity included in Class III-V farms is projected to decline from 20.0 in 1980 to 8.9 percent in 1990.

RESEARCHABLE ISSUES

The dynamic financial future of agriculture suggests a number of issues that merit additional research. Only a limited subset of these issues will be identified here; this subset will include issues in the area of acquisition of funds and assets by producers, supply of funds by lenders and the financial intermediation process.

Capital-Labor Substitution

The historical trend of the substitution of capital for labor in agriculture has been well documented. But the economic forces that encouraged that substitution may not be as prevalent in today's agriculture. First and foremost one might hypothesize that the price of capital and the capital costs per unit of output have risen more rapidly in recent years than that of labor.

Increased capital costs have occurred not only because of rising interest rates and opportunity costs on capital, but also because of dramatic increases in the per unit of output investment requirements in modern agriculture. Furthermore, technological advances that are embodied in capital inputs have also encouraged capital-labor substitution. If technological innovation is less prevalent in U.S. agriculture in the future as some researchers suggest, this force may be less persuasive in acquiring new capital inputs to replace labor. Finally, capital-labor substitution is in part a response to internal and external labor rationing--many farmers want to expand their operations without incurring the problems of hiring an employee or feel that the quality of employees available is not adequate to maintain an efficient business. Consequently, they substitute capital inputs that will allow them to produce more livestock or till more acres with the same labor supply. This force may increase in relative importance in the future as an explanation of capital-labor substitution in agriculture.

The issues of capital-labor substitution and the optimal utilization of resources in agriculture in an environment of risk requires an extension of our traditional theory of resource allocation. Procedures to incorporate risk considerations are well known; an integrated theory of production and finance that recognizes the important impacts that finance costs and constraints, as well as financial leverage and debt utilization, have on optimal resource use, product mix and firm size is not as well developed and understood. Significant contributions by Vickers have been made in this area (Baker and others have also made contributions here);¹⁰ I would recommend that any serious student or researcher in the fields of production economics, farm management or finance

become well acquainted with this excellent seminal attempt to integrate the theory of production and the theory of finance.

Asset Pricing and Cost Analysis

The pricing of capital goods as a function of their discounted net income stream and the related issue of the allocation of capital costs per unit of output is relatively straight-forward and easily understood in times of stable prices. Traditional net present value and capital recovery procedures (as opposed to simple budgeting approaches) provide reasonable accurate estimates of value and annualized cost.

But such procedures may need substantial modification to provide accurate estimates in inflationary times. The problems arise primarily in recognizing real and/or nominal growth in the income stream of the asset, in accurately recognizing the capital costs of an asset when its replacement is increasing in price, and in accurately determining the after-tax income when depreciation allowances are based on historical cost and tax rates are not adjusted for inflation.

New concepts and procedures to resolve these problems are now being recognized. Incorporating the growth in the annual income stream for land and recognizing land as an asset with "growth stock" characteristics is a major breakthrough in land valuation research; possibly similar concepts should be applied to other agricultural assets. Using the sinking fund approach to depreciation allowances so that adequate funds are available to replace the asset is an additional advancement. The proper recognition of the real cost of income taxes and the inclusion of real tax liabilities in investment analysis is now being recognized in agricultural applications, but additional contributions are needed in this area.¹¹ In summary new additions to some well accepted

(and not so well accepted--at least by agricultural economists) concepts of investment analysis and cost allocation will be required to provide more accurate information in inflationary times.

New Financial Instruments and Terms

Changes in the national and international financial environment including higher and more volatile interest rates suggests that innovation in lending terms and instruments can be expected in the future. Variable interest rates that reflect changes in money market conditions are becoming more popular. Delayed or variable payment schedules may be used to adjust the repayment schedule to repayment ability. Some lenders may offer reverse-annuity repayment schedules where the payments increase over time but are less than the interest obligation during the early years and the unpaid interest is added to the outstanding loan balance. Others may offer options for the borrower to delay a payment, (for example, in 1 year out of 10) to reduce the risk of default in years of low cash income. Other types of arrangements may be utilized whereby the lender receives a percentage of the increase in value during the life of the loan agreement (an "equity kicker") in addition to receiving the annual payment.

An additional development in real estate financing that is being used in the urban (and to a limited extent in the rural) real estate market is the second mortgage. As commonly used, the seller of the property accepts equity in the form of a second mortgage as part of the sale arrangement rather than receiving the entire equity as cash. The buyer then assumes responsibility for annual payments to the holder of the first mortgage (frequently a financial institution) as well as to the seller who holds the second mortgage. Such arrangements are used to reduce the size of the downpayment required to purchase the property as well as to transfer a first mortgage with favorable terms to the

buyer if the mortgage is assumable. A similar arrangement called a wrap-around mortgage, where the holder of the second mortgage (typically a financial institution or a third party) accepts the responsibility for making the payments on the first mortgage, can also be used to take advantage of a favorable interest rate on a first mortgage.

These mortgage arrangements may become more common in financing farm real estate transfers when current market interest rates are substantially higher than the fixed rate on an outstanding mortgage. However, with an increasing proportion of farm real estate loans made on a variable-rate basis where the advantage to the buyer of assuming the loan is minimal, and with the availability of installment contracts where downpayments are comparatively low compared with conventional financing, second and wrap-around mortgages are not expected to expand dramatically.

