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FLOW-OF-FUNDS ACCOUNTING

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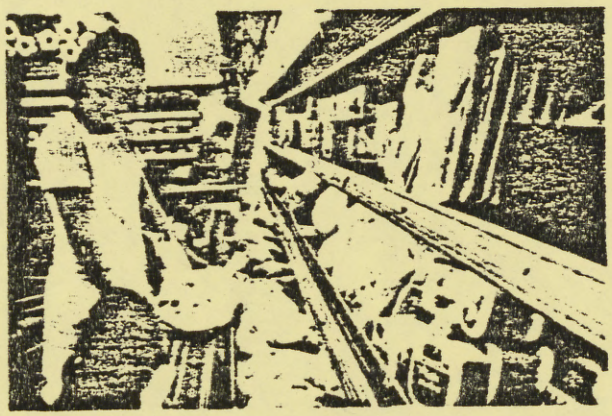

UNITED STATES DEPARTMENT OF AGRICULTURE

FARM SECTOR APPLICATION OF FLOW-OF-FUNDS ACCOUNTING

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ABSTRACT

This paper assesses the impact of existing financial data gaps and specifies future data collection priorities that will substantially improve farm financial analysis. Development of farm sector financial accounting has been hampered by a lack of an understanding of Flow-of-Funds (FOF) objectives at the national level and the intermingling of FOF concepts with National Income and Product (NIPA) accounting concepts at the sector level. In addition, lack of documentation of data sources and data estimation methodologies has blurred the issue of data quality and in turn retarded both the development of improved data collection procedures and farm sector accounts.

Keywords: farm income, balance sheet, finance, flow-of-funds, national income and product accounting.

FARM SECTOR APPLICATION OF FLOW-OF-FUNDS ACCOUNTING

Farm sector borrowing has historically outstripped the increase in farm sector financial assets. In response to this outcome, farm financial analysts have been attempting to develop financial accounts to explain past debt increases in terms of sector cash outflows. Within these accounts, purchases of real estate from discontinuing proprietors are cited as a major cash outflow. As conceptual shortcomings to explain total cash flows became apparent, the sector application of Flow-of-Funds (FOF) financial accounting has been expanded to include consumption expenditures, personal taxes, and nonfarm investments. Their empirical measurement has proved elusive however.

Financial analysts have attempted to bridge these data gaps by use of secondary data and most recently by residual estimates. Unfortunately, lack of documentation of data sources and data estimation methodologies has blurred the issue of data quality and in turn retarded both the development of improved data collection procedures and financial economic accounts. The purpose of this paper is to assess the impact of existing financial data gaps on the farm financial accounts and to specify future data collection priorities that will substantially improve farm financial analysis. A review of past financial accounting efforts is first needed to understand the rationale of present day financial accounts and their supporting data. Only then can future data collection priorities be accurately specified to support any existing or proposed farm sector financial account.

Historical Development of Farm Financial Accounts and Their Rationale

Tostlebe and Johnson's analysis of farm sector financial flows encountered a major dilemma. No saving occurred during 1954 to 1958 as cash funds from capital consumption allowances and the increase in debt exceeded the cash uses of funds to acquire capital, to increase financial assets, and to increase inventories (table 1). Johnson was naturally skeptical, warning "it hardly seems reasonable to assume that net income made no contribution to net investment during the period 1954-58" (Johnson, 1963, p. 377).

The illusion of continual net cash disinvestment arises in the Tostlebe and Johnson account because capital consumption allowances at replacement cost value and total farm debt increase are questionably included as capital finance (Smith). Replacement cost valuation of balance sheet assets and capital consumption allowances are needed for interindustry comparisons, calculating rates of return, and productivity analysis. However, book value capital consumption allowances determined under Internal Revenue Service regulations are the internally generated funds permitted to be charged by farmers for asset replacement.

A second adjustment required in the Tostlebe and Johnson account in order to accurately and consistently monitor financing of capital formation is to split total farm borrowing between capital borrowing and borrowing for all other purposes. Tostlebe and Johnson did not separate capital borrowing from total farm borrowing because information about loan purposes was lacking.

Development of an account monitoring the financing of farm capital formation as defined by Tostlebe and Johnson was not pursued. Following researchers added sources and uses of noncapital and nonfarm funds to their farm sector financial accounting statements. This path of development probably occurred because financial analysts desire accounts to explain total cash and debt flows.

Melichar and Doll increased the use of funds by adding an estimate for proceeds withdrawn from the farming sector by the sellers of farm land (table 2). The dilemma encountered by Tostlebe and Johnson of net cash disinvestment was indeed resolved as positive savings now occurred each year. Melichar's reaction to this result? "Knowing the past capital flow opens up a whole new world of analysis" (Melichar, 1973, p. 320). The analytical gain referred to by Melichar was that saving could now be estimated in the account by subtracting increases in debt from capital flows. In Melichar's analysis, internal financing is then determined from the projected savings rate and projected farm cash flow. "When this internal financing is subtracted from the projected capital flow, the projected annual increases in debt are obtained" (Melichar, 1973, p. 322).

No longer were farm financial analysts restricted to descriptive analysis. "....I note some interesting findings bearing on the underlying causes of the debt increase process - findings that raise questions about the completeness of the popular current assessment of that process. Where my story differs from the standard analysis, I take the liberty of stating the differences boldly - perhaps more boldly than they deserve to be advanced, given deficiencies of the data base and the fact that current econometric work on aggregate postwar farm financial behavior is still in the exploratory stage" (Melichar, 1973, p. 313).

Penson, Lins, and Irwin created a Sources and Uses of Funds Statement (SAUF) based on Flow-of-Funds accounting concepts by adding nonfarm income flows to the sources of funds and noncapital items to the uses of funds (table 3). Their purpose was clear. " The purpose of FOF analysis in a national economic accounting system is to relate changes in balance sheets with income accounts. For our purposes, the role of FOF analysis is to relate changes in current accounts as given in the

Farm Income Situation to changes in the Balance Sheet of the Farming Sector; to describe how we moved from one year's balance sheet to the next" (Penson, 1971, p. 7).

