USES AND MISUSES OF CASH FLOWS AND SOURCES AND USES OF FUNDS ACCOUNTS

The primary use of any accounting system is to monitor the performance of the sector or entity for which the account is constructed. If the sector or entity is imprecise, corresponding problems occur in the monitoring function. Previous discussion pointed out the imprecise nature of farm sector accounts, so interpretations of the accounts need to be viewed with caution.

There are many focuses that the monitoring function can take. For example, one monitoring function is to assess the welfare position of the farm sector participants. Such welfare assessments require a basis of comparison. (For example, income and wealth of the farm sector participants are often compared with those of people in the nonfarm sector.)

Cash flow accounts for the farm sector have limited value for welfare assessment because cash flow accounts for the nonfarm sector are not readily available. However, historical cash flow accounts can and have been used to measure changes over time in the nominal and real "personal consumption and other cash uses" of farm sector participants. Trends in such consumption patterns suggest possible improvements or deterioration over time, but comparison with other sectors is generally not made.

Farm sector sources and uses of funds statements would appear to offer a rich source of information for welfare assessment if combined with other sectors into a national flow of funds matrix. Unfortunately, existing national flow of funds accounts do not separately identify the farm sector. In addition, estimates of internal revaluations of assets are not available for all sectors of the economy. Hence the welfare assessment value of farm sector sources and uses of funds statements is also very limited.

A second monitoring purpose of the farm sector accounts is to assess the level of internal versus external financing of capital and noncapital expenditures. Historical comparisons have revealed an increasing reliance on external sources of funds. Such information is useful in policy decisions regarding the need for special credit programs for farm operators. It also has some implications for the liquidity position of farm operators.

A third monitoring function of the farm sector accounts is to provide a measure of the financial strength of farm operators to farm input suppliers. For example, several major input suppliers have used historical and projected cash flows accounts for the farm sector to help analyze the potential for expanded demand for agricultural inputs. And after reviewing farm sector accounts and other sources of information, a large metropolitan bank decided to start a farm loan department. The extent of the use of accounts for such decisionmaking cannot be readily determined as the accounts are public information.

The farm sector accounts, besides the monitoring function, have been very useful in suggesting a structure for modeling efforts designed to measure the impact of policy and behavioral variables on financial structure of the farm sector. For example, the AIW simulator was designed around functional equations to estimate components of cash flows and balance sheet accounts. The accounts provide a structure around which such models can be developed.

One misuse of the cash flows account and sources and use of funds account resulted from a basic misunderstanding of modeling efforts, such as those used in estimating the AIW simulator. One requested use of the model was to "validate" farm

income estimates with projections from the AIW simulator. Such requests are, of course, nonsensical because one may attempt to validate models with the data series from which the model was built, but one cannot reverse that procedure.

Other misuses can arise by considering part of the account apart from the entire account. The recent interest in mutual funds investment in farmland was justified in part on the need for additional outside equity capital in agriculture. Evidence of the need for additional outside equity capital was based in part on the historical and projected values of the purchases of real estate from discontinuing proprietors published by ESCS. However, this value by itself offers few clues to the need for additional equity capital. One would also need to consider the amount of debt capital and other cash sources of funds available to farm operators to purchase land. Such comparisons, however, were ignored.

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FARM SECTOR CASH FLOW AND SOURCES AND USES OF FUNDS ACCOUNTS: DISCUSSION

By John R. Brake*

First, I find little to quarrel with in David Lins' article. He covers a lot of ground, generally in an adequate way. In fact, as I read the article, I could not help but think that we have come a long way since Penson, Lins, and Irwin published their first piece on this topic, in the American Journal of Agricultural Economics. First we have moved a long way toward narrowing the differences between the Penson, Lins, and Irwin article and the comment by Brake and Berry on that article. Much more importantly, we have come a long way toward understanding this technique of analysis, thanks to John Penson, Dave Lins, and others.

I have but one minor comment on the article, after which I will discuss some issues concerning the accounts. My minor disagreement concerns a place late in the article where Lins suggests that purchases of farm real estate by one farm operator from another are not, and I think he implies, should not be, recorded if the seller remains a farm operator. He goes on to criticize Simunek for a statement that sales of land to the nonfarm sector represent funds available to the farm sector to reinvest in farm capital accumulation. He argues that Simunek is inaccurate since most of the land sold to the nonfarm sector is by farm proprietors who quit farming.

My disagreement is twofold. First, one could include purchases of farm real estate by one farm operator from another, though, of course, the two do balance out. Second, Simunek's point is correct though relatively unimportant. The point is that most farmland is purchased by farmers from people who are leaving or have left the farm sector. The amount bought by farmers far outweighs the farmland that is sold by continuing farmers to others.

However, to the extent this latter type of transfer does occur, these are, in fact, funds available to the farm sector to reinvest in farm capital accumulation. An excellent example would be sales of farmland on the urban fringe. These sales might be to developers or speculators. The farmers then move farther away from the city, buy a new farm, and begin farm operations. Receipts from the first sale help to finance the second. I suspect Lins would agree with these points as I would agree with his counter argument that such sales are probably relatively unimportant.

Let us turn to some issues for discussion. A basic question is, what are the important purposes of these data and models? Who uses them and what problems are they trying to solve? Lins has suggested that monitoring the farm sector is a major purpose, certainly a valid suggestion. I would also include basic understanding of the sector and of the dynamics of movement from one period to another as purposes. There must be others, including many specific policy issues.

For example, I do know that my comments on, and criticisms of, earlier work were colored greatly by my interest in the financing requirements of the farm sector and my assumption that these represented a basic purpose of such models. To overstate somewhat, my model was that farmers had to use credit to make purchases of needed items whose cost were greater than their internal savings. Hence, for my purposes, some assumptions or projections on input prices, replacement rates for machinery,

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turnover rates on real estate, farm operating expenses, gross income levels, and consumption functions could give great insight into future credit needs. With further refinement, I still believe this to be a useful model. Further, I believe the potential for analysis of consumption functions, durable input purchases, real estate purchases, and other questions is tremendous if we can develop improved data.

We do need to give further thought to some of the public policy issues for which this type of analysis would be useful. It seems to me such issues would include study of consumption and investment decisions, operating costs, financing of cash flows, debt service in relation to gross income, and the importance of external versus internal financing.

Another issue is whether one designs the cash flow analysis or sources and uses of fund analysis to utilize data that now exist or whether one starts from a conceptual base and then lets the model specify the data needed for analysis. For example, one approach on the micro side is the idea that it might be useful and informative to trace the changes from a beginning balance sheet of a farm operation through time to the next balance sheet. This operation can be done on a purely cash basis, on a cash and inventory-depreciation basis, or on both bases plus revaluations of capital assets. For some purposes, revaluation of land values is important. In other instances, this may be less important. At any rate, it is possible to trace through time the changes in cash and other assets that lead from one balance to another. This is a useful concept, and a useful exercise. Further, this approach can be done in a purely business context or, as is more appropriate for a better understanding of the typical farm situation, it can include both business and household.

Using this approach on the macro side involves a number of problems, as indicated by Lins. These include intrasector sales and receipts which can (but need not) be netted out. Participants enter and leave the sector, and entries and exits probably do not balance out. Operators leaving the sector are important for financing purposes because a large share of sector financing requires items from purchase of these farming assets (including real estate) to retain them in the sector. Also, Lins well illustrated the difficult question of who should be included as participants in the sector. Should farmworkers, or others?

These are difficult questions, and they do give us problems in sector as opposed to micro analysis. But, so what? I would argue we have at least as much difficulty going from the micro to the macro in theoretical applications using, for example, demand or supply analysis. As one quick example, look at the literature in which authors try to draw macro applications from linear programming analyses of representative farms. The authors have had to use flexibility constraints to keep the adjustments somewhat within reason. The conceptual base for going from micro cash flow analysis to macro analysis is at least as solid as is the base in any other area, in my estimation.

Terminology is another point for consideration. Its inconsistency and vagueness is well illustrated by Lins. The situation resembles that in interest rate terminology. Consumer finance and agricultural finance specialists have been guilty of using inconsistent and questionable interest rate terminology. The mathematics of finance specialists have been clear and consistent on the concepts. The question I raise is whether internally consistent, descriptive, and meaningful expositions exist of terminology in accounting or in earlier work on cash flow or sources and uses of funds analysis. If the answer is yes, let us use them. If they do not exist, then let us develop them.

The descriptive character of the terminology is rather important. For example, to me, funds imply cash. A flow of funds should generally mean cash movement. It

is difficult to understand or use capital appreciation or depreciation as a flow of funds when there are no dollars moving. In my rationale, funds movement implies a decision by a controller. Appreciation does not imply an active decision.

Transaction implies a two-way interchange; that is, dollars for goods, goods for goods, and so on. To imply that depreciation or appreciation are transactions seems inappropriate. Of course, this is not to argue that they are unimportant. They are important, but they are nonmoney capital flows or capital revaluations, not transactions.

Finally, I again repeat my plea for using gross rather han net data for some purposes. Where it is not now possible, I would urge that we study the possibility of undertaking research to obtain the necessary data. Lins indicated in one of his tables that using net rather than gross figures for different lending institutions could give a misinterpretation of the importance of the lending institutions. There can be no question that, by using only year-to-year changes in outstanding debt, one seriously underestimates the importance of credit in financing the agricultural sector. Rather than live with this data shortcoming, let us get the data needed for the model to show the true importance of credit institutions in financing the sector.

ANALYTICAL RATIOS BASED UPON A FARM SECTOR CASH FLOW STATEMENT: DISCUSSION 1/

By Emanuel Melichar

A table showing annual cash sources and uses of funds in the farming sector has been published in Agricultural Finance Outlook since 1973. The purpose of this note is to demonstrate that analytical ratios based on these data can provide insights into aggregate farm financial behavior beyond those presented thus far in that publication.

The account as published in the December 1976 issue of Agricultural Finance Outlook (3, pp. 16 and 19) is reproduced in parts A and B of table 1. The sources of funds, shown in part A, include cash farm income (net farm income and capital consumption allowances), off-farm income, and the net increase in farm debt. In part B, uses of funds are shown as consisting of several capital flows and of total nonfarm uses (personal consumption and other cash uses) which are derived residually (total sources less total capital flow). Total capital flow consists of capital formation (machinery purchases, real estate improvements, and other capital purchases) and purchases of real estate from discontinuing proprietors.

