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FARM HOUSEHOLD AND BUSINESS ESTABLISHMENT INCOME DICHOTOMY

Invited paper submitted by the Department of Agriculture, United States of America*

1. Farm income accounting in the United States dates to the early twentieth century. The concept of farm income employed in the initial development of the accounts viewed U.S. farming as an industry and treated the production agriculture sector as though it were one farm business (handbook). The farm accounts were developed to be consistent with the U.S. national income and product accounts. This required an accurate accounting of output from farm production and associated activities, the valuation of services provided by farm households such as food and housing, and measurement of goods and services purchased from non-farm sectors of the U.S. economy. The account's primary functions were to measure proprietary income and corporate profit generated by U.S. farming, to examine farm income over time, and to compare farm industry performance with other sectors of the U.S. economy.

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As corporations and other entities played a small part in farming in the early twentieth century, proprietors' income contributed to a huge majority of the total. Farm sector income measurement was so closely aligned with the U.S. national income and product accounts that in the mid-1950's the U.S. Department of Agriculture (USDA) was designated as the lead agency in preparing estimates of farm sector income and output. Fifty years later the USDA, through its Economic Research Service, still holds this responsibility.

2. Use of national farm income estimates has moved beyond portrayal of the economic output and national income of an industry to an assessment of the performance of farms and the economic well-being of farm people. Thus, production activity based accounts developed to measure sector-wide output and national income from production began to be used to assess performance and well-being of institutions, namely farms and farm people. USDA's first estimates of personal income for the farm population were, for example, developed in 1934, when benchmark data on non-farm income of farm people became available.

3. The personal income concept focused on the residence of farm people and included income from farming and non-farm sources. Total personal income was measured by adding aggregate sector-wide estimates of income from farm sources to aggregate farm population estimates of income from non-farm sources. Data series were manipulated to construct per farm or per capita estimates of income. Estimates of income derived from production activities were divided by an industry-wide estimate of the number of farms. Likewise, per farm averages of off-farm income were calculated by dividing an estimate of total off-farm income by the same industry-wide number of farms. The two disparate data series were then summed to provide an estimate of income per farm operator family.

4. Returns to capital and labor used in sector-wide production activities and the off-farm income earned by farm people were allocated to institutions, businesses, and households without regard to ownership and employment of resources. In the 1930's, when USDA initiated use of activity-based production accounts, the farming sector was largely comprised of farm-household units where the activities of the farm household were closely intermingled with those of the farm business it controlled. Moreover, farm households at that point in time, committed few resources to off-farm pursuits, including allocating labor to off-farm wage work. By 1986, when ERS stopped estimating income for operator households by summing the returns to capital and labor earned by owners of farm assets and the off-farm income earned by farm households, the operating and financial structure of farms and the households that controlled them had changed dramatically.

5. This paper is organized to illustrate changes in the household-firm structure. The paper then draws on these structural changes to demonstrate that production-based accounting systems overstate the proportion of labor, management and capital returns that accrue to traditional operator households. The paper documents that households no longer allocate their resources solely, maybe even primarily, to the farm they control. Household choices are used to illustrate a range of livelihood strategies used by farm households, including farming as a second career. A paradigm is developed where household-firm decisions with regard to resource ownership and use in farm production activities and off-farm pursuits are woven into a consistent, integrated approach to estimation. At the heart of the discussion is knowledge of resources used in production, ownership of these resources by institutions, and how

institutions, including households, decide to allocate assets across economic activities both within and outside the farm sector of the national economy. Finally, the recognition of resource ownership leads to a discussion of wealth and the comprehensive measurement of economic well-being.

Using Value-Added Accounting to Measure Economic Activity of Production Agriculture

6. Economic activity is the production of goods and services. Economic activity may generate both marketed or non-marketed goods and services. While non-market activity of households and volunteer work contribute to economic activity and are thus included in the broadest meaning of the concept, the definition used by national accounts to delineate the production boundary excludes some of these activities. A common measurement approach is to add up the value of all goods and services produced in a given period of time, such as one year. Money values may be imputed for services when there is no cash transaction. Since the output of one business (for example, steel) can be the input of another (for example, automobiles), double counting is avoided by combining only "value added." Value added is an economic term to express the difference between the value of goods and the cost of materials or supplies that are used in producing them. Value added is thus defined as the gross receipts of a firm minus the cost of goods and services purchased from other firms. Value added includes wages, salaries, interest, depreciation, rent, taxes and profit.