Brake and Barry warned that conceptual difficulties arise in attempting to apply FOF, an aggregative macro concept, to the farm sector which requires disaggregative micro measures and analysis. For example, the entry of new farmers and the exit of retiring farmers during the year introduces conceptual and practical problems that complicate Flow-of-Fund analysis. This example as well as other types of financial transactions are not recorded in either an income statement or a balance sheet. "Thus a SAUF statement is not expected to be a perfect link between an income statement or a balance sheet; rather, it can stand alone as a measure of financial position" (Brake, 1971, p. 667).

Brake and Barry's argument was rejected. "Brake and Barry's contention that a SAUF statement is not expected to be a perfect link between an income statement and a balance sheet again reflects a monopurpose viewpoint that we consider unnecessarily limiting. Our own effort specifically was expected to provide such a link - an approach, we might add, that is consistent with much of the literature on the aggregate social accounts" (Penson, 1971, p. 669).

Two other conceptual changes were presented in the SAUF in table 4 by Brake and Barry. Gross farm borrowing is included as a source of funds and gross repayments as a use of funds. Penson, Lins, and Irwin had previously recognized that the inclusion of gross borrowing and repayment data in the SAUF is preferable to net farm borrowing. Penson, Lins, and Irwin had simply desired to introduce FOF to the agricultural economics profession by using published USDA data only. Brake and Barry introduced a second conceptual SAUF change by excluding noncash transactions such as appreciation

and inventory change. Brake and Barry state "To include appreciation in real estate as either a source or use of funds makes little sense. Appreciation is not a transaction and does not generate a flow of funds; it represents only an accounting revaluation of assets."

The exchange contained in the articles by Penson, Lins, and Irwin (1970, 1971) and the article by Brake and Barry illustrates the basic problem surrounding FOF. Combining elements of the income statement, balance sheet, and capital finance account within a single sector FOF account becomes confusing. Financial analysis is better served by disaggregated income, capital flows, capital finance, and balance sheet accounts as will be shown later.

The capital flows account (CFlA), capital finance account (CFiA), and change in balance sheet account (CBSA) in tables 5, 6, and 7 developed by Simunek are based on National Income and Product Account (NIPA) concepts. The impetus for development of the CFlA and CFiA arose from the recommendeations contained in "Farm Income and Capital Accounting--Findings and Recommendations of a 1972 ERS Task Force." The accounts represent a return to Tostlebe and Johnson's earlier work. Data that had become available from the Census of Agriculture and the Farm Credit Administration are used to split total farm borrowing between capital borrowing and borrowing for all other purposes. Capital consumption charges are converted from replacement market value to book value to provide consistency between actual internal funds available for capital financing and the need to acquire loans. For example, including replacement value depreciation of $93,478 million in the capital finance account from 1960 to 1974 instead of the book value of $64,867 million will lessen external capital financing requirements by $28,611 million. The inclusion of replacement value

capital consumption allowances in the CFiA is not consistent with the fact that farm proprietors borrowed $23,154 million of capital financing. A final adjustment in the NIPA accounts is the recognition of net transfers of real estate out of the farm sector as sector dissaving.

Opening and closing balance sheets were shown to be linked by capital flows as measured in the CFlA and asset revaluations. The CFiA revealed that internal financing was important not only for its magnitude but also because of its certainty. During the two periods of tight credit during the 1960's, internal capital finance increased to support higher levels of capital formation. "Because of the importance of internal financing, future farm finacial research needs to include investment allowances, depreciation analysis, capital transfers, and saving behavior in conjunction with past farm financial research devoted primarily to interest rates and credit availability" (Simunek, 1976).

Monitoring the production-consumption-saving process is an essential purpose of NIPA. Value of production as measured in the income and product account is divided between saving and consumption in the CFlA and CFiA. Saving is defined as current production not consumed and dissaving as capital stock consumed. The CFlA delineates the forms in which capital is accumulated, and the capital finance account monitors its manner of internal and external financing.

A circular flow of analysis is involved. Production creates income; income allows consumption and saving; saving enlarges capacity; and increased capacity permits a higher rate of production. NIPA accounts are

therefore essential for any comprehensive analysis of capacity expansion and consequent changes in income and employment levels.

But if the capital flows and finance accounts based on NIPA methods relate successive balance sheets via capital formation and financing, what purpose does SAUF now serve? This after all was the rationale advanced for the adoption of FOF for the farming sector. The response has been to yet again expand FOF financial accounting by residually estimating net nonfarm investment (Penson, 1977).

"Simunek recently estimated a farm capital flows account that, if added to the present sector economic accounting system, would identify specific sources of change in stocks of farm production capital between successive balance sheets. Yet the sector economic accounting system continues to lack an account or set of accounts that would provide analysts with information on the gross saving of farm production sector participants and the extent to which they finance their farm and nonfarm investments with internal versus external sources of funds. Without this information, analyses of the changing financial position of farm production sector participants must be viewed as partial and incomplete" (Penson, 1977, p. 49).

The justification for FOF, now modified to include net nonfarm investment as an analytic tool for farm financial analysis, was more succinctly stated by Melichar. "In recent good farm income years, how much did farmers put away in the form of nonfarm investments, and in years of poor farm income, do nonfarm investments get drawn down to finance farm investments and consumption?" (Melichar, 1977, p. 73).

Residually estimating gross capital formation in the PIOA account and net nonfarm investment in the CFiA is the basic rationale of the "new" accounts (tables 8 and 9). "This paper proposes two new accounts to the farm production sector economic accounting system, which together provide needed information on financial outcomes for farm operator families" (Penson, 1977, p. 59). Emphasis added by underlining is mine. Aggregative, as used in the proposed capital finance account, refers to the inclusion of nonfarm investment flows and not to participants which remain limited to continuing farm operators.

No difference exists between the economic accounting purposes originally advocated by Penson in presenting his SAUF based on FOF accounting and the "new" CFiA and PIOA accounts based on NIPA accounting. Both sets of FOF and NIPA accounts were presented by Penson to monitor intersector cash flows. Penson in presenting the CFiA and PIOA accounts is simply introducing a new methodology to estimate net nonfarm investment. No new account, accounting system, or accounting purpose is being introduced.

