Commercial Agriculture Versus The Farm Home

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ABSTRACT

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To better understand the evolving structure of agriculture, data are being collected over several years from a representative panel of farm operator households. The analysis provides information about farm households' level of income, their financial condition, their off-farm employment, the importance of non-farm income, and their management and marketing innovations.
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Introduction

Agricultural economists and rural sociologists at The Ohio State University have initiated a longitudinal study of Ohio farm operator households. In order to better understand the evolving structure of agriculture and forces affecting this structure, data will be collected over several years from a representative panel of farm operator households. Information is to be gathered concerning farm income, non-farm income sources, off-farm employment, assets and liabilities, and characteristics of the farm business. Also, sociological phenomena are being investigated such as demographics, attitudes and values, socio-psychological well-being, and involvement in community organizations and social support networks.

The purpose of this discussion is to highlight results from the first year of the study, especially the economic condition of farm households and attributes of farm businesses. A common thread running through the discussion is that the way "farm operator" is defined greatly affects conclusions that are drawn about farms, their output and productivity, the importance of off-farm work to household income, household financial condition, operator acceptance of management and marketing alternatives, etc. Very few farms, relative to the census definition, account for the great majority of sales and all of the net profit. Our evidence supports the conclusion that these few genuinely commercial operators are fully committed to farming, tend not to work off the farm, and depend almost exclusively on the farm for household income. These are in some degree of financial stress, are innovative, and commonly use a wide range of marketing and management practices. When the census definition is used, opposite conclusions are possible: operators' off-farm employment is
common, non-farm income comprises the majority of household income, financial stress is slight, and marketing and management practices used on farms are rather narrow.

The Sample

A stratified random sample of farm operators was selected from a list frame of Ohio farm operators. To obtain the sample, annual sales were estimated for each farm in the list frame based on crop acreage and number of livestock on each farm. The population was stratified into nine sales classes (<$2,500; 2,500–4,999; 5,000–9,999; 10,000–19,999; 20,000–39,999; 40,000–99,999; 100,000–249,999; 250,000–499,999; and 500,000 and above) (Figure 1A). Next, a procedure was used to minimize the variance in sales for the sample by estimating the population's variance in each sales class, then solving for the optimum proportion of each stratum to be included in the sample. The resulting sampling rate for each sales class was:

<table>
<thead>
<tr>
<th>Annual Sales</th>
<th>Sampling Fraction (N/n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2,500</td>
<td>45.8</td>
</tr>
<tr>
<td>2,500–4,999</td>
<td>19.0</td>
</tr>
<tr>
<td>5,000–9,999</td>
<td>24.2</td>
</tr>
<tr>
<td>10,000–19,999</td>
<td>30.9</td>
</tr>
<tr>
<td>20,000–39,999</td>
<td>25.3</td>
</tr>
<tr>
<td>40,000–99,999</td>
<td>19.3</td>
</tr>
<tr>
<td>100,000–249,999</td>
<td>17.5</td>
</tr>
<tr>
<td>250,000–499,999</td>
<td>5.9</td>
</tr>
<tr>
<td>&gt;=500,000</td>
<td>2.9</td>
</tr>
</tbody>
</table>
Data were collected by telephone interviews and by mail questionnaires. Letters preceded the calls; respondents knew they would be contacted and that records as aids to accuracy would be helpful. For the telephone interviews, twenty local farm wives were hired and trained to make calls during winter and spring evenings and weekends. The telephone interviews were used to collect factual data about the household and farm business. The mail questionnaire was comprised of about 200 attitudinal and behavioral items used primarily in sociological research.

Response rates were generally favorable (Figure 1B). Only about 20 percent of those contacted refused to participate, and many of those refusing stated that spring field work was too time consuming to permit them to participate. A total of 940 usable schedules resulted from the telephone interviews and comprised the sample for this analysis. Respondents attempted to provide the most accurate financial and production data available, often using tax returns or farm accounts as sources of information.