A form of personal loan that may be used increasingly to finance farm firms is the family debenture. As noted later this financing arrangement can be used along with the corporate structure to facilitate the intergenerational transfer of the farm firm. If such arrangements are used to encourage nonfarm heirs to leave their investment in the corporation, intrafamily debt will be substituted for external debt, which will affect the amount of institutional credit needed to refinance each new generation of farm ownership.

Interest Rate Risk

The increased risk in agriculture means that careful financial planning and risk management have become more important than ever. Melichar has noted that although physical and product market risk have received the most attention in studies of risk in farming, "risk of adverse changes in farm input markets have become more prominent. And among these, the risks originating in financial

markets--manifested as unanticipated adverse changes in the cost and availability of farm loans--are becoming more important."¹² Melichar argues that risk originating in financial markets are manifested in two ways--changes in the availability of farm loans and interest rates. He indicates that with respect to the availability of farm loans, supplies of funds to farmers have not been drastically curtailed in the aggregate even during "credit crunches", although various institutions, particularly rural commercial banks, have encountered severe liquidity problems during such periods. As to interest rates, evidence is mounting of "significantly increased cyclical variability of rates at rural banks."¹³ With the increased dependence of rural banks on money market certificates and other deposits tied to national money market conditions, interest rate variability is reflected in the cost of funds for farm borrowers.

With the variable rate interest plan, the Farm Credit System has also transferred (in part) the risk of interest rate changes to their borrowers. Thus, farmers are subject to more fluctuation in the cost of debt, and with increased utilization of debt in comparison to the income stream, the risk of repayment is substantially increased.

Melichar has argued further that because, in part, of variable interest rates, "lending operations of financial institutions are no longer quickly discouraged by the interest rate increases or monetary restraint initially encountered during a business expansion. . . . loan availability is maintained and borrowers who are enjoying higher sales and profits are not likely to be significantly dissuaded from further borrowing by moderate rate increases alone. Thus, the rapid build up of debt now continues beyond the point at which it

earlier would have been slowed by problems of the lenders".¹⁴ In essence, Melichar argues that variable rates may lead to credit overextension.

A key issue in the agricultural financial markets today is who can best handle interest rate risk (borrower or lender) and what methods might be used to reduce the risk arising from interest rate fluctuations. Could lenders use interest rate futures to protect themselves and their customers against rate fluctuations? What about offering fixed rate loans at a rate premium to the borrower to reduce his risk but also compensate the lender for accepting this risk? And how can variable length-amortization schedules that result in adjustments in the loan length rather than the annual payments when interest rates change, be used to reduce the financial consequences of interest rate fluctuations? The policy issue of aggregate response to interest rate fluctuations (as noted earlier) also merits investigation.

Entry Into Agriculture

Concern has been expressed in recent years about the opportunities for and impediments to entry into agriculture. This issue is not only of concern to those who are attempting to enter farming, but it has also become a policy concern at both state and national levels, with particular emphasis on the implications of entry into agriculture for the structure and control of the farming sector and the future of the family farm.

Programs to help beginning farmers should consider the control of resources, subsidized credit, and risk. Some have proposed to assist the beginning farmer to attain control of resources, particularly land, through a program of government acquisition of real property. This property is then leased to the qualified beginning farmer for a period of years with an option to buy at the end of the lease period.¹⁵ Although such programs enable the

beginning farmer to attain control of necessary resources, a number of problems are encountered. First, the state or federal agency becomes an active bidder in the real estate market and either directly or indirectly will have an influence on the price of farmland. Furthermore, many individuals are not supportive of government agencies (federal, state, or local) owning and/or controlling additional farm real estate. Also, the questions of who qualifies as a participant in the program and how farms are allocated between qualified participants are also problems.

An alternative strategy that might have some potential in the area of resource control, particularly with respect to real estate, is to provide an incentive for retiring farmers to rent their land on a long-term lease to qualified beginning farmers rather than to sell the land to an established farmer or even to a government agency. The incentive might be in the form of a tax credit for rent received under such an arrangement. It might be a specially indexed government bond in which the landlord could invest rental income that would give him a retirement income over time that is adjusted for inflation. The program could be structured to encourage the landlord to provide a long-term rental arrangement rather than a traditional one-year lease. Such an arrangement might also include for the tenant a first option to buy, after a designated period of time, at a market or other designated price.

A similar incentive might be provided to encourage retiring farmers to sell their land on favorable terms to qualified beginning farmers. The objectives of such a program would be to enable the qualified buyer to obtain the land at a price that is less than fair market value (to reduce his capital outlay and financial risk) and yet to enable the seller to receive the same after-tax proceeds as would have been obtained if the land was sold at fair market value

to an established farmer. A special tax exemption of part or all of the capital gains might be possible, if a retiring farmer sells to a qualified new entrant.