If reliable estimates of farm real estate purchases, personal consumption, personal taxes, and nonfarm investments exist or can be developed, the present farm economic accounts can be expanded to analyze the complete breadth of production, income, and financial behavior. It is for this reason that existing as well as proposed data series are reviewed for empirical accuracy.

SAUF Financial Data Gaps

Purchases of real estate from discontinuing proprietors

Data on the net purchases of real estate from discontinuing proprietors in table 9 are not collected directly but are estimated from the value of all farm voluntary and estate transfers. Outlined below is the procedure to estimate net purchases of real estate from discontinuing proprietors (Lins, 1977). 1/

PURRET = VALTRN * (1 - RSIF) * (1 - RSD)

Where:

PURRET = Purchase of real estate from discontinuing proprietors

VALTRN = Value of all farm voluntary and estate transfers (Source: USDA, 1981, table 18).

RSIF = Percentage of sellers of farm real estate who remain active in farming (0.095)

RSD = Percentage that debt owed on real estate transferred is of the asset transferred (0.111)

The value of voluntary and estate transfers (VALTRN) is not empirical data collected from farmers but is itself estimated from two sources. The number of voluntary farm and ranch transfers is collected from farmers in the February Farm Report Survey. Average acres transferred and value per acre transferred are collected in a special survey of bankers and realtors. The value of voluntary and estate transfers is then estimated by multiplying the number of transfers by average acres transferred and value per acre transferred. An error may arise in estimating the value of voluntary and estate transfers because of the lack of sufficient information by farmers, bankers, and realtors about each voluntary and estate sale. For example, in a change of ownership caused by an estate settlement, does the farmer or realtor accurately know how much is sold, traded, or given to the new owner? Or if a "sale" is actually a like kind property exchange to avoid taxes?

Farmers are asked in the February Farm Report Survey to report acres transferred from changes in ownership in their farm and for all farms that border or corner their own. While this may give a more representative indication of trends, it can result in some duplication by respondents. Another type of error occurs in the February Farm Report Survey. In the past, USDA requested farmers to supply information that would apply to all farms in the locality in addition to the operator's own farm. However, USDA found that "Experience indicated that a farmers' lack of exact information about the changes in acreages and livestock numbers on his neighbors' farms made locality answers on these items relatively unreliable" (USDA, 1963, p. 13).

The census value for all farm real estate purchased in the 1970 Census Survey of Farm Finance equals $2,287 million. 2/ Compare the census data against the 1970 value of voluntary and estate sales of $5,368 million published in Farm Real Estate Market Developments and the value of real estate purchased from discontinuing proprietors (PURRET) of $4,100 million reported in the SAUF for 1970. The magnitude of the difference is surprising, especially since the census value of purchases of real estate should be much higher than both VALTRN and PURRET for three reasons. First, real estate purchasers in the census survey include landlords as well as continuing farm operators whereas PURRET excludes purchases by landlords. Landlords purchased $228,390 million of the farm land in 1970, or approximately 10 percent of all farm land purchases. Second, real estate purchased in the census survey includes forced sales. VALTRN and PURRET do not include forced sales but are limited to voluntary and estate sales. Third, purchases of 10

acres or less included in Census are not included in VALTRN and PURRET. The census data stress the need for frequent and detailed surveys. 3/

Discontinuing proprietors

The equation (PURRET = VALTRN * (1-RSIF) * (1-RSD)) states that 100 percent of farm real estate sold (VALTRN) is by farmers. The RSIF benchmark of 9.5 percent means that 90.5 percent of those farmers selling land then discontinue farming. 4/ The equation also states that all farm land purchased is by farm operators only. All three statememts are difficult to accept. The RSIF benchmark thus provides the conceptual foundation for establishing SAUF on a "continuing proprietor" basis. Otherwise, there is no sector cash outflow. More current farm real estate transfer data indicate that net sector cash outflows caused by farm operators discontinuing farming may not be as extensive as suggested by the 1964 RSIF benchmark. Nonfarmers purchased 31 percent of the value of farm real estate sold in 1981 (USDA, 1981b, p.28). These farm real estates purchases by nonfarmers do not create a farm sector cash outflow based on SAUF concepts and definitions. In summary, both the value of voluntary and estate sales (VALTRN) and that percentage of VALTRN causing a net farm sector cash outflow to discontinuing proprietors may be significantly overstated.

Personal tax and nontax payments

Personal tax and nontax payments in the Penson PIOA are erroneously taken directly from the disposable personal income of the farm population series (USDA, 1980b). The SAUF is for continuing proprietors residing on and off farms. The farm population includes continuing and discontinuing farm operators, landlords, farmworkers, and any nonfarmer residing on a farm. Annual survey data of personal tax payments are not available. Internal Revenue Service tax

data are used to estimate the disposable personal income of the farm population series.

Off-farm income

An aggregated PIOA account including off-farm income is highly questionable if the account is not distributed by farm size. About 64 percent of off-farm income in 1980 was on farms with sales under $10,000 but with only about 3 percent of total cash receipts and less than 7 percent of total farm debt (USDA, 1981a). SAUF or any other type of FOF account distributed by economic size of farm alleviates the problem but benchmark data need to be collected for distributing farm real estate transfers by value of sales class.

Nonfarm investment

Estimates of personal consumption and personal taxes are required in the PIOA by Penson in order to permit him to estimate net nonfarm investment in his capital finance account by residual methods. Consumption data for 1973 were collected in the Farm Operator Family Living Expenditure Survey. Personal consumption for all other years in the PIOA is based on the 1973 benchmark. In the first step of his procedure, a residual estimate of total capital accumulation (gross saving) is developed in the PIOA by subtracting estimated personal consumption and personal taxes from personal income as shown in table 10. A residual estimate of net nonfarm investment is then derived by subtracting farm capital accumulation and certain financial assets from total capital finance as shown in table 11.

