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WHAT CAN BE LEARNED FROM CALCULATING VALUE-ADDED?

BY

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WHAT CAN BE LEARNED FROM CALCULATING VALUE-ADDED*

Value-added is a familiar concept to most applied economists. Increasing the value-added component of production is commonly cited by economists and others as a worthy objective (Carlin and Handy). Most of us can give a satisfactory explanation of what it represents in general terms. Surprisingly, we seldom make the calculations necessary to determine net value-added by a business or a group of businesses, except as the Department of Commerce makes such calculations in the Census of Manufactures every five years.

The purpose of this paper is to make a case for calculating net value-added for farm businesses and the sector on an annual basis as an additional way to understand and track the changing structure of agriculture and contributions from farm operations to the national economy. In analyzing the farm economy, we tend to examine total sales of crop and livestock products and changes in this total from year to year (Hanson, et. al.). Likewise, we study national estimates of net farm income as a way of looking at the sector and its relative progress. Estimating net value-added will provide additional insight into understanding economic activity in farming and its impact on other sectors of the economy.

DEFINITION

The concept of value-added is easily explained in a standard economics textbook. Net value-added represents wages, rent, interest and returns to management (or profit) from a business or a sector (Baumol and Blinder). In an accounting sense, the value-added of a firm is its revenue from production minus the amounts paid for goods and services purchased from other firms. This difference represents payments for the use of labor, capital, land and management. Value-added differs from net farm income in that all payments for wages, interest, taxes, and rent are a net addition to value-added while treated as deductions in making that calculation.

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Table 1. CALCULATION OF NET VALUE-ADDED
Averages, All Wheat Farms, FCRS, U.S. 1989

Description	Average per farm	
Operator's Revenues:		
Commodity sales	$47,605	
Government payments	9,054	
Custom work and other farm related	4,256	
Changes in inventory	5,155	
Home consumption of farm products	92	
Total		$66,162
Landlord's Revenues:		
Cash and share rent	$11,846	
Government payments	2,893	
Total		14,739
Contractor's Revenue:		
Value commodities received		72
Total Revenue		$80,973
Operator's Expenses:		
Chemicals and fertilizer	$ 9,268	
Gas, oil and repairs	9,000	
Seed	2,941	
Wages and benefits	2,415	
Interest	6,403	
Taxes	2,193	
All other cash expenses	16,744	
Total		$48,964
Landlord's expenses		2,274
Contractor's expenses		0
Total Cash Expenses		$51,238
Gross Value-Added:		
Total revenue	$80,973	
(-) Total cash expenses	51,238	
Difference	$29,735	
(+) Interest	$ 6,403	
(+) Taxes and fees, operator and landlord	3,458	
(+) Cash wages and benefits	2,415	
(+) Non-cash perquisites labor	84	
Gross Value-Added		$42,095
(-) Depreciation		6,114
Net Value-Added		$35,981
Other:		
Value of use of operator's dwelling		$ 2,040
Net value-added as percent of operator and landlord revenue		46%

NET VALUE-ADDED FOR FARMS AND THE NATIONAL INCOME ACCOUNTS

Making an estimate of net value-added is a relatively straight forward calculation for any farm business. All cash expenses except wages, interest, taxes, and rent are subtracted from all cash receipts after adjustment for changes in inventories like livestock and crops (Table 1). The value of farm produce consumed by the operator and hired labor as well as other perquisites provided employees is added. Depreciation is then deducted to get net value-added. This general procedure was followed in estimating net value-added for each of the 11,836 farms in the FCRS for 1989 which is used to make the national estimates which are presented in this symposium (Morehart).

The procedures outlined differ somewhat from those followed in the National Income Accounts as this presentation and the one by Gerald Schluter will indicate. It is somewhat different when one only thinks of a single sector as compared to handling all sectors of the economy simultaneously (Lee, et. al.). The key differences are:

(1) The value of the use of the operator's dwelling is not included in the calculation for the farm business.
(2) Government payments to farmers are included as part of farm income.
(3) Landlords' farm resources are considered as a part of the agricultural sector, not in the general real estate sector. Landlords' expenses and income are part of individual farm operations and are included as part of farm operations. Rent for agricultural land is a positive contribution to net value-added.

The value of the use of operators' dwellings is a substantial amount in aggregate for all farms, swelled substantially by the large number of "farms" with sales of $10,000 or less which make up 47 percent of total numbers. For most of these units, agricultural output is small; net value-added without the value of the use of the dwelling is either a small negative or positive number. When the use of the dwelling is included, net value-added usually exceeds cash receipts for these farms. While this makes the aggregate total for the sector look "good," it disguises the true contribution from farming by this contribution from housing. The argument for excluding it is to give a truer picture of value-added from the agricultural part of these businesses.

