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FINANCIAL STATUS OF U.S. AGRICULTURE AND IMPLICATIONS OF THE LONG RANGE CROP OUTLOOK TO FARM EARNINGS AND LAND PRICES

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For a perspective on trends and the recent financial status of U.S. agriculture, I'm indebted to Emanual Melichar, Senior Economist for the Federal Reserve System.[1] As can be seen in Figure 1, real earnings on farm capital (before interest payments) and the real value of farm assets in the U.S. have maintained a consistent relationship over the past 70 years. Major departures can be observed in wartime, during the Great Depression, and with the shock in the early 1970's from the unexpected world grain shortage. Real asset values did decline during the 1920s and 1930s before a long term upward trend that ended in the early 1980s. The widely expected collapse in land prices following World War II was buffered by a succession of government farm programs to maintain incomes.

The rate of return to total capital, as shown in the bottom section of Figure 1, has averaged close to 4 percent. In periods when interest rates farmers pay for borrowed capital is near returns on total capital, the rate of return to equity capital is about the same as on the total. Because of rising interest rates in recent years, farmers are paying considerably higher interest rates on outstanding debts than the capital is earning in agriculture. Consequently, returns to equity capital has declined to the lowest point since the Great Depression.

Such a low rate of return on equity capital could be endured if land prices were rising. Indeed, over the past 25 years, owners of farm assets realized another 4 percent real return per year from capital gains. This added up to a total return of 8 percent over and above consumer price inflation. Ownership of farm assets has been a good investment. This

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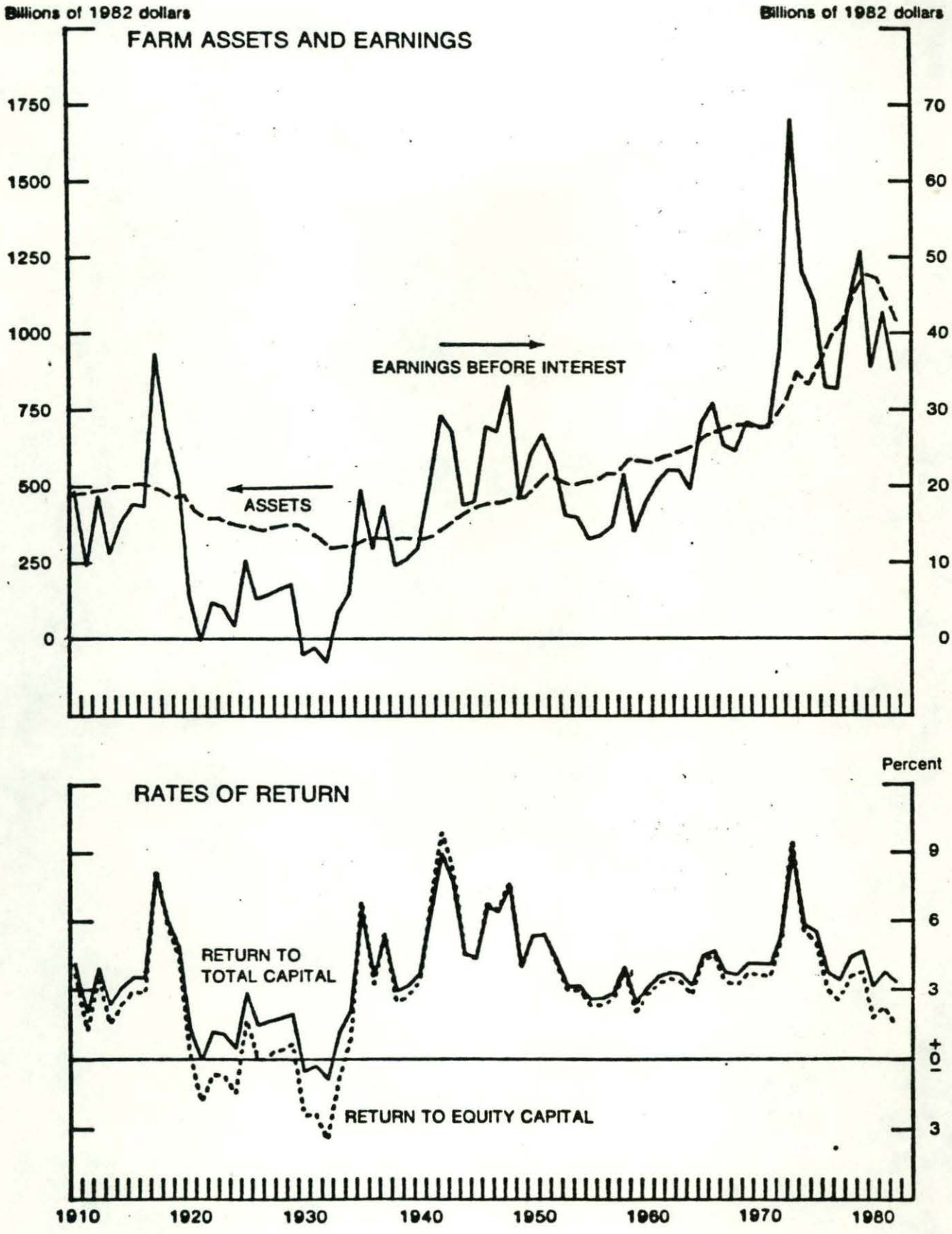
[1] Emanual Melichar, "Trends Affecting and Exhibited by Commercial Banks in Agricultural Areas," paper presented at a symposium on "Agricultural Communities: The Interrelationship of Agriculture, Business, Industry and Government in the Rural Economy," Congressional Research Service, The Library of Congress, Washington, D.C., May 19, 1983.