7. In USDA's value-added accounts, value of production from farms (production agriculture's economic activity) is divided into two categories: commodity production and service and other income (figure 1). Commodity production entails crops, livestock, and livestock products. Service income and forestry represent alternative sources of income from commodities and provide additional diversification of risks from changes in weather and commodity markets. The format of the agriculture value added account is designed to display sources and allocation of total value of production. Gross value added represents total value of production less net government transfers and the cost of inputs used in production. The significance of this measure is that it is a major component of determining the contribution to gross domestic product (GDP) for a particular activity. The relative contribution of different activities (sectors) is measured using GDP. Net value added is measured by subtracting depreciation on buildings and machinery from gross value added. It represents the sum of the economic returns to all the providers of factors of production: farm employees, non-operator landlords, lenders, contractors, and farm operators of agricultural businesses.

Farms Acquire Assets from Many Sources

8. Today, many farms, particularly larger operations have complex institutional arrangements. Entities sharing in the risk of production encompass not only individual proprietors, but also include a myriad of individual investors and legal entities. These stakeholders contribute resources with the expectation of receiving financial rewards commensurate with sharing the risks of production. The value added accounting framework explicitly recognizes this partitioning among resources providers and thus accommodates the changing structure of U.S. farming. In some cases payments to stakeholders are established

prior to production (land, labor, and capital) and are relatively straight forward to determine. Net farm income can be derived by subtracting payments to landlords, lenders, and hired labor that provide inputs or services, but do not share directly in market, production, or financial risks. Thus, net farm income represents the earnings of farming's risk takers, those who own and supply resources to production activities.

9. Embedded in the value-added measurement of farm sector income, is the return to farm operator households from farming activities. Knowing the relative share of farm households' contribution to net value added does not provide the information necessary to understand and explain their economic behavior. The major shortcomings are that this measure does not recognize how these institutional units individually contribute to production and share the rewards and it does not recognize other non-farm activities of farm households as institutions that control the organizational actions and production activities of farm business establishments.

Farm as a Complex Business Supercedes the One Farm-Household Model

10. The classic farm business model keyed on the intermingling of agricultural production and home consumption at a central location, the farm. This farm-household interdependence was referred to by describing the farm as, "a complete economic unit by itself" (Heady, Back, and Peterson p.387). The household-firm relationship has also been described as the "one-farm, one-owner, one-operator, low-debt model" of agriculture (Harrington and Manchester). Economic and social changes have altered the business environment for farms, and the goals held by farm operators and their households. Farmers, like other participants in the national economy, have responded by repositioning their business arrangements and organizational structures to best achieve business, personal, and household goals.

11. The classic model largely depicted a flow of factors of production, including managerial services, decision-making and equity capital, from the household to the business with an accompanying flow of profits and retained earnings from the farm to the household (figure 2). However, for many years, the decision and organizational structures of farms, including farm-household linkages, have been recognized as more complex than the one farm-one household model (Carlin and Smith; Patrick and Eisgruber; Johnson, Perry and Morehart). A modernized farm-household linkage model depicts multiple providers of factors of production and multiple recipients of the income generated from production activities.

12. The claim on a farm's value contributed to the national economy and net income by households that control the business and others depends on how assets were acquired for use in production (figure 3). Farms operated by a single family typically use their own resources to acquire inputs and underpin production activities. In this case, the farm household would claim the income from production activities. However, in U.S. farming a "new" agriculture has emerged from, "changes in technology, in economic climate, in institutional structure, and in ways of doing business (Boehlje)". A key attribute of this new agriculture is control of assets as opposed to ownership of assets. Assets may be acquired from a large number of owners. Asset control and introduction of complex organizational structures is observed in U.S. farming. For example, 209,000 farms rent land for a share of production, another

633,000 rent land for cash, 50,000 farms grow commodities for another firm under a contractual arrangement, over 900,000 farms owe debt at year-end, and nearly 200,000 farms have multiple persons or households engaged in either the possession of assets or the ownership structure of the business. A portion of the income generated by value-added to the national economy from farm production activities does not accrue to the operator's household. The income distribution or sharing arrangement may result from either a formal contractual arrangement (written contract with a non-farm firm) or from informal partnering (father-son-daughter farming arrangements). However they arise, the introduction of multiple households or other entities that contribute to the farm business creates a disconnect in the one-to-one relationship between the level of income generated by business activities and the income of the farm household.