To set the stage for the computation of various analytical ratios, several additional series are derived from these data. The income flow (from part A) can be regarded as composed of capital consumption allowances2/ and net income, and this detail is shown in part C of table 1. Next, the total capital flow (from part B) can be regarded as financed either through borrowing (measured by the net increase in debt, from part A) or from internal sources. This partition is shown in part D, with internal financing being computed residually (total capital flow less the net increase in debt). Finally, the total or "gross" internal financing can be regarded as met first from the funds received as capital consumption allowances, leaving a residual, "net" internal financing (last line of part D, calculated as gross internal financing less capital consumption allowances), to be met from net income.

From the various series in parts A through D of table 1, one can calculate at least four sets of ratios with analytical utility. These ratios are presented on an annual basis in the lower panel of table 1. Several of them were used by Tostlebe in his study of farm finance during the first half of this century (2). Tostlebe showed how their levels varied greatly over periods encompassing farming booms and depressions. To facilitate similar comparisons, the years since 1960 have been grouped into five periods in table 2, and the average ratio over each period is shown. Both tables 1 and 2 also present the ratios that Agricultural Finance Outlook (3) implicitly estimated for 1976 and forecast for 1977.

1/ This material was presented by Emanuel Melichar in the open discussion period following the paper presented by Lins. Because of the length of the comment and the need to include tables he distributed at the meeting, it appears here as an added discussion.

2/ Capital consumption allowances are shown as published in Farm Income Statistics (4). These correspond to all items of capital formation shown in the Agricultural Finance Outlook account except "breeding livestock," which is an unpublished series estimated by the authors of the latter publication, and for which corresponding estimates of depreciation allowances are not available. Such depreciation is small relative to total depreciation, however, and thus the data and ratios presented here are not significantly affected.

Table 1.-- Cash sources and uses of funds for the U.S. farm sector, 1961-77

Item	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976 1/	1977 5/
	Billion dollars																
A. Cash sources of funds 2/																	
Cash income from farm and off-farm sources 3/	23.8	24.7	25.8	26.7	28.9	32.6	31.1	33.1	36.5	37.5	38.7	46.8	64.9	64.8	62.6	66.0	66.2
Net flow of real estate loans	1.0	1.3	1.7	2.1	2.3	1.9	2.0	2.3	1.8	1.1	1.9	3.6	5.5	5.0	4.6	5.8	7.0
Net flow of nonreal estate loans	.8	1.4	1.5	.6	1.8	1.7	1.1	-0.5	.7	1.1	2.4	3.2	4.3	3.1	4.2	5.0	4.0
Cash sources of funds	25.6	27.4	29.0	29.4	33.0	36.2	34.2	34.9	39.0	39.7	43.0	53.6	74.7	72.9	71.4	76.8	77.2
B. Cash uses of funds																	
Purchases of machinery and motor vehicles	2.9	3.2	3.5	3.8	4.1	4.6	5.1	4.6	4.5	4.9	4.8	5.7	7.7	8.4	8.9	9.5	10.0
Capital improvements to real estate assets	1.7	1.8	1.9	1.9	1.9	2.1	2.3	2.1	2.3	2.4	2.5	2.4	3.0	4.1	3.8	3.8	4.3
Other capital purchases 4/	1.0	.9	.6	.6	1.0	.8	1.6	1.6	1.2	1.5	2.5	3.1	2.4	0.9	1.3	1.7	1.9
Annual capital formation	5.6	5.9	6.0	6.3	7.0	7.5	9.0	8.3	8.0	8.8	9.8	11.2	13.1	13.4	14.0	15.1	16.2
Purchases of real estate from discontinuing proprietors 6/	3.2	3.3	3.5	3.9	4.3	4.6	4.4	4.3	4.3	4.1	5.8	8.5	11.4	9.5	9.8	11.2	12.5
Total cash flow of capital 6/	8.8	9.2	9.5	10.2	11.3	12.1	13.4	12.6	12.3	12.9	15.6	19.7	24.5	22.9	23.8	26.3	28.7
Personal consumption and other cash uses	16.8	18.2	19.5	19.2	21.7	24.1	20.8	22.3	26.7	26.8	27.4	33.9	50.2	50.0	47.6	50.5	48.5
Cash uses of funds	25.6	27.4	29.0	29.4	33.0	36.2	34.2	34.9	39.0	39.7	43.0	53.6	74.7	72.9	71.4	76.8	77.2
C. Income flow	23.8	24.7	25.8	26.7	28.9	32.6	31.1	33.1	36.5	37.5	38.7	46.8	64.9	64.8	62.6	66.0	66.2
Capital consumption allowances	4.4	4.5	4.7	4.9	5.1	5.4	5.8	6.2	6.6	6.8	7.4	7.9	8.9	10.6	12.5	7/14.0	7/15.2
Net income	19.4	20.2	21.1	21.8	23.8	27.2	25.3	26.9	29.9	30.7	31.3	38.9	56.0	54.2	50.1	7/52.0	7/51.0
D. Capital flow	8.8	9.2	9.5	10.2	11.3	12.1	13.4	12.6	12.3	12.9	15.6	19.7	24.5	22.9	23.8	26.3	28.7
Debt-financed	1.8	2.7	3.2	2.7	4.1	3.6	3.1	1.8	2.5	2.2	4.3	6.8	9.8	8.1	8.8	10.8	11.0
Internally financed--gross	7.0	6.5	6.3	7.5	7.2	8.5	10.3	10.8	9.8	10.7	11.3	12.9	14.7	14.8	15.0	15.5	17.7
--net	2.6	2.0	1.6	2.6	2.1	3.1	4.5	4.6	3.2	3.9	3.9	5.0	5.8	4.2	2.5	7/ 1.5	7/2.5
Analytical ratios	Percent																
Relative burden of capital flows																	
Capital flow/income flow	37	37	37	38	39	37	43	38	34	34	40	42	38	35	38	40	43
Real estate purchases/income flow	13	13	14	15	15	14	14	13	12	11	15	18	18	15	16	17	19
Capital formation/income flow	24	24	23	24	24	23	29	25	22	23	25	24	20	21	22	23	24
Allocations to internal financing																	
Gross internal financing/income flow	29	26	24	28	25	26	33	33	27	29	29	28	23	23	24	23	27
Net internal financing/net income	13	10	8	12	9	11	18	17	11	13	12	13	10	8	5	3	5
Prospective burden of debt financing																	
Debt financing/income flow	8	11	12	10	14	11	10	5	7	6	11	15	15	12	14	16	17
Debt financing/net income	9	13	15	12	17	13	12	7	8	7	14	17	18	15	18	21	22
Relative role of debt financing																	
Debt financing/capital flow	20	29	34	26	36	30	23	14	20	17	28	35	40	35	37	41	38
Debt financing/capital formation	32	46	53	43	59	48	34	22	31	25	44	61	75	60	63	72	68

1/ Preliminary. 2/ Cash sources of funds from sale of real estate to the nonfarm sector are not included due to the lack of data. 3/ Gross cash farm operating expenses have been deducted from gross cash farm income in the account. 4/ Includes net additions to household furnishings, commercial bank deposits and currency, and purchases of breeding livestock. 5/ Forecast by the AIW simulator. 6/ Data published in AFO-17 are corrected for 1969-77. 7/ Based on author's projection of capital consumption allowances.

The first set of ratios reflects the relative burden that capital flows place on the income flow. The first ratio is simply the total capital flow as a percentage of the total income flow. In the next two ratios, each of the primary components of capital flow--capital formation and real estate purchases--are separately shown as a percentage of total income flow. The most interesting finding is that the relative capital burden did not increase during the farm investment and land price boom of 1973-75, as a small decrease in the relative burden of capital formation offset a small increase in the relative burden of real estate purchases. However, the capital flows forecast for 1976 and 1977 would constitute a sharp rise in the relative burden. One may be wary in using these forecasts because similar annual forecasts of capital flows made by USDA since 1973 have consistently overestimated actual flows; however, the relative size of the overestimates has been decreasing as estimating procedures have been re-examined and improved. With this caveat, it appears that the relative burden of real estate purchases may be moving sharply above its recent historical relationship to income flow and net income.

Table 2.--Analytical ratios for selected time periods, 1961-77

Item	61-64	65-69	70-71	72	73-75	76	77
Relative burden of capital flows:							
Capital flow/income flow	37	38	38	42	36	40	43
Real estate purchases/income flow	14	14	13	18	15	17	19
Capital formation/income flow	24	25	24	24	21	23	24
Internal financing:							
Gross internal financing/income flow	27	29	29	28	22	23	27
Net internal financing/net income	11	14	13	13	7	3	5
Debt financing:							
Prospective burden:							
Debt financing/income flow	10	9	8	15	14	16	17
Debt financing/net income	13	11	10	17	17	21	22
Relative role:							
Debt financing/capital flow	27	24	22	40	38	41	38
Debt financing/capital formation	43	38	34	75	66	72	68

The second set of ratios examines the proportion of their income flow that farmers are allocating to the internal financing of capital flow. Surprisingly, in spite of the extraordinary farm income of 1973, farmers as a whole reduced the proportion of their income flow (or of their net income) allocated to internal financing. It appears that they used most of their additional income to increase greatly their personal consumption and/or nonfarm investment, rather than to finance farm capital flows or to repay outstanding farm debt.

The third set of ratios may indicate the prospective burden of ongoing debt financing. They are a rough indicator only, as they relate current debt financing to current income flow or net income. Preferable indicators would relate the future stream of debt service commitments to future income flow or net income. Nevertheless, the recent increases in the ratios shown indicate that income flows must rise in the future to avoid an increase in the relative burden posed by outstanding farm debt. Given current income trends, the legacy of the recent period of high farm income may be one of increased rather than reduced relative debt repayment burden.

Ratios in the last set simply compare the net increase in debt to capital flow and capital formation, respectively. These measures supplement the one set of ratios regularly published in Agricultural Finance Outlook (which relate the net increase in debt to the total cash sources of funds) in indicating the relative role of debt financing. One advantage of the additional ratios is that they are roughly comparable with those computed in earlier studies by Tostlebe (2) for 1900-1950 and by Melichar (1) for 1950-1969. It may be significant, for instance, that the only prior period in which the ratio of debt financing to capital formation resembled the level of 1972-77 is, as estimated by Tostlebe, 1915-19. The latter period has been generally described as a speculative, debt-financed farm boom based on euphoric long-term income projections that later failed to materialize.

It appears that these analytical ratios offer fruitful insights into relationships that are difficult to discern from examination of the flow series only.3/ I therefore suggest that such ratios be regularly presented and discussed in Agricultural Finance Outlook.