Debits must equal credits in NIPA accounting. Penson has taken advantage of this accounting identity to develop residual estimates of gross capital formation in the PIOA and his ultimately desired goal - net nonfarm investment in his capital finance account. Only three economic series are estimated as residuals in the farm economic accounts. Accurate data for net income, net equity, and net saving are extremely difficult to collect in an economic survey given their role assigned for economic analysis and their subjectiveness arising from the net concept. However, estimates of gross farm income, gross farm capital formation, and gross farm capital in the USDA farm economic accounts are based on annually collected empirical data.

But Penson has outlined his estimation procedure to estimate gross nonfarm capital formation in his PIOA. For this reason, no user of the proposed account can say they have not been forewarned of its limitations. Others find the methodology of residually estimating gross capital formation in the PIOA objectionable as it violates the basic tenets of NIPA accounting. The NIPA accounts are regarded by many of its adherents as much of an economic data collection system as an economic accounting system. NIPA accounting, by establishing objectives, concepts, definitions, and individual accounts, forces systemizing basic economic statistics and assists in identifying statistical gaps. NIPA accounts acquire data consistency by requiring debits to equal credits and sector accounts to sum to the national account. Statistical discrepancy is the difference between the sum of estimates debited and estimates credited within a sector or national account. Confirmation of independently derived estimates may be inferred as statistical discrepancy approaches zero. The validity of statistical discrepancy as an indicator of data accuracy is diminished by residual estimates.

"Data on saving cannot be collected, given its definition and role assigned for economic analysis. However, two residual estimates of saving may be developed in the NIPA accounting framework to provide useful cross checks. Each residual estimate of saving is statistically independent of the other and a small statistical discrepancy would therefore provide support of their validity. In addition to the residual estimate of saving in the capital finance account, a residual estimate of saving may also be developed in the personal income and outlay account if independent estimates of personal consumption and taxes are available" (Simunek, 1977, pp. 46-47).

The statistical discrepancy of 12 percent occurring in the 1973 PIOA account estimated by Simunek (1978) using all available empirical data led to the following comment. "Statistical discrepancy is unacceptably high in the personal income and outlay account for farm proprietors. The inescapable conclusion is that the reliability of estimates of any and all economic aggregates contained in the national farm economic accounts is subject to question" (Simunek, 1978).

This assessment contrasts starkly to Penson's assessment that the validity of the capital finance account is largely dependent upon the accuracy of only one economic series -- personal consumption. "The acceptability of the capital finance estimates presented here hinges largely on the creditability of the personal consumption of nondurable goods and services estimate. Any measurement error here will bias the residual estimate of net additions to equity invested in nonfarm capital in the capital finance account presented" (Penson, 1977, p. 67).

Sector Application of Flow of Funds

Table 12 summarizes and compares the purposes between National Income and Product Accounting and Flow-of-Funds. No inherent conflict exists among national income accountants in applying NIPA accounting concepts and procedures at the national or sector level. No such consensus exists regarding the appropriate application of national FOF concepts and procedures at the sector level. Witness the debate contained in the article by Brake and Barry and the response by Penson, Lins, and Irwin whether the farm sector FOF account should include noncash transactions such as inventory change and capital gains. Brake and Barry exclude inventory change and capital gains from their SAUF whereas Penson, Lins, and Irwin adopt the opposite position.

The accounting treatment of inventory change and capital gains in the CFiA and PIOA under NIPA procedures is quite clear. Inventory change is a component of saving and is therefore included in the CFiA. Capital gains are excluded from the CFiA because no saving "stands behind" capital gains. Purchases of real estate from discontinuing proprietors do not result in an increase of farm capital available for production. Therefore, purchases of real estate from discontinuing proprietors are not included in the CFiA under NIPA procedures.

Terminology confusion

The NIPA definition of saving, production not consumed, is not adhered to in the Penson capital finance account. The commingling of purchases of real estate from continuing proprietors with saving in the NIPA capital finance account blurs and confuses the purposes between two dissimilar economic accounting systems. This failure to clearly demarcate the differences between NIPA and FOF accounting systems is unfortunate. Terminology then becomes confused, which in

turn confuses accounting purposes and data collection priorities. It is preferable either to use non-NIPA terminology to prevent confusion or adhere to NIPA account concepts if the NIPA terminology is retained by excluding net purchases of real estate from discontinuing proprietors from the NIPA labelled capital finance account. 5/

National Income and Product Accounting

Saving links all NIPA sector accounts. Consequently, saving links the farm balance sheet to sector and national income and product. Value of production is measured in the income and product account. Value of production is the sum of consumption plus gross saving. Net saving (net capital formation) is derived residually in the capital flows account by subtracting capital disappearance from gross saving. Opening and closing balance sheets are linked by net saving in the capital flows account and asset revaluations. Saving in the capital finance account is equal to saving in the personal income and outlay account. The personal income and outlay account relates the farm business to the farm operator family by monitoring the decision to divide personal income between consumption and saving. 6/

NIPA definitions must be rigorously adhered to if the linkage among the sector NIPA accounts is to be maintained. The integrity of the definition of saving is of critical importance since saving is the direct link among the sector NIPA accounts. This direct linkage is broken in the Penson capital finance account

by including purchases of real estate from discountinuing proprietors. Analysts are likely to confuse the purposes of the farm sector NIPA and FOF accounts if the definition of NIPA saving is not maintained. Even then farm income and financial data are often misused because data users are not always familiar with the underlying concepts. Witness the erroneous use of personal taxes paid by the farm population in the Penson PIOA for continuing farm operator families. The effect will be reverse for NIPA labelled farm sector accounts. Analysts are generally well-aquainted with NIPA and will automatically assume all data and accounts are consistently defined with NIPA value of production and saving.

Flow-of-Funds

Monitoring the transfer of cash among sectors is the basic rationale for the application of FOF concepts. The National FOF account is basically a balance sheet of all financial insitutions. The sector balance sheet provides data to construct the national FOF account. The net increase in debt in the sector balance sheet equals the net cash flowing into the sector from the central money market. A positive increase in financial assets is the net cash flowing into the central money market from the sector. Summing financial asset and debt data in the sector balance sheets will conceptually derive the national FOF account. However, the lack of sector financial data plus the tendency of firms to operate in more than one business sector has prevented the development of sector balance sheets in support of the national FOF account. The farm sector is of course a notable exception.