13. In U.S. Farming, about 74 percent of farms still follow the classical model where the household provides all of the production resources. This segment of farms is composed primarily of rural residences (70 percent) or intermediate size farms (less than \$250,000 in sales) where a large majority of operators and spouses hold primary occupations other than farming. The remaining fourth of farms, where the controlling household of the senior partner or operator has decided to acquire production resources from multiple households or entities, account for nearly 80 percent of farm value of production. Farms with more complex ownership structures are also the farms that engage in use of business arrangements such as production contracts that further erode the one-to-one relationship between production activities, farming income, and household income. Contracting firms, for example, tend to retain ownership of commodities and pay the contracting farm household for the use of their services and farm business facilities. This relationship necessitates the sharing of income between the contract firm and the farm household.

14. The complexity of modern farming is reflected in two major types of household linkages with the farm. Some households do not share in business or financial risks of the farm business even though they have some type of business relationship with the farm. These non-operator households furnish labor, debt capital, or operating inputs in exchange for payment upon delivery or under some contractual arrangement. Examples include labor in exchange for wages and funds for expansion or operation in exchange for interest and debt repayment. Landowners may be the most commonly recognized non-operator households. Households with an ownership interest include operators, partners, and shareholders of assets. Each provides risk capital in return for shares of income and capital appreciation (losses). The household-farm link may be only one of many business linkages that exist (figure 4).

Farm Operation and Performance Underpin Income Disconnect

15. A second major disconnect arises in U.S. farm production that contributes to the income dichotomy between farm business establishments and farm households. First, a large share of farm households have chosen to specialize either in the production of crops (21 percent), or livestock (48 percent of households). A fourth of households produce both crop and livestock commodities while 6 percent of households produce neither. Value of production is distributed relatively evenly among the farm specialty groups. Crop only farms generate 36 percent of total value of production, livestock only farms 29 percent, and joint

crop-livestock producers 35 percent. Complicating the business-household income dichotomy issue is that a variety of business arrangements that affect the distribution of income are used by different farm groups. Share renting of land, for example, occurs more commonly on crop only farms. Meanwhile, production contracts are found most often on livestock operations. Thus, resource ownership and control issues also enter into the household income calculus even when considering farms that specialize in specific production activities. The point, however, is that traditional approaches to income accounting viewed the farm industry as a national farm or as a collection of farms based on commodity grouping. Household choices with regard to the commodities produced on their farms make it difficult, at best, to say much about household income from enterprise production activity (Morehart).

16. Second, leaving aside organization of the farm, in the U.S. there is no strongly observed relationship between the efficiency of production of a specific enterprise, as measured by costs, and the income performance of the entire farm (figure 5). This, of course, could reflect differences in the success of marketing activities, but it could also be due to farms' engaging in multiple production activities making it difficult to say much about the performance of a farm based on a single enterprise activity. Even when there is a close correspondence between the enterprise and the farm, as might be expected for a farm that specialized in production of a commodity such as milk, the ownership and tenure structure of the farm can disrupt the classic farm-household income linkages.

Livelihood Strategies Contribute to Farming Activity and Household Income Disconnect

17. While it is known that farm operator households, on average, earn a substantial portion of total household income from off-farm sources, it is likely less well known that operators frequently own additional farms, non-farm businesses, and a variety of non-farm financial assets. The decision to allocate both human and financial assets to activities other than farming is reflective of a hierarchy of personal and family goals (Patrick and Eisgruber). Choosing to invest in another business or to work off-farm may add diversity to the operator's financial portfolio and spread risk and opportunity across multiple asset classes. As Lee has indicated, the decision to allocate resources to confirm activities is consistent with maximizing income and making efficient use of resources (Lee, JFE). Decisions of farm households to allocate a share of household labor, management, entrepreneurial capacity, or financial assets to non-farm activities drives another wedge into the one-to-one relationship between labor, management, and capital returns from farming and the total income of households from all sources. And, the wedge is not small given that almost a third of senior operators of the largest, most complex business organizations, family corporations, have an off-farm job for salary or wages.

