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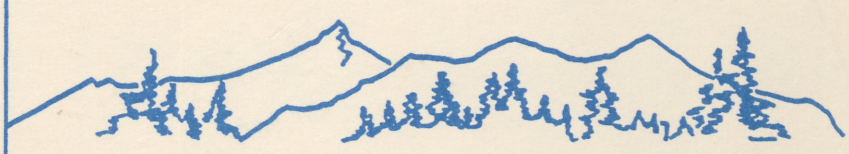

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RATES OF RETURN IN THE FARM AND NON-FARM SECTORS: HOW DO THEY COMPARE?

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This study uses newly-released data to estimate and compare rates of return in the farm and non-financial corporate sectors, 1970-87. Relative profitability depends upon numerous factors, including estimation methods, which "farms" are considered, whether returns from capital gains are included, and the time period chosen.

Agricultural economists and policy makers debate whether U.S. farmers are at a continuous economic disadvantage relative to the non-farm sector. Since both income and wealth affect well-being, analysts compare rates of return on investments -- aggregate returns and capital gains per dollar of assets (equity).

Rates of return on farm assets from current income are frequently much lower than interest rates on financial assets and returns on other non-financial assets, making farm investments appear less profitable. However, agricultural economists typically include ex ante real capital gains/losses in rates of return comparisons since economic well-being is affected not only by the current level of income, but also by changes in wealth resulting from capital gains and losses on assets. Barry and others have examined the risk-rate of return performance of agriculture relative to other assets measured at current cost. Barry concluded that risk-adjusted returns in agriculture may have been high relative to their risk, whereas others using post-1980 data reported different results (Barry).

Economic Research Service (ERS) rates of return estimates vary greatly depending on which "farms" are considered, how assets are valued, and how returns are estimated. The large number of farms with sales under $40,000 per year (nearly 75% of all farms) distorts the rates of return comparisons. If only farms with sales of $40,000 per year or more were included, the U.S. farm sector's rate of return would be over 60 percent higher (Ryan, 1989-90). Also, if farm assets were valued at original cost, rates of return from current income would be substantially higher and from real capital gains considerably lower (Ryan, 1987). Furthermore, returns estimates vary greatly depending upon whether farm assets, or operators' labor and management, are considered the residual claimant to income (Hottel and Gardner).

To compare rates of return, both the numerators (income after taxes, plus capital gains) and the denominators (dollar value of assets or equity) of the rates of return ratios must be comparable. The purpose of this study is to develop consistent data series to compare the rates of return from current income and the total economic rates of return, including real capital gains, in the farm and non-financial corporate sectors.

Conceptual Problems and Measurement Concerns

ERS estimates both the rates of return from current income and the total economic rate of return, including real capital gains. The rate of return on assets (ROA) from current income is the ratio of residual income to farm assets to the average value of the beginning and end of year's farm assets. The rate of return on farm equity (ROE) is the ratio of residual income to farm assets, excluding interest paid, to the average value of the beginning and end of year's farm equity. The total real economic (ex ante, expected) rate of return is divided into two components: current income as a percentage of assets (equity) and unrealized real capital gains as a percentage of assets (equity).

Some have noted the difficulty in determining the capital gains contribution to total returns, and questioned the practice of including returns from real capital gains in total returns. One problem with simply adding returns from real capital gains to returns from current income is that each year's capital gains are not necessarily realized. Therefore, the absolute value of real capital gains is overstated, since ERS procedures consider neither the additional contingent liabilities nor the discounted present value of the capital gains (Ryan, 1987). Dunford has offered a counter argument. Although anticipated capital gains are not fully realized until the property is sold, equity increases due to land appreciation can be used to finance other investments -- increasing the present value of anticipated (unrealized) capital gains (Dunford).

Adding the rate of return from ex ante (economic) real capital gains to the ex post (accounting) rate of return from current income does not represent "double-counting" farm sector returns. Melichar argues that since the price of farm assets reflects real capital gains due to expected future income growth, those gains should be included in computing the total returns to farm assets (Melichar, 1989). Equity increases due to land appreciation can either be sold or used to finance other investments.

There are two reasons why accounting and total economic rates of return in the farm and non-farm sectors have not been comparable. First, farm sector asset and equity values are measured at current market value, whereas non-farm sector assets and equity are typically valued at original cost. Second, estimates of after-tax returns are not comparable. The Economic Research Service of the U.S. Department of Agriculture (USDA) and the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce use different methods to estimate depreciation expenses. Also, BEA's after-tax returns in the non-farm sectors are net of corporate income taxes paid, whereas USDA's after-tax returns in the farm sector are not. However, data now exist to allow meaningful comparison and evaluation. The non-financial

corporate sector was chosen for comparison since it is the largest non-farm sector in the BEA data series.

