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Alternative Indicators of Farm Operators' Earnings

By Roger P. Strickland*

Abstract

Official U S Department of Agriculture (USDA) estimates of net farm income, measured in nominal dollars, have fluctuated widely over the past few years. When measured in real dollars, net farm income has trended downward, in the aggregate, it approaches the levels of the thirties. Far fewer farm operators share in the aggregate, resource efficiency is far greater now than in the thirties, and agriculture's financial management has become increasingly complex and sophisticated. Therefore, USDA measures of net farm income may not be reliable indicators of farm earnings. This article analyzes several alternative indicators of operator earnings.

Keywords

Net farm income, farmland appreciation, agricultural tax preferences

The statistic most widely used as an indicator of the earnings of U S farm operators is the U S Department of Agriculture's (USDA's) estimate of net farm income. Some limitations of this statistical aggregation across a wide range of farm types, farm sizes, and commodities are generally acknowledged. Other deficiencies may not be so apparent.

Chronic inflation in the U S economy has affected relative prices and has altered the priorities of farm operators. To operators, the value of the production of agricultural commodities has decreased relative to other economic activities that are peripheral to production.

One such activity is investment in farmland. In less inflationary times, decisions regarding the purchase of farmland were probably based principally on its value in production and on reducing uncertainty. Chronic inflation, in combination with substantial liberalization of the terms under which land purchases could be financed, have changed the profitability and relative importance, to farm operators, of investing in farmland (table 1). Prospective earnings from highly leveraged purchases of appreciating land were sufficiently attractive to warrant diversion of a farm operator's attention away from commodity production.

Tax planning is a second economic activity peripheral to commodity production, its effects on the operator's finances have increased under inflation. The progressive nature of the income tax is a major reason for this relationship. A contributing factor is the tendency for the Congress to reduce the

average rate of taxation by legislating various means of sheltering income through deductions and exclusions. Whereas lowering of marginal rates of taxation would automatically reduce taxes, increased sheltering of income puts the burden of implementation on the farm operator.

Table 1—Operators' net farm income, nominal and real, 1930-81

Year	GNP implicit price deflator ¹	Operators' net farm income	
		Nominal ²	Deflated ³ dollars
	1972=100	— Million dollars —	
1930-34 average	27.7	3,023	10,898
1970	91.5	14,151	15,474
1971	96.0	14,633	15,241
1972	100.0	18,665	18,665
1973	105.7	33,349	31,551
1974	114.9	26,130	22,738
1975	125.6	24,475	19,493
1976	132.1	18,682	14,141
1977 ⁴	139.8	18,391	13,152
1978	150.1	26,458	17,633
1979	162.8	32,697	20,088
1980	177.4	19,860	11,195
1981	193.6	23,000	11,880

¹ *Economic Report of the President Transmitted to the Congress*, Feb. 1982, table B-3.

² Data through 1980 are from (15, tables 80-82). The 1981 estimate is from (14, p. 9).

³ Computed by dividing the first column by 100 to convert to a simple ratio and by dividing the results into the second column.

⁴ Based on the 1974 Census of Agriculture definition of a farm, which is sales of \$1,000 or more; this definition applies to 1977 and all subsequent years.

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An operator who gives no thought to income taxes except for completing the tax forms typically pays more taxes than one who allocates time to tax planning. Therefore, as with investing in farmland, tax planning is an economic activity separate and distinct from commodity production.

A farm operator is a producer of agricultural commodities, a land investor, and a tax planner. Many decisions represent compromises to achieve a balance among two or more objectives—for example, purchasing land rather than renting, timing of purchases and sales, and formulating strategies for replacing equipment.

To get an indication of the level and changes in an operator's financial status, one can measure the costs and returns to each activity separately and then aggregate the net benefits or earnings across activities, or one can measure the aggregate costs and the aggregate benefits and then take the difference. This procedure is not an academic exercise because consistent determination of appropriate costs and benefits cannot be made prior to a decision regarding the economic activities that those results are to measure.

Net Farm Income

The USDA net farm income statistic is correlated to, but not entirely comparable to, what an operator reports to the Internal Revenue Service (IRS). The principal difference is in the treatment of depreciation. The IRS uses a cost basis and permits rapid depreciation unrelated to an asset's useful life. USDA uses replacement value as the basis for depreciation, which yields a higher annual depreciation than the cost basis, and USDA relates that depreciation to the asset's useful life, which yields a lower annual depreciation.

