THE BENEFITS OF AGRI-FOOD VALUE CHAINS

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1. Overview

The idea of "value chains", introduced and popularized by Michael Porter (1985) has received increasing attention in agricultural sectors in recent years in response to a number of economic factors and consumer trends affecting agri-food enterprises. This paper reviews the concepts of agri-food value chains, describes the economics behind the motivation for firms to enter into a value chain partnership and explains how a value chain strategy could benefit all stakeholders in the agri-food industry.

2. What is a Value Chain?

Various researchers, organizations and companies offer slightly different formal definitions of value chains. Generally, these definitions employ terms such as "partnerships", "alliance", and "collaboration" and focus on adding value, increasing market share and satisfying or exceeding consumer demand.

A value chain is a mutually beneficial partnership among all players involved in the production of a product in which each partner contributes and shares knowledge, information and contributes expertise to improve (differentiate) the final product to better satisfy consumer demand relative to the chain's competitors. Inherent in this definition is that the value chain must efficiently "add value" to the product for the benefit of all involved in the chain; value that is determined by the perceptions of the consumer. It is assumed that value can be added to a product more efficiently by an interdependent value chain partnership than could be done by an individual effort by a member of a traditional supply chain.

3. Benefits of Value Chains

The benefits of agri-food value chains, as mentioned, are inherently mutual. To remain competitive in today's global business environment a focus on separate links in the overall supply chain is not likely to be enough (Womack and Jones, 2005). To maintain viability and increase market share, a thorough understanding of all parts of a supply (value) chain (facilitated through a value chain orientation) is increasingly necessary.

Focusing on collaboration among the interdependent links in the value chain increases the probability and efficiency of enhancing the overall value of a product relative to a strategy of exercising control over the entire chain by one link with dominant market power. As Gooch (2005) recounts, Henry Ford enjoyed his major successes in mass production of automobiles through value chain management by collaborating with interdependent suppliers. His eventual attempt to control the entire process through vertical integration led to the failure of many of the enterprises in which he did not have expertise.

Each link in a traditional supply chain brings a wealth of knowledge and expertise to the table. Knowledge can be categorized into distinct forms (Hobbs, 2001; Sachwald, 1998). "Codifiable knowledge" can be easily documented and presented in forms such as books or data. Such knowledge may be patentable by a firm and transferred among partners for the benefit of all in a value chain. An example of this could be models developed by retail grocery firms to estimate the effect of advertising campaigns, product attributes, pricing schedules or product placement strategies on consumer spending.

A value chain has the unique ability to provide benefits to its partners through the utilization of "tacit knowledge". Tacit knowledge refers to knowledge that cannot be explicitly stated because it is "inaccessible by consciousness" (Hildreth and Kimble, 2002; Polanyi, 1967). For example, the tacit knowledge or generations of experience built up in the human capital of a family farm would take generations to be re-learned should such an operation be bought up in vertical integration and a new farm manager appointed.

Sharing knowledge among partners is the main asset of the value chain. This allows the partners to work together to identify and respond to consumer demands faster, and with lower transaction costs than would be possible without such a relationship.

Value chains allow partners to improve technology or production methods, to secure a supply of inputs and market access and improve buyer-seller relationships. The benefits of a value chain approach to efficiently conduct business to satisfy current and respond to changing consumer demand is not easily replicable by traditional independent supply chains.

