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Original scientific paper

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CONCEPT OF VALUE-ADDED IN AGRICULTURE AS A RESPONSE TO COMPETITIVE MARKETPLACE

Abstract

Value added is a key indicator to understanding the contribution of the primary inputs, economy of scale, and technical change in the production process. This indicator is a difference between the value of output and the costs of intermediate inputs or intermediate consumption. Value added data can be used in monitoring and evaluating the performance of agricultural holdings, farms and agribusinesses and provides a measurement rod for measuring their economic contribution to the national economy. Namely, this indicator is useful for assessing the productivity of different input and hence for improving the efficiency. When aggregated over all sectors and industries in a certain national economy, value added is equal to gross national product and therefore equal to gross national expenditure.

For agricultural producers and agribusinesses, value-added has of a particular importance because it offers a strategy for transforming an unprofitable enterprise into a profitable one.

Main intention of this paper is to bring some clarity to the value-added concept in agriculture and promote it as a strategy for successful operation of agricultural producers (agribusinesses).

Key words: agriculture, value-added, agribusiness

JEL classification: Q10, Q12, Q13

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Introduction

Value added is a term frequently mentioned when discussing the future profitability of agriculture. It gains popularity mostly during the 1990s and in the economic literature agricultural value-added initiatives have been identified as a means to help agricultural producers absorb the shocks brought about by globalization.[2] In the era of globalization with considerably increased competition in agricultural sector and the rapid commoditization of its products, pursuit of agricultural value-added initiatives, then, may be seen as a strategic response to these circumstances. Of course, these trends themselves have been vastly boosted from various trade liberalization agreements involving the United States, such as the Canada-US Trade Agreement, NAFTA and the WTO.[3] Other factors influencing this situation include increasing consumer demand for convenient, ready-to-eat/cook, safe and nutritious food products and their willingness to pay premiums for such service-embedded products.[4] Although interest in value-added agriculture has been increasing, it is a concept that is poorly understood by many producers and policy makers. The concept has in recent years been used as a mean for justifying improvements in almost anything, starting from value-added accounting[5] to value-added public relations[6]. Thus, value-added branding, for example, is conceived of to be superior to plain branding.[7] Yet, it must be outlined that the argument of how and how much better "value-added" makes any activity it qualifies has not been profoundly discussed in the literature. Thus, value-added agriculture is considered as a superior form of agriculture but there has still not been brought precise frame and measure the implied superiority.

[2] Coltrain, D., D. Barton and M. Boland: Value-Added: Opportunities and Strategies; Arthur Capper Cooperative Center, Department of Agricultural Economics, Cooperative Extension Service, Kansas State University, 2000, pp. 5-9.
[3] Amanor-Boadu, V.: Trade Liberalization and the WTO Negotiations after Seattle, Guelph: George Morris Centre, March 2000, p.12.
[4] Kent Wolfe: Getting a Food Product to Retail, the University of Tennessee Agricultural Development Center, and ADC Info. No. 40, July 1999, pp. 52-55.
[5] Calhoun, C.H., M.E. Oliverio and P. Wolitzer.: Ethics and the CPA: building trust and value-added service; New York: John Wiley, 1999, p. 11.
[6] Harris, T.: Value-Added Public Relations: The Secret Weapon of Integrated Marketing; Lincolnwood, IL: NTC Business Books, 1998, pp. 98-102.
[7] Nilson, T.H.: Competitive Branding: Winning in the Marketplace with Value-Added Brands; New York: John Wiley & sons, 1998, pp. 42-48.

This paper describes what value-added in agriculture means, why adding value is important, and how producers might add value to their products.

1. THE CONCEPT OF VALUE-ADDING IN AGRICULTURE

Today's agro-food system extends well beyond the farm gate to include manufacturers of farm inputs (such as fertilizer and tractors), food processors, transporters, wholesalers and retailers of food and other farm products. The producers' share of total agro-food economic activity has fallen over the years with continued industrialization, new technology, and consumer demands for more varied and convenient products. The agro-food system as a whole, however, remains a significant force in the economy.