Combining internally generated funds measured in the CFiA with external sources of funds measured in the balance sheet within a single financial sector account will perhaps link FOF accounting with NIPA accounting. Historically, FOF accountants have pursued this endeavor in the sector financial account referred to as a Sources and Uses of Funds Statement. NIPA accountants combine internal and external financing as well as personal income and expenditures within the Personal Income and Outlay Account. The basic difference between the two accounts is the definition of saving. NIPA farm saving is always defined as current farm production not consumed and combines farm cash and farm noncash elements. No standard FOF definition of sector saving exists but it can be safely characterized as a sector gross cash flow concept combining sector and nonsector transactions of the sector business firms.

In the final analysis, the purposes and uses of any farm economic account must justify the efforts to maintain the account and to furnish the human resources and financial support to improve the account. What purposes are served by the proposed capital finance account as presently conceptually constructed within FOF even if purchases of real estate from discontinuing proprietors were accurately estimated? The proposed accounts fail to explain or predict total farm borrowing since real estate purchases between continuing proprietors are excluded. Excluding intrasector and intrafarm transactions also limit these proposed accounts in monitoring total gross cash flows.

Reviewing table 12 reveals that net purchases of real estate from discontinuing proprietors follows NIPA accounting concepts and not FOF accounting concepts because FOF entries are gross for both intersector and intrasector financial tranactions. Therefore, the contribution of the net purchases of real estate from discontinuing proprietors series is for NIPA purposes and not FOF financial analysis purposes as was initally stated in presenting the SAUF statement. Because of its NIPA concepts, a comparison of the effects of the purchases of real estate from discontinuing proprietors on NIPA farm saving is much more appropriate than a comparison between purchases of real estate from discontinuing proprietors and the increase in total farm debt.

A single conceptual adjustment will eliminate the present confusion surrounding NIPA and FOF accounting purposes and their appropriate application to the farm sector, especially regarding the proper treatment of real estate purchases. The CFlA and CFiA are sub-accounts to the PIOA, as their entries are summed into the net saving entry contained in the PIOA. Net saving in the PIOA must not deviate from its NIPA definition, production not consumed. Where then should real estate purchased from discontinuing proprietors be shown so as not to violate NIPA accounting concepts? Real estate purchased from discontinuing proprietors should be included in the NIPA sector accounts but not as a component of capital formation in the CFiA. Rather, they should be included in the PIOA with gifts, contributions, and other types of sector financial transfers in the net transfer component of personal outlays (Simunek, 1977).

Objectives of Flow-of-Funds

Financial analysts in their past development of farm sector financial accounts have tried to satisfy four objectives including (1) monitoring the contribution of farm income to farm capital formation, (2) linking farm income directly with the farm balance sheet, (3) monitoring intersector gross farm cash flows, and (4) explaining total farm debt increases. The CFlA, CFiA, and PIOA based on NIPA procedures can contribute in accomplishing the first two objectives.

On the other hand, analysts utilizing FOF concepts have been stymied by data constraints in developing a sector FOF account to monitor intersector gross farm cash flows and to explain total farm debt increases. One result of these efforts has been the examination of the PIOA and CFiA accounts based on NIPA procedures as tools for financial analysis. But do the PIOA and CFiA accounts answer the questions that have been the paramount interest of FOF analysts? The NIPA accounts yield certain financial analytic insights especially regarding internal financing. But the NIPA accounts cannot fully explain total farm debt increases nor fully monitor intersector gross cash flows as identified by Brake and Barry.

Annual collection of gross borrowing data by purpose of loan is urgently needed. With these data, the PIOA can be improved for financial analysis by including gross as well as net borrowing data. For example, gross capital expenditures for buildings and equipment in the NIPA accounts are netted for trade-ins. Borrowing data must also be on a net sector basis in the PIOA but sub-entries could be included for gross borrowings and repayments. Perhaps including these gross financial sub-entries will provide the often discussed but yet to be established linkage between NIPA and FOF (Hicks, Host-Madsen, Ritter).

However, the PIOA containing sub-entries for gross borrowings and repayments, although improving financial analysis, will still not provide all the information required for FOF analysis.

As stated previously, the CF1A, CFiA, and PIOA based on NIPA procedures can monitor the contribution of farm income to farm capital formation and link farm income directly with the balance sheet. Including gross farm borrowing and repayment sub-entries will improve the ability of the PIOA to monitor intersector gross cash flows. However, neither NIPA or FOF can fully explain annual debt increases, the fourth objective of farm sector financial accounting. The only solution is annually collecting and publishing gross borrowing data by purpose of loan.

The single sector FOF accounting approach

Further examination of applying FOF to the farm sector and relating FOF to NIPA is needed. The FOF concept as outlined in the literature stresses a single sector financial account, the Sources and Uses of Funds Statement, to accomplish the four financial accounting objectives. Contrast the single sector FOF account approach to NIPA which utilizes several sector accounts. NIPA accounts discussed in this paper include the income and product account, the capital flows account, the capital finance account, the change in balance sheet account, and the personal income and outlay account. Current FOF controversies concerning appropriate definition and transactions can the traced to the simple fact that a single FOF sector account is required to serve several functions and accomplish many objectives. FOF analysts need to either disaggregate the SAUF and/or incorporate the NIPA accounts directly into their financial analysis.

The single sector FOF account approach not only confuses accounting objectives but also de-emphasizes the importance of depreciation. This de-emphasis occurs despite the fact depreciation is the largest source of farm funds from 1960 to 1974 (table 6). No estimate of depreciation is required in the sector SAUF because gross cash income is credited and cash expenses are debited in the SAUF. This reasoning may of course be reversed. Development of a capital flows account and a capital finance account is of little interest to FOF analysts who are not as concerned with capacity expansion and capital financing as are NIPA accountants.