Figure 1


Billions of 1982 dollars
Billions of 1982 dollars
FARM ASSETS AND EARNINGS
1750
1500
1250
1000
750
500
250
0
70
60
50
40
30
20
10
0
EARNINGS BEFORE INTEREST
ASSETS
Percent
RATES OF RETURN
9
6
3
+0-
3
RETURN TO
TOTAL CAPITAL
RETURN TO EQUITY CAPITAL
1910
1920
1930
1940
1950
1960
1970
1980

fact contributed to the rise in farm land values in the late 1970s when farm incomes were declining. There was the expectation that land prices would continue to increase and this optimism was bid into the land market.

The question is, "Will there be a snowballing effect as farmers tone down their expectations about land prices?" Even if real land prices held constant, returns to equity capital would be quite low relative to the risks involved. A continued decline in real land prices would have a devastating effect on a large number of farmers.

Consider the rate of return to capital in agriculture in 1982, 3.3 percent on total capital and 1.4 percent on equity capital. Table 1 illustrates the effect of leverage and interest rates on returns to equity capital for an average farm. With a debt/asset ratio of 20 percent and paying 11 percent on outstanding debt, this farmer would realize 1.4 percent return on equity capital--the national average situation. Note that the farms that are particularly vulnerable to adversity are those with debt/asset ratios above 40 percent.

Table 2 provides additional information about which farms would be in greatest difficulty with declining farm incomes and land values. The salient points are as follows:

1. Nearly 60 percent of all farmers have little or no debt.
2. About 18 percent of all farmers have debt/asset ratios above 40 percent.
3. Nearly half of the large farms ($200,000 of annual sales and over) and nearly a third of the medium sized farms (annual sales of $40,000-$199,000) have debt/asset ratios over 40 percent.

Table 1

Effect of alternative debt leverage and cost on profitability of a farm in 1982

Debt/asset ratio (percent)	Interest rate on outstanding debt (percent)		
	7	11	17
	Return to equity capital in 1982 (percent)		
0.....	3.3	3.3	3.3
10.....	2.9	2.4	1.8
20.....	2.4	1.4	.0
30.....	1.7	.0	-2.6
40.....	.8	-1.8	-5.8
50.....	-.4	-4.4	-10.4
60.....	-2.2	-8.2	-17.2
70.....	-5.3	-14.7	-28.7
80.....	-11.5	-27.5	-51.5
90.....	-30.0	-66.0	-120.0

This farm had the farm sector average rate of return to total capital (before interest payments on any borrowed capital), 3.3 percent.

If it also had the farm sector average debt/asset ratio of 20 percent and the average interest rate of 11 percent on that debt, its return to equity capital was 1.4 percent (row 3, column 2).

Table 2

Estimated distribution of farms by relative debt level within farm-size groups, January 1, 1983

Size of farm (annual sales, $000)	Relative debt level of farm operator (debt/asset ratio, percent)					Percentage distribution in classes with debt/asset ratio over 40 percent, by farm-size groups
	Total	0-10	11-40	41-70	71 and over	
	Percentage distribution of operators					Operators
All farm operators.....	100	58	24	11	7	100
Large farms (200 and over)....	100	20	36	25	19	10
Medium farms (40 to 199).....	100	34	35	18	13	39
Small farms (10 to 39).....	100	55	26	11	8	23
Very small farms (under 10)...	100	73	16	7	4	29
	Percentage distribution of debt					Debt
All farm operators.....	100	5	32	32	31	100
Large farms (200 and over)....	100	3	26	33	38	40
Medium farms (40 to 199).....	100	5	34	33	29	42
Small farms (10 to 39).....	100	7	37	29	26	10
Very small farms (under 10)...	100	8	37	32	23	8
	Percentage distribution of assets					Assets
All farm operators.....	100	47	31	14	8	100
Large farms (200 and over)....	100	26	38	22	14	38
Medium farms (40 to 199).....	100	38	37	16	8	43
Small farms (10 to 39).....	100	61	26	8	4	10
Very small farms (under 10)...	100	73	18	6	3	9