A common recommendation to help beginning farmers is to provide subsidized credit. In fact, the Farmers Home Administration (FmHA) is a classic example of such a program. If credit programs are judged to be an important part of the incentive mechanism to encourage entry into agriculture, one might consider the use of government guarantees rather than direct subsidies through lower interest rates for beginning farmers. The key attribute of the guarantee of the private sector loan by a federal or state agency is that one is relying on the expertise of the private sector to make decisions about the chances of success for a particular individual. A smaller government bureaucracy is required as well. For example, Minnesota's Farm Security program for beginning farmers includes (1) a 90 percent guarantee for the period of the loan, and (2) a deferred 4-percent interest payment adjustment providing the loan is for less than twenty years. This deferred interest is payable without an interest charge at the term of the contract or loan.¹⁶

A program to encourage seller financing to beginning farmers with an installment contract arrangement might be developed with tax incentives. For example, recent amendments to the Minnesota Farm Security Act exempt from state income taxation all interest received on an installment sale of land to qualified beginning farmers participating in the program. Such a program might encourage retiring farmers to sell their real estate at a lower price or on longer contract terms than would be offered to an established farm operator.

One of the key problems faced by beginning farmers is the risk encountered because of uncertain production and prices and high financial leverage. In many cases, it would appear that new entrants could acquire control of the resources

(particularly land) through conventional renting or leasing activities if they could handle the financial risk associated with modern day agriculture. Although empirical studies are not available, it would appear that one of the more significant options to assist beginning farmers would be to develop a low-cost insurance program to reduce production, price, and income risk. A program might be written with the lender or landlord as a co-beneficiary of insurance proceeds so that in the case of low crop yields or low prices due to conditions beyond the control of the beginning farmer, insurance proceeds would be shared between both parties. Such a program would reduce the risk to the lender or landlord, thus increasing his willingness to advance funds or lease the land to the beginning farmer, as well as reducing the risk of the farmer in terms of a reasonable standard of living for his family.

Intergeneration Transfers and Nonfarm Equity

With the rapid growth in the equity base of agriculture, a key concern of farmers and their lending institutions is the issue of maintaining that equity base during the process of intergenerational transfers. The estate tax reforms of recent years certainly reduce the potential equity drain from agriculture to pay estate taxes, but they do little to solve the potentially more serious problem of equity outflows to compensate nonfarm heirs during the intergenerational transfer process. With growth in firm size and the desire to maintain these larger farm units as "going concerns" beyond a single generation, the problem will become more acute. Certainly, the legal structure is available to encourage business continuity during the intergenerational transfer process (in particular, the corporation or even a properly structured partnership can be used), but additional innovation in financial markets and instruments may be necessary to encourage the nonfarm heirs to maintain their equity interest in

the farm firm. Utilizing a combination of debentures and stock (common, preferred, non-cumulative voting, convertible preferred, etc.) in the capital structure of the corporation with the nonfarm heirs receiving debentures that generate a competitive rate of return and have a specified liquidation value holds promise, but other innovations may be needed.¹⁷ Furthermore, the credit demands that will exist in the future to finance intergenerational transfers will be substantial and will significantly influence the debt-equity structure of many farm firms.

A related issue is that of nonfarm sources of equity capital for farmers. Many people abhor the infusion of nonfarm equity capital into agriculture, whether it be in the form of a large corporate entity buying and operating a farm or a local businessman, banker, or doctor buying farm real estate. Yet others claim that such nonfarm investment is beneficial to beginning farmers by maintaining the rental market for farmland, thus enabling smaller farmers to acquire a land base, obtain economies of size, and share risk with other equity investors.

The issues of nonfarm equity capital in farming can probably be most rationally analyzed if one focuses on the terms of trade and incentives provided to farmers and nonfarmers to acquire farm assets. In my judgment, public policy should attempt to eliminate any unique incentives that nonfarmers may have in comparison to farmers in purchasing agricultural assets--both groups should at a minimum have equal tax and other incentives for such purchases. Furthermore, policy should be structured to maintain a balance between the rights of owners and the rights of renters of agricultural assets. If "reasonable" terms of trade are maintained and artificial incentives eliminated, the issue of who owns the asset becomes less crucial although it is by no means eliminated entirely.

Farm Growth and Structure

The incentives for growth of the farm firm have been well documented. Economies of size encourage farm expansion (at least to a point of the minimum cost of production), and motivations to increase family income encourage growth beyond the point of minimum cost since there is little evidence that the average cost curve is upward sloping with size. Opportunities to obtain quantity discounts in the purchasing of inputs, and possible higher prices for a large volume of higher quality products also encourage increases in size. Improved management skills enable operators to handle larger farms. Figure 3 indicates the current and projected size distribution of farms in the U.S.