A third adverse effect of the single sector FOF account approach is eliminating statistical discrepancy to monitor data accuracy. This previously described effect is the most serious.

Consensus on the appropriate single sector FOF account may never develop. Several appropriate sector FOF accounts may exist depending on the financial analysis desired. A proposed definition of a sector FOF account is any economic account relating gross borrowing to one or several economic transactions. Therefore, an account relating gross borrowing with purpose of loan can be considered as a type of sector FOF account. The personal income and outlay account relating gross borrowing to personal consumption and saving is a type of sector FOF account. An account relating gross borrowing to intra-sector and intra-firm transactions as suggested by Brake and Barry is a sector FOF account. The balance sheet relating gross borrowing to gross production capital stock is of course a sector FOF account.

Summary

In attempting to explain farm debt increases, FOF concepts and methods have been urged for adoption. Yet, the purposes of FOF at the national level appear to be incompatible to linking the income statement with the balance sheet and to explaining total debt increases at the sector level. A farm sector FOF financial account is therefore needed which is more compatible with national FOF purposes than the present SAUF statement to monitor sector gross cash flows.

Explaining farm sector debt increases is extremely difficult. No consistently defined time series data is available for borrowing by purposes. Neither are data available for certain financial and real estate transactions within and between enterprises. As a result, farm financial analysts have assumed that real estate purchases from discontinuing proprietors have been substantially responsible for the past large net farm debt increases. Certain data from the 1970 Census of Farm Finance and the 1981 Farm Real Estate Market Developments indicate that this assumption may not be warranted.

Personal consumption, personal tax, and nonfarm investment data do not exist to support a PIOA account based on NIPA concepts as an analytical tool for financial analysis. Farm financial analysts must now decide what data and/or economic accounts are needed to explain past financial outcomes. The clear demarcation of NIPA, FOF, and traditional firm accounting purposes should assist in specifying data collection priorities such as net versus gross data, cash versus noncash data, operator versus landlord data, and farm versus nonfarm data. Within any accounting system, there can be no doubt that farm real estate transfer data and gross borrowing by purposes data are collection priorities.

Table 1. Uses and Sources of New Capital in Farming, by Selected Periods, Anual Average, 1945-1958

Item	1945-1949	1950-1954	1955-1958
	$ millions		
Uses of funds			
To maintain, increase, or improve:			
Land and buildings	1,160	1,740	1,260
Machinery and motor vehicles	1,980	2,900	2,040
To increase inventories:			
Livestock	- 340	140	0
Stored crops	0	220	500
To increase financial assets:			
Cash working balances	340	60	120
Financial reserves	560	220	180
Total uses	3,700	5,280	4,100
Sources of funds			
Increase in debt	840	860	1,100
Capital consumption allowances	1,740	3,300	3,060
From net income	1,140	1,120	- 60
Total sources	3,700	5,280	4,100

Source: Johnson.

Table 2. Capital Flows, Annual Average, 1950-69

Item	1950-54	1955-59	1960-64	1965-69
		$ Millions		
Gross capital expenditures:				
Vehicles, machinery & equipment ..	3.1	2.8	3.2	4.7
Buildings and land improvements ..	1.5	1.4	1.3	1.3
To increase:				
Livestock inventory	.5	.1	.3	.0
Stored crop inventory	.1	.2	.0	.3
Demand deposits & currency	.0	- .1	- .1	.1
Time deposits & savings bonds	.1	.0	.1	.3
Required by real estate purchases ...	2.2	2.7	3.2	4.2
Total capital flow	7.5	7.0	7.9	10.8

Source: Melichar 1969.

Table 3. Farm Sector Sources and Uses of Funds Statement, 1967

	$ billion	
Sources of funds		
1. Net farm income	14.6	
2. Nonfarm income	10.7	
3. Capital consumption allowances	5.7	
4. Net change in real estate debt	2.2	
5. Net change in non-real estate debt	2.5	
6. Capital appreciation of real estate assets	9.9	
Total sources of funds	45.6	
Uses of funds		
7. Total capital expenditures	6.1	
8. Net change in farm inventories	0.5	
9. Net change in financial assets	1.0	
10. Net change in deposits and currency		(0.6)
11. Net change in U.S. savings bonds		(-0.1)
12. Net change in investment in cooperatives		(0.5)
13. Total investment in real estate assets	11.2	
Subtotal	17.5	
14. Proprietor withdrawals	28.1	
Total uses of funds	45.6	

Source: Penson 1971.

Table 4. Sources and Uses of Funds Statement for the Farm Sector

Sources of funds
Farm marketing receipts and government payments
Nonfarm income
Reduction of financial assets
Sales of capital items
Real estate borrowing
Non-real estate borrowing
Cash inheritance and gifts
Total sources of funds
Uses of funds
Farm operating expenditures
Capital expenditures: land, buildings, durables, breeding livestock
Nonfarm business expenditures
Additions to financial assets
Proprietor withdrawals: consumption, income taxes, social security taxes
Real estate debt repayments
Non-real estate debt repayments
Cash inheritances and gifts
Total uses of funds

Source: Brake 1971.

Table 5. Farm Capital Flows Account, 1974

Debit	$Million	Credit	$Million
Gross capital expenditures	11,295	Capital consumption allowances	10,640
Land improvements	283	Dwellings	1,514
Dwellings	866	Service structures	2,223
Service structures	2,387	Machinery and motor vehicles	6,903
Machinery and motor vehicles	7,759		
		Net real estate transfers	1,113
Inventory change	-1,635	Land	920
Crops	-2,085	Dwellings	101
Livestock and poultry	450	Service structures	92
		Net capital formation	-2,093
Gross capital formation	9,660		
		Gross capital disappearance plus net capital formation	9,660

Source: Simunek 1976.