Comparison of Accounting Rates of Return

The first step is to use the Federal Reserve System's (FED) newly published estimates of non-farm sector asset values at current cost. Land holdings are stated at current market values, while reproducible assets are valued at current cost net of straight-line depreciation.

Next, the USDA's after-tax returns estimates were adjusted to conform to BEA's method of estimating after-tax returns in the farm and non-farm sectors. First, USDA's net farm income estimates were reconciled to BEA's net farm income definition. Second, farm sector returns were adjusted to include business taxes (property and corporate income taxes) but exclude non-business taxes such as taxes paid by sole proprietorships, and personal income taxes.

Corporate income taxes paid by the farm sector were obtained from BEA and Internal Revenue Service (IRS) estimates. Although the IRS/BEA data on corporate income taxes paid by farm producers likely understate the corporate income taxes paid by USDA's "farm sector", they serve as a workable approximation.

From 1971 through 1975, rates of return from current income in farming were more than double those in the non-financial corporate sector. From 1976 through 1979, they were nearly equal. The years 1980 through 1985 gave mixed results. Farm sector rates of return on assets were generally higher (1.0 to 3.2 percent), except for 1980 when the non-financial corporate sector's estimated rate of return from current income jumped to nearly 6 percent. However, rates of return on equity were lower from 1980 through 1984, as residual income to farm equity was low (even negative) during this period (Figures 1 and 2).

Comparison of Total Economic Rates of Return

The total economic rates of return on farm assets and equity include the real capital gains component (unrealized) of total returns. In periods of rapidly changing or increasing farm income and land values, such as the 1970's, measures which include capital gains yield better estimates of profitability than those that do not.

Including capital gains/losses dramatically affects the comparison (Figures 3 and 4). For example, from 1970 through 1980, rates of return on assets from real capital gains in the non-financial corporate sector ranged from 6.1 to 14.2 percent. This pushed total real returns to 8.4 to 16.1 percent over that period. In the farm sector, rates of return from real capital