For important parts of commercial agriculture, government payments are not an issue. Fruits, vegetables, many field crops and all livestock except dairy operate outside the direct influence of government commodity programs. Prices and production are largely determined by market forces. For most of the storable

grains, as well as cotton, peanuts, sugar and dairy products, government programs have influenced both prices and production for more than 50 years. Over time, this has become true in most western countries as well. Thus, government payments are a source of cash farm income in lieu of the market prices that "could have been expected if international markets were not distorted by these programs." For North Dakota in 1987, adding government payments increased aggregate cash receipts by 22 percent, while in California, it amounted to only 3 percent (Stanton). One other argument for including government payments is because it is partly a payment for the use of land (rent) taken out of production to meet program requirements.

Increasingly, farmers rent an important part of the cropland they harvest. This is an important part of the agricultural sector in terms of both output for share leases and rental income and the associated expenses. These are a part of the FCRS business units and incorporated into all the calculations.

Size Distribution of Farms

Additional perspective on the size distribution of farms is provided when net value-added is considered in addition to the usual size distribution based on gross sales of agricultural products. The commonly used intervals are maintained in this presentation except that a set of negative intervals must be included as well (Table 2). Over 41 percent of all farms had gross sales of $20,000 or more in 1989. In contrast, just over 29 percent of the farms had value-added of $20,000 or more. In both cases, it is this group of farms that accounts for the bulk of sales and net value-added.

The distribution based on gross sales indicates that almost 95 percent of sector output comes from farms with sales of $20,000 or more (about 890,000 farms). The distribution based on net value-added suggests that 103.9 percent of that total comes from 630,000 farms with net value-added of $20,000 or more. This rather implausible result simply calls attention to the other part of the value-added distribution where negative value-added is also a regular result. Nearly 35 percent of the farms do not make a positive contribution to output from the sector. As many as 5.8 percent of the total (126,000 farms) end up with negative, net value-added results which are sizable ($-10,000 or less).

Table 2. SIZE DISTRIBUTIONS OF FARMS
United States, 1989

Size class	Percent of all farms by: Gross sales[1]	Percent of all farms by: Net value-added	Percent of a national total for: Gross sales[1]	Percent of a national total for: Net value-added
		(percent of total)		
$500,000 and over	1.8	1.0	38.0	35.2
250,000 to 499,999	3.4	1.7	15.9	15.6
100,000 to 249,999	9.7	6.7	21.6	28.0
40,000 to 99,999	14.0	10.6	13.7	18.0
20,000 to 39,999	12.4	9.1	5.4	7.1
$ 10,000 to 19,999	11.8	7.5	2.6	2.9
5,000 to 9,999	12.1	7.3	1.6	1.4
0 to 4,999	34.8	21.3	1.2	1.0
-1 to -4,999		23.3		-1.2
-5,000 to -9,999		5.7		-1.1
-10,000 to -19,999		3.0		-1.1
Less than -$20,000		2.8		-5.8
Total[2]	100.0	100.0	100.0	100.0

[1] Source: ERS, USDA, National Financial Summary, 1989, ECIFS9-2, January 1991.

[2] ERS estimates a total of 2,171,000 farms in 1989.

If one describes all the farms with net value-added of +$5,000 or less as a group, that make little or no positive contribution to the sector's performance, it points out more clearly the structural differences inherent within production agriculture. A group of 600,000+ farms make the basic contributions to the economy for the sector. About 60,000 farms provided half of that total in 1989. There are also a substantial number of "large" farms in terms of gross sales which do not contribute to the economy in any given year. This may arise because of crop failures, disease problems, poor management, family problems, etc. While some succeed in other years, others fail. This is part of structural reality as well.

What a Value-Added Series for Production Agriculture Contributes

A value-added series for production agriculture calls attention to the net contributions of this sector to the national economy. It emphasizes what the sector adds in total and the group of farms that are primarily responsible. Less weight is given to aggregate sales. Emphasis is placed on net additions to final output and not simply how much was sold in a given year. It provides a way to separate the farm with $1,000,000 of sales but -$20,000 of net value-added from the farm with $100,000 of sales but +$50,000 of net value-added. Productivity and profitability are both emphasized in net value-added. Increases in size result in this measure when employment is generated, resources are used productively, and a net return to management is registered. Addressing ways to increase net value-added on individual farms and for the sector as a whole provides a positive way to look at production agriculture. It's an important addition to our capacity to understand more fully what is happening in agriculture in the United States.

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