Defying the Cobweb Pricing Model in Agricultural Products; A Value Addition Approach in Kenya

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Abstract

Agriculture in Kenya is characterized by an imbalance between the quantity demanded and quantity supplied throughout the production cycle. This discrepancy is caused by seasonality in supply while the demand remains relatively constant. The time lag from production decision to actual production makes agricultural products price inelastic. This imbalance in the market causes a disequilibrium in the product market and hence volatility in prices. The cobweb model stipulates that the time lag in agricultural production causes a cyclical distortion in prices and therefore the current price offered in the market determines the future supply in the agricultural market. Value addition is any activity or process that increases the shelve life of raw agricultural products. Processing, packaging, branding and storage of agricultural products not only increase the return to farmers but also ensure that there is a constant flow of products in the market throughout the year hence curbing price volatility. Farmers and agribusiness in Kenya and Africa as a continent can create a trillion dollar food market by 2030 if they mechanize their production, expand their capital access, irrigate their lands, add value to their produces and adopt production of high value crops.

Keywords: Cobweb Mode; Time Lag; Value Addition; Price Volatility

Introduction

Fluctuations in agricultural prices among small scale farmers have discouraged both the existing and potential farmers to venture into this business. Due to the perishability of most agricultural products, farmers become vulnerable to manipulation by buyers and middle men and therefore becoming the net losers in the whole supply chain [1]. In a free market, the Adam Smith's invisible hand determines the prices of goods and services. At market equilibrium point, there exists an equilibrium price and equilibrium quantity. This is what determines the price of any commodity in free market system. The price at this point is known as the market clearing price.

$$S_t = D_t$$

When there is disequilibrium between the amount demanded and the amount supplied in the market, price distortion is inevitable. Why the prices of agricultural products remain unstable is due to its uniqueness in the pricing decision. According to cobweb theory, farmers determine how much they will produce currently based on the price they received the preceding year [2]. Due to the time lag involved in agricultural production, the current supply is a function of the price last year which is a function of the amount supplied.

$$S_t = S_{t-1}$$

The agrarian economy in Kenya is faced by seasonal production of agricultural products. The fluctuation in the supply in the market distorts the price mechanism of the ever competitive market. According to the law of supply, ceteris paribus, supply is a positive function of price. As the price increases, the quantity supplied in the market increases as this acts as an incentive to produce more and vice versa.

Discussions

Value addition to agricultural products is the process of increasing the economic value and consumer appeal of an agricultural commodity [3]. According to Uchechukwu [4], value added agriculture entails changing a raw agricultural product into something new through storage, cooling, drying, processing, packaging, extracting or any other type of process that differentiates the agricultural product from the original primary or raw agricultural products.

The law of demand and supply stipulates that a market clearing price can only be achieved at equilibrium point. Equilibrium price for raw agricultural products in Kenya is rarely achieved due to the seasonality nature of their production. According to the cobweb model, price elasticity of supply in agricultural products is perfectly inelastic [5]. The time lag from production to harvesting causes a cyclic instability in the market and therefore a recurring disequilibrium in agricultural product market.

To achieve equilibrium through price mechanism, quantity demanded in the market should at any point match the quantity supplied. From the figure below, a shift to the left means that the supply has decreased and therefore increases in price of commodities. On the other hand, a shift to the right decreases the prices of agricultural products. This is due to seasonality in production as much of agrarian practices in the country are rain fed.

The equilibrium quantity supplied is denoted by Qe while the equilibrium price is denoted by Pe which is the market clearing price at the equilibrium point E0. S0 and D0 are the original supply and demand functions respectively. A decrease in supply causes the price to rise while an increase in supply causes the prices to decrease. S1 and S2 are the new supply curves.
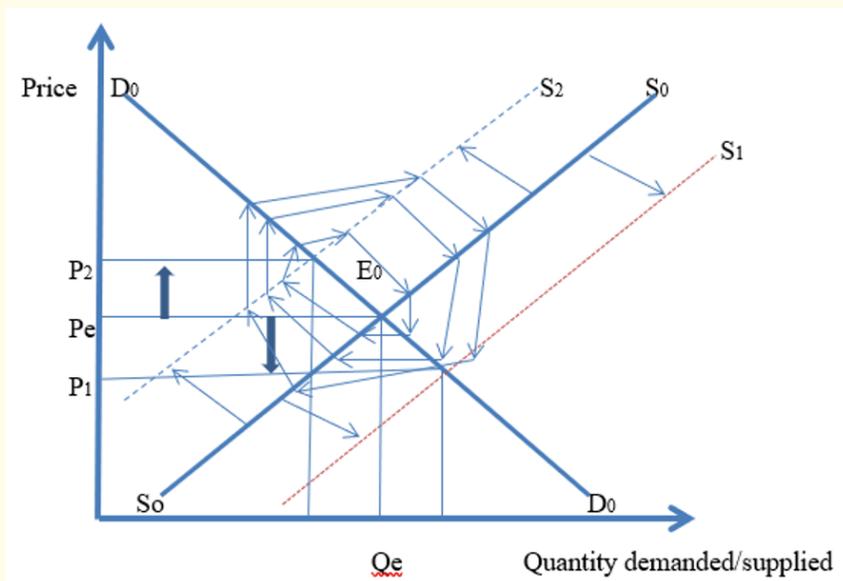
The cobweb theory stipulates that future production decision is based on the current price of any agricultural commodity. If the current price is high, farmers tend to respond by producing that specific commodity whose price is lucrative. Due to inelasticity of farm produce to price change, the time lag for production takes time and therefore the degree of response is low. By the time the farm produce are ready, there is an influx of the product in the market.