USDA's net farm income series deducts production expenses from gross farm income. Gross farm income is composed of the following: (1) receipts from sale of farm commodities, (2) value of inventory change, (3) direct Government payments, (4) other farm income (custom work, recreational income, and so forth), and (5) value of home consumption.

Total production expenses are composed of the following: (1) fertilizer, chemicals, and seeds, (2) fuel, repair, and operations of machinery and equipment, (3) hired labor, (4) machine hire, (5) depreciation, (6) interest, including real estate, (7) property taxes, (8) net rent to nonoperator landlords, and (9) purchase of farm commodities, such as feed and seed.

Two possible reactions by agricultural producers to high marginal tax rates are to illegally conceal income or to legally shelter income from the IRS. Assuming the latter strategy, the potential impact on USDA's net farm income estimates that result from tax planning should be evaluated; consideration should then be given to possible changes in the components in net farm income. Perhaps a farm income series after taxes should also be investigated.

Agriculture's Tax Preference

Two readily available methods of effectively sheltering income are tax deductions for interest and depreciation. Farm real estate interest and taxes are particularly attractive as income tax shelters. In situations where a farmer has been able to finance a purchase with a long-term mortgage requiring only a small downpayment, most of the costs associated with landownership for the first 10 years are interest and taxes. The Government would contribute a share of the cost.

Davenport, Boehlje, and Martin have analyzed some of the pressures placed on the structure of American agriculture by the effects of tax policies and note that in a tax-favored industry, such as agriculture with its use of cash accounting, the annual returns on investment consist of the commercial returns from the sales of commodities produced and the return from the management of tax assets and liabilities (1).¹

The authors conclude that tax policy has exerted upward pressure on the price of farmland and that this fosters a substitution of capital for labor and causes farm operators to alter management practices in order to take advantage of tax preferences. They also contend that the tax system not only enhances the earnings of farm investors and operators, but that the benefits of the tax advantages are frequently more certain than the return from production. A greater degree of certainty, of course, translates directly into an enhanced value being placed on these benefits, relative to those having a higher degree of risk.

Investing in farmland and legally avoiding payment of taxes is smart financial management. The problem is that the gains from appreciation of the land and the taxes avoided are not reflected in USDA's net farm income estimates, but the cost of additional interest on the farm's real estate mortgage and additional property taxes are included. Hence, USDA's estimates are biased toward a lower income than that perceived by farmers.

The situation regarding the use of depreciation to reduce taxes is similar. By using additional first-year depreciation and accelerated depreciation procedures, farmers can write off a substantial portion of their purchases in the first year and most within the first 2 or 3 years. With the Government paying perhaps half the costs through deductions and credits, management of equipment purchases becomes as much an element of financial planning and cash flow strategy as it is an element of agricultural production.

The cost of trading up to larger equipment or to the newest technology or of buying ahead for expansion would show up in USDA's farm income accounting on the expense side as

¹ Italicized numbers in parentheses refer to items in the References at the end of this article.

increased depreciation, interest charges, and property taxes. But, the benefits accruing to the tax management activity would not be directly reflected, even though they might be partially and indirectly reflected in subsequent years through higher productivity, lower capital expenditures, and future earnings on current taxes not paid.

Tax management is a legitimate and profitable activity that generates definite financial gains from taxes not paid. Implementation generates additional income and expenses. USDA's net farm income series may include many of the additional expenses, but few of the benefits. The result is an underestimation of farm income.

USDA could improve accuracy by redefining farm income. One alternative is to correct the weaknesses and omissions of the current series which reflect three related activities—commodity production, real estate investing, and tax planning. Another alternative is to separate the income and expenses associated with two or more of the activities. The choice is a function not only of the types of information desired and the analysis to be performed but also of the costs of implementing each alternative, particularly the cost of obtaining data not currently available.

Farmland Appreciation

There are two alternatives for handling farm real estate. The ownership of real estate can be treated as an investment unrelated to production. Ownership is not a prerequisite for farming, nor is it a factor of production. Land is the factor of production, and the right to use it may be acquired by leasing.

Treating real estate as an investment is consistent with the way the Department of Commerce handles residential dwellings in its Personal Consumption Expenditures component of its Gross National Product accounts, where ownership of dwellings is treated as an investment and a rental charge is included as an expenditure (17). This approach is also consistent with the recently announced changes for housing costs in the Consumer Price Index.