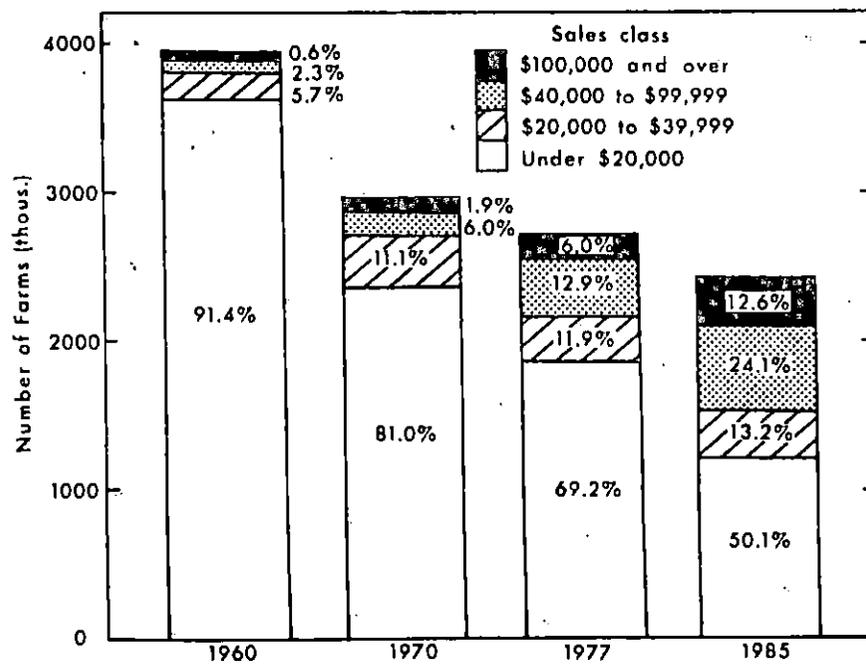
In addition to the private incentives for growth, government programs, particularly price support programs and taxation policies, may have implications for growth as well as the relationship between capital gains compared to cash return on agricultural assets. Research completed in this area has only focused on a few of the important issues.¹⁸

Availability of Public and Private Credit

In view of the essential nature of credit to finance production, prospective sharp increases in production costs and land prices, and recent experience with scarce supplies of funds and high interest rates, it is not surprising that farmers and their spokesmen are concerned and press for policies which assure them adequate supplies of loan funds at reasonable costs. Indeed some argue that this is the most important credit issue of the Eighties.

Analysts suggest however, that if the economic health of agriculture is sound, farmers will be able to compete with other borrowers at competitive rates. Some even argue that for several reasons farmers may be getting more than their "fair share" of credit funds especially when funds are scarce and

Figure 3. Number of farms by sales class.



Source: Lee, Warren, Michael Boehlje, Aaron Nelson and William Murray, Agricultural Finance, 7th ed., Iowa State University Press, 1980, Chapter 1.

interest rates rise to ration those scarce funds. This possibility arises for several reasons:

- o The banks of the Farm Credit System have unlimited access to the central money markets and thus can continue to lend when banks (especially small banks) may be "loaned up" relative to their reserves. Moreover, because their interest rates are based on average money costs rather than current costs, interest rates charged by the Farm Credit System banks tend to lag private bank rates in rising markets. This tends to insulate FCS borrowers somewhat from market rates, and encourage more credit use than market conditions would warrant.
- o Country banks historically have loaned from reserves deposited in savings and checking accounts. These are low cost funds and enable these smaller banks to, in turn, lend to farmers and local businesses usually below prime rates charged in larger money centers. Thus, in the past farmers were somewhat insulated from the effects of "credit crunches" and restrictive monetary policies. This insulation has largely eroded during the last two years as banking regulations have changed and as competitive pressures have forced smaller banks to offer certificates of deposit and other instruments which, in effect, now tie their cost of money more directly to the central money markets. Nevertheless, even during the scarce credit period last year (Winter and Spring, 1980) farmers continued to borrow from rural banks at rates below those charged by large city banks.
- o Public lending institutions lend to farmers at rates or terms usually involving some element of subsidy. These institutions frequently are not responsive to interest rates or money supply signals of markets; consequently, farm borrowers see that money as being cheaper than competitive conditions suggest it should be. Thus, they likely use more than would be the case if they had to pay the true market costs.

The net result of these and other factors is that the farm sector likely uses more loan funds and at lower rates than would be suggested by private market conditions. This may lead to more capital investment and increase the capital intensity and productive capacity of agriculture more than otherwise would have been the case in recent decades. This, in turn, may have exacerbated the problem of overproduction and depressed prices, and increased pressure for income support programs and more liberal credit policies.

The question remains whether agriculture needs special credit considerations today. That question is especially relevant if the profile of the farm sector outlined in a number of recent studies--a sector of large-scale firms realizing competitive financial rewards--is accurate. Certainly lending institutions serving farmers must recognize the unique requirements of agriculture: the seasonal nature of production, the critical importance of timing, the year-to-year volatility of prices and incomes, etc.

But the farm sector is no longer characterized by millions of small family farms, relatively poor, and facing inequitable treatment in money markets. Smaller farms today generally have sufficient off-farm income that their total incomes compare favorably with nonfarm family incomes, they are not considered risky borrowers, they finance most of their needs with internal savings, and their debts are small relative to asset values and repayment capacity. Larger commercial farms are large, capital intensive businesses earning competitive returns. In view of this emerging reality, is there continuing justification for public credit policies and programs which provide favored treatment for agriculture? If so, under what circumstances and for whom are such policies needed?

Who is not served by private money markets: The place to start is to examine who will likely not be funded if the money markets work reasonably well. Those likely to have difficulty in private farm credit markets include:

1. Existing farmers who are submarginal because of economic factors.
 - o Submarginal only under atypical adverse conditions.
 - o Submarginal under typical conditions.
2. New or would-be farmers who are submarginal in the beginning but who with specialized credit help can "graduate" to being above marginal under normal conditions.

- o Beginning farmers.
 - o Limited resource farmers.
 - o Farmers lacking skills or training.
3. Existing farmers who are temporarily submarginal because of natural disasters.