3/ Additional proof for this proposition surfaced during the preparation of this note. Investigation of a suspicious drop in the originally computed ratio of real estate purchases to income flow led to the discovery that real estate purchases had been incorrectly published in AFO-17 (3) for years after 1968. The unusual financial behavior, in this case traced to a data-recording error, was far more prominent in the ratio series than in the original flow series.

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DISCUSSION

QUESTION: Swings in the volume of stored crops are important reasons for changes in farm debt. I have a theory that since the swings in crop inventories are hard to explain, the AIW simulator omitted these because it was unable to simulate them well. Is that the reason that they are not in the account now published in Agricultural Finance Outlook?

ANSWER: No. However, the statement is accurate that any model we try to use to estimate inventory changes is not too successful. But that is not the reason that such swings are not in the account. Inventory changes do not belong in a cash flow account because they do not represent a cash flow. And if you look at the sources and uses of funds statement presented in the Lins paper, you will see they are included.

COMMENT: They are not included in the sources and uses of funds statement published in Agricultural Finance Outlook.

COMMENT: The reason they are not included there is because that account is a cash sources and uses of funds statement, which is the same as a cash flow statement.

QUESTION: In the cash sources and uses of funds statement published in Agricultural Finance Outlook, there is a line entitled annual capital formation. That is annual capital formation not including inventory change. How do you reconcile those two things?

ANSWER: I am not sure that I can defend the terminology used. But the items listed under annual capital formation all involve cash flows. Changes in inventories do not involve cash flows, except to the extent that there is an expenditure by farm operators to generate the increased inventory. And in that sense, it is picked up in the cash income figures.

COMMENT: In my opinion, an account which does not include inventory change is not the most useful account. Users who are interested in looking at the relationship between capital formation and nonreal estate debt would not find the account useful. Perhaps what we need is deletion of the term "cash" and publication of the sources and uses of the fund statement, which does include changes in inventories.

COMMENT: There are different uses that can be made of different accounts. One of the reasons we went to a cash flow statement as opposed to a sources and uses of funds statement was the confusion over calling capital gains a source of funds. That probably caused more concern to people than the item you are pointing out here. One alternative is to publish the sources and uses of fund statement with a cash and a noncash section.

COMMENT: Probably the major use of the account is for projecting the change in debt or explaining it. When farmers are suddenly holding more wheat inventories and getting loans on them, this account is an important item in explaining nonreal estate debt. One should have this item in any model that is projecting or explaining that debt level. We should have an account that includes that item, but excludes capital depreciation which farmers are not trying to finance.

COMMENT: I am not sure what you would call such an account. You cannot call it a cash flow statement since it would have noncash items in it. You shouldn't call it a sources and uses of funds statement, because you don't have all of the sources

and uses listed. A second point relates to the comment on nonreal estate debt, and how it is affected by inventory changes. Because inventory change is not published in a cash flow statement does not imply that inventory changes have no impact on nonreal estate debt. In fact, in the AIW simulator model, they do have such an impact.

QUESTION: We are trying to get measures of own-account capital formation. The cash flow statement published in Agricultural Finance Outlook has been carrying an estimate of purchases of breeding livestock for quite some time. Do you have any comments on this? It poses certain problems for users because there is no documentation as to where the series on purchases of breeding livestock come from nor is there an estimate of depreciation on such livestock. Is this a good way to handle such an account?

ANSWER: It may or may not be a good way. We do include an estimate of the purchases of breeding livestock because it is highly important. If we exclude it, we miss an important item in capital formation. The estimates are based upon the 1970 Agricultural Finance Survey.

COMMENT: I think there is agreement on the need to include it. It is just that there is lack of documentation as to where the series comes from.

COMMENT: There is no problem in giving better documentation. We can in fact present the manner in which the data series is derived from the 1970 benchmark estimates.

COMMENT: I think that the ratios suggested by Melichar could be very useful. One of the real concerns about ratios of this nature, however, is illustrated in one of the tables presented by Lins. He looked at different levels of netting versus grossing to show what impact this had on the ratios currently presented. I suspect that you could show a substantially different ratio if in fact you chose a different level of disaggregation.

QUESTION: Is capital formation different at different levels of grossing versus netting?

ANSWER: No, it is not. But I am talking about the net flows of loan funds.

COMMENT: The term "cash flow," in the ratios presented by Melichar, may be an undesirable term since there are cash flows other than from farm and nonfarm income. For example, net increases in debt are one such cash flow. Consequently, a different term should be used for the item Melichar now calls cash flow.

COMMENT: Cash flow from income might be a good term.

COMMENT: It was suggested by Lins that the capital flows and capital finance account does not give one an estimate of consumption, and that the cash flow and sources and uses of funds statements do. He also suggested that the cash flow statement does not record gross capital formation or net capital formation. It seems under that circumstance one couldn't very well record consumption. The difference may be on how we define savings.

COMMENT: The consumption referred to in the cash flow statement is an estimate of personal consumption of food and other noncapital items. It should not appear on a capital flows or capital finance account since it represents noncapital items.

COMMENT: Simunek does not have personal consumption in his capital flow or capital finance account.

COMMENT: But the savings offset that. You can take savings away from income and also get consumption.

COMMENT: I am bothered by the large number of these accounts that we have floating around. If each one of these accounts gives us new and useful information, we should have it. But if the difference is minor, we should be able to explain it to the general users so they don't have any confusion. In looking at the cash flow and sources and uses of funds statement suggested by Lins, I do not find much difference between those accounts and the capital flows and capital finance account presented by Penson. Wouldn't the capital flow statement in conjunction with the balance sheet give users the same information presented in the sources and uses of farm statements proposed by Lins?

COMMENT: If in fact a net change in the balance sheet account was published in the balance sheet publication, I would agree with that comment.

COMMENT: I disagree. Neither the balance sheet nor the capital flow measures noncapital consumption.

COMMENT: I wouldn't confuse a cash flow statement with the Penson capital finance account. The Penson capital finance account is not derived from the cash flow account presented by Lins. The cash flow statement includes more than just capital purchases.

COMMENT: We need to be as consistent as possible in the various accounts that are presented. We should be able to develop some consistency between balance sheet and income accounts and any other type of accounts developed from them.

COMMENT: What you are arguing for is consistency in the data matrix from which these accounts are developed. We need the level of disaggregation in that matrix which will allow us to form the various descriptive accounts. If one uses the same data matrix, one ought to arrive at a consistent set of accounts.

COMMENT: I would like to comment on the item of savings proposed by Simunek. In one instance, he indicates that figure is $4.2 billion but that is only farm savings. Simunek is suggesting that you can take farm savings and substract it from income and get consumption. Yet much of the savings is in nonfarm items so his procedure is not correct.

COMMENT: If we want a good estimate of consumption, we should estimate it directly in terms of the farm family expenditure survey or a similar survey.

QUESTION: Lins identifies what can be measured with the current cash flow statement and sources and uses of fund statements and with the capital flows and the capital finance accounts proposed by Simunek and Penson. Are these identifications made only to indicate how the accounts are constructed now, or do they indicate what they can do theoretically?

ANSWER: The identification was related to the accounts as they are now structured.

QUESTION: Table 4 in the Lins article is called a cash flow statement. Wouldn't it be more appropriate to call it a personal income and outlay account for continuing proprietors? This terminology would be more consistent with national income accounting.

ANSWER: I think you have to be very careful there. Most people who look at this account know nothing about national income accounting terminology. They do know about firm level accounting. And they have never heard of such a thing as a personal income and outlay account in firm level accounting. They call that statement a cash flow statement, or a statement of change in financial position.

COMMENT: Some of the Melichar analytical ratios looked at the ratio of debt to various items. But those figures are based on net change in debt. Conceptually, when I think of the amount of financing with debt, I see it as the amount of new debt taken out to purchase real estate this year and the amount of new debt taken out to finance machines and equipment. It does not represent the difference between the amount of new debt taken out to purchase real estate and the amount of repayments on purchases 10-15 years back. I am sure data problems are paramount, but, conceptually, isn't that closer to what most of us think of as debt financed? If that is the proper concept, then as one gets a strong upward trend, using the net figure understates the importance of debt financing during the year.

COMMENT: I have been looking at some information from the Federal Land Banks and the volatility in repayments. I am not sure that the argument that you are making is important. The average repayment is very high, something like 15 to 18 percent per year. I think if you look at new loans, much of what you will pick up is the difference between the interest rates on old loans and new loans. I think change in debt outstanding is a more accurate description of what is really going on.

COMMENT: I think relating outstanding debt to net income is useful. With respect to grossing debt flows, it is all right as long as you also do that on the other side. For example, if you divide gross flow of debt by gross income you get a ratio. The important point is to watch how that ratio moves over time, not just the magnitude of the ratio. A good example is real estate transfers wherein we take the total value or real estate transfers and divide by the total value of real estate. That is a useful ratio.

COMMENT: When I think about financing, I think about credit that is forthcoming this year to help purchase capital items. When one nets that out, in some instances, one makes a mistake by underestimating. Conceptually, do you visualize the debt due this year in the repayment of past real estate loans as coming out of internal financing? I do. I conceptualize repayments on loans as internal financing coming out of my income. The important concern is not the net change in my debt this year, but the amount that I borrowed for the purchase of capital.

COMMENT: If you put acquisitions on one side of the account, and repayments on the other side of the account, obviously you net out at the same place.

QUESTION: Given the fact that we have only part of the data to gross farm debt figures, would you suggest that we have a mixture of gross and net flows in our account?

ANSWER: I would favor continuing on a net basis until we have sufficient information for complete grossing. But I think we have to be careful in interpreting the importance of debt financing. For example, suppose over the next 5 years there is no net increase in debt. The ratio presented by Melichar would suggest that there is no external financing of agriculture. I say that is ridiculous. There is debt capital being used for capital formation; it is just that there is no net addition.

COMMENT: But if there is no net increase in debt, and capital formation is taking place, then it is being internally financed.

COMMENT: You have a good point there, but if one were to turn that around and take it to the extreme, one could say that there is no need for credit institutions.

COMMENT: That conclusion would be a misuse of the data.

COMMENT: I think, to the extent possible, we should try to get information on both net and gross flows. In that regard, the Federal Reserve System has initiated a survey that will allow one to estimate the gross flow of nonreal estate loans from commercial banks.