4. The Economics of Value Chains

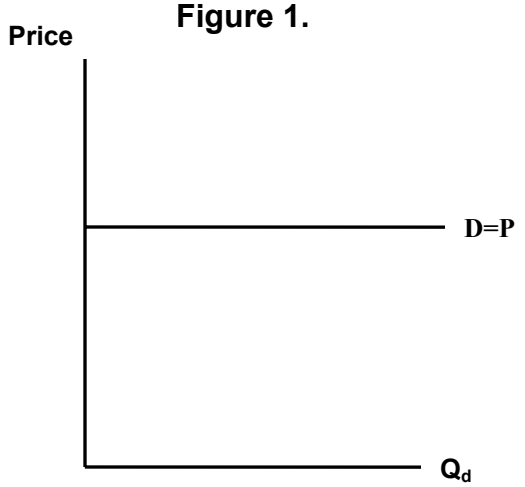
The potential benefits resulting from a successful value chain partnership can be explained using the simple economic theory underlying a demand curve. Demand for a good depends on (is a function of) the price of the good, price of complement goods, price of substitute goods, consumer income and consumer tastes and preferences. Formally:

$$Q_{d\,i} = f(P_i, P_c, P_s, I, TP) \qquad \textbf{(1)}$$

where:
- $Q_{d,i}$ = quantity demanded of good i
- P_i = price of good i
- P_c = price of complement good
- P_s = price of substitute good
- I = consumer income
- TP= consumer tastes and preferences

Demand for a product is influenced by changing one, or a combination of, the variables on the right hand side of equation (1). In the absence of value chains, competing products (substitutes) commonly compete on the basis of price (P_i). In economic theory, an environment of perfect competition is assumed to arise if: firms are "price takers", i.e they comprise a sufficiently small proportion of total market output, products are homogenous (very similar to competing products) and there is free market entry and exit, implying that it is easy for new firms to enter the market and buyers can easily switch between sellers. This type of situation is displayed graphically in Figure 1.

Figure 1.



An attempt to increase price in the case of perfect competition will result in the loss of all sales.

This is the demand curve facing an individual firm under the assumption of perfect competition. As mentioned, a key assumption of perfect competition is product homogeneity; the products of different firms are very similar or indistinguishable. Raw agricultural or fisheries-based commodities, by definition, are good examples of homogenous products. In general, although this trend is changing, a consumer will not care if a fish comes from Boat A or Boat B as quality is at least perceived to be the same. In this case, producers of homogenous goods are price takers. Any attempt to increase the price of a homogenous good will reduce or eliminate a firm's sales of the product, ceteris paribus[2].

Agriculture, historically, can be argued to most closely resemble a perfectly competitive industry (Pindyck and Rubinfeld, 2001). In response to this, price-based competition in agri-food industries has been fierce and has led to consolidation at all levels of the traditional supply chain, although not at proportional rates.

Through consolidation, the least cost-effective producers have been driven out of the industry. In agriculture and the fisheries, consolidation has been more prevalent at the retail, processing and input-supply levels than at the producer

[2] All else remaining the same.

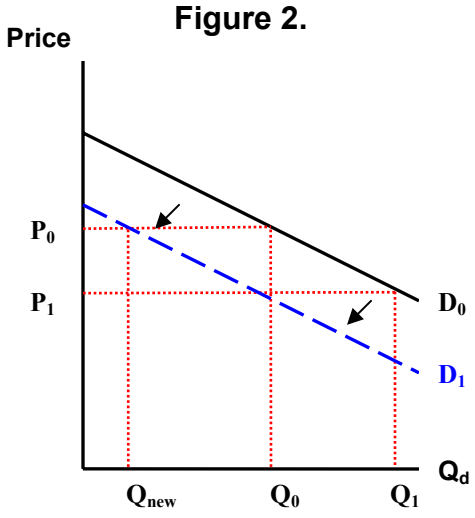
level. This has resulted in, for example, traditional farms having little if any market power as well as having to accept lower prices while being expected to adhere to certain production practices which add value (such as food traceability programs) but without additional compensation.

Traditional firms supplying raw commodities to independent processing companies or retail are a textbook example of Figure 1. This is not meant to suggest that the firms exhibiting market power are operating with evil intentions; they are responding to market forces and without such a response they would be put out of business by more "cost-effective" competitors.