18. USDA survey results show that farm households, like many U.S. families, employ a wide variety of livelihood strategies to generate income to support their choices with regard to consumption, saving, and investment (figure 6). The Census of Agriculture has, for several decades, documented the trend toward off-farm work by farm operators, showing that three of ten operators worked off farm by the 1930's and that over half of operators had moved into non-farm labor markets by the 1960's. Not only has the share of operators working off farm grown but the amount of time, as measured in days worked off farm, has increased as well

(figure 7). Household livelihood choices provide the footing for the third major disconnect in the one-to-one relationship between income earned from farm production and the incomes of farm households. Namely that households have chosen to allocate assets, including human capital, to a variety of economic pursuits that yield a return, some of which is in the form of money. Other returns may be in the form of accretion of wealth through gains in asset values (Mishra et.al.).

19. Twenty-five years ago a majority of operators (54 percent) still reported farming as their principal occupation. This has changed dramatically. Now, a majority of operators report something other than farming as their main occupation. Evidence of multiple livelihood strategies being used by farm households has emerged from data collected by the Census of Agriculture and more recent USDA national surveys of farms and farm households (Agriculture Resource Management Survey, ARMS). Household earning strategies are revealed in the choices made with regard to employment and investment. On some farms only the operator reports off farm work, while on other farms the spouse reports holding the non-farm job. Some households decide that both the operator and spouse will hold off-farm jobs. Yet other households decide that neither the operator nor the spouse will engage in off-farm work (figure 8). Even larger shares of operators work off farm for a wage or salary (54 percent) than report a non-farm job as their primary occupation (46 percent). For spouses the percent reporting career choice and off-farm work are closer with 56 percent working off farm and 52 percent reporting a non-farm occupation. Livelihood strategies not only include where to work, but where and how to use funds available for saving and investment purposes. Examining household income sources reveals that farm households earn income from a wide variety of non-wage and salary sources including multiple farms, non-farm business operations, financial assets, and both public and private retirement funds.

20. While off-farm work by farm operators is well documented, empirical evidence is only now emerging to document that off-farm work by operators and members of their households is most often a career choice rather than an action needed to support the farm business. In 2001, 46 percent of operators and 52 percent of spouses reported that a job other than farming was their principal occupation. Of key interest was whether the off-farm work by operators and spouses was a career-oriented decision. To obtain information about the employment choices, operators who reported a principal occupation other than farming, were asked whether that occupation was the operator's and his/her spouse's career choice. Three-fourths of operators and four-fifths of spouses responded that their non-farm occupation was their career choice (figure 9).

21. When households were classified based on whether or not income was shared, we observed that it is most often operators of larger more complex businesses with multiple households or legal partners where the operator focuses on farming as the primary occupation (figure 10). This 26 percent of farms account for 80 percent of production value. The three-quarters of farms organized as proprietorships that do not share income generate the remaining 20 percent of production. These findings further underpin the difficulty of using farm income to assess household welfare. Additionally, when operators were asked whether they and/or their spouse worked at an off-farm job prior to becoming a farm operator, a third of both operators and spouses reported off-farm work prior to becoming involved in operating a farm (figure 11). This result suggests that many households come to farming as a second

career. The attributes of these households are not yet well understood, but they certainly have implications for policy related to farmland use, farmland turnover, and the retirement/succession planning of farm households.

22. A widely held perception has been that farmers have worked off-farm to help pay farm expenses or debt or to continue a way of life (Barlett). Results from USDA surveys suggest that, fewer than 10 percent of farmers who work off-farm may be doing so to help with debt or expenses related to the farm. The large majority of operators and spouses work off-farm to increase their household incomes or for other reasons (figure 12). Moreover, the decision to work off-farm does not appear to be a recent decision. Operators reported having worked at their off-farm job over 15 years, while spouses had worked 12 years (figure 13).