Table 6. Farm Capital Finance Account, 1960-74

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
	Million $										
Capital finance account											
Gross capital expenditures	4,488	4,614	5,022	5,411	5,688	6,105	6,688	7,446	6,696	6,865	7,285
Inventory change	397	336	620	629	-817	1,042	-83	657	124	99	6
Financial asset change	-446	92	352	59	354	417	323	581	583	408	543
Accumulated capital	4,439	5,042	5,994	6,099	5,225	7,564	6,928	8,684	7,403	7,372	7,834
Capital consumption allowances at book value	3,119	3,141	3,235	3,344	3,448	3,582	3,758	4,020	4,286	4,510	4,783
Capital consumption allowances at replacement value	4,337	4,388	4,530	4,696	4,903	5,111	5,384	5,781	6,200	6,574	6,760
Less: depreciation valuation adjustment	1,218	1,247	1,295	1,352	1,455	1,529	1,626	1,761	1,914	2,064	1,977
Net real estate transfers	1,494	1,588	1,562	1,148	1,452	1,830	2,139	2,599	2,429	1,700	1,936
Capital borrowing	711	872	1,006	1,166	915	1,398	1,473	1,502	933	1,084	1,092
Saving	-885	-559	191	441	-590	754	-442	563	-245	78	23
Capital finance	4,439	5,042	5,994	6,099	5,225	7,564	6,928	8,684	7,403	7,372	7,834
Cash flows											
Net farm borrowing											
Including CCC Loans	1,404	2,287	2,291	3,000	2,416	3,854	3,371	3,368	3,059	2,572	1,457
Excluding CCC Loans	1,179	1,811	2,732	3,129	2,799	3,989	3,622	3,105	1,808	2,567	2,257
Internally generated funds	3,728	4,170	4,988	4,933	4,310	6,166	5,455	7,182	6,470	6,288	6,742
Farming income of proprietors	13,860	14,545	14,811	14,721	13,566	16,267	17,544	15,868	16,040	18,136	17,896

Source: Simunek 1976.

Continuation of Table 6.

1971	1972	1973	1974	Total
7,357	8,045	10,535	11,295	103,540
1,397	861	3,627	-1,635	7,260
717	873	853	183	5,892
9,471	9,779	15,015	9,843	116,692
5,243	5,484	6,076	6,838	64,867
7,350	7,887	8,937	10,640	93,478
2,107	2,403	2,861	3,802	28,611
1,559	1,234	1,169	1,113	24,952
2,160	2,538	3,111	3,193	23,154
509	523	4,659	-1,301	3,719
9,471	9,779	15,015	9,843	116,692
4,630	6,231	8,792	7,713	57,075
4,244	6,700	9,835	8,144	57,921
7,311	7,241	11,904	6,650	93,538
18,547	24,065	41,654	35,781	293,301

Table 7. Change in Farm Balance Sheet Account, 1974

Item	Balance Sheet of the Farming Sector January 1, 1975 (1)	Balance Sheet of the Farming Sector January 1, 1974 (2)	Total Value Change (1 -2) (3)	Due to Transactions					Due to Asset Valuations (3-8) (9)
				Capital Acquired (4)	Capital Consumption (5)	Capital Assets Transferred (6)	Debt Incurred (7)	Total Transactions (4-5-6-7) (8)	
Assets($ million)									
Real estate	371,355	325,339	46,016	3,536	3,737	1,113		-1,314	47,330
Land	307,111	268,828	38,283	283		920		- 637	38,920
Service structures	30,744	26,772	3,972	2,387	2,223	92		72	3,900
Dwellings	33,500	29,739	3,761	866	1,514	101		- 749	4,510
Nonreal estate	97,781	103,397	- 5,616	6,124	6,903			- 779	4,837
Machinery and motor vehicles	50,193	39,485	10,708	7,759	6,903			856	9,852
Livestock and poultry	24,570	42,378	-17,808	450				450	-18,258
Crops	23,018	21,534	1,484	-2,085				-2,085	3,569
Financial assets	15,060	14,877	183	183				183	
Claims($ million)									
Liabilities	77,538	69,570	7,968				7,968	-7,968	
Real estate debt	46,305	41,253	5,052				5,052	-5,052	
Nonreal estate debt	31,233	28,317	2,916				2,916	-2,916	
Proprietors' equity	406,658	374,043	32,615					-9,878	42,493

Source: Simunek 1976.

Table 8. Personal Income and Outlay Account, Farm Operator Families, Current Dollars, 1970-75

Item	1970	1971	1972	1973	1974	1975
	Billion $					
Personal income						
1. Current farm operating surplus of farm operators	16.7	17.5	21.4	36.3	30.3	30.3
2. Off-farm wages and salaries, royalties, dividends and interest, nonfarm business profits and professional income, and social security benefits	17.4	18.8	20.5	23.7	26.4	28.4
Total	34.1	36.3	41.9	60.0	56.7	58.7
Personal outlays						
3. Personal tax and nontax payments	3.0	3.2	3.4	4.4	5.1	5.1
4. Net flow of disposable income withdrawn by discontinuing farm operator families	0.5	0.6	0.6	0.5	0.3	0.5
5. Repair and operation of household capital items	3.0	3.1	3.1	3.3	4.3	4.5
6. Purchases of nondurable goods and services by continuing farm operator families	14.8	15.6	16.7	18.2	22.6	26.0
7. Personal gross saving by continuing farm operator families	12.8	13.8	18.1	33.6	24.4	22.6
Total	34.1	36.3	41.9	60.0	56.7	58.7

Source: Penson 1977.