As the complexity of the agro-food system has grown, agricultural producers, agribusiness firms and policymakers have turned to the concept of value added to assess the role of agriculture in a modern economy. Value added provides a measuring rod for measuring economic contribution. Value added data can be used in monitoring and evaluating the performance of companies or industries, and hence for improving their efficiency. Value added is similarly useful for assessing the productivity of different inputs.

At the level of entire economy, value added can be an important policymaking tool. It can contribute in the allocation of resources among user groups when determining the appropriate level of economic development, discussing issues on the promotion of export or evaluating the impact of different options to expand a primary sector. But there is often confusion, and sometimes misunderstanding, about what "value added" really means.

Value added as an economic accounting concept is used to trace the final value of goods and services purchased by consumers back through the economy to the points where the value was created. Thus, the value-added approach can identify sources of economic well-being and accounts for sources of income by tracing payments for the final goods and services. Value added places the cost of producing goods and services in perspective by comparing the cost to what is received for that cost.

In a productive activity, value is ultimately created using primary inputs, also called factors of production. These are commonly grouped into four categories:[8]

[8] Rob Holland and Kent Wolfe: Considerations for a Value-Added Agribusiness; Agricultural Extension Service, the University of Tennessee, 2010, p.21.

- land and other natural resources such as water,
- labor of workers,
- capital, such as machinery and buildings,
- management and entrepreneurship.

Land, labor, capital and management are the fundamental sources of economic value.

Primary industries such as agriculture and mining create value from natural resources. In a few instances, the primary products created are sold directly to final consumers as primary products, or to another industry as raw materials. The second industry uses factors of production plus other purchased inputs to add value to the raw materials. This creates a final product for consumers, or an intermediate product for a third industry. There may be several more intermediaries before the product reaches the final consumer. Each adds value by combining factors of production with intermediate products or raw materials. The relationships between an industry and its suppliers (usually purchases by the industry) are called backward linkages. Relationships with buyers (usually industry sales) are forward linkages.

Thus, in a modern economy, a typical product passes through several value-adding activities before reaching the final consumer. There are five general ways by which value may be added. Value is added by physically changing the form of raw materials or intermediate products. Butchering beef and milling wheat into flour are examples. Location and time values are added by transporting and storing goods so that they will be conveniently available for consumer purchase. Possession value is added by wholesalers, retailers, and others who facilitate trade. Activities here include credit, insurance, and the transfer of ownership rights. Finally, value is added by providing information about products. Advertising and promotion, grades and standards, trademarks, and labels are typical examples.

The value added to the economy by the agro-food system can be measured in many different ways, but the two basic measures are gross value added and net value added.

Gross value added recognizes that each step adds value as agro-food products move forward through the marketing chain. The cost of agro-food (raw or intermediate) products is subtracted from sales to avoid double-counting the value added earlier by other agro-food businesses.

An agricultural producer or an agro-food business usually must use inputs from industries that are not part of the system. Fuel, packaging, electricity, office supplies, and legal services are some examples. Since the cost of these goods and services was not subtracted, a portion of an agro-food gross value added is actually contributed by other sectors of the economy. This outside value added can be deducted to get net value added in the agro-food system.

Since net value added deducts the cost of all purchased inputs except an industry's own factors of production, it represents the total returns to all factors employed by the industry. Net value added should not be confused with producer profits, which deduct the cost of factors of production. Net value added is a legitimate and, from economists' perspective, the preferred measure of an industry's contribution to the economy. Net value added is comparable to the figures given in national domestic product and income accounts.

The value added by the agro-food system can be estimated for different:[9]

- products or product groupings,
- firms, industries, groups of industries, or the entire economy,
- number of intermediaries or levels separating agriculture from the final consumer.

Such comparisons can be made over time, or the value added by one entity can be compared to others as a measure of relative importance in the same time period.