23. Operators and spouses not only make decisions about whether one, both or neither work off-farm, this decision may be coupled with the hiring of farm labor. Over a fifth of households where the operator only worked off-farm also paid wages to hired labor. Thirty-seven percent of these households also hired custom work performed on their farms. While a larger share of farms where neither the operator nor the spouse worked off-farm hire labor, the share of farms with hired labor or custom hire were not greatly different. Using hired labor in conjunction with off-farm work by the operator or spouse suggests that farm households are evaluating tradeoffs between farm and non-farm work commitments, pay, and benefits. These are important factors in determining the greatest benefit to the household's economic status.

24. Both operators and spouses engaged in a wide variety of jobs and are employed in both public and private sector industries (figure 14). Operators and spouses were asked to report whether they worked at administrative/professional, technical, production, self-employed, or other types of jobs. About a fifth of operators selected each of the type of work options, revealing no dominant type of job being held by operators. About the same share of operators were self-employed in a non-farm business they owned as worked for another business or public entities. Administrative/professional jobs did dominate the type of work reported by spouses, with almost half selecting this job type. Only about 5 percent of spouses reported work in production-related jobs.

25. The types of employment and jobs held by farmers and/or their spouses in conjunction with commuting and residential location information provide concrete evidence of participation in non-farm economic activities. While households that control residential and small farms most often combine farming and off-farm work, members of households that operate large farms also have chosen to work off-farm. This is especially the case for spouses. Overall, across all farms, about two-thirds of operator's work time is spent off-farm. For spouses the proportion is even larger at 84 percent. Even for households where the senior operator states that farming is their primary occupation, over half of work time is spent off-farm. In today's agriculture, only 14 percent of households report a concentration on farming with no work off the farm by the operator. Households' choices to combine farm and off-farm labor allocations result in an income level that is generated by varied sources of earnings. For a large majority of U.S. farm households, farm production activity income represents a minority share.

Use of Household or Business Establishment Income Measures

26. Given the number of stakeholders in U.S. farming, careful attention must be placed on which measure of contribution to economic output and income to use. There was a time when net farm income could be legitimately viewed as a measure of the net income that farm households received from their farms as well as an indicator of the farm sector's contribution to the production of goods and services within the national economy. As demonstrated, however, many of today's farms have multiple households and other entities contribute at-risk capital to the production process. Parties who acquire or retain ownership of assets and share in production risks also generally share in the distribution of product and income generated from production activities.

27. In the U.S., sector-wide measures of income have traditionally masked the distribution of income that flows from the sharing of asset ownership. This is a result of the national farm focus of the sector-wide income and output accounts. More and more, however, within the U.S. questions are being raised about what is agriculture (Offutt)? Where do the boundaries of the modern farm begin and end? What does the change in the price of a specific commodity mean to the welfare of persons who live in farm households or reside in rural areas? Who receives the benefit of commodity and other national agricultural programs? To address these and other such questions work is underway to more accurately account for the ownership of production assets and for the participation of households and other entities in farming.

28. Our work has not lead to a rejection of value-added accounting for farm output or to use of the business establishment as a unit of measure. Instead, results from our survey research have hastened a broader approach to data collection that focuses more closely on the decision unit for farms. That is, we are more closely centering on the farm household as the focal point around which to ask questions about farm production activities, the ownership of production assets, the disposition of income, and, even, operational and strategic management of the business. From an agricultural industry perspective, the U.S. agricultural income accounting system is not diminished in its ability to generate national estimates of value-added to the U.S. economy and to track sector-wide trends over time. The accounting system is being repositioned to more accurately account for the participation of multiple operators/households in farm business establishments along with other entities. This will enable the income accounting system to recognize multiple owners of assets and to distribute income to participants. Heterogeneity is recognized across farms and among households. This new system explicitly recognizes that an operator household may not receive all the income generated by its farm business. Likewise, use of the household as a unit of observation reveals that farming income is but one source of earnings to a predominant share of farm households.