COMMENT: I would like to comment on the ratios proposed by Melichar involving prospective debt burden. The ratios suggest that prospective debt burden is going up over time. Rather than viewing that as a burden, one could look at it as capacity. Also when we start comparing years such as 1961 and 1962 to 1974 and 1975, we have said nothing about how the structure of agriculture has changed over that time period. With a farm sector that is changing considerably over time, one needs to consider changes in the sector in interpreting the ratios. The burden may not be increasing at all. The ratio has changed, that is true, but in terms of being able to handle that amount of debt, the sector may be in a better shape to handle a higher ratio now than the lower ratio which existed in 1960-61.

COMMENT: What you are suggesting is that the sector has changed in the direction of going to a higher level of permanent debt financing. The only burden then is the interest rate. But doesn't this suggest that as long as income exceeds the interest payment, all is well? I don't think so. If the ratio now is twice as high as it was in 1960, can one conclude that the structure is changing twice as fast?

COMMENT: It seems to me that the ratios are much more valid comparing very shortrun changes over a few years than they are in analyzing very long term changes in agriculture.

COMMENT: But if a ratio doubles in 10 years, we cannot conclude that the structure of agriculture has changed dramatically. Knowing how the structure has changed and relating that to the ratio allows us to make a more meaningful interpretation.

NEW DIRECTIONS IN FARM SECTOR ACCOUNTING PROCEDURES AND ESTIMATION TECHNIQUES

By Lindon Robison and Peter Barry*

INTRODUCTION

As the title of this article suggests, we are to prescribe the new directions in accounting procedures and estimation techniques for the ESCS farm sector accounting system. That those more qualified to provide the new directions declined to do so suggests the futility of our achieving such lofty goals. Let our views, then, be treated as an inquiry rather than a prescription.

For purposes of this article, the existing farm sector financial accounts (FSFA) include "the Balance Sheet of the Farming Sector" (BSFS), "the Gross and Net Farm Income Statements" (FIS), and "the Sources and Uses of Funds Statement" (SAUF). These financial statements provide the starting point for any discussion of new directions in farm sector accounting practices; and, if new directions are needed, it is because the existing accounts are deficient in terms of usefulness, accuracy, or both. Thus, our first tasks are to assess the usefulness of existing FSFA's and of the proposed "new accounts" and to assess their accuracy. Then we will suggest an alternative characterization of the farm sector--as a corporation--with the view that its economic activities can be measured by an integrated set of income and product accounts proposed by others which we endorse. We conclude with suggestions for improving existing accounts and their empirical estimation techniques and with suggestions for some new areas of research.

HOW USEFUL ARE EXISTING FARM SECTOR FINANCIAL ACCOUNTS?

The usefulness of the FSFA's is closely related to the kinds of economic questions they can help answer. However, in discussions of macro-agricultural finance, it is interesting to note the rather high degree of abstraction used in formulating both the questions and the descriptions of the agricultural sector. There are numerous references to "economic problems," "economic situation," "financial condition," "what's happening," "economic features," "financial performance," "well-being," and so on. What do these all mean? How does one respond to the question: "What is the economic situation of agriculture?" By answering "fine," "good," "okay"? The abstraction of these replies roughly matches the abstraction of the questions, causing doubt as to the ability of existing FSFA's or any other set of accounts to provide meaningful answers.

It seems useful to confront more directly the kinds of information to be provided by farm sector accounts. Consider the following questions: What is the agricultural sector's value-added contribution to GNP? How does the contribution of the farming sector compare with those of other sectors now and over time? How are wealth and income distributed among agriculture and other sectors of the economy? What is the aggregate level of efficiency of resource use in the agricultural sector and how does it compare with other industry sectors? Are productivity and value

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added for different agricultural commodity subsectors stable over time? What is the liquidity structure of the production sector and how is it affected by changes in other sectors of the economy? What is the productive capacity of the agricultural sector? What are the impacts of price supports or loan programs (and other policy actions) on the efficiency, stability, and liquidity of the farming sector?

If our accounts can provide answers to most of these kinds of questions, the accounts are likely useful. However, an important point is that these questions all reflect different kinds of "economic performance" at the sector level -- for comparison over time, or among sectors, and in contribution to national or international aggregates.

The sector level seems appropriate, since this is the level at which many of the data appear to be collected or estimated and the accounts formulated. At this level, much can be said about the different measures of economic performance. But what can be said about performance within the sector? Can meaningful "enterprise analysis" be done from aggregative data if the sector accounts are not generated from these "enterprise accounts" in the first place? The answer, in our view, is that not much can be said. It is no different from the corn-hog farmer's looking at this total income statement and balance sheet and trying to assess the relative performance of the corn versus the hog enterprise. It can be done, but very arbitrarily. If the enterprise data are not there to start with, no sophisticated analytical estimation techniques are going to reduce very much the degree of arbitrariness in assessing relative performance.

So let us consider the application of the kinds of questions outlined above in assessing economic performance within the production sector. Can they be assessed using sector data for the following classes: individual farm families, farm types, commodity groups, size and age groups of producers, credit versus noncredit users, different tenure groups, different legal business organizations, States, regions, and others? The answer appears to be no. The data can be reliably used only at a level of dissaggregation that reflects the manner in which they were collected. It is reasonable to analyze data on saving and investment behavior of farm operators if one has data reflecting the saving and investment behavior of farm operators. Without such disaggregated data, it is questionable to make specific inferences about disaggregated behavior. All the variation among the heterogeneous units comprising the sector is lost in the aggregative data.

One obvious new direction needed in the farm sector accounting procedures is to disaggregate the data collection and the accounts developed therefrom. What do we get, for example, when we average a production sector that has 1,000 large producers with output exceeding that of the 2 million small producers? Can one average number possibly provide relevant information? Or alternatively, consider that about 4 percent of the farms with sales greater than $100,000 produce about 47 percent of the total cash receipts (see table). Because of the bimodal nature of producers in the farm sector, one has the uneasy feeling that, at the current level of aggregation, FSFA's for the farming sector probably most accurately describe a "unicorn." For purposes of intrasectoral analysis, the level of aggregation renders our existing FSFA's nearly useless.

Income of farm operators from farming, by value of sales classes, 1970-75 1/ (Cash receipts from farming including other income)

Year	Farms with sales		
	$100,000 and over	Under $100,000	All farms
	Million dollars		
1970	18,092	36,707	54,799
1971	19,671	36,974	56,645
1972	25,260	40,554	65,814
1973	41,317	49,171	90,488
1974	44,452	49,620	94,072
1975	42,750	48,622	91,372
	Percentage change		
1970-71	8.7	0.7	3.4
1971-72	28.4	9.7	16.2
1972-73	63.6	21.2	37.5
1973-74	7.6	0.9	4.0
1974-75	-3.8	-2.0	-2.9
	Percentage distribution		
1970	33.0	67.0	100.0
1971	34.7	65.3	100.0
1972	38.4	61.6	100.0
1973	45.7	54.3	100.0
1974	47.3	52.7	100.0
1975	46.8	53.2	100.0

1/ All figures include Government payments.

Source: Farm Income Statistics, Econ. Res. Serv., U.S. Dept. Agr., July 1976.

Because the FSFA's are national aggregates, they appear most useful for national policymakers and organizations with national interest. The intensity of the interest in the accounts at the national versus the State level is exemplified by the three-to-one ratio of BSFS subscribers in Washington, D.C., to subscribers in California, a leading agricultural State.

The lack of interest in the aggregate FSFA's is also demonstrated by lack of reference to the accounts by academic economists. In the last 3 years of issues of the American Journal of Agricultural Economics and in the last four volumes of the Agricultural Finance Review, academic economists referred to the BSFS only three times and the SAUF statement only once. Farm income estimates, available by States, were referred to more often. The most logical explanation of the lack of reference to either the BSFS or the SAUF is that they are available only as a national total, and researchers focusing on their respective States or farm types in those States find this level of limited value. Moreover, there are reconciliation problems in these accounts which we will address shortly.

Leontief once complained that academic economists worried about theoretical models to the exclusion of data problems, thus leaving the data problems to the

employees of the Federal statistical agencies (14). 1/ We also point out with some alarm the lack of interest of academic agricultural economists in the construction of sector accounts. 2/ However, the fault lies not so much with the academic economists as with Government economists whose interests are restricted to the national level.

To increase usefulness, we recommend that data collection procedures be modified to provide disaggregates either by size, type of farm, geographic region, or State, and that accounts then be formulated at more dissagregated levels. Providing disaggregated estimates of the FSFA's is a way of involving academic economists whose support for funds may restrict them to the consideration of localized issues.

ACCURACY OF FARM SECTOR ACCOUNTS

Producers and researchers of farm sector accounts have at least two important charges: (1) to produce numerically accurate and conceptually correct accounts, and (2) to assume responsibility for the correct use of the accounts. The completion of the first responsibility can be enhanced by close coordination with researchers at land grant universities and statistical agencies. The second responsibility requires that the correct uses of the accounts be identified. We cannot simply "let the user beware" but must make serious efforts to provide guidelines as to the confidence limits of the estimates and cautions, where needed, in their interpretation.

Recent statements about our agricultural statistics appear to agree on one point: the characterization of the farming sector and its economic accounts as those of a large family farm is no longer accurate. Apparently, our first responsibility is not being met--our accounts are not conceptually accurate. Consider the statement by Carlin and Handy:

> The national family farm and the marketing bill are useful concepts...However, they do not give an adequate picture of the role of the food and fiber sector in our national economy nor the size, structure, and performance. These are the questions increasingly being asked today (7).

Or consider the statement from the AAEA committee on agricultural statistics:

> We will continue to need to construct statistics that say something about physical farms or firms of various sorts, but the farm or firm as the basic unit of observation from which all food and fiber statistics are constructed is conceptually obsolete (2).

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

2/ Budd noted that papers presented in a recent session of the American Agricultural Economics Association on measuring the agricultural sector were all written by employees of the Federal Government (6).

Finally, from the Task Force Report on Farm Income Estimates:

> Organizational changes in the farm sector have made traditional farm income measures increasingly unrealistic. Because of growing heterogeneity among producing units, no major group of producers is now realistically represented by data series that were considered valid in the past (11).

These warnings regarding the adequacy of our data system are not new. A 1968 USDA report added:

> Many of the data series through the USDA were designed with the implied concept of agriculture as an isolated farm industry, related to the rest of the economy only via product market...Changes in the economy giving rise to misinterpretation of the Balance Sheet of Agriculture in the 1940's have accelerated, widening the gap between the correct and the common interpretations. In an evolutionary way, the Balance Sheet as a depiction of the financial structure of agriculture has grown out of date. Concepts we could accommodate to 20 years ago are not adequate. The same sorts of difficulties confront a number of other USDA data series (13).