Gross and net value added can be calculated for all the goods produced and sold by an industry, or they can be calculated on a per unit basis.[10] On-farm value added can be found from farm cost of production data. Off-farm measurements usually emphasize forward linkages after the farm gate. Off-farm figures can then be broken down by marketing function such as processing and transportation, and wholesaling. Other common breakdowns are gross value added by input cost category, and the shares of net value added contributed by different factors of production.

[9] Wood, E.G.: Added Value: The Key to Prosperity-Third edition; Tip tree, Essex: Business Books Ltd., 2000, p. 16

[10] Chopra, S. and P. Meindl: Supply chain Management: Strategy, Planning, and Operation-2nd Ed.; Upper Saddle River, NJ: Pearson Prentice Hall, 2004, p 24.

2. INCREASING THE VALUE-ADDED IN AGRICULTURE

There are two concepts that can be applied in order to increase value adding in agriculture. First one is based upon increasing the efficiency of production, and thereby widening the margin between gross output value and the cost of intermediate inputs. Second approach towards incensement of the value added is by changing the form, function, quantity, or other product or process characteristics that increases the margin between gross output value and intermediate input cost.[11]

When considering efficiency incensement as a way of value adding, one must bear on mind that efficiency can be separated into technical, allocative, or scale efficiencies. Technical efficiency compares an agribusiness's ability to utilize labor, land, intermediate inputs, and capital to similar agribusinesses. If one agribusiness can produce agro-food product with five attributes and another agribusiness can produce agro-food product possessing ten attributes with the same amount of inputs, the first agribusiness is considered only half as (technically) efficient as the second. Prices play no role in technical efficiency. Prices are important in an agribusiness's allocative efficiency, however. Allocative efficiency compares input and output choices of firms based on prices. For example, if two agribusinesses both produce agro-food products with ten attributes, but one agribusiness's costs are 10 units while the other agribusiness incurs 5 units in costs due to using a different mix of inputs or finding a cheaper source of supply, the higher cost agribusiness is said to be (allocatively) inefficient. Alternatively, if an agribusiness could increase its revenues by producing eight kilos of wheat and two kilos of corn instead of two kilos of wheat and eight kilos of corn, without changing costs, the agribusiness would be allocatively inefficient due to its choice of outputs. In both cases, both agribusinesses might be technically efficient in terms of converting inputs to outputs. Finally, scale efficiency refers to the overall size of an agribusiness's operations. Depending upon production practices, an agribusiness might face increasing, decreasing, or constant returns to scale. Under increasing returns, for example, the per unit cost of production might fall if the plant were to increase in size. Numerous studies have compared the technical, allocative, and scale efficiencies in agriculture and agribusiness and

[11] Coltrain, D., D. Barton and M. Boland. Value-Added: Opportunities and Strategies, Arthur Capper Cooperative Center, Department of Agricultural Economics, Cooperative Extension Service, Kansas State University, 2000, p. 7.

concluded that not all agribusinesses are efficient.[12] When they are inefficient in the production of their core products, increasing value added can result from pinpointing and correcting the sources of the inefficiencies. Two points are important in considering efficiency. First, the individual agricultural producer (agribusiness) might best increase value added by improving the technical, allocative, and/or scale efficiency of their core production (business). Second, when considering expanding into new value-added ventures, proposed business plans should be compared with existing agribusinesses. If the proposed development fails to achieve common norms for technical, scale, or allocative efficiency, plans should be redrawn, reconsidered, or scrapped.

Most agricultural value-added discussions focus on changes in the form of primary agricultural products, changes in the production process, or changes in marketing strategies (new products, new ventures, new markets). The single assumption connecting these efforts is that there are unexploited profits going unclaimed in the manufacture of food, fiber, industrial, or other products from raw agricultural outputs. However, this concept requires more entrepreneurial behavior of agricultural producers and agribusiness, followed by focusing on niche markets or developing new uses for their products. Namely, if farmers only invested in additional processing activities for their products, they could bypass the monopoly power of large agribusiness firms and thus retain more of the value of the raw agricultural product by selling directly into the wholesale or retail markets. This strategy might be successful if new ventures can deliver either a new product filling a niche market, or if the venture allows an entrepreneur to bring a product to market at a lower cost than existing firms. Cost advantages might result from lower input costs, an improved technology, or a transportation advantage to reach a market.