Table 9. Capital Finance Account, Continuing Farm Operator Families, Current Dollars, 1970-75

	1970	1971	1972	1973	1974	1975
	Billion $					
Capital accumulation						
Farm capital accumulation						
1. Purchases of machinery and motor vehicles for business and household use minus trade-in value	5.3	5.3	6.2	8.1	8.6	9.2
2. Purchases of capital improvements to farm real estate	2.2	2.3	2.1	2.8	3.8	3.5
3. Purchases of farm real estate minus sales	3.2	4.5	6.5	8.6	7.1	7.4
4. Net additions to household furnishings and equipment	0.2	0.7	1.1	0	0.3	0.3
5. Net additions to farm inventories	0	1.4	0.9	3.4	-1.3	2.9
6. Net additions to currency and demand deposits	0.2	0.2	0.4	0.3	-0.2	0
Total farm capital accumulation	11.1	14.4	17.2	23.2	18.3	23.3
Nonfarm equity capital accumulation						
7. Net additions to time and savings deposits, U.S. savings bonds, and investments in farm cooperatives	0.9	1.5	1.5	2.0	1.5	1.9
8. Net additions to equity in life insurance reserves, individual retirement accounts, stocks and bonds, and other nonfarm capital	3.6	3.0	7.3	19.6	13.9	6.8
Total nonfarm equity capital accumulation	4.6	4.5	8.8	21.6	15.4	8.7
Total	15.7	18.9	26.0	44.8	33.7	32.0
Capital finance						
9. Farm capital borrowing minus principal repayment	3.0	5.1	7.8	11.0	9.0	9.1
10. Retained farm earnings of individual and family-held farm corporations	-0.1	0	0.1	0.2	0.3	0.3
11. Total personal gross saving	12.8	13.8	18.1	33.6	24.4	22.6
Total[a]	15.7	18.9	26.0	44.8	33.7	32.0

Source: Penson 1977.

Table 10. Personal Income and Outlay Account

Personal income
1. Current farm operating surplus of farm operators
2. Off farm wages and salaries, royalties, dividends and interest, nonfarm business profits and professional income, and social security benefits
Less: Personal outlays
3. Personal tax and nontax payments
4. Net flow of disposable income withdrawn by discontinuing farm operator families
5. Repair and operation of household capital items
6. Purchases of nondurable goods and services by continuing farm operator families
Equals: Residual estimate of personal gross saving by continuing farm operator families[a]

[a] The residual, personal gross saving, is incorrectly labelled. The correct label is residual estimate of net farm and nonfarm investment.

Table 11. Capital Finance Account

Capital finance

1. Farm capital borrowing minus principal payment
2. Retained farm earnings of individual and family-held farm corporations
3. Residual estimate of personal gross saving by continuing farm operator families[a]

Less: 4. Farm capital accumulation

Less: Nonfarm financial capital accumulation

5. Net additions to time and savings deposits, U.S. Savings Bonds, and investments in farm cooperatives
6. Net additions to equity in life insurance reserves, individual retirement accounts, stocks and bonds and other nonfarm capital

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Equals: Residual estimate of net nonfarm investment

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[a] Source: Table 10.

Table 12. Comparison of NIPA and FOF Accounting Systems

Concept	NIPA	FOF
1. Purpose	To measure value of production and its division between consumption and saving	To measure gross cash flows from sectors with cash surpluses to sectors with cash shortages
2. Sectors	Business, household, government, and foreign	Finance, business, household, government and foreign
3. Unit of measure of business subsectors	Product[a]	Firm[b]
4. Unit of measure of transactions	Net	Gross
5. Key economic variable to monitor purpose	Saving	Borrowing and financial deposits
6. Sector account to measure key economic variable	Capital flows account	Balance Sheet
7. Sector account to relate key economic variable to finance	Capital finance account	Sources and uses of funds statement
8. Sector account to relate key economic variable to balance sheet	Change in balance sheet account	Sources and uses of funds statement
9. Sector account to relate key economic variable to income	Personal income and outlay account	Sources and uses of funds statement
10. Performance measures of adequacy	Capacity output; capacity utilization	Interest rates; rates of return

[a] Livestock and crops.
[b] Sole proprietorships, partnerships, and corporations.

Footnotes

1/ This is the basic procedure used to estimate purchases of real estate from discontinuing proprietors except that Penson has adjusted it to "net out" sales of farm real estate to nonfarm sectors. The adjustment procedure and the data required are not documented and discussed by Penson. I have not reviewed the adjustment procedure because of the lack of documentation.

2/ Real estate purchase and sales data from the 1979 Census of Farm Finance have not been released.

3/ USDA has taken several actions to improve the data base in support of existing and proposed farm sector economic accounts. A workshop on Farm Sector Financial Accounts was sponsored by the Economic Research Service in Washington, D.C., April 1977 to review NIPA and FOF accounting purposes and proposals as well as their supporting data base. Questions were added and/or expanded on the 1979 Census of Farm Finance Survey to improve farm sector financial informantion. Funding for the annual Farm Production Expenditure Survey was expanded to improve its reliability and to permit disaggregating farm production expenses and capital expenditures. Farm real estate collection methodologies were documented in "Sources and Uses of Land Value Statistics" (USDA, 1981). Funding was obtained to initiate a new land value survey beginning in 1982. The 1982 survey of bankers and realtors has been structured to divide farm operator sellers between continuing and discontinuing operators. Internal Revenue Service (IRS) farm tax data and the Current Population Survey (CPS) farm self-employment income data have been reviewed for possible use. The optimisim gained from these successes must be tempered. The 1983 Census of Farm Finance Survey will not be conducted because of an amendment to the U.S. Department of Commerce appropriations bill. Even if the Census Farm Finance Survey is permitted, it may be necessary to reduce its content because of respondent burden. IRS and CPS farm data are being reviewed for possible use partly in anticipation of reduced funding for data collection. For example, the quarterly farm labor survey conducted by the Statistical Reporting Service has been discontinued. IRS has proposed reducing sampling from 7,000 to 2,000 Schedule F's, greatly limiting IRS farm tax data usefulness for farm sector economic accounting purposes. Economic accounting issues and data needs identified in this paper will assist to specify future data collection priorities in the expanded surveys and, if necesary, to specify future data maintenance priorities in the event of survey reduction or elimination.

4/ The 1964 benchmark data of RSIF and RSD are acknowledged as outdated and requiring updating (Lins, 1978).

5/ A reading of Lin's 1977 article is suggested. Lins states "In the course of reading work by different authors, the casual or even seasoned reader of accounting literature is likely to experience terminology illness. "Terminology illness" can be diagnosed as the pain resulting from authors' use of the same name for different accounts or, conversely, authors' use of different names for the same account. The illness is likely to become more severe if one reads both social accounting literature and the more traditional accounting literature for a single firm."

6/ Farm operators are also individuals without families.

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