To assert that the "national family farm" concept of the agricultural sector is obsolete is not new or surprising. However, to appreciate the difficulty associated with modifying the characterization of the farming sector requires a brief review on the origin and evolution of the family farm.

In Thomas Jefferson's day, independence from commercial exchanges in the input and output markets was the distinguishing characteristic of the farmer. While the merchants produced for others, the farmer produced primarily for himself, and it was this independence which Thomas Jefferson admired. He wrote:

> Moral corruption is the mark set on those, who, not looking up to heaven to their own soil and industry, as does the husbandman, for their subsistence, depend for it on the casualties and caprice of customers. Dependence begets subservience and venality, suffocates the germ of virture, and prepares fit tools for the designs of ambition (4).

Jefferson would have been likely to claim that family farming lost its virtue when it became commercial, dependent on the input markets for factors of production and on the output markets as an outlet for its surplus production. 3/

More recently, the family farm became an important political issue. Preservation of the family farm, beginning with the Franklin Roosevelt Administration, was one area where a consensus was possible. The goal became to preserve the family farm from the large farms that might drive it out of business. How to define the family farm and hence measure the success of any programs to preserve it was another problem. It was generally accepted that there were upper

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3/ David Brewster, ESCS, agricultural historian in the National Economic Analysis Division, has written a highly informative (and as yet unpublished) account of family farms. The historical review of family farms in this section of the article draws heavily on his work.

sales limits on family farms (set by the amount of labor a family could provide) and lower sales limits (the returns it took to support a family and the acres required to employ the family's labor). The bounds on the value of production which defined the family farm were originally set between $600 and $10,000--and nearly 56 percent of the Nation's farms qualified.

However, any arbitrary definition of family farms based on sales was bound to prove inadequate due to changes in prices and productivity. As could have been predicted, the definition based on sales was replaced by more liberal definitions based on the amount of labor that could be employed beyond the family's own labor--1½ man-years. With the modified family farm definition, family farms accounted for roughly 95 percent of the total in 1964 (17). Since 1964, major changes have occurred in the farming sector. There is no reason to believe that family farms still comprise 95 percent of the total, even using the most liberal of definitions. 4/

The official definition of the family farm contains nothing in it to distinguish it from other family proprietor businesses except the output of the business and the major source of the labor. Indeed, should any greater reverence be accorded a family proprietorship which owns and operates a gas station than a family farm? We think not--since it is the ownership of resources which induces efforts beyond those exerted by the nonowner. The truly distinguishing characteristic of the family farm, namely independence from the input and output markets, has long since vanished. Considering the evolution of the family farm, the recent advice of Carlin and Handy appears particularly appropriate:

> Most businessmen will concede that mixing nostalgia with business practices can have dire consequences. The time has come to separate the view of farming as a business activity from that of farming as a way of life (7).

To escape some of the emotional baggage associated with the name "family farm," we suggest the farming sector be viewed as a corporation. If viewed in this manner, the operations of the business are clearly separate from the activities of the household. Similarly, we would not expect those who work for the corporation and/or may hold equity claims in the corporation to provide necessarily a homogeneous group for purposes of analysis. Nor could we expect to make welfare assessments about the owners and operators of the corporation based on the earnings of the corporation unless it were their sole means of support. While the word "corporation" may have negative connotations, particularly when used in association with a sector characterized by proprietorships, it does emphasize the business aspects of farming and separates these from activities of the household.

Focusing on the business aspects of farming has three important advantages: (1) it is conceptually more correct to describe the farming sector as a business--a corporation--than to describe it as a family operation, (2) it meets the information needs of account users, concerned with how well the food and fiber system performs in its contribution to national objectives, and (3) it may reduce the statistical burden associated with collecting data on numerous small farms which contribute little to the total product of the farm sector. Information on the income and wealth of those formerly classified as farmers will always be needed, but it can likely be supplied using data that are quite separate from those collected to measure production and capital accumulation in the farming sector.

4/ Nicolitch (18) states that 1969 estimates of the number of family farms are based on predictions from the 1964 census. The 1969 estimate is the one most often referred to when inferences are made today regarding the family farm's importance.

The need to separate business from household activities in the farming sector seems justified by recent statistical measures. The 1974 census indicated that only 40 percent of those families living on farms reported farming as their major occupation. Of those whose major occupation was farming in 1970, over 20 percent lived off the farm. This divergence of place of residence and occupation supports our theoretical model which separates assets of the farm corporation from those of the households supplying its labor, management, and equity capital. Making welfare implications about farmers based on farm income is also difficult because of the significant importance of off-farm income. Nonfarm earnings of the farm population have averaged over 85 percent of operators' net farm income over the last 10 years.

Linkages with other sectors of the food and fiber system have also modified the traditional family farm model and they have shifted resource ownership and control. Food processors, for example, have greater control over the production decisions of farms. In some cases, they insist that specified inputs be employed, and that specified quantities of outputs be delivered on certain dates. In many instances, this control has been achieved through vertical integration--primarily in the vegetable, fruit, poultry, and livestock enterprises. The application of outside managerial skills in farm decisions suggests that farm investment and production decisions are not necessarily restricted to investment decisions by farm households.

The set of accounts for measuring the farm "corporation" has been suggested by others. Carlin and Smith (8) suggested the use of an integrated system of income and product accounts to describe the farm business sector. Carlin and Handy (7) proposed nearly the same set of accounts to measure the food and fiber system. The system of accounts, classified either by product or by establishment, included: the income and product account, the inventory of capital stock account, the capital flows account, the balance sheet account, and the income and outlay account. While there appears to be widespread agreement that these accounts provide a useful accounting system, implementation has been slow. One major difficulty has been the change in emphasis from the farm business to the food and fiber system. Efforts to identify the food and fiber sector are nearing completion; perhaps progress can now be made toward using the accounts. 5/

We recommend that a system of farm sector accounts as suggested by Carlin and Smith be developed. Although the exact game plan cannot be supplied here, we can see the development occurring in three distinct stages. First, using whatever data are available and employing whatever simplifying assumptions necessary, initial estimates of the accounts should be constructed. Second, the accounts should be publicized through exposure by publication in the journals, special bulletins, and symposia for the purposes of receiving professional feedback relative to their usefulness and conceptual correctness. Third, based on the initial experience in the construction of the accounts, coordinating agreements with the Statistical Reporting Service (now part of ESCS) should be made to secure the needed data. Included in these agreements would be the requirement to establish disaggregated sampling frames either by region or by commodity to formulate disaggregated accounts. The last stage would consist of standardizing the procedures for producing the accounts originating from ERS (now part of ESCS).

5/ Eldon Weeks, National Economic Analysis Division, ESCS, is currently preparing a publication on a conceptual framework for identifying and measuring the food and fiber sector.

IMPROVING THE EXISTING FSFA's

An integrated system of farm sector accounts will exist, at least initially, alongside existing FSFA's. Therefore the current accounts warrant attention and demand improvement where possible. Though many of our concerns about these accounts have already been mentioned, we summarize below some of the more important ones.

Dyer's recent paper presented to the Western Agricultural Economics Association created quite a stir (9). Using information from a 1974 ERS-sponsored survey, Dyer separated estimates of cattle production into uses for consumption or for capital formation. The inclusion of price valuation adjustments for livestock in the farm income series resulted in a $7.5-billion reduction in net farm income. Bonnen quoted Dyer's results in his 1975 AAEA presidential address to stress the importance of revising the farm income series. Melichar criticized both Dyer's work and Bonnen's quotation of Dyer's work, primarily for considering unrealized capital gains in Dyer's capital flows account and in the farm income statistics (16).

However, Dyer's work and later work by Browning and Dyer focused on a real problem--the treatment of livestock in the inventory account. There is no argument against the notion that dairy cows and breeding stock belong in capital accounts, not inventory accounts. Dyer was demonstrating that livestock can be included in capital accounts, and that it could have a substantial impact. Although Melichar found some serious conceptual errors in the estimation procedures, the importance of Dyer's contribution should not be diminished.

The disturbing result of Dyer's work on the need to account for breeding livestock in the capital account is that there are no continuing efforts to do so. It appears that only a one-time look at the livestock inventory account in an atypical year has occurred.

Questions are also being raised about USDA's depreciation schedule. Work by Penson, Hughes, and Nelson (21) on capacity depreciation of farm tractors suggests that the current method used to calculate building and machinery depreciation may overstate the actual decline in productivity of the assets. The study on capacity depreciation is supported by engineering data and it probably correctly measures the pattern of decline in productivity of the assets.

However, USDA's depreciation schedule more closely fits the observed price declines associated with used equipment. The difference between the two measures--between the market price of used tractors and the original price adjusted for capacity depreciation--may be explained by several factors, one of which may be a risk premium reflecting the increased risk of breakdown during crucial production periods. Thus, it appears that further study is needed on the various factors influencing economic depreciation and what the USDA depreciation series should actually be measuring.

Another comment on the farm income statement relates to its usefulness in comparisons with other sectors of the economy. FIS, as currently constructed, views the farming sector as large family or proprietary farms. This view is rather difficult to integrate into the national income accounts when the concern is with the value added in the farming sector and how it is allocated among the factors of production. The national income accounts are useful policy tools. Because they are consistent with our view that a separation is needed between the activities of the farm corporation and the families who work or hold equity claims in farming, we recommend that the farm income statement eventually be replaced with an income and product account. Currently, an income and product account is constructed in the Department of Commerce based primarily on data collected by USDA.

Improvements in the FIS statement will also improve the farm sector income and product account since both will rely on the same data series. Specific changes needed to construct an improved farm sector income and product account are contained in a 1975 Task Force Report on Farm Income. A major recommendation included in the report is construction of a data series that accounts for inventories of purchased materials and inventories of growing crops. Another problem is the synchronization of farm and nonfarm inventories and the accounting of farm-related income earned by nonfarm corporations.

Now, let us consider a few points on the construction and analysis of the Balance Sheet of the Farm Sector (BSFS). First, consider the organization. Currently, assets and liabilities are classified based on security (real estate, nonreal estate) and tangibility (physical and financial). Someone can probably explain why--perhaps it is the way in which the data were reported back in the forties. But the method is somewhat unorthodox. Balance sheets usually exhibit a liquidity classification: current and fixed, or current, intermediate, and fixed. The liquidity classification provides for more meaningful analyses--especially of liquidity. Why not use it?

