Entrepreneurial Supply Chains and Strategic Collaboration: The Case of Bagòss Cheese in Bagolino, Italy

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Submission to the 19th International Food and Agribusiness Management Conference
Global Challenges, Regional Solutions
Budapest, Hungary
June 20 - 23, 2009

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Abstract

Globalization is challenging many small towns and communities as they lose populations and economic activity. Yet, through entrepreneurial supply chains, some communities are organizing themselves to forge local solutions to their global challenges. Entrepreneurial supply chains are inter-firm relationships that bring organizations with a mutual recognition of need for and dependence on valuable assets that are inexhaustible in use but is easily depreciated with misuse or abuse together to leverage and their shared responsibility in protecting these assets even as they use them for their economic activities. Using Bagòss cheese as a case example, the research shows that entrepreneurial supply chains can provide superior economic benefits to small towns and communities as they address the challenges presented them by accelerating globalization.

Introduction

O'Hara and Stagl (2001) argue that increasing globalization has altered the relationship between economics and society as local alternatives merge as strong competitors to imports in local markets. They view the emergence of community supported agriculture as an example of the evidence that certain characteristics of production are becoming more important in the interaction between consumers and markets. For example, food production and consumption have taken on broader roles than meeting the economic needs of the producers and the nutritional and energy needs of consumers. Increasingly, within the context of globalization, food production, distribution and consumption have become political tools in addressing environmental challenges (Theodoropoulou, et al., 2008), dealing with conservation and preservation of traditions and culture (Leong, 1989) and contributing to economic development (Arce and Marsden, 1993) even as they provide economic sustenance to the producers and ethical comfort to consumers.

This role of food production and consumption is becoming important because of increasing consumer sensitivity to the interactions between food production and distribution, on

the one hand, and environmental degradation and climate change, social injustice and other forms of cultural exploitation as well as adverse outcomes of expanded global activities. The increasing sensitivity is emerging from a larger proportion of consumers in both developed and developing nations moving up on their Maslow's hierarchy of needs, from where food is merely a source of energy and nutrition to where it is an indication of being self-actualized (Amanor-Boadu and Schnitz, 2008). The economics and competitiveness of local firms are being influenced by an increasing number of consumers making their choices on the basis of extrinsic characteristics of the food products (organic, small farms, natural, animal welfare, fair trade, etc.), and taking the intrinsic characteristics as a given.

Food products that are successful in achieving these broader objectives exhibit specific characteristics that offer them a competitive advantage in the global consumer marketplace and a production advantage over other locations and production methods. For example, products with *appellation d'origin* such as "Champagne" and "Bordeaux" in French wines and "Vidalia onions" in the U.S. have succeeded in positioning themselves as having characteristic qualities to warrant premiums and recognition. Within the context of the resource-based view of the firm, these idiosyncratic characteristics will encompass uniqueness in resources that are rare and valuable, are inimitable and non-substitutable (Lippman and Rumelt, 1982). Additionally, for the resource owners to be successful in sustaining their competitive advantage in the products they produce, they must possess a credible threat of retaliation for any potential competitors (Day and Reibstein, 2004).

The purpose of this paper is two-fold. First, we seek to develop a new concept—entrepreneurial supply chains—as a construct for explaining an emerging trend in local economic development efforts in an increasingly global marketplace. The second purpose is to apply this

concept to describe the production and marketing of Bagòss cheese, produced in the Italian village of Bagolino. The application involves the simulation of the outcomes of this entrepreneurial supply chain strategy and compares them to alternative governance mechanisms and in intellectual property protection.

Entrepreneurial Supply Chains and Strategic Collaboration

Supply chains are frequently structured with a single champion who is described as the "owner", and thus, controls most of the strategic decisions associated with performance. The importance of an "owner" evolves from the concentration of the benefits from collaboration at a particular point in the relationship and the control over access to these benefits. For example, a retailer as a champion of an agri-food supply chain controls access to consumer traffic, which allows it to extract premiums from consumers and distribute it according to its perception of the contribution various upstream participants made. In exchange for a share of the value extracted, participants have to conform to champion's specifications with respect to input use, production quantities, packaging formats, prices, and delivery locations and times, etc. The need for these specifications and their enforcement is more critical if the products flowing from different suppliers upstream are commingled at some point in the downstream segment of the chain.

This supply chain "champion" governance structure often creates conditions for opportunism that exhibits itself as a search for anonymity by upstream firms (Amanor-Boadu and Starbird, 2005). Anonymity becomes valuable because of the difference between the participating benefits and the expected costs of external failure risks that are directly traceable to a source. The "champion" governance structure may also foster moral hazard at points along the supply chain where participants perceive themselves to be powerless (Amanor-Boadu, Trienekens and Williams, 2002; Starbird, Amanor-Boadu and Roberts, 2008). Here,

participants in the supply chain who perceive themselves as powerless will find it advantageous to shirk on the necessary effort that is unobservable by the champion to minimize potential risks to the whole supply chain. The "champion" governance structure may provide incentives for this behavior because the benefits are privatized while the costs are distributed across the whole chain. The risks of moral hazard are exacerbated under conditions of imperfect traceability amidst sampling and diagnostic errors and are especially important where food safety issues are concerned.

These inherent risks in traditional supply chains may be addressed with oversight protocols that aim to increase transparency and reduce the value of anonymity and/or increase rewards to discourage moral hazard. However, executing these protocols is always a challenge and can be expensive if the participants' objectives are not aligned and the net benefits from not complying with the rules of engagement are positive.

Entrepreneurial supply chains become an effective alternative to traditional supply chains under the foregoing conditions when benefit access points are not controlled at any single point in the supply chain. Under these conditions, a "champion" will not have the power to enforce any compliance and any oversight protocols provide little or no benefits to the chain's members. When this is the case, it becomes more efficient to implement entrepreneurial supply chains.

Entrepreneurial supply chains are inter-firm relationships characterized by a mutual recognition of need for and dependence on a valuable asset that is inexhaustible in use but is easily depreciated with misuse or abuse. Participants in entrepreneurial supply chains, therefore, recognize a shared responsibility in protecting and enhancing the value embedded in the asset and build strong mutual trust and trustworthiness. They are usually able to develop and sustain this strong mutual trust and trustworthiness by maintaining close contacts with each other, and

they are able to do this because of their relatively small numbers vis-à-vis their industry. Although they may compete in the same marketplace, participants in entrepreneurial supply chains compete via blue ocean strategies (Kim and Mauborgne, 2005), a competition strategy that involves the development of alternative strategy maps that specifically avoid price competition and focus on market expansion.

The governance structure is entrepreneurial because each firm in the relationship focuses on sharpening its strategy map to maximize the value it can extract from the market by being different in how it exploits the common assets it shares with its partners. The collective success of participants in an entrepreneurial supply chain is supported by a mutual recognition that their customers and patrons cherish variety and hence their individual success is dependent on their collective diversity, and hence, on the success of all others in the relationship. Participants in entrepreneurial supply chains, therefore, organize themselves organized around the assets that give them their raison d'etre and focus their attention on leveraging those assets to enhance their individual positions while ensuring efficient information and knowledge through the whole organization (Figure 1). They appreciate and celebrate their idiosyncratic contributions to their collective value creation. Because they are non-linear, entrepreneurial supply chains are usually more extensive than traditional supply chains, encompassing government agencies that enforce regulations for the use of particular assets, as well as businesses in multiple industries who all depend on the assets providing the value foundation.

{Editor Note: Figure 1 goes about here}

Three distinct groups of entrepreneurial