A separation of the costs and returns attributable to real estate investment from USDA's current farm income series requires two changes in the current procedure. One is the addition of the two real estate ownership costs—interest and taxes—which are now deducted as production expenses. The second is to deduct, as a production expense, the opportunity cost of operator-owned real estate by use of an imputed rental value.

A second alternative for handling farm real estate is to leave in the expense items and include an estimate of the benefits, positive or negative, accruing from change in value of farm

real estate.² A major difficulty in implementing this alternative is allocating the change between operator and nonoperator landlords. USDA's income series measures the earnings of farm operators, therefore, only the appreciation in value of farmland owned by operator landlords could be included. This allocation is not made in USDA estimates of change in the value of farm real estate.

The tax-sheltering component of the benefits and costs related to depreciable equipment is less clear and even more difficult to isolate. It is not likely that farmers would purchase equipment simply because the Government would reimburse them for up to half the purchase price, but it would certainly increase the attractiveness of potential acquisitions.

The effects of making tax management a key objective of farm management would be (1) replacement of machinery sooner than operators would otherwise to gain reliability during critical operations, (2) an increase in mechanization, and (3) the purchase of excess capacity to allow for expansion. The tax-sheltering benefits could be viewed as a self-perpetuating source of funds for continuous expansion. With multiyear loans, the savings in the early years could exceed loan payments.

Estimates for 1975-80 show the empirical significance of the possible underestimation of net farm income due to tax management and appreciation. The actual underestimation depends on one's assumptions regarding what definitional changes should be made to the current farm income series. What follows is intended as illustrative, rather than as definitive. Table 2 contains data for adjusting the published series, and table 3 presents the adjustments.

Currently, USDA includes interest and taxes on farm real estate in farm production expenses. The aggregate value of all farm real estate for each of the 50 States and the United States as of February 1 is published annually. The February 1 to February 1 difference in real estate value can be used as a reasonable approximation of the change occurring during the calendar year.³

Making a reasonably accurate apportionment between operator and nonoperator landlords for the change in value of real estate is extremely important, given the large values involved relative to the size of the other factors. The ratio in table 2 used to make this allocation was taken from an extensive survey of U.S. landownership (6). Annual information on the occupation of recent land buyers agrees with this ratio (16, table 21).

² Melichar has explained why capital gains are necessarily a significant portion of the total return to farm real estate (2, 7, 8).

³ Alternative conceptual approaches for valuing unrealized farm land capital gains as income have been proposed (4, 5, 9, 10, 11), and the reader might want to consider them before using a simple difference in future analyses.

Table 2—Earnings and expense items included or excluded from farm income under alternative definitions

Year	Interest on real estate ¹	Taxes on real estate ²	Rent to operator owned real estate ³	Income equal to one-fourth of depreciation ⁴	Change in real estate value ⁵
<i>Billion dollars</i>					
1975	3.4	2.9	5.9	3.1	635.7
1976	3.9	3.1	5.4	3.4	44.1
1977	4.4	3.3	5.2	3.7	32.8
1978	5.1	3.0	6.3	4.2	56.4
1979	6.2	3.2	7.0	4.8	56.7
1980	7.3	3.5	7.5	5.3	40.7

¹ Interest on "real estate debt including operator dwellings" published in (15, table 61)

² Unpublished component of "business taxes" published in (15, table 2)

³ A net rent imputed to farm real estate owned by operators as follows

(a) Deduct net-rent-paid-to-operator-landlords from the expense item net-rent-paid-to-all-landlords to get net rent paid to nonoperator landlords (15, table 2)

(b) The ratio of percentage of operator-owned farmland (56.4) to percentage owned by nonoperator landlords (43.6) times the net rent to the latter group equals imputed rent to former group (15, table 1)

⁴ Twenty-five percent of the depreciation reported in (15, table 64)

⁵ Change in the total value of farm real estate (16, table 6) multiplied by the share of operator-owned farmland (56.4 percent) (6)

⁶ Real estate value reported on March 1 in 1975 and on February 1 for later years. The 1975 value was converted to a February 1 basis

Table 3—Operators' realized net farm income, real estate investment income, and tax savings from depreciation activity, 1975-80¹