Nonetheless, cost or price based competition, while providing the ability to compete or increase market share in the short term, is easily replicable and unsustainable; price can only be reduced by so much. This strategy is also unimaginative and ignores the benefits of a value chain approach.

In Nova Scotia, retail consolidation in the agri-food sector is evident, with only two dominant firms remaining. Despite this market power, as mentioned, a price-based strategy is not ideal. A firm could decrease price and increase market share (quantity demanded) of a homogenous product, however, a competing firm with market power could just as easily employ such a strategy. If a competing firm lowered its price relative to the initial firm, the initial firm would see a decrease in demand for its product, ceteris paribus. Such a situation is illustrated in Figure 2.

Figure 2.

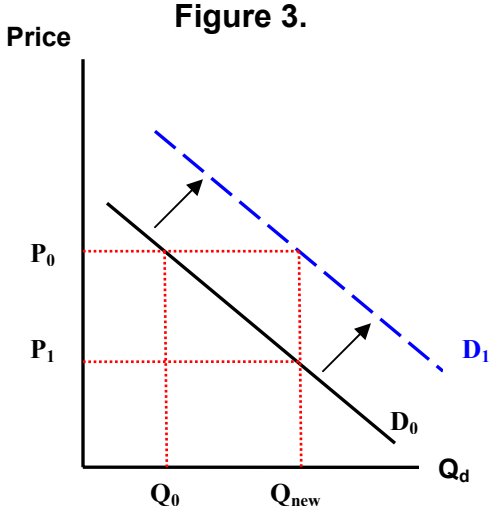


A decrease in (own) price, from P_0 to P_1, results in an increase in the quantity of the good demanded, from Q_0 to Q_1. If the price of a substitute (competing) good were to decrease, the demand for the initial good would be less at every price (shift in the demand curve from D_0 to D_1), for example, at initial price P_0, quantity demanded decreases from Q_0 to Q_{new}.

Again, a value chain's major benefit is the improved ability to satisfy changing consumer demand through cooperation among the interdependent partners. This implies that a value chain is targeting the "taste and preferences" factor in the consumer demand curve, as opposed to price. Successfully meeting consumer demand relative to a competing firm, through adding value along the

value chain decreases the reliance on price competition through product differentiation. In fact, changing the taste and preferences of consumers toward the product of a value chain effectively "shifts out" the demand curve for the product (for example from D_0 to D_1 in Figure 3). A shift in demand causes an increased quantity of a good to be demanded at every price (an increase in quantity demanded from Q_0 to Q_{new} at a price of P_1). Analogously, a consumer will be willing to pay a higher price for a given quantity of the product (an increase in willingness to pay for quantity Q_{new} from P_1 to P_0).

Figure 3.



Adding value to a product differentiates the product to better satisfy the tastes and preferences of consumers. This is analogous to a "shift" in demand from D0 to D1. With a shift in demand, more quantity of a product is demanded at every price, or, consumers are willing to pay more for a given quantity of product.

5. IMPLICATIONS

With the economics explained, what does this mean for the stakeholders of agri-food industries? The future will be much different for those who participate in a traditional supply chain than for those who are value-chain oriented.

First, consider supply chains in the context of a farmer. In this scenario, the strategy will be similar to that of the past two decades in commodity agriculture: maintain or improve economic efficiency relative to competitors to secure a return on investment as a supplier primarily to processor, wholesale or retail buyers. The results of this strategy are evident in the rural areas of North America. A significantly smaller number of diversified traditional family farms dot the country-side while larger mono-commodity corporate farms become the reality.

With some market power established by the remaining larger farms, the economic situation would appear to be more stable and may very well be in the short term. The reality of the traditional supply chain today, however, is that it operates in a global marketplace. Nova Scotia's small land mass, variable climate, short growing season and distance from major traditional markets,

agricultural inputs and a low-cost and reliable workforce is simply not competitive with other regions in commodity production.