29. To drive U.S. work to develop a consistent, integrated farm income account system, the Agricultural Resource Management Survey, a collaborative annual effort by the Economic Research Service and the National Agricultural Statistics Service, has been designed to account for the range of types and sizes of farm businesses engaged in agricultural production activities. The controlling household of the senior or dominant operator is enumerated. Other contributing households and operators are identified. Survey instruments used with the farms are developed to provide sufficient data to develop for each farm an indication of value

contributed to national output, net income after accounting for capital use and inventory adjustments, and for the disposition of income among parties that have an ownership interest in production. For the farm's controlling household, data are obtained to establish human capital, financial and other asset allocations to farm and non-farm activities. This integrated data collection system enables the development of farm business and household accounts for the same unit of observation. A result has been the development of a series of income measures each of which makes a contribution to clearer understanding of the contribution of farming to the U.S. economy, the performance of farms as business establishments, and the welfare of households of farm operators (figure 15). Data users can select measures of income that more correctly match the intended use of the data.

Ownership of Production Resources and Household Wealth

30. Production agriculture has changed dramatically in the past two decades. There are many entities that contribute resources to production agriculture. As a result, income, assets, and debt once owned by the operator and his family are no longer relevant. These have to be allotted to all the parties that contribute resources (labor, capital, land). Another issue is the degree of separability between the household and business when balance sheets are constructed for these different levels of aggregation and the problems that arise from using different data sources and concepts. Many farm businesses are unable to make a clear distinction between business and family assets and liabilities. This is particularly true where the farm and family expenses are paid for out of the same account. Moreover, balance sheets that focus solely on production agriculture will not address today's agricultural policy issues nor adequately represent the diverse economic activity of farm households.

31. Measurement of farm operator household net worth is plagued by many of the same considerations involved in measuring income. The recognition, for most farm households, that the farm business is not the sole source of wealth leads to measurement of assets and liabilities of household members that are not farm related. The 1999 ARMS collected detailed information on farm household assets. The results suggest that farm households, much like their non-farm counterparts, are diversified in their portfolio of financial assets (figure 15). Even with this diversity in financial assets, on average, farm business assets (real estate) are the primary contributor to farm household wealth regardless of the size of the farm business.

32. While the measurement of farm operator household farm and non-farm assets provides some indication of how stakeholders share in the total value of production assets used in farming, little is known about many of the other major stakeholders. As a follow-on to the Census of Agriculture, the Agriculture Economics and Land Ownership Survey (AELOS) collects information on the characteristics and economic contribution to agricultural production by landlords. In 1999, the survey results show that non-operating landlords had \$436 billion in farm assets and nearly \$23 billion in agriculture related debt. Thus, non-operating landlords accounted for 43 percent of the nearly \$964 billion reported farm sector equity in 1999. Further partitioning of wealth among resource providers would require information on the value of assets provided by contractors, and non-family farm households.

Summary and conclusions

33. An integrated data collection system is necessary to drive the development of consistent household, business establishment, and enterprise performance and well-being measures. Despite the importance of income and wealth to farm households' economic well-being, many assessments often emphasize the role of one measure to the exclusion of the other. For studies addressing the economic standing of a farm household relative to a household in the general population, the economic indicator of choice has been income. In addition, analyses have typically focused on average income without considering variations in contributing sources. The capability to recognize the contribution of a variety of resources owners achieved through use of the value-added accounting framework in conjunction with the nuances of household income measurement recognized by the availability of a comprehensive micro-level data system produces multiple measures of income.

34. The most widely recognized group of stakeholders, farmers and their households earned about a third of the value that farming contributed to the national economy in 2001. Because so many parties share income from farming it is no longer easy to draw conclusions about what national estimates of farm income or value-added mean for income that farmers earn from farm self-employment. Today's farm household engages in a wide variety of strategies to earn a livelihood, a focus only on income from farming or non-farm work to the exclusion of other sources not only presents an incomplete perspective about household income, but also sells short the wide variety of decisions made by farmers and family members to increase their overall household incomes. Measures of sector income are valuable indicators of how the farming sector is performing on a national scale. Nonetheless, these measures may not be the best tools with which to track the financial situations and needs of farmers and farm families—especially if they are to be used as a basis for creating new farm policies.

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