

Conclusions

As onfarm and off-farm activities compete for scarce managerial time in U.S. farm operator households, economic decisions (including technology adoption and other production decisions) are likely to shape and be shaped by time allocation within the household. Time allocation decisions are usually not measured directly, but their outcomes, such as onfarm and off-farm income, are observable.

Our research finds that the farm-level efficiency of farm households decreases as off-farm activities increase. Smaller farms, which average the highest off-farm incomes, obtain the lowest farm-level efficiencies. These results support the hypothesis that farm operators who devote more time to off-farm activities have less time to manage the farm. However, examining efficiency from a wider perspective, we find that household-level efficiency (including off-farm income-generating activities) is higher across all farm sizes than farm-level efficiency alone. Moreover, the beneficial effect of off-farm income is higher for smaller farms. In fact, farm households operating small farms achieve efficiency levels comparable to those operating larger farms when off-farm income is included. These results, therefore, suggest that farm households operating small farms have adapted to shortfalls in farming performance by increasing off-farm income.

By including off-farm income-generating activities in the household output portfolio (in addition to the traditional farm products), many farm households, especially those operating smaller farms, are able to enhance diversification. The advantages of such diversification, measured by the household-level economies of scope, are substantial. These results suggest that off-farm employment may enhance onfarm diversification, especially for households operating small farms.

The economic inducement of smaller farms to increase their size (measured by the economic concept of scale economies) is reduced when we include off-farm income. Household-level scale economies (which include off-farm income-generating activities) are closer to constant returns to scale than are farm-level scale economies (which only consider the farm business). However, the beneficial effect of off-farm activities in improving scale economies is more pronounced for households operating smaller farms. These findings provide a different way of measuring the role of off-farm work in improving the economic condition of farm households, particularly those operating small farms.

The adoption of agricultural innovations is also linked to off-farm income through managerial time. For example, the adoption of managerial time-saving technologies is significantly related to higher off-farm household income for U.S. corn/soybean farmers, after controlling for other factors. On the other hand, managerially time-intensive technologies are associated with significantly lower off-farm income.

In a broader sense, these findings confirm the tradeoff between time spent on farm and off-farm activities or, in economic terms, the substitution of economies of scope (derived from engaging in multiple income-generating activities, on and off the farm) for economies of scale.

A number of implications follow. Each of these implications reinforces the importance of understanding farmers' decisions in the context of the farm household rather than the farm operation alone. First, our research provides empirical confirmation of Smith's suggestion that households operating small farms, which lack economies of scale, are more likely to devote time to off-farm opportunities, more likely to adopt management-saving technologies (like herbicide-tolerant crops), and less likely to adopt management-intensive technologies (such as integrated pest management).

The relationship between off-farm work and economic performance also suggests that a farm household's dependence on off-farm income has an effect on the distributional consequences of government policies. Government policies affecting agriculture—such as conservation, research and development, extension, and farm support—may affect farm households differently depending on the relative importance of onfarm and off-farm income-generating activities. Thus, the consequences of government policies depend on the diversity of U.S. farm households, particularly regarding their income sources. For example, a policy promoting the adoption of management-intensive agricultural techniques (such as IPM) may not be fully effective unless it takes into consideration the demands in managerial time imposed by IPM adoption.

This research also has implications for private agricultural research and development (R&D). While innovators often base their economic evaluations of returns to R&D on the expected profitability of potential innovations for farmers (i.e., the extent of yield increases and/or input cost reduction resulting from an innovation relative to the costs of adoption and current management practices), this report shows that there is an important additional element to be included in such evaluations: the value of management time.