Next, consider the approach taken in measuring savings and investment behavior and wealth accumulation. In two current studies (23, 27), analysts use so-called capital flows accounts, personal income and outlay accounts, and capital finance accounts as points of departure in examining these issues. Again, in a financial accounting view, the approach seems unorthodox. It is more common to start with the income statement and derive retained earnings, adjusted for equity withdrawals, as a measure of equity growth from which various hypotheses on savings and investment behavior might be tested. The balance sheet shows the beginning and ending stocks which have changed with the income flows. SAUF then reflects changes in financial position and provides further detail on how various kinds of funds were used. In short, there seems to be excessive reliance placed on SAUF accounts, including capital flow and capital finance accounts to do the analysis; such a reliance might be reduced with more consistent statements of income and wealth.

Consistent FIS and BSFS would show retained earnings (additions to equity) on the income statement equalling the change in net worth between balance sheets formulated at the beginning and end of the accounting period, respectively. These equalities must exist if the statements are to be certified as true, consistent reflections of the productive performance of the economic unit being studied. The linkage between income and wealth is based on income generated from production activity including changes in values of current inventory items. Unrealized capital gains or losses play no part in these accounts. Only realized capital gains or losses influence the balance sheets, and they are treated as income or wealth on the income statement as well.

What can be said of this inherent linkage of the income statement and balance sheet for the farming sector? Very little. It is well-known that the statements cannot be easily reconciled and why they can not. As an example:

> It (the balance sheet) has used current market values of assets rather than book values as is customary in industry accounting. ...Further, data are not available to reconcile the balance sheet statement with farm income or flow of funds statements as is usually possible in corporate and other business financial reports (31).

If there is serious intent to report the economic performance of a "national farm", corporate or otherwise, why not produce a consistent, integrated annual report like that of any corporate firm required by law to report to its shareholders?

Of course, there are problems of asset valuation, intrasector flows, withdrawals of equity by departing farmers, farm consolidation, home consumption of produced goods, and proper recording of depreciation; but these can be dealt with, as they are now, as long as there is some attempt to produce a consistent, logical set of accounts. This does not necessarily mean exclusive use of book values for agricultural assets, which would lead to some ridiculous treatment in the case of land valuation. Some periodic revaluation or other adjustment may be warranted to better reflect real wealth and to better permit comparisons with other industries. But, by the same token, annual recording of unrealized capital gains on fixed assets as a source of wealth without also recording it as a source of income seems arbitrary.

Another point of inconsistency is that the income statement excludes net returns to the nonfarm landlords. The BSFS, however, blends together the farm and household assets, including those owned by nonfarm landlords. This characterization was adequate when the residence of the farm population was closely linked to the members' occupation. But this inconsistency in the treatment of nonfarm landlords is inadequate and needs to be changed.

The SAUF statement originally proposed by Penson, Lins, and Irwin (20) tried to accomplish the difficult, if not impossible, task of reconciling a farm income statement and a balance sheet of the farming sector which were not consistent. The account was originally published by USDA in Agricultural Finance Outlook, but it apparently received little use. Its usefulness was further limited because comparable SAUF statements in other sectors did not exist. More recently, because of the difficulties associated with SAUF, there has been a shift to reporting cash sources and uses of funds. Until the consistency between the FIS and BSFS is improved, linking balance sheets with income statements by using a SAUF statement is of questionable value.

Researchers generally recognize that supplemental capital accounts to the BSFS are needed. Similar capital flows accounts have been published by Simunek and Penson. The advantage of these accounts is their separate accounting of capital formed in the farm business. They also provide useful information about the change in productive capacity by monitoring net additions to the capital stock and they can identify the source of financing used to acquire the capital stock. However, to estimate the capital accounts, additional information is needed to identify the increase in debt actually used for purchases of capital stock. Furthermore, classification of the capital flows accounts either by establishment or by product concept is still needed.

THE A.I.W. SIMULATOR

The A.I.W. simulator has been used for forecasting and policy analysis within USDA since 1974. Its very use in USDA qualifies it as an important estimation tool. Yet there has never been a formal review or independent testing of the various properties of the model. Of course, the lack of formal documentation as well as the complexity of the model may have discouraged potential reviewers; nevertheless, those who rely on the estimates of the simulator should understand its properties and appreciate its capabilities and its limitations. 6/ It is hoped that a USDA

6/ Our major source document used in this model is the dissertation by Penson (19). A limitation of this source document is that it refers to the original version of the simulator. Subsequent changes have not been documented.

bulletin describing the model will soon become available. In the interim, some review comments may be helpful.

The major theoretical framework of the simultaneous portion of the model is the "portfolio balancing" theory. According to Penson "...the conceptual and statistical models developed in the present study (by Penson) draw heavily upon the theory of portfolio balancing first advanced by James Tobin..."(19). The result of the portfolio balancing theory as applied by Penson is that investors simultaneously consider the complete range of assets (physical and financial) when formulating their desired portfolios.

We claim that the "portfolio balancing" theory developed by Penson to account for simultaneity of demand between physical and financial assets is conceptually inadequate because the impact of risk is not included. Simultaneity in the demand for assets could be deduced between assets either by assuming a production function in which the inputs simultaneously determine the output or by assuming an uncertain environment in which investors are expected utility maximizers and the covariances between the probability distributions of investments determine, along with expected prices, whether two investments are complements or substitutes. Neither of these approaches was used in the development of the A.I.W. model. Instead, a utility function in a certain environment was assumed. Thus if wealth is assumed to be the source of utility, it is difficult to rationalize why an investor would ever invest in any assets other than those producing the greatest expected return.

Tobin justified the portfolio balancing originally because of investors' aversion to risk. Tobin wrote "the principle of not putting all your eggs in one basket" explains why a risk-avoiding investor may well hold a diversified portfolio even when the expected returns of all assets in it are not identical. Tobin later formalized this intuitive argument for simultaneity into a mean-variance analysis in which the investor's expected utility function and the expected returns and variances and covariances on individual investments determined the simultaneity of demand (29).

Since Tobin's work, expected utility theory has been widely used and with generally favorable results to explain individual investment behavior. Financial economists have formulated fairly complete theories of "portfolio balancing" that simultaneously treat assets and liabilities (26). However, because expected utility theory applies only to individual investors, little empirical work has been done in aggregative statistical models employing the results of expected utility theory.

A further improvement in the A.I.W. model would be the separation of the "contrived" from the "observed" data series. Contrived series are those not obtained from sample information or from data sources which actually measure the data series in question. Two examples in the A.I.W. model are real estate debt and short term debt held by individuals and others. Including these contrived series along with the debt series for which reliable estimates are available, places the simulator in the position of estimating the estimates--and perhaps confusing the actual relationship which can be measured. 7/ If the "contrived" estimates are needed to complete the financial accounts, then they should be entered as identities using the formula from which they are derived.

7/ In the 1974 Agricultural Finance Outlook, the volume of outstanding short term debt is forecast to equal $47.6 billion. As it turned out, short term debt outstanding was overestimated by $12.4 billion--a sizable overstatement. Of the $12.4-billion error, $10.6 billion was due to revision in the outstanding debt held by individuals and others--a series for which annual estimates are not available.

One final comment relative to the A.I.W. model is the excessive use of lagged endogenous variables. As used in the A.I.W. simulator, the lagged relationship allows a dynamic adjustment to occur between desired and actual levels of the dependent variable. The use of lagged endogenous variables also implies an econometric lag structure. A possible area of investigation would be tests involving alternative lag structures.

New Techniques

An area of interest which may require the use of new techniques is construction of statistical models with risk components. Before such models are constructed, however, the limiting assumptions required to construct them need to be identified; and some theoretical foundations for aggregating individual investors' response under risk need to be provided. We introduce one approach to aggregating under risks. The stringent assumptions required to obtain such an aggregative risk model should provide a warning "to proceed cautiously" in the construction of risk models if any usable results are to be hoped for.

Assume that the mth investor possesses an expected utility function U with arguments of expected wealth (w), portfolio variance (σ) and, at the equilibrium, a tradeoff between expected wealth and variance of λ. Assume the investor's initial wealth (w_o) can be restricted to two asset choices: a risky asset x^1`, with variance o^11` and expected return (r^1`-1), and a safe asset with a certain return (r_2-2). The expected utility function for the investor could be written as:

$$(1) \quad U(\lambda,\sigma,w) = \lambda w - \sigma$$

By constraining his investment in x_1 and x^2` to allocable funds w^o`, and then solving x^2` in terms of x^1` and w^o` (x^2` = w^o` - x^1`), we can write the expected utility function in (1) as:

$$(2) \quad U(\lambda,\sigma,w) = \lambda((r_1 - r_2)\, x_1 + r_2\, w_o) - x_1^2\, \sigma 11$$

Maximizing equation (2) for x^1`, we obtain the demand curve for x^1`as:

$$x_{1_m} = \lambda_m (r_1 - r_2) / \sigma_{11}$$

Assuming all investors face identical distribution for the risky asset and assuming that the individual purchases of x^1`do not affect the distribution, we can aggregate the demand for x^1`for all m individuals as:

$$(3) \quad \sum_m X_{1_m} = (r_1 - r_2) \sum_m \lambda_m^1 / \sigma_{11}$$

Next taking logarithms of the aggregate demand function, we obtain the linear relationship between expected return and variance common in aggregate risk models:

$$(4) \quad \log(\Sigma x_{1_m}) = \log(\Sigma\lambda_m) + \log(r_1 - r_2) - \log \sigma_{11}$$

One more restriction is needed before equation (4) can be estimated. Since the expected returns and variances associated with investment choices x^1`and x^2`, are parameters which may change over time, the sum of the λm's must be assumed to remain

constant, implying that, on average, investors display constant absolute risk aversion. 8/

More complicated results for investment models of more than one risky asset along with income and substitution models have been derived elsewhere (25). Our emphasis here is to identify the severity of restrictions required to obtain even a simplified aggregate risk model. These restrictions require the following: (1) that an investor's isoutility function is approximated by a linear tangent line with a slope determined by his individual expected utility function, (2) that each investor is facing the same distribution for his choice of risky assets, and (3) that on average investors display constant absolute risk aversion.

Investors choosing farm plans on the basis of means and variances are not likely to face identical distributions in their choice of risky assets and are likely to display decreasing absolute risk aversion. Thus, the aggregation breaks down. Overcoming the aggregation difficulties will be a serious problem facing those who construct aggregative risk models, and it is hoped that some new techniques can be developed to solve the problem. We encourage researchers to face the problem directly so that later empirical results are usable.