In many ways Ohio farms are representative of U.S. farms (USDA(a)). Farm size distribution is nearly identical (Figure 1A). Ohio farms lie in three distinct regions: the Corn Belt region which encompasses the western half of the state; the Appalachian region which covers the southeastern, unglaciated portion of Ohio; and the Northeast region in which dairy farms predominate. Farms in the sample, and in the larger population, are concentrated in the Corn Belt and Northeast (Figure 1C).
Results

Household Income

Non-farm income is extremely important to Ohio farm households (Figure 2A), accounting for three-fourths of total income in this sample. Over one-half of all farm operators work off the farm (Figure 2B). Since farm income fluctuates from year to year, non-farm income has a stabilizing effect on the farm family's income. Also, those working in off-farm jobs typically receive benefits such as health and disability insurance, workers compensation, life insurance, unemployment insurance, and retirement plans. So the picture that emerges for farm operator households, as broadly defined, is that farming is one of several household activities, and it is an important, but not the most important source of household income. Similar patterns are reported in other states such as Wisconsin and North Carolina (Jesse, et al.; Lilley, et al.)

Here again it is important to notice how the census definition affects the data. Farms with annual sales of less than $40,000 have a very strong influence. These constitute about two-thirds of all Ohio and U.S. farm operator household's but contribute only about 10 percent of total farm output. It is worth recognizing that these farms serve primarily as residences for families whose farming activities contribute little to family income. Even farms with sales of $40,000 to $100,000 show similar characteristics.

If farm operators are defined to include only those farms with sales of $40,000 or more (i.e., those producing 90 percent of the output), only then does over half of household income derive from farming and only one-fourth of the operators work off the farm. If the definition restricts farm operators to those with sales of $100,000 or more (i.e., those producing three-fourths of
the output), two-thirds of the household income comes from farming and only 8 percent of the operators work off the farm.

Spouses contribute significant non-farm income to the household regardless of farm size (Figure 2C). Other important sources include social security, interest and dividends, and other nonfarm investment earnings.

Household Balance Sheets

On January 1, 1987, Ohio farm operators had an average net worth of $235,000 (Figure 3A), and their debt/asset ratio was 0.18 (Figure 3B). Both measures are quite similar to those for all U.S. farm operators (USDA(b)). Financial stress, as measured by the proportion of farms with a debt/asset ratio of 0.40 or higher, appears in only 18 percent of these households, and over 40 percent have no debt. When only larger farm operations are examined, the picture is more severe. For those households with farm sales totaling $40,000 or more, net worth is sizable ($375,000), and even larger for those with sales totaling $100,000 or more ($468,000). However, one-third of these commercial farms are experiencing financial stress, and nearly all have debt.

Again, however the definition of farm operator shapes the conclusion. Financial stress is a problem for a significant proportion of those farm households responsible for most of the output. Financial stress is negligible only when farms are defined broadly, as in the census.

Farm Operations

Differences in production costs between larger and smaller farms are noticeable (Figure 4A). Economies of size explain many of these differences and are well documented on U.S. farms (Batte and Sonka; Wilson; Stanton, for
example). Other explanations apply as well: larger farms are technically more efficient, obtaining higher yields for the same inputs; larger farms are able to obtain volume discounts in purchasing inputs; and larger farms are able to realize higher prices for products.

Certainly, the relatively high depreciation expenses per dollar sales on smaller farms supports an economies of size conclusion. Depreciation expenses associated with farm machinery and buildings are relatively high, illustrating the difficulty of equipping the small farm economically.

To measure technical efficiency, a "productivity index" was calculated for each sales class. First, the index for each crop or livestock enterprise is computed by dividing yields by the state average. Then, the indexes for corn, soybeans, wheat, dairy and hogs are averaged. Although it remains uncertain that the smaller farms are applying the same rates of fertilizer, seed, feed, etc., as the larger ones, it does appear that larger ones gain some degree of technical efficiency (Figure 4B).

Operators of larger farms tend to buy their inputs from more distant sources (Figure 4C). Average distance traveled to input source (purchases of fertilizer, chemicals, seed, and feed) are more than twice as far for larger farms (sales of $250,000 and more) as smaller ones (sales less than $40,000), and the larger farms are paying lower per unit delivered prices as a result. Others have documented these buying advantages received by larger farmers (Zulauf and King, for example).