Providing public credit to preserve the normally healthy moderate-size farm temporarily caught in adverse conditions could be consistent with the long-term goals of agricultural policy. Present trends suggest that about two-thirds of the land sold each year is bought by operating farmers and consolidated into existing farm units. This is the primary source of increasing concentration in the farm sector. If the normally-healthy but temporarily-in-trouble farms are allowed to go out of business, it is not unreasonable to assume that some portion of their assets will be consolidated into other existing units. Thus, assuring that such farms obtain the funds needed to stay viable would be consistent with the goals of efficiency, preserving a pluralistic agriculture for resiliency and future flexibility, providing economic opportunity for more people, and ultimately food security. If, instead of a moderate-size family farm, the farm in temporary trouble is very large, it is not clear that the same arguments for public credit assistance hold.

There would appear to be no direct economic reasons for trying to preserve those farms that are submarginal even under normal economic conditions and for whom that does not appear to be a temporary phenomenon with subsidized public credit. Both the subsidy in the credit program and the inefficient use of resources implied by the farm being submarginal are social costs. However, perhaps one more question should be asked: Is the social cost ultimately greater if the farmer goes out of business? This is not likely if there is

alternative gainful employment. But if the displaced farmers or workers end up as a public liability anyway, social costs may be minimized by extension of public credit to keep them in business, at least until better opportunities are available.

The same general comments apply to the farmers in trouble because of natural disasters: it would be consistent with goals of efficiency, competitiveness and future flexibility to provide public credit assistance to efficient size family farms. For larger farms the question is how far should the public go in sharing the risks and protecting the interests of the wealthy?

For the third group, those who need specialized credit help or terms, the appropriateness of public credit assistance depends on the likelihood that they will successfully graduate to private credit and eventually repay the public investment through taxes, efficient use of resources, and contribution to pluralism in the farm sector. It is in these programs, more than any other, that "social" objectives and economic objectives of policy come face to face.

The policy issues of assistance to beginning farmers are difficult. If there are not resources to assist all would-be farmers, who are the lucky ones? How will the selection process affect who will be farmers in the future? The issue are sometimes put in terms of new credit arrangements needed for beginning farmers who wish to purchase land. Several economists have shown rather convincingly that the high land prices of recent years are quite rational. In other words, in terms of long-term returns to investment (from farming and from land value appreciation), land is a good buy even at today's high prices. But studies have also shown that if that land is purchased with borrowed funds, the income flow from farming will not cover principal and interest payments during the early years of the loan. Emil Melichar uses the analogy of land as a

"growth stock", an asset which might be an excellent long-term investment, but one could not expect to pay for it from the earnings in early years.¹⁹

This poses a dilemma! Only those who inherit land or those who can cover payments from other sources of income can begin farming as an owner/operator. Thus, there is a "selecting out" process, strengthened by the distributional impacts of the tax laws. Not surprisingly, those favored by the selection process tend to be those with high incomes, including operators of large farms with high equity in land already owned. In fact, existing farmers buy approximately two-thirds of the land sold each year, and thus are the primary entrepreneurs of increased concentration.

Loans for beginning farmers could be arranged such that repayment schedules are matched with income flows; i.e., postpone more of the amortization to the later years of the mortgage. But, there are dangers. Unless such loans are restricted to those unable to afford early payments and who intend to farm the land over a long period of time, they could increase the returns to owner's equity in early years, thus enabling one to bid up land prices, hold it for a years while ownership costs are low, and then sell it at a higher price when repayment costs begin to rise. Such a program could thus worsen land price appreciation unless some safeguards were built into the loan program.

The Farmers Home Administration: To most people, public credit in agriculture means the Farmers Home Administration. The FmHA program has undergone dramatic change in recent years. In 1960, FmHA administered eight programs, of which farm operating loans accounted for 64 percent and farm ownership loans accounted for 14 percent of the total funds. In 1979, FmHA operated at least 23 programs with farm operating loans accounting for 6 percent and farm ownership loans accounting for 5 percent of the funds. Emergency

disaster, economic emergency, individual housing, rural rental housing, water and waste loans and grants, and business and industrial development loans each accounted for larger shares of FmHA activity in recent years. This does not necessarily mean that FmHA has neglected its traditional role. The absolute level (as opposed to percentage share) of farm operating and farm ownership loans was record high in 1979. What the current situation does indicate is that the FmHA has become a giant, many-faceted agency that perhaps has been absorbing programs and mandates (many unrequested) faster than it can maintain a clear sense of purpose and direction. The addition of large loan and grant authorities in 1980 to support the Alcohol Fuels Program merely exacerbates the situation. Over \$14 billion of loan and grant obligations were made by FmHA in 1979, and the FmHA portfolio was nearly fifty times its size in 1960.

Who is served by FmHA's programs and what needs are being met that would not be met by private lenders? By design, the Agency is a lender of last resort. That is, its borrowers are supposed to be those unable to obtain funding elsewhere. A recent study of borrower characteristics suggests that in 1979 the farm operating and farm ownership loans were heavily directed to young farmers and those with small net worth and low incomes. Over 68 percent of the money loaned in the Farm Ownership program that year went to farmers with less than \$12,000 in net cash income and less than \$120,000 in net worth. Over 74 percent of the Farm Operating Loan money went to farmers in the same category. In the same year, 50 percent of the money loaned in each of these programs went to persons under the age of 30.