According to the law of supply, surplus in the market causes the price to decrease and therefore acts as a disincentive to farmers producing in period t+1. Since the production is based on the current price, few farmers will produce in period t+1 since prices in period t are low. Consequently, there will be shortages in the market and therefore this attracts high prices and the cycle repeats indefinitely.

This paper attempts to find solutions to this cyclical pattern in the agrarian economy. When a farmer cannot project with a certain degree of certainty the return on investment, it deters further investments in such a venture. With data and information, agriculture is gradually transforming from traditional subsistence farming into agribusiness. Agricultural commercialization in Kenya is through agro processing and value addition is the future of the country and the continent at large.

Conclusion and Recommendations

Kenya receives rainfall in four to six months per year. Majority of small scale farmers in Kenya rely on rain fed agriculture. This limitation creates a seasonal market in the agrarian economy hence triggering a cyclical process of product availability. Value addition of agricultural products ensures longevity of products shelve life. This therefore ensures that there is a constant supply of agricultural products in the market and therefore avoiding product shortages in the agricultural product markets.

Farming doesn't require rain, it requires water. By irrigating farms, it breaks the cycle of seasonality in agricultural production and therefore supplementing rain fed agriculture. The time lag for production therefore would be irrelevant since farm produces would be easily available and accessible throughout the year.

In Kenya, creative farmers are increasing their profitability by vertically integrating their production processes as opposed to horizontal increase in their production volumes. Emerging issues in value addition in agriculture includes segregating and identity branding. This practice ensures consumer preferred characteristics along the supply chain. In an era of information, farmers are still fetching higher revenues in raw products in identity branding especially in organic farming where production is demand driven.

Massive investment in techno agriculture in Kenya is inevitable. To achieve food security and job opportunities, raw marketing of agricultural products should be discouraged. The government in collaboration with farmers should heavily invest in farm mechanization and irrigation to ensure availability of variety of agricultural products throughout the year.

Farmers should consider value additions instead of selling their products as raw commodities. These includes making ready-to-eat salad packs from vegetables, extraction of juice from fruits, milling of cereals and processing of products like milk among others. Once this is achieved, farmers should package, brand and offer transportation in consumers' preferred form, place and time.

To achieve maximum value addition and therefore optimize return on farm investments, Kenyan farmers must continually cultivate competitive advantage by adopting modern production technologies, improve efficiency in production and adopt land use consolidation model to benefit from economies of scale. By doing so, prices of agricultural products will stabilize and therefore any rational producer will be well informed about any agribusiness model before taking any investment decision.

Small scale farmers in Kenya will truly be sovereign when they are empowered to add value for their produces and break the myth of 'produce season' where middle men and brokers take advantage of this seasonality to manipulate the farm gate prices. By value addition, agro processing industries will emerge based on intra-regional comparative advantages.

Bibliography

1. Ameru JN., *et al*. "Towards Improving Agricultural Marketing Information Systems for Smallholder Farmers: A Tharaka Nithi Case". *Journal of Agriculture and Sustainability* 11.2 (2018): 99-128.

2. Lindgren K., *et al*. "Projection of a heterogenous agent-based production economy model to a closed dynamics of aggregate variables". *Advances in Complex Systems* 18.5-6 (2015): 1550012.

3. S Datta., *et al*. "Value Addition of Horticultural Crops: Recent Trends and Future Directions". 1st edition. New Delhi, India: Springer (2015): 179-189.

4. Uchechukwu-Agua AD., *et al*. "Postharvest handling and storage of fresh cassava root and products: a review". *Food and Bioprocess Technology* 8.4 (2015): 729-748.

5. Huong NV and Yorobe JM. "Maize supply response in Vietnam". *Asian Journal of Agriculture and Development* 14.2 (2017): 89.

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