Similar differences appear between operators in their purchase of management services from off the farm (Figure 5A). Accountants, attorneys, consultants, and computer services are purchased regularly by the largest farms and infrequently by the smallest. This propensity to purchase information
services from off farm experts may further explain the cost advantages of larger farm operators.

Finally, larger operators use a wider range of tools in marketing their products (Figure 5B). Operators in general rely primarily on selling on local cash markets, but larger farmers report regular use of forward pricing with local markets, hedging with futures contracts, and delayed pricing. Some of the largest farmers ($500,000 sales or more) had used options contracts in 1986 as a marketing tool. Distance to product market also varies by size, with larger farmers transporting products much farther (Figure 5C). Clearly, the use of a broader range of marketing tools, and sales in more distant markets, indicate that more effort is devoted to the marketing function on the part of large farm operators in their determination to realize the highest net prices.

While not documented here, similar results were obtained for farmers' adoption of conservation tillage and other conservation practices. Larger, full time operators have a higher propensity to adopt these practices. Others report similar results (Belnap and Saupe).

Implications

Ohio farm operators are representative of their U.S. counterparts, and the preceding analysis likely would be similar for a larger U.S. farm population. The shrinking farm population is well publicized, but the remaining farm households are far from homogeneous. In fact, most farms, as defined by the Census, are rural households and the members of the household have only a peripheral interest in farming. Little of their household income comes from farming, and their financial condition is stable. Most of their effort is
devoted to off-farm jobs; they are high cost farm producers; and they are not very innovative.

Not until annual gross sales approach $40,000 or $100,000 and up do we see farm operators become full time operators. These larger operators use family labor, primarily; they are relatively low cost producers, use a wide range of management services, use innovative marketing practices, are quick to adopt conservation practices, and are generally committed to farming. All these characteristics are increasingly true as farm size increases.

They are also in some degree of financial stress. Many of these farms do not own enough resources to make them financially secure and are driven by competitive necessity to take calculated financial risks in attempts to make these operations viable enterprises for the long pull. Spouses and family members make important economic contributions as they work on the farm, but they also provide substantial amounts of off-farm income.

It is ironic that many public policies strive to assist smaller rural households and discriminate against the full-time commercial farm operator. Payments from the Federal farm programs are limited for larger operators, but few of the rural households are affected by these payment ceilings. Our results show that Farmers Home Administration and the Farm Credit System lend proportionately more to the smaller operators. Yet, the image of helping the family farmer through assisting the smaller farm operation is at odds with reality. The family farm - the household committing its labor and capital to agriculture, using innovative practices, producing at a low cost, needing the most financial assistance - has relatively large annual sales and is probably still getting larger. Many farm policies are unknowingly discriminating against these farms due in part to an antiquated image of farm structure.
Figure 1A  Farm Operators, by Sales Class

U.S.  Ohio

Figure 1B  Classification of Contacts

Sales

Figure 1C  Location of Farmers in Sample
Figure 2A

Farm Household Income (1000)

- Net Farm
- Non-farm
- Total

Income: $160 $140 $120 $100 $80 $60 $40 $20 $0

Sales: $10,000 10-19,999 20-39,999 40-99,999 100-249,999 250-499,999 $500,000 All farms

Figure 2B

Operators: % With Off-farm Jobs

- Annual Sales

0 9 18 27 36 45 54 63 72 81 90

<=$9,999 10-19,999 20-39,999 40-99,999 100-249,999 250-499,999 $500,000 All farms

Figure 2C

Sources of Non-farm Income

- Operator
- Spouse & fam
- Other Income

Sales: $24,000 20,000 16,000 12,000 8,000 4,000 0

<=$9,999 10-19,999 20-39,999 40-99,999 100-249,999 250-499,999 $500,000 All farms
Figure 4A

Expenses per Dollar Sales

Figure 4B

Productivity Index by Size

Figure 4C

Inputs: Distance to Source
References