However, the economic emergency loans were distributed a bit differently. The borrowers tended to have low incomes (presumably that is what put them in an "emergency" situation) but over one-third of the money loaned in 1979 went to

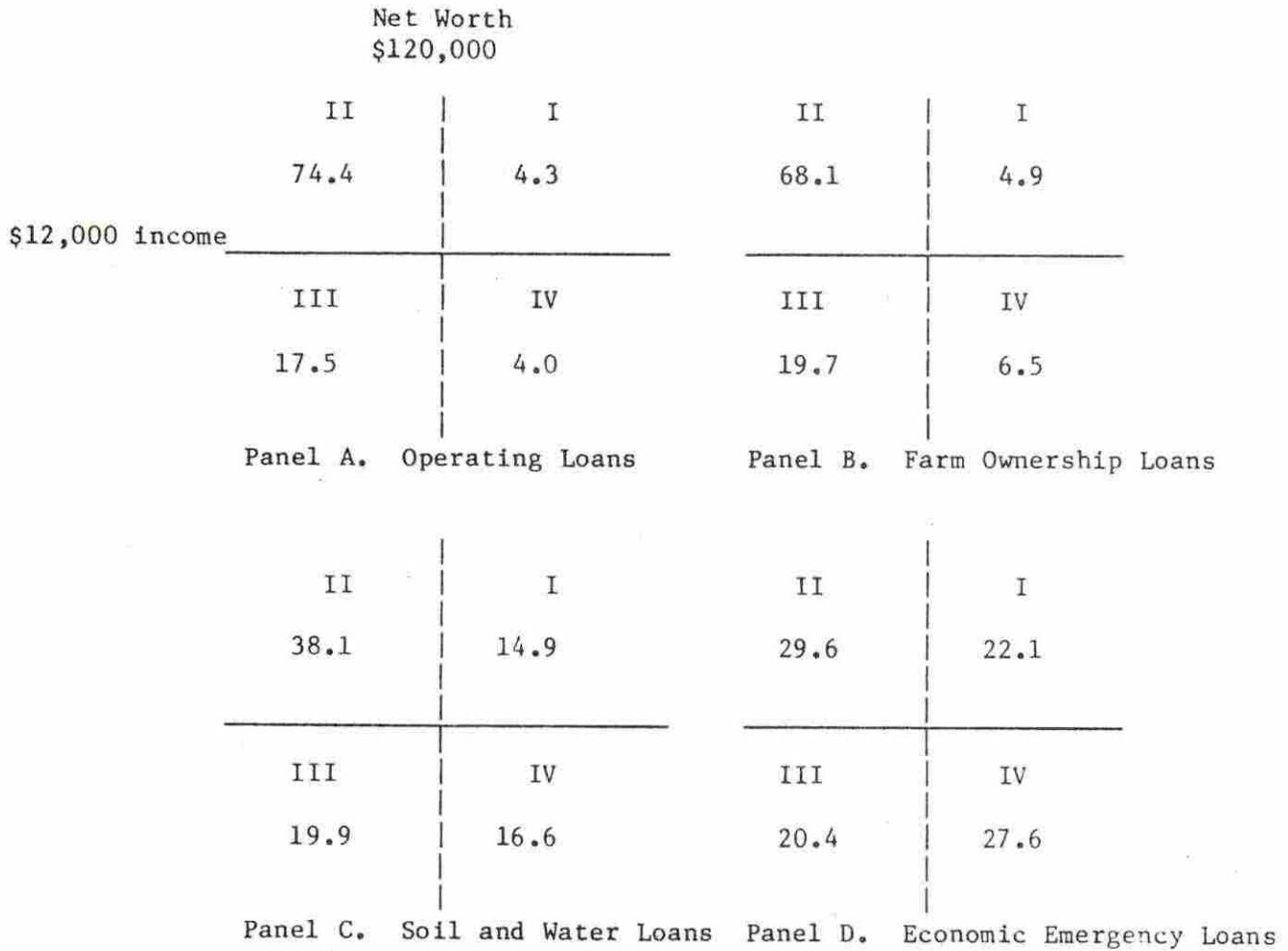
farmers with more than one-half million dollars in assets. Farms with gross value of sales of over \$40,000 represent one-fifth of all farms but received over two-thirds of the money loaned under the Emergency Program in 1979.

Figure 4 summarizes the distribution of program money loaned to farmers in specified net worth and net farm income groups in 1979. As expected the targeted operating loan and ownership loans are concentrated in quadrant II (low-income and low net worth). A larger proportion of Emergency Program money loans went to farmers with higher farm incomes and net worths.

Supply of Funds and Financial Intermediation

The regulation of depository institutions: Rural commercial banks have traditionally depended upon local sources of deposits as the funding base for loans and investments. As the major depository institution in the community, rural commercial banks have been somewhat isolated from activities in national money markets. This dependence on local deposits is now presenting serious difficulties for rural commercial banks for at least two reasons: (1) loan demand in many rural areas is growing more rapidly than deposit supply, and (2) competition for local deposits from other depository institutions, such as savings and loan associations (S&Ls) and credit unions, has reduced the market share of local deposits of commercial banks. To illustrate the magnitude of the competition for funds, during the period from 1970 to 1978, banks' volume of household, time, and savings deposits grew by 153 percent, while the volume of savings and loans increased by 195 percent and credit unions increased by 246 percent.²⁰ Projections of recent trends and expanded authority in deposit instruments, such as Negotiable Order of Withdrawal (NOW) accounts, suggest that banks will continue to lose market share to S&Ls and credit unions without aggressive marketing programs and/or changes in government policy.