As competitive pressures continue to weigh on retailers, they will need to further tighten margins to offer cost savings to the consumer and maintain market share. In a supply chain, it will be the farm share of this margin that absorbs the cost. Declining profits lead to declining re-investment by farms, aging infrastructure and obsolete technologies, accelerating the cycle. If the cycle becomes too much and a farm cannot operate in such an economic climate, there are many other substitutes available to the retailer. The commodity farmer, with the retail channel closed for the time being, has the options of alternative marketing channels such as some form of direct to consumer sales or exit from the industry.

Now switch to a value chain model. The main implication for farmers is a loss of some autonomy in exchange for longer term viability and a fair return for the resources and output of the farm. Working in a partnership with retailers will require somewhat of a "leap of faith" for some producers who have come to view potential partners as adversaries over years of mistrustful supply chain agreements. As a member of a value-chain, the farm is removed from perfect competition. Agri-food products are shielded from swings in commodity prices because they are now differentiated through innovation at all levels of the value chain, ultimately driven by consumer demands identified through information exchange.

The implications for the retail sector are equally beneficial and will also require an adjustment in the corporate mindset. Rather than holding market power over primary commodity producers, market power will be shared along with the competitive advantages of all value chain partners to elevate products above those

Oregon Country Beef is a cooperative of over 100 family-owned beef ranches in the western United States. OCB was officially incorporated by 14 ranchers in 1987 with the goal to "provide sustainable means through a group to profitably market quality beef products desired by the consumer while retaining every possible bit of independence".

OCB has successfully differentiated their product from commodity beef by adhering to unified strategies. The cooperative focuses on "natural family raised cattle", pasture fed for 16 months and finished at one feedlot for 3 months with corn, potatoes and alfalfa to ensure uniform quality. Beef is strictly hormone and anti-biotic free. They stress the utmost in humane animal practices. OCB is third-party certified by the Food Alliance for its environmentally sustainable and socially responsible practices.

The cooperative relies on relationships throughout the value chain from individual ranch family, to retail, through to their customers. The mission statement explicitly states that OCB will excel at translating cost and carcass data into information to guide individual ranchers' management decisions. OCB stresses the importance of its relationship with its feedlot (owned by a member) and packer (>10 year business relationship) and ensures a fair share of carcass value for all partners. The cooperative's share of the value chain revenues collected at the retail level are mutually agreed upon between the retailer and OCB. Retailers are chosen by the cooperative based on shared corporate values. All ranch families visit a retail store and perform product demonstrations one weekend each year.

Oregon Country Beef became a value chain success story by offering a superior product and building relationships through mutual benefit. Retail sales in 2003 reached US 18 million…without any legal contracts.

www.oregoncountrybeef.com

The New Zealand King Salmon Company produces 40% of the world harvest of farmed King Salmon and employs a staff of 360. Annual turnover amounts to approximately $43.7 million CDN. NZKS has become the preferred supplier of farmed King Salmon for outlets in New Zealand, Japan, Australia, Southeast Asia and the United States.

NZKS is vertically integrated over much of the value chain and is able to ensure the quality of its salmon from the hatchery through delivery. Marketing emphasis is placed on the health benefits (particularly the high content of Omega 3), superior texture and colour, and rich flavour. The company adheres to strict quality control and marketing through HACCP, assurance of traceability and third-party monitoring of the environmental impact of their aquaculture sites. The company has created partnerships with key transporters and feed-suppliers, the latter of which must also ensure traceability of feed inputs, thereby adding further value to the final product.

Software that efficiently integrates data from all aspects of production is employed and allows customers to place specific orders at any time of day. A close relationship with customers is stressed and orders are received, and in top condition, anywhere in the world within 60 hours of harvest. The software also allows the company to forecast supply and demand in the short, medium, and long-term.