Data from the 1979 Farm Finance Survey, Bureau of the Census, as tabulated by ERS, USDA, and (a) adjusted for probable underreporting on the survey date and (b) updated to reflect changes during 1980-82, including increases in total debt and assets, an increase in the number of indebted operators, and liquidation by some operators with high debt/asset ratios. A description of the adjustment and updating will be available from the author.

4. Nearly two thirds of the agricultural debt is on farms with debt/asset ratios above 40 percent. Banks and other creditors have a major stake in near term developments in farm incomes and land prices.

If the price projections on major crops from the MSU Agriculture Model turn out to be in the ballpark, highly leveraged crop producers will face severe economic difficulties over the next 5 years under relatively free market conditions. Table 3 presents trends in gross revenue and total costs per acre in producing corn, soybeans, and hard red winter wheat since 1970. These costs were based on USDA estimates of national averages. Cash rent was used as a measure of land costs. These figures do not include the benefits from participating in the government programs.

The declining ratio between gross returns and costs in the early 1980s to levels well under "one" was accompanied by falling land prices. If land prices remain relatively stable, which implies a real decline, and the cost of land is calculated at 4.3 percent of its value (in line with long term returns to farm capital), the ratios of gross revenue to total costs would follow a pattern as indicated in Table 3. The ratios remain relatively low and below "one" for at least the next 4 or 5 years with wheat being particularly suppressed. A recovery is projected into the late 1980s or early 1990s.

The implication of these projections for farm policy is that pressures will continue in the near future for price and income support programs. This, of course, assumes normal weather patterns and no major international conflict. But even if the Agriculture Act of 1985 provides support at levels near those for 1984, crop producers' incomes will be held back and this will place downward pressures on land prices in the next few years.

Table 3 . Estimates and Projections of Gross Income and Total Costs Per Acre for Producing Corn, Soybeans and Hard Red Winter Wheat in the U.S., 1970-83 and Projected to 1992[1/]

Year	Corn			Soybeans			Hard Red Winter Wheat		
	Gross Revenue	Total Cost	Ratio	Revenue	Total Cost	Ratio	Gross Revenue	Total Cost	Ratio
	$/acre			$/acre			$/acre		
1970	96	100	.96	76	76	1.01	38	43	.89
1971	95	103	.92	83	79	1.06	42	44	.95
1972	152	110	1.38	121	83	1.46	53	47	1.13
1973	233	117	1.99	158	92	1.71	115	53	2.18
1974	217	155	1.40	157	115	1.37	103	67	1.53
1975	219	182	1.20	142	129	1.11	106	80	1.25
1976	189	202	.94	178	147	1.21	76	88	.86
1977	183	218	.84	180	162	1.11	66	88	.75
1978	227	224	1.01	196	173	1.13	86	95	.90
1979	276	259	1.07	202	195	1.03	119	114	1.04
1980	283	300	.94	200	216	.93	120	137	.88
1981	274	339	.81	182	241	.75	116	150	.77
1982	304	350	.87	182	242	.75	116	149	.77
1983	282	351	.80	218	247	.88	127	154	.82
1984	314	348	.90	221	244	.91	107	160	.67
1985	288	358	.80	223	247	.90	105	165	.64
1986	307	370	.83	236	258	.91	122	178	.69
1987	349	386	.90	255	266	.96	140	180	.78
1988	374	406	.92	280	278	1.01	153	190	.81
1989	403	427	.94	309	292	1.06	168	201	.84
1990	429	451	.95	340	305	1.11	183	213	.86
1991	455	476	.96	350	320	1.09	200	246	.81
1992	486	503	.97	379	336	1.13	216	240	.90

[1/] Total costs represent non-land costs plus cash rent in 1982 and 1983. In 1984 to 1992, the land component is calculated as the price of land in 1983 times the long-term average return to capital of 4.3%.

Most U.S. farmers have considerable resiliancy in face of such pressures but those that are highly leveraged will be put to a very severe test.