Having on mind this two principal concepts, adding value to agricultural and food products can be accomplished in a number of different concrete ways, but generally falls into one of two main types:[13] innovation or coordination.

Innovation is about improving existing processes, procedures, products, and services or creating new ones. Innovative value-added activities developed on farms or at agricultural experiment stations are sources of national growth through changes either in the kind of product or in the technology of

[12] Sato, K. "The Meaning and Measurement of the Real Value Added Index," The Review of Economics and Statistics, Vol. 58, No. 4. (Nov., 1976): 434-442.
[13] Tilley, D.: "Value-Added Activities as a Rural Development Strategy: Discussion."Southern Journal of Agricultural Economics, 1989, p.21

production.[14] Innovation also can come from research about alternative crops that can be grown successfully by producers to replace traditional crops.

A specific type of innovation is industrial innovation by which traditional crops are processed into nonfood end uses. In these innovative value-adding activities, thanks to the scientific research, final product actually represents nonfood use for common agricultural products (ethanol from corn, biodiesel from soybeans).

Coordination, either horizontal or vertical, focuses on coordination (arrangements) of the activities between those that produce and market farm products in order to actively change traditional marketing relationships that link consumers, food retailers and wholesalers, food processors, and producers. Horizontal coordination means consolidation among individuals or companies from the same level of the food chain. Vertical coordination includes contracting, strategic alliances, licensing agreements, and single ownership of multiple market stages in different levels of the food chain.

A specific type of coordination is vertical integration where the idea is to align and control all of the segments of a production and marketing system under single ownership. The factors aligned and controlled are price, quantity, quality, and transactional terms of exchange and the benefits are consistent quality from the field to the shelf, elimination of middlemen and even saving money for consumers.[15]

Nevertheless, before producers examine value-added processing and marketing, cost minimization in production much be achieved. Only low cost and efficient producers will be able to survive and compete in production agriculture. Adding value cannot take the place of reaching the efficiencies of production attainable through technology and economies of scale.

Conclusion

Ever since agriculture becomes economic activity, agricultural producers and policymakers are seeking to extract more local value from both agricultural products and from land, capital, and people. In today's global

[14] Kraybill, D., and T. Johnson: "Value-Added Activities as a Rural Development Strategy." Southern Journal of Agricultural Economics,1989, p.167-170.
[15] King, R.. "Management and Financing of Vertical Coordination: An Overview." American Journal of Agricultural Economics, 1992, p. 215.

economy characterized by severe competition, for survival of their businesses, agricultural producers other than on producing primary commodities must also focus on examining ways to improve the returns from their farm operation. Adding value to agriculture is a logical answer that can stem the decline in farm income and provide a decent standard of living.

In this paper we have explained that adding value to agricultural products is the process of changing or transforming a product from its original state to a more valuable state that is preferred in the marketplace. Possible approaches toward value added incensement in agriculture are through innovation and/or coordination. Innovation focuses on improving existing processes, procedures, products, and services or creating new ones. Industrial innovation is processing traditional food products into nonfood uses. Coordination involves arrangements along the food chain. Horizontal coordination entails pooling or consolidation from the same level of the food chain. Vertical coordination involves contracts and agreements along different food-chain levels. Vertical integration aligns and controls price, quantity, quality, and transactions.

However, at the end we must point out that even if in today's economic environment adding value to agricultural products becomes vital, before producers examine value-added processing and marketing, cost minimization in production has to be achieved. Namely, adding value cannot replace the efficiencies of production attainable through technology and economies of scale.

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