Year	Published USDA estimate	Real estate as separate investment activity ²	
		Before adjustment for depreciation	After adjustment for depreciation
<i>Billion dollars</i>			
Current dollars			
1975	24 5	24 9	28 0
1976	18 6	20 2	23 6
1977	18 4	20 9	24 6
1978	26 5	28 3	32 5
1979	32 7	35 1	39 9
1980	19 9	23 2	28 5
Deflated dollars, 1972=100			
1975	19 5	19 8	22 3
1976	14 1	15 3	17 9
1977	13 2	15 0	17 6
1978	17 7	18 9	21 7
1979	20 1	21 6	24 5
1980	11 2	13 1	16 1

¹ Estimates in columns 2 and 3 computed from column 1 and data from table 2. I computed the deflated value by dividing the current dollar estimates by the price index from table 1

² Includes taxes and interest on real estate from production expenses and excludes rent to operator-owned real estate

Tax Benefits of Depreciation

To allocate depreciation expenses between tax planning and farm production, I considered 25 percent of the depreciation expense as income resulting from taxes avoided in response to tax shelter incentives. My rationale is as follows. Assume that equipment purchases permit a tax reduction of roughly half the purchase price. Large, commercial farmers purchase most of the equipment, particularly when measured in purchase value, and they concentrate their purchases in high income years. Assuming a marginal tax bracket of 50 percent, the combination of the depreciation and tax credits for purchases should permit farmers to avoid taxes equal to at least half their purchase price. For tax purposes, machinery and equipment are typically depreciated over a period that is no more than half, and often much less than half, their useful life. Accelerated depreciation procedures in combination with short writeoff periods allow savings to be concentrated in the first half of the truncated writeoff period. On the premise that the tax savings are, at a minimum, captured twice as fast as under a depreciation procedure approximating the actual rate of consumption, and assuming the 50-percent tax rate, then $0.5 \times 0.5 = 0.25$ is the portion of the depreciation charge considered as income accruing to these tax-avoidance activities.

Implications for Farm Income

The extent of underestimation (if any) of farm income resulting from a downward bias in the procedure due to the effects of chronic inflation and the structure of the income tax code is likely to increase as the trend in the tax policies on depreciation moves towards expensing or fully depreciating the asset in the year purchased. This trend will greatly increase the ability of operators to adjust in the short run and to smooth out the high-income years with large purchases of additional, depreciable equipment. As in the past decade, the full deductibility of interest and real estate taxes also allows farmers to flatten out the long-term rate of ascension in farm income. Whenever operators conclude that a sustainable increase in actual farm income has occurred, they can intensify their efforts to purchase land, bidding up the price of land and letting the Government make a significant portion of the payment through taxes foregone. At worst, farmers assume they will have to sell the land for a profit if their cash flow turns negative.

A high marginal tax rate makes the purchase of additional land very attractive and likely accounts for much of the seemingly unrelenting pressure for farmland purchases as an investment. The progressive tax structure is regressive in its assistance to land purchasers. In the early years after purchase, when payments are almost all interest and taxes, the farmer in the 50-percent marginal tax bracket gets half the payment back, but the farmer in the 20-percent marginal tax bracket gets back only a fifth. A buyer with no taxable income gets no tax refund and, thus, no Government assistance.

The Congress does reduce the effective average or *de facto* marginal tax rates from time to time, but it does so indirectly by increasing deductions and credits to allow sheltering of reported income. The absolute level of the top marginal tax rate is highly symbolic and politically sensitive (that is, the rich should pay their share) and is thus difficult to lower. The U.S. tax code has become more complex and indirect, but USDA's definition of farm income has not changed accordingly.

The proposed adjustments to the current definition of operators' net farm income do significantly raise the estimates (table 3). Both sets of adjusted estimates reflect the exclusion of costs resulting from investment in farm real estate. A rental charge for operator-owned land is included as a cost of production.

Table 2 shows the change in real estate value. The appreciation in value of real estate is not totally unrealized earnings prior to being sold; the owner may benefit or lose monetarily from the change in value without selling. The equity can be realized through borrowing. The change in current market value affects the borrowing power of the owner. Unmortgaged equity may be treated as a form of savings for emergencies and retirement. There can be a direct tradeoff within an individual's portfolio between equity in real estate and other assets—for example, stocks, bonds, certificates of deposits, and cash. As the real estate changes in value, it may be offset by changes in other instruments in the portfolio. For example, after substantial appreciation in the value of real estate, other assets might be sold and future planned savings reduced or discontinued. Both actions, taken in response to increased real estate equity, provide additional money for consumption, savings, and investment that would not otherwise be available.⁴

Conversely, real estate is usually considered a balance sheet item, and the desire for accounting consistency could dictate separating the costs and benefits of real estate investment.