Figure 1. Rates of return on assets from current income, 1970-87

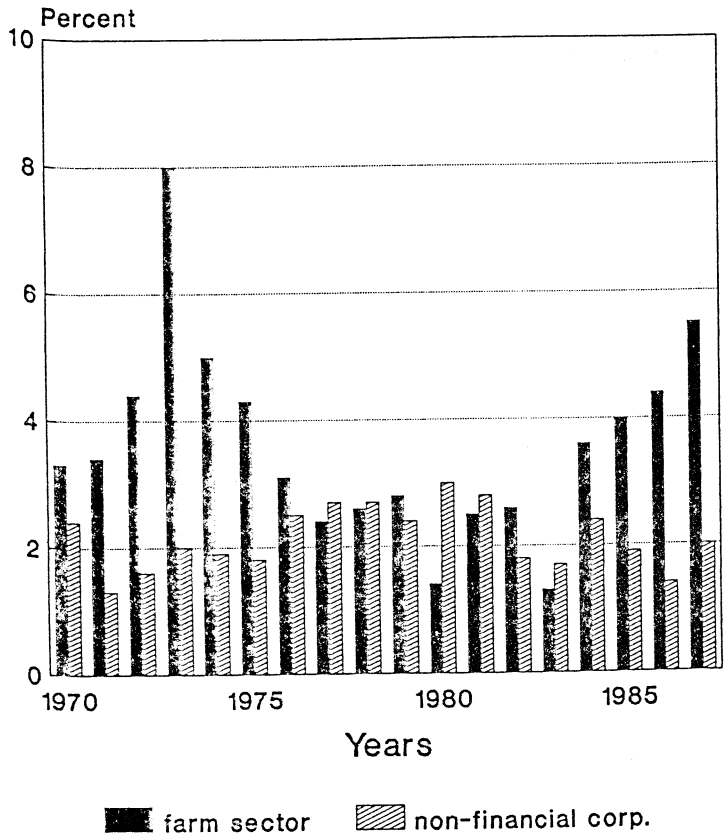


Figure 2. Rates of return on equity from current income, 1970-87

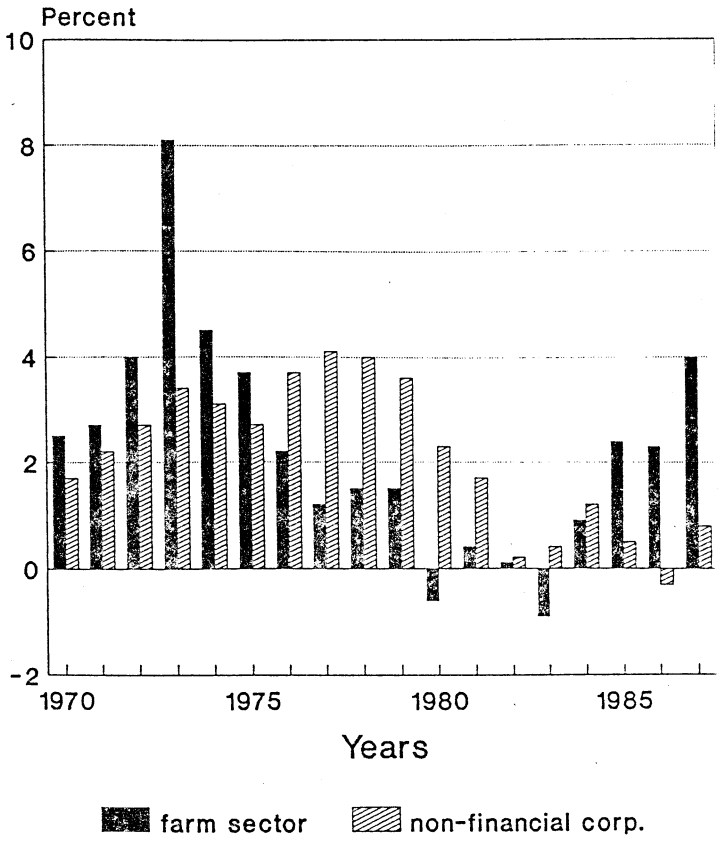


Figure 3. Real rate of return on assets, including capital gains, 1970-87

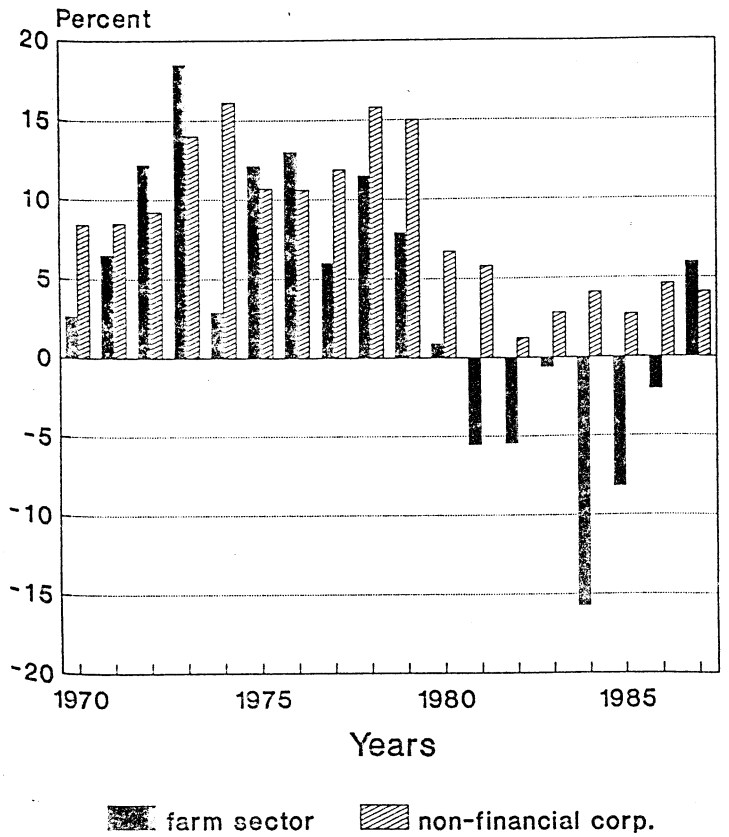
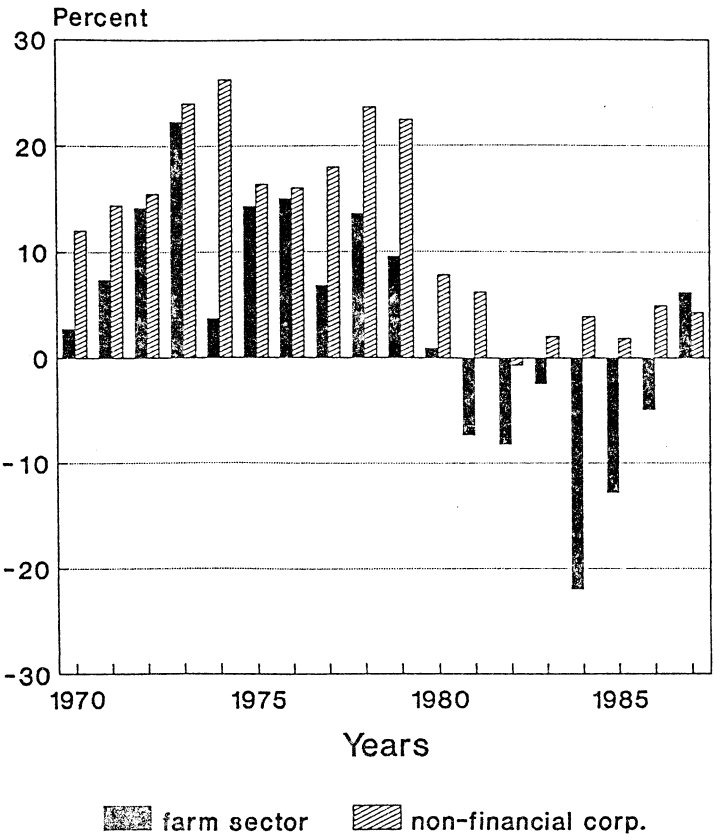