CONCLUSIONS

The development of an integrated set of economic accounts is needed for the agricultural sector. Moreover, we suggest that the focus of these accounts should be on the farm business and its production activities. A description of the kinds of accounts needed seems generally agreed on:

> An income and product account to measure value added in the sector; a capital flows and capital finance account to monitor changes in the capital stock and its manner of financing;
>
> A balance sheet account to monitor additions to capital;
>
> A sources and uses of funds statement to monitor financial flows; and
>
> Personal income and outlay accounts for target groups of farm sector participants, provided they can be identified and the required data collected.

Those who currently maintain our FSFA's deserve our support and respect. They already are working to implement some of the changes suggested here. However, limited resources and the costliness of acquiring new data have resulted in limited progress. We hope our remarks and this workshop will help focus attention on an important need, accurate farm sector financial accounts.

8/ The negative exponential utility function which gives rise to equation (1) exhibits constant absolute risk aversion.

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NEW DIRECTIONS IN FARM SECTOR ACCOUNTING PROCEDURES AND ESTIMATION TECHNIQUES: DISCUSSION

By John C. Moore and George D. Irwin*

Lindon Robison picked his program participants well with his initial selection of George Irwin to review the final paper. Unfortunately, the real expert could not be here and I was asked to substitute. I must admit that my exposure to this area has been quite recent. I will attempt to keep things general and to leave the more technical discussion to the experts.

Robison and Barry have brought out, in their article, some of the problems with farm sector accounts that researchers have been struggling with for some time. The ERS (now part of ESCS) staff had a major effort underway back in 1968 when they undertook to review ERS research in agricultural finance. One of the study groups, in particular, went far in describing needed changes in the Balance Sheet of the Farming Sector. In the early seventies, the ERS in-house Farm Income Committee provided insight into suggested improvements in the Farm Income accounts. And, most recently, the Farm Income Task Force Report provided an outsiders' look at the current methods and techniques for estimation of farm income statistics in ERS.

The Robison-Barry article appears to draw considerably from these earlier studies. This is not a fault, but it may now be time to begin accepting these earlier suggestions as well as the ones Robison and Barry make and to begin attempting to fit the accounts together in a new framework. Why not take the accounts as outlined in the Farm Income Task Force Report and lay out some recommendations for making the balance sheet and flow of funds accounts consistent with it? We need to begin to implement many suggestions already made. We need also to begin identifying the costs versus the benefits of the ideas under consideration. I will make a few specific comments on the Robison-Barry article and follow these with a list of possible objectives for farm sector finance accounts.

The authors attempt to assess the usefulness of farm sector accounts. The endeavor is crucial, I believe, since we need to be aware of the demand side of the equation before we can seriously discuss the farm sector financial accounts. But the task is quite difficult and, I believe, not handled adequately in the article. To measure usefulness or demand for these accounts by noting the references to them in academic journals hardly represents a very accurate criterion of their usefulness. Certainly the accounts were considered by their designers to be more than simply a system of accounts for academic personnel.

The authors do admit that the accounts are used by many Government economists, policy advisors, and others with national interests. I would guess also that extension workers in the public policy area, as opposed to authors within the American Association of Agricultural Economists, depend heavily on this series. I might add to that list, the use of these accounts by financial institutions. We in the Farm Credit Administration regularly provide our banks, our board, and the Congress with information derived from these financial accounts.

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An important question seems to follow from the lack of reference to these accounts in the academic journals. The observation was made that these researchers, worried about their respective State economies, may find the national totals uninteresting. But why is this so? Are these researchers misguided or are the accounts constructed so as to be of little use below the national policy level? If these researchers are simply more worried about their own State economies, then the recent attempts to publish the balance sheet accounts on a State basis may improve their usefulness considerably.

The authors suggest that, to stimulate interest and involvement in these accounts by academic economists, the accounts could be disaggregated and summed for national estimates. The idea has considerable merit. But it is still questionable as to how involved university economists can become, especially in the theoretical aspects of these accounts that must remain the primary responsibility of economists working at the national level. However, conferences such as this one may contribute significantly toward improving the involvement of these researchers.

I think we can safely say that the farm sector financial accounts are useful to a variety of people--even to some academic economists. But this value may not be as important as how the accounts are used. Knowing their use may help us determine what changes in design should be considered. The authors list a series of questions that they speculate might be relevant questions to ask of these accounts regarding economic performance at the sector level. But they make no assessment of whether the accounts are actually able to answer these questions. In all fairness, however, such an assessment would be extremely difficult. The authors do correctly point out that not much can be said about performance measures within the sector, mainly because the aggregate data are not generated from individual farm accounts in the first place.

Certainly the producers of these accounts need to be careful that the meaning and the shortcomings of the accounts are well understood for those many nonacademic types who do use the data. I do not believe that current resource allocation in ESCS has permitted that job to be done as often as it should. I believe the last major effort occurred in about 1970, when the USDA series, "Major Statistical Series of the U.S. Department of Agriculture," was published. 1/ Just what precautions do the producers of these accounts need to provide for the users to keep them up to date with the latest improvements? This is an important question.

Another point concerning the use of these accounts is the authors' stated need for accurate and conceptually correct accounts. While the goal is certainly laudable, minor inaccuracies in the data base may be better than not having the data available at all. Policy decisions are often not sensitive to minor variations in the data. In many cases, it is sufficient to have data that can be accurate only in pointing the direction and rough magnitude of change. Policymakers must go on in their decisionmaking, lacking the luxury of waiting for perfectly accurate data to be produced.

In one section of the article, I was left somewhat confused on whether the authors are calling for the measurement of the farming sector or the food and fiber sector. The Carlin and Handy article recommended an integrated system of accounts to describe what they referred to as the food and fiber sector, but Robison and

1/"Major Statistical Series of the U.S. Department of Agriculture, How They are Constructed and Used," Agricultural Handbook number 365, Vols. 1-11.

Barry recommend a system of farm sector accounts as suggested by Carlin and Handy. Are these accounts meant to be the same? Are the author's recommendations meant to tie into the work Eldon Weeks is doing on a modeling of the food and fiber sector?

Another difficulty with the article is its focus on the farming sector as a business corporation without consideration that welfare considerations and income distributional impacts may be of equally vital public concern. I think Bob Reinsel mentioned earlier in the conference that it is becoming increasingly difficult to know whether we want to talk about the agricultural production sector or the welfare of people. We may need to let this question remain open. The well-being of the vast majority of the people who live on farms may be as important a question for policymakers as farm production accounts for those few large farmers who produce the bulk of the farm product.

We certainly would have difficulty keeping track of any structural changes among the large number of small and part-time farmers, if we limit the account focus to the business corporation concept. It is logical to use two sets of accounts to describe the two groups. We should maintain both, at least until we can see a better justification for making a choice between measurement of the production sector versus the welfare of the farm sector participants.

There is a difficult phasing-in problem with a system of new accounts since I think we must admit that the current system is widely used. The phase-in will require a major commitment of resources for several reasons:

(1) The old accounts must be kept going while the new ones are being phased in.

(2) Many of the suggested improvements require new data to be obtained from agencies outside ESCS.

(3) The current ESCS staff is already fully occupied and thus in a poor position to make any revisions.

There may be an opportunity to capitalize on the emphasis given the commodity outlook groups in recent years. Perhaps new data being obtained as a result of the commodity initiatives can be adapted to income accounts. Irwin argued in his critique of the Farm Income Task Force Report that "it would seem efficient to integrate commodity data by product account with the farm income work."

The 1978 ESCS budget calls for an increased item for statistics on rural credit in the amount of $300,000. The research justification is in terms of the performance of rural credit markets. But perhaps data collected for such a project would provide some background for going toward a revised system of farm sector financial accounts. There is a particular need to demonstrate that such data can be collected, especially since SRS rarely collects anything other than physical data. As was pointed out by Steve Guebert earlier in the conference, financial data for individuals do create significant respondent refusal problems.

The section of the article labeled "New Techniques" leaves me somewhat confused since the authors failed to show how or if these new techniques relate to the question of the needed data series. They need to carry their work further in demonstrating how statistical models with risk components can be useful in designing a new or revising an old system of farm sector accounts.

It might be useful at this time to list a possible set of objectives for new farm sector accounts:

(1) Measure the production sector.

(2) Measure the well-being of various groups.

(3) Measure the various commodity sector groups.

(4) Make consistent with National Income Product Accounts and Federal Reserve flow of funds accounts.

(5) Construct first with aggregates in mind and second with disaggregation in mind (at least as far as budget allocations will go.)

(6) Construct with annual data on aggregates and with 5-year benchmark data on disaggregates.

(7) Link across the food and fiber sector as a measurement of coordination and control in agriculture.

(8) Combine with a clear users manual that will help reduce some of the misuses we have noted throughout this conference.

DISCUSSION

COMMENT: I would like to respond to several issues raised in the Robison-Barry article. I concur that my use of Tobin's portfolio balance theory was a naive attempt at incorporating the effects that risk might have on the portfolio balance struck between physical and financial assets. I probably stated too strongly that the theory of portfolio balance was heavily used. But work by Chau, Hamburger, and Hammer clearly documents the need for simultaneity on different grounds. I have suggested elsewhere that we try to incorporate risk in a more meaningful manner into the AIW simulator. Efforts are underway to do this.

There was also a comment that we shouldn't begin trying to model contrived data series. If the data series is, for example, taken as a ratio, then we ought to be modeling that part of the series that is observed. We could use ESCS conventions and definitions to come up with the totals. I agree with that, but sometimes these conventions are hard to find. If, in fact, a model of this nature is evaluated in terms of its forecast ability, it becomes very important that these contrived data series be incorporated in the manner suggested.

As to too many lagged endogenous variables in the AIW simulator, I agree that we need to look at other lag structures. But I don't think we can say definitely that some other lag structure will be better than the geometric one. The technique for incorporating the geometric lag structure now used in the model does save on degrees of freedom. As to whether the model has lag coefficients greater than one, I understand there are only one or two functions in the model with that property. In those particular cases, the functions should be refit.

COMMENT: One of the reasons we can develop the types of accounts proposed is that we have much more data available for agriculture than for other sectors. I think it would be very useful if the various financial accounts were presented with a line number for each item. We could then determine how the various accounts overlap and what the sources of data are. We could easily see what similarities exist among various accounts.

COMMENT: One point that I disagree with in the Robison-Barry article is the assumption that farm income data now represent information for a family farm. For example, the receipt side numbers have nothing to do with family farms. These are strictly a measure of total receipts from farm production.

COMMENT: Part of the confusion might come from the fact that ESCS also publishes data on the off-farm income earned by farm operator families.

COMMENT: I am not sure why that particular data series was started. My point is that I am not sure why we started relating farm income statistics to the family farm.