Figure 4. A Low Net Worth-Net Operating Farm Income Profile of FmHA Borrowers in Terms of Percent of Program Money Loaned to Each Class of Farmer, 1979*†



* The coordinates of the points of intersection for each panel are net worth equals \$120,000 and net operating farm income equals \$12,000.

† Quadrants I, II, III, and IV consist of low income-high net worth, low income-low net worth, high income-low net worth, and high income-high net worth farmers, respectively.

As to specific policy issues that deserve research emphasis, the impact of changing rules and roles of depository institutions brought about in part by the Depository Institutions Deregulation and Monetary Control Act of 1980 should be evaluated. What is the implication of differences in branching regulations between S&Ls and commercial banks in unit banking states? What will happen to the role of commercial banks in the agricultural loan market if S&Ls implement policies to make agricultural loans? Might S&Ls provide increased access for farmers to long-term mortgage funds compared with commercial banks? And what will be the impact of nationwide NOW accounts on the deposit base of commercial banks in rural areas?

A related issue is the opportunity for rural commercial banks to obtain access to funds from national money markets. Procedures such as correspondent arrangements with regional or national banks, discounting loans with Federal Intermediate Credit Banks (FICBs) through a direct line or an Agricultural Credit Corporation (ACC), or participating in secondary markets through FmHA and SBA guaranteed loans may provide banks with money market access. However, such procedures frequently exhibit high transaction costs, and in some cases successful use of such arrangements is highly unpredictable. Changes that might reduce the transaction costs and improve the flow of funds from national money markets to rural commercial banks through the traditional procedures should be evaluated. For example, increased awareness of the secondary market for SBA and FmHA loans and reduced administrative costs of closing and marketing such loans in that market should be investigated. Innovative ways for small banks to have access to money markets through joint participation in bankers acceptances or joint offerings of commercial paper should be evaluated. Furthermore, the opportunities to utilize state-wide pooling techniques such as the recently

formed Iowa Banker's Mortgage Company (a joint venture of cooperating banks in Iowa to make residential real estate loans and merchandise them on a pooled basis in national money markets) should be investigated with reference to agricultural loans. Some of these methods to obtain access to national money markets may require governmental action to implement.

Competition between lenders: The competitive position of various lenders in the loan market is not independent of funds availability, but legislation concerning the lending authority of competitors will further influence the competition that various lenders encounter for agricultural loans. In particular, recent expansion of the lending authority of the Farm Credit System to include agribusiness loans may affect the competitive position of commercial banks.²¹ Furthermore, banks have consistently argued that the differential tax treatment allowed Farm Credit System agencies under the tax laws that apply to cooperatives enables them to obtain a competitive advantage. If savings and loan associations implement lending programs related to agriculture and expand their deposit base, an additional competitive pressure will face many commercial banks in rural areas. And credit unions already are providing increased competition for the banking sector regarding consumer loans.

A key issue that merits research in this area is the relative importance of legislation and policy decisions compared with management policy in maintaining market position. In some regions of the United States, commercial banks and other lenders have had a virtual monopoly (or certainly an oligopolistic position) in the financial market due to regulations concerning de novo entry or entry through branching. Some lenders may have become lethargic in servicing

the financial needs of the community, and increased competition may be justified to provide additional services.

Banking structure: The issue of bank structure (branch banking, holding companies, and the like) has been pushed aside in many states as banks have focused on usury legislation and nonbank competition. However, the implications of bank structure and changes in that structure for the flow of funds and the resulting costs and level of financial services provided to various sectors of the economy merit further investigation.

The determinants of and factors influencing funds flows within and between local markets are not well understood. However, numerous studies have been completed on the implications for competition and funds flows of changes in bank structure regulations.²² Most of these studies have been descriptive, with limited recognition of either the supply of and demand for funds in various markets or the transaction costs and management constraints that would impede or encourage funds flows between markets and regions. In addition, one of the striking characteristics of these studies is the inconsistency of their results. For example, some analysts indicate that changes in branch banking or holding company regulations result in a decline in lending activity for farmers, and thus a flow of funds from rural to urban areas.²³ Others indicate that changes in bank structure result in increased lending activity with local borrowers, including farmers.²⁴

As noted elsewhere, a spatial allocation approach to structure and flow of funds analysis possesses a number of desirable attributes.²⁵ First, the method explicitly recognizes the structural form of financial markets and specifically includes variables that are important in describing that structure. The approach allows the analyst not only to describe funds flows on an after-

the-fact basis, but also to evaluate the causes or determinants of funds flows and to prescribe future flows of funds that are optimal with respect to the specified objective functions. Consequently, information from such a methodology includes both the optimal pattern of funds flows between markets and the equilibrium prices for sources and uses of funds in various geographic regions. Additionally, the implicit cost of internal management constraints and external regulatory and policy constraints that influence flows of funds can be evaluated explicitly. For example, the costs of particular risk preference behavior of bank management could be examined. Or, the impact on flows of funds of legislative mandates, such as usury ceilings, could be determined.