Figure 4. Real rate of return on equity, including capital gains, 1970-87



gains ranged from -0.6 to 10.5 percent, and total real returns from 2.6 to 18.5 percent. Likewise, including capital gains/losses on equity also greatly affected the farm versus non-financial corporate sector comparison. Total real returns in the farm sector were generally lower than those in the non-financial corporate sector, and showed considerably more variation.

From 1981 through 1986, including capital losses in farm sector rates of return on assets drove total real returns negative -- from 1.1 in 1980 to a minimum of -15.6 percent in 1984 (Figure 3). Including the modest capital gains in non-financial corporate sector rates of return kept total real returns positive.

The rate of return on equity can be expressed as a weighted average of the rate of return on assets (ROA) and the cost of debt (COD) where the weights are the proportional claims of assets (A) and debt (D) on total equity (E):

(1) $$ROE = ROA \times A/E - COD \times D/E.$$

Differences in rates of return between farm and non-farm investments are related to leverage decisions in the sectors. Table 1 shows how the farm sector's higher cost of debt (COD) and relatively smaller use of debt capital (D/E) affect relative rates of return in the farm and non-financial corporate sectors, and the significance of the capital gains component of returns.

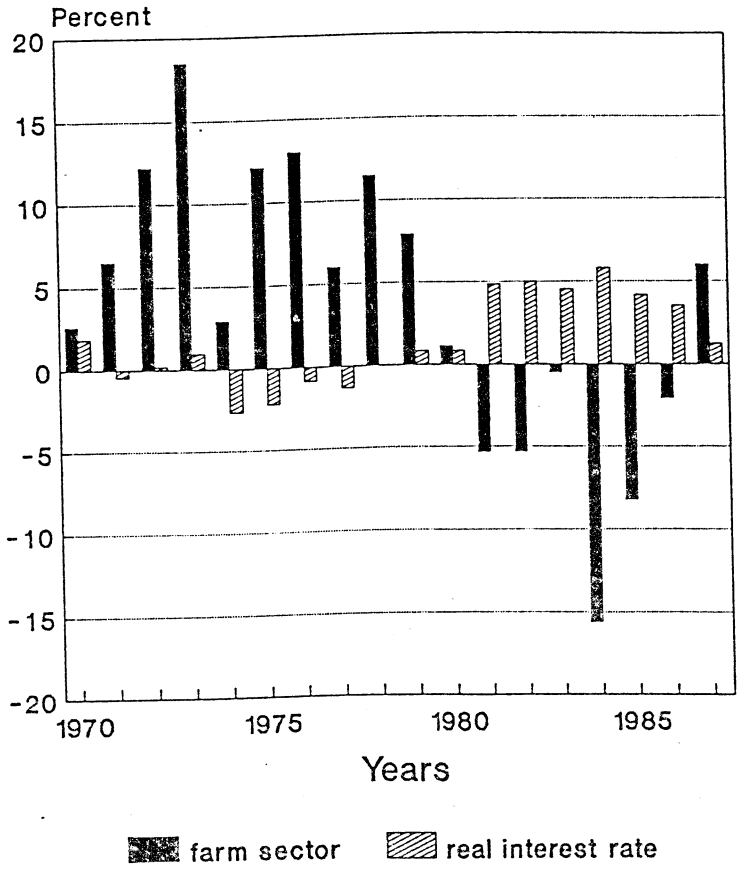
The comparison of the total real economic rate of return on farm assets with the total real rate of return on U.S. Treasury bills is also noteworthy (Figure 5). From 1970 through 1979, total real rates of return in the farm sector were generally strongly positive, while real interest rates were low or negative. Consequently, these low or negative real interest rates provided investors an economic incentive to buy assets which inflated in value -- like farmland. However, this situation abruptly changed from 1980 through 1986. Total real rates of return in the farm sector were negative due to large capital losses, while real interest rates averaged 4.1 percent. This is significantly higher than the historical average of less than 2 percent. Lins noted that if real interest rates remained high, one would expect a continued softness of demand for assets like farmland, where a significant part of the total return is from capital gains. Investors could beat the overall rate of inflation by 4 to 6 percent while taking on very little risk (Lins, 1989, p. 35). In fact, real interest rates have fallen, ranging from 1.2 to 3.6 percent from 1987-89, while total real rates of return in the farm sector have risen, ranging from 5 to 8 percent over the same period. 1/ Farmland investments have become somewhat more attractive.