The New Zealand King Salmon company has succeeded by creating reliable and dependable relationships with its suppliers and customers and guaranteeing a high-quality product produced with economically efficient yet sustainable practices.

www.kingsalmon.co.nz

of the competition. Instead of being price makers, retailers (and other partners in the value chain) must agree to an equitable distribution of revenue generated by the chain. This may translate into a smaller piece of a bigger pie, however the benefits of offering a superior product to consumers and escaping the lowest price "race to the bottom" competition of undifferentiated markets will ultimately, if not immediately benefit all value chain partners through increased and sustainable return on investment.

Information exchange and trust will be additional keys to the creation and maintenance of a successful value chain. Retailers do not generally play a role in the actual production of an agri-food product. The retailer offers benefits to the value chain by providing access to large volumes of consumers and their observations (through data collection and research) of consumer demands. To maximize the success of a value chain, this information must be communicated to the rest of the chain. The dissemination of operations and sales information through the value chain is a change that partners will need to adjust to, trust, and embrace.

6. FORMING A VALUE CHAIN

Successful value chains will often form out of industry hardship, rather than an acceptable status quo. In all cases, a value chain must be formed around a core win-win strategy to achieve sustainable competitiveness.

In Nova Scotia, the initial steps toward creating a value chain will likely need to be taken by producer groups. In the current economic environment, consumers (and thus retailers) are demanding agri-food products that are either different

than what is produced in Nova Scotia, or that are similar but can be produced for less in competing regions. Work has been done to identify trends in consumer demands for different commodities, and producers need to agree to work together to offer products that meet or exceed these demands. With a strategy put in place to satisfy consumer demands, markets will open to producers, as will the potential to create value chains with other members of existing supply chains.

Nova Scotian producers have a number of assets that can be leveraged along with new strategies to differentiate their products and decrease the damaging effects of pure price competition. Consumers are beginning to understand the value of supporting local food production. The economic, environmental and health benefits of buying local are now evident and are increasingly receiving popular media attention. Complementing the benefits of local food production with a strategy of implementing premium food quality and safety standards for Nova Scotia agri-food products will differentiate these products in the eyes of the consumer and will give producers increased market power. A need for producers to work together to efficiently produce a large enough supply of differentiated product will take cooperation between individual producers. An agreement to move forward toward such a goal could be agreed to at annual meetings.

With an official commitment towards a progressive strategy, collaboration with other partners in the future value chain can begin. Feasibility studies and other research will need to be performed to guide development. The intention of producer groups to pursue a value chain approach to production needs to be communicated to other members of the traditional supply chain. A well thought out plan to advance the ability of local agri-food sectors to meet consumer demand will catch the attention of collaborators that also understand consumer demands and can see the benefits of working with the sectors. Contributing early in the process will ensure that collaborators build trust, inform the process and secure a place in the ultimate value chain. Formal agreements on pricing, supply logistics and other sensitive issues could benefit from the appointment of third party facilitators particularly in the early stages of value chain implementation.

Individual farmers and fishermen offer perhaps the most important service to Nova Scotians. The true benefits of sustainably produced local food were lost on much of the population in the past but are seeing a resurgence in many parts of the world. Complementing the natural advantage of local food with other consumer demands offers producers in this province the potential for a unique form of market power, one that cannot be duplicated. The formation of a value chain with such a group makes simple economic sense for all potential value chain partners who are struggling under price competition.

7. CONCLUSION

A value chain approach to doing business has the potential to improve profitability and product quality with benefits accruing to all stakeholders of the chain, including consumers. Consumer demands are changing rapidly and will continue to do so as a result of demographic change, concerns over the health effects of food, the environment, local communities etc.

Combining assets, both knowledge and capital based, among interdependent links in a value chain will improve the effectiveness of identifying, responding to, and supplying consumer demand. Trust among partners will need to be established and maintained to sustain an effective value chain. This may be challenging in breaking free of some mistrustful relationships inherent in traditional supply chains. The rewards of doing so, however, are clear and significant.

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