The methodology contains sufficient flexibility to accommodate wide variations in market delineation, institutional alternatives (banks, savings and loans, and credit unions), savings and investment instruments (deposits and loans and investments with various risk, maturity, and return characteristics), and management and regulatory constraints. It also allows an analysis of proposed changes in the financial environment preceding the implementation of those changes. For example, the implications for funds flows and equilibrium prices of a proposed holding company acquisition, changes in branching regulations, improvements in the secondary markets for insured or guaranteed loans, or introduction of electronic funds transfer could be evaluated. Such proposals could be examined through changes in the transaction costs of moving funds from one market to another or through changing the competition parameters in the objective function and pricing constraints.

Also, policy proposals that would directly affect credit allocation to certain sectors of the economy could be included in the constraint or activity set of the model. Anti-redlining proposals that mandate credit allocation to

areas that are supposedly inadequately serviced and policy options that would subsidize lending activity to a particular industry, such as agriculture or small businesses in rural communities, could be analyzed. The addition of temporal dimensions to the model to reflect seasonality in demand and supply for funds could assist in assessing funds flows between markets experiencing short-term surpluses and deficits. A spatial allocation methodology may be an excellent vehicle to conceptualize and empirically evaluate numerous funds flow issues.

CONCLUSIONS

The research opportunities and needs in the area of agricultural finance are numerous, and we have only identified some of them here. The issues range from the theoretical to the applied, from the micro to the aggregate, from the demand side of the capital market to the supply side. No longer is the field and focus of agricultural finance synonymous with that of agricultural credit and credit institutions. The work is analytical as well as descriptive. A key determinant of the progress of research in this area is not only the resource base, but also (particularly with respect to aggregate and policy issues) the availability of reliable data and the leadership of such organizations as the USDA, the Farm Credit Administration, the American Bankers Association and the Federal Reserve System.

FOOTNOTES

¹ Lee, Warren, Michael Boehlje, Aaron Nelson and William Murray, Agricultural Finance, 7th edition, Iowa State University Press, 1980, Chapter 1.

² Hoffman, George, "Farm Income Situation and Outlook", Outlook 81 - 1981 Agricultural Outlook Conference, November 19, 1980.

³ Lins, David, "The Financial Condition of U.S. Agriculture: Past, Present, Implications for the Future", ESCS Staff Report, National Economics Division, ESCS, USDA, June 1979.

⁴ Lee, et al., op. cit., Chapter 1.

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⁶ Hughes, Dean, Stephen Gabriel, Ronald Meekhoff, Michael Boehlje, David Reinders, George Amols, "Financing the Farm Sector in the 1980's: Aggregate Needs and the Roles of Public and Private Institutions", National Agricultural Credit Study, Interim Report, 1980.

⁷ Hottel, J. Bruce and Robert D. Reinsel, "Returns to Equity Capital by Farm Type and Economic Class of Farm Based on 1970 Data," NTIS Access No. PB 281-597, National Technical Information Service, September 1977.

⁸ The economic sales class designations (Class IA, IB, II, etc.) refer to the current Census definitions. The projections assume that the sales class definitions (i.e., gross sales levels) remain constant in real dollars, not in nominal dollars.

⁹ Numbers presented in this paragraph are a weighted average of the percent changes in each class of farms, not the percent changes for the all class category.

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¹³ Ibid, p. 160.

¹⁴ Ibid, p. 164.

¹⁵ Young Farmer's Homestead Act of 1975, S2589, Congressional Record, Vol. 121, No. 159, 30 October 1975, 218929.

¹⁶ The Family Farm Security Act. Minnesota Statutes, Sec. 41-51-41.61L passed in 1977.

¹⁷ A corporation (Subchapter S or regularly taxed) capitalized with a combination of stock and debentures can simultaneously satisfy the goals of business continuity and estate and retirement planning. The interest payment on the debentures must be made, so the debenture holders (usually retiring parents) have a guaranteed income as long as they own the debentures. The interest payments are tax deductible to the corporation; but dividends, which may be an alternative source of retirement income, are not. Retirement-age farmers could receive income during retirement years in the form of a salary from the corporation or earnings in a sole proprietorship, but such salary or earnings are considered earned income under the Social Security rules and would probably result in payment of Social Security taxes and reduce the potential Social Security retirement benefits. However, interest paid on debentures is not earned income, so full Social Security benefits can be received.

Debentures can be particularly useful in estate planning when the family includes on-farm and off-farm heirs. The owners of the debentures have no management control because of the debt nature of debentures. Consequently, at the death of the parents, the on-farm heir can receive the stock and have controlling interest and management authority and responsibility for the corporation. The off-farm heirs can be given the debentures which have no management control but generate an annual return in the form of interest. Since the debentures have a specified maturity, the off-farm heirs cannot force the corporation and the on-farm heir to redeem them for cash until they mature. Thus, the on-farm heir obtains control of the corporation and need not pay out the off-farm heirs in cash immediately, but the off-farm heirs receive an annual return on their inherited capital.

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