1/ Corresponding data are not available for the non-financial corporate sector for 1988 and 1989.

Table 1. Farm sector vs. non-financial corporate sector: rates of return, cost of debt and debt/equity ratios

Item	Rate of return on assets	Rate of return on equity	Cost of debt	Debt/equity ratio
		Percent		
Excluding capital gains				
1970-79:				
Farm	3.5	2.7	7.5	20
Non-financial corporate	2.1	3.1	3.6	60
1980-87:				
Farm	3.3	1.5	10.4	26
Non-financial corporate	2.1	0.9	4.4	59
Including capital gains				
1970-79:				
Farm	8.9	10.4	1.4	20
Non-financial corporate	12.0	18.9	-2.7	60
1980-87:				
Farm	-3.7	-6.1	5.3	26
Non-financial corporate	4.1	3.9	-0.3	59

Figure 5. Total real rate of return on farm assets vs. real interest rate 1/



1/ Inflation-adjusted U.S. T-bill rate.

Concluding Comments

This study has used newly published income and balance sheet data to estimate rates of return experienced by those who have invested in agricultural and non-financial corporate sector assets. How do rates of return compare? The answer depends on (1) the time period chosen, (2) whether returns from capital gains are included, (3) which "farms" are considered, (4) how assets are valued, (5) how returns to factors of production are estimated, (6) whether returns to assets or returns to equity are compared, and (7) whether the rates of return estimates are adjusted for differences in risk characteristics of the sectors.

References

Barry, Peter J., "Capital Asset Pricing and Farm Real Estate," American Journal of Agricultural Economics, 62(1980): 549-53.

Dunford, Richard W., "The Value of Unrealized Farm Land Capital Gains: Comment," American Journal of Agricultural Economics, 62(1980):260-62.

Hottel, Bruce J., and Gardner, Bruce L., "The Rate of Return to Investment in Agriculture and Measuring Net Farm Income," American Journal of Agricultural Economics, 65(1983): 553-57.

Lins, David A., "Does Investing in Farmland Pay?", Top Producer, August 1988, p. 22.

Melichar, Emanuel, "Capital Gains versus Current Income in the Farming Sector," American Journal of Agricultural Economics, 61(1979): 1085.

Melichar, Emanuel, conversation with Kenneth Erickson, 1989.

Ryan, James T., "Alternative Asset Valuation Methods and the Rate of Return to Equity in Agriculture," USDA-ERS, selected paper, American Agricultural Economics Association meetings, August 2-5, 1987, p. 3.

Ryan, James T., unpublished manuscript, USDA-ERS-ARED, 1989-90.

U.S. Department of Commerce, Bureau of Economic Analysis, Survey of Current Business, July issues; U.S. Department of the Treasury, Statistics of Income, Corporate Income Tax Returns, selected years; Board of Governors of the Federal Reserve System, Balance Sheets for the U.S. Economy, 1949-88.