⁴ John Rutledge, president of Claremont Economic Institute, presents a lucid discussion of the concept of portfolio balance and the resulting strategies in time of high rates of inflation in (12).

from production income. There are two reasons for not doing so. One is a relative lack of confidence in the result because adequate data are not available. The other is that commodity production as an income-producing activity has diminished in importance relative to real estate investing to the point that for many landowning operators, it may not be worth the added expense of separating the earnings from the two financial activities.

One alternative for quantifying the current income effect is to make assumptions regarding the future sale date of the property, the applicable taxes, and the appropriate discount rate, and then to discount the after-tax change in value back to the current period. Another alternative is to attempt to derive the current income effect of the change in value as if realized through loans obtained by use of the change in value within the year as loan collateral.

This latter effect would certainly be much less than the change in value estimated in table 2 for several reasons. First, lenders will not make loans equal to 100 percent of the appraised value. Second, changes in appraised value tend to lag or be more conservative than changes in market value as appraisers await evidence that these changes are not temporary. Third, the interest and any other costs of the loan have to be deducted.

One can sense the importance of making adjustment for appreciation of real estate value by comparing the change in real estate value (table 2) with the reported USDA estimates of net farm income (table 3).

The benefits accruing from taxes avoided when operators avail themselves of depreciation and tax credit incentives are small relative to changes in real estate value, but these benefits are likely to be a substantial percentage of net income from production of agricultural commodities. All the associated costs—additional depreciation, taxes, and interest, professional tax consultations, and labor hired to allow operators to do tax planning—are already included in the current accounting for net farm income, but none of the benefits from taxes saved is included. It would be difficult to separate out the costs. Although allocation of benefits to that activity might be somewhat arbitrary, it deserves serious consideration.

Conclusion

The income tax codes have evolved over time by allowing the sheltering of income rather than by reducing the marginal tax rate. Appreciation in land values is highly correlated with the rate of inflation, and the value of earnings from appreciation is enhanced considerably relative to earnings from producing commodities because appreciation is taxed at the capital gains rate (13).

Thus, farming has become a highly integrated package of three activities (1) production of agricultural commodities, (2) tax planning, and (3) real estate investment. To adequately derive the revenues and expenses associated with each activity, one needs a detailed knowledge of the interrelationships to separate the farm establishments' expenses and revenues by the accruing activity. Sufficient data are probably not available to support either an empirical determination of the methodologies required for a separate series or an accurate estimate of the resulting income statistics. Commissioning a scholarly analysis of the methodologies and data requirements would require substantial additional resources, this is unlikely, given the current economic situation. Nonetheless, improved measures of the three activities combined are economically feasible.

Perhaps the more useful approach is to increase the use of alternative financial statistics which are either already available or which can be determined from available statistics. Having several indicators in addition to net farm income may permit a more effective analysis. At any given time, multiple indicators may provide additional information, confirm or disprove a specific issue, and suggest other hypotheses. Two such indicators would be cash flow and farm income after taxes.

Cash flow is important because it indicates the money a firm has available for paying expenses and debts and for making new investments. Cash flow includes depreciation allowances, thus, it reflects changes in the tax laws that allow the exclusion of income through depreciation.

An estimate of farm income after taxes would incorporate the costs and benefits of tax planning. An after-tax income series would, of course, show a different level of income than the current before-tax series, but more important, it would show a different year-to-year change and a different trend over the last decade. The difference in trend could well lead to different conclusions about changes in the financial condition of agricultural producers than would analyses based on current USDA series.

A separate estimate of the changes in value of farm real estate might be computed and combined with the other indicators. As both the question of the appropriateness of including the change in the value of farm real estate and the choice of methodology for valuing that change would likely be extremely controversial, users could exclude the estimate or add it to another indicator as they saw fit.

Doll and Widdows found that using the traditional valuation model, $V = R/d$, leads to the conclusion that funds invested in agriculture earn their opportunity cost only if real capital gains are added to annual asset earnings. They believe that this interpretation depends upon the acceptance of the equivalence of the real capital gains and the annual income flow (3).

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