QUESTION: I have a question for Barry and Robison. You came out fairly strongly in favor of a product concept of accounting. What in your own mind swayed you in that direction as opposed to an establishment type of concept that could be used for welfare assessments? I believe that if you push in one direction, say for product accounting, then by implication you ignore the other because of our limited resources.

ANSWER: One of the things we identify is the fact that it is extremely difficult to get at welfare assessments with the current structure of data. It is much easier to move to a product type of concept. What we were endorsing was an integrated set of income and product accounts.

QUESTION: So your emphasis on product accounting is based upon the ease of doing it, rather than on the need for it?

ANSWER: No, it depends upon the questions that can be answered with the set of accounts that is being proposed. I am not sure that if you want to make welfare implications that the appropriate break is farm operators. Perhaps there is some other more meaningful measure of welfare assessments.

COMMENT: One thing that has bothered me throughout this discussion is the definition of welfare. There is not a one-to-one correspondence between income and welfare. Certainly income might be some sort of indicator of changes in welfare but it is not the same.

COMMENT: We have talked about more than income. We have also included wealth. But there is also more to welfare than income and wealth.

COMMENT: I would like to comment on the discussion here about the 1972 farm income task force and its report. I don't think we should attach undue meaning or any novelty to its recommendations. It was simply a job in which six men were teamed together and each set up as a specialist. We worked about 6 months each, half-time, to cull the literature of economic accounting for agriculture. We looked at the system of national accounts and gleaned what seemed to be the best ideas. It took about 1½ years of professional time. I think the results were worthwhile. Many people said that these were new suggestions. But most of them were not.

One component of the 1975 task force report, in essence, endorsed the 1972 task force proposals. The 1975 task force report recommended how to get the data and what modifications are needed to improve data, particularly those which go into preliminary estimates.

As to the current efforts to construct a set of accounts for the food and fiber system, there are fewer hours committed to the effort. This approach makes one consider much more complex interrelationships among the sectors in the food and fiber system and the relationship of these sectors to the economy and the rest of the world. A rough draft paper is now being prepared on the logical structure and recommended accounting rules for the aggregate accounts.

COMMENT: It has been mentioned that there have been several attempts to integrate the balance sheet and income statement. Several years ago, Simunek prepared an article on the relationship between the balance sheet and income statement. It seems to me that it was a very useful product. It is a good way to explain the changes in the balance sheet. I believe it would be a useful idea to make the Simunek article an integral part of the balance sheet publication.

COMMENT: I agree. I believe that this would be a very useful supplement in the balance sheet.

COMMENT: Estimates of capital gains are now published in the balance sheet. But when we get to the question of reconciling the balance sheet with the income statement, we must recognize that there are two or three definitions of farm income.

QUESTION: Looking at that table proposed by Simunek I notice that real-estate transactions are going down. Could you explain why the constant dollars of real estate as recorded in the balance sheet are going up?

ANSWER: The reason for that is because someone's methodology is probably wrong. There is an arbitrary adjustment of the constant dollar values for orchards, and so

on. One could make the constant dollar value of the balance sheet reflect the constant dollar investment in the capital flows account. That decision needs to be made.

COMMENT: The current effort now is to go from current market value back to the reconciliation. It makes more sense to me to start out with them reconciled and then go to the current market value basis.

COMMENT: The problem with that is that real estate values are now estimated in current market values.

COMMENT: In talking about the amount of capacity depreciation, the amount of capital consumed during the year, and declining values, Robison-Barry suggested that increasing risk may describe a large part of the difference between capacity depreciation and declines in price. They then conclude that the depreciation series now published by ESCS should not be changed in any significant way. This seems to suggest that they want the basic definition behind that series changed to include something besides capital consumed.

QUESTION: Does your capacity depreciation series reflect the actual physical capacity of that machine at that point in time? Suppose you have something approaching the one-hoss shay capacity depreciation schedule. Assume a machine works for 10 years and then suddenly falls apart. Now if it is well known that a piece of machinery is going to fall apart at the end of 10 years, wouldn't the price reflect the farmer's knowledge of how close he is to that point when it will fall apart?

QUESTION: Given that argument, why would price decline the most in the first year?

QUESTION: Shouldn't your productive capacity theoretically include the discounted current value of future productive streams?

ANSWER: We would argue then that one has moved to economic depreciation as opposed to capacity depreciation. To me, that kind of logic explains the difference between the amount of capital consumed and price. But there are other things that are captured in price as well.

COMMENT: It is not really economic depreciation because the machine has not yet worn out. There is some deterioration in the steel that one cannot detect. The machine can wear out but one can't determine this by its productive capacity.

COMMENT: As long as the machine continues to perform the same function, I don't see why one should record the depreciation until it is actually consumed.

COMMENT: But in the one-hoss shay case, the item wears out because something in the structure of metal causes it to fall apart after 10 years. You should be considering that it is wearing out even though you may not be able to detect it in what the machine does.

COMMENT: But if we have a capital stock series that we want to use in a production function relationship, we would certainly want to represent a tractor as the services that it provides at the point in time that it enters into the production function.

COMMENT: But that may not be relevant for a set of financial accounts.

COMMENT: Yes, it would be as long as one assumes that the farm is not going to go bankrupt. We are not suggesting that you drop the current series entirely. But if econometricians want to work with production functions and investment functions wherein the behavior is described by how much productive capacity the farmer wants, they ought to publish a set of capital stocks based upon the way the machines wear out.

QUESTION: If that machine changed hands between two operators, how would it be valued?

ANSWER: Presumably, it would not drop in productive capacity if I sold it to you.

COMMENT: But I would consider the fact that the machine has only limited life remaining. This would determine the price that I would be willing to pay.

COMMENT: Given the ESCS definition of depreciation, I would still argue against changes in the depreciation figures. An important capacity of a machine is that it doesn't break down. A new machine doesn't break down as much as an old one. That capacity is being lost when the machine gets older. Even when it is functioning properly, the probability that the machine will break down increases as it gets older.

COMMENT: That is correct. But the way the depreciation series is calculated now, the machine is considered to be much more of a risk in the first few years than in the later years.

COMMENT: One explanation is that the warranty expires after 1 or 2 years. I would argue that an important capacity of the machine is lost over time.

COMMENT: It seems to me what should be recorded is the actual loss in productive capacity. Not what one thinks might be lost. Price in fact will pick up part of the difference.

COMMENT: I am saying that the price actually does reflect what is lost.

COMMENT: Yes, but it also measures much more. I believe that the depreciation series in a capital flow account should represent the amount of capital that is consumed.

COMMENT: And I would argue that part of the capital being consumed is the machine's reliability.

COMMENT: But its reliability doesn't affect the production function at all.

QUESTION: Leaving reliability out of it, how can you argue that the productive capacity does not reflect how much of the total life of the machine is used up? Suppose you have a tractor that in the first year loses only 1 percent of its reliability but it has a useful life of only 10 years. Wouldn't I be fooling myself if I put in the account that it only depreciated 1 percent the first year? Shouldn't I put in there that I used 10 percent of it this year? In the first 9 years, I would be way overstating my income and in the 10th year I would be understating it.

COMMENT: I think we are confusing the two issues. First of all, it is not being suggested that capacity depreciation be used in income measures. Rather it should be used in production function analysis.

COMMENT: There is some confusion. We suggest that our capacity depreciation definition match the definition that is suggested in the current farm income series. So, if a broader concept is needed for the farm income account, fine.

COMMENT: We have talked for some time about various financial accounts--how they interrelate and how they might be used. Can we spend some time nailing down how we define the various segments of the production sector? Many of the arguments concerning differences in definition could be resolved.

COMMENT: Getting a consensus of more than one may be difficult. We now have a large number of accounts and one is tempted to throw up his hands and say what is the use. But perhaps this is a necessary step in the development of better accounts. Maybe we are not yet ready to define boundaries of our accounts.

COMMENT: I am worried that we publish too early some of our exploratory forays into new accounts. I think when people see published official accounts, with accounting frameworks that we as a group have not settled on, then we invite skepticism later on.

COMMENT: I am convinced that we don't know what the boundaries of the sector are. We haven't decided yet.

COMMENT: I don't think that is your concern in this group. Income figures and some other data are being collected for a farming sector. It's what's being done with that sector that is very troublesome right now.

COMMENT: We don't really know what constitutes the sector we are collecting the information for.

COMMENT: The sector has been defined and data are being collected for it. Whomever they collect income data for and put down in the income situation--that's your sector. The balance sheet is being collected for the same people.

COMMENT: You are telling me that we don't have any alternatives. I think we do.

COMMENT: But within the alternatives, problems exist right now in what you are doing.

COMMENT: We are developing sets of accounts here that go beyond what we have in the sector part of the income account.

COMMENT: I disagree. I think you are working with that same data and we are talking about the same sector.

QUESTION: I certainly would like to have annual data on borrowing by purposes, depreciation, use of investment credit, and on own-account capital formation. There also seems to be some need for improvement in obtaining data on purchases of real estate from discontinuing proprietors. What are our chances of using the annual farm expenditures survey for getting such data? Is this survey planned for the future? Can we count on it and what do we have to do to justify getting our questions on it to improve our data?

ANSWER: First, there will not be a survey next year. Second, if you are going to get more data, then someone has to decide what to cut out. There's a great deal of effort now by the Office of Management and Budget to restrict data collection, not only in the number of surveys but in their length.

QUESTION: What about the possibility of adding questions to the Census Bureau Survey?

ANSWER: After talking with Census personnel, I would say the chances are good that they will have a finance followup survey in 1978. They are about at the stage where, if you have suggestions on what should be on this next survey, it would be good to get them in.

CONCLUDING COMMENTS

We anticipated many results from this workshop. In planning the conference, what we hoped to do was to identify the differences and unique contributions and limitations of the various farm sector financial accounts. And I think we have largely achieved these aims through some good papers and lively discussion. Several observations can be made as a result of our discussion.

There is considerable difficulty in identifying the farm sector for which we want to define financial accounts. Some difficulties are associated with publishing accounts that we haven't fully resolved. Some new directions in our farm sector accounts can generally be agreed on, but lack of resources now and perhaps even more stringent limitations in the future may inhibit progress. Nevertheless, whatever progress or changes may be made in our farm sector accounts should begin by answering the question: "Who needs the account and for what questions?"

We ought to do something based upon the results of this conference other than publish them in a book that will get put on the shelf somewhere. We plan to draft a set of recommendations that will be given to ESCS supervisory personnel for actions to be taken. We appreciate the effort that each of you have put forth to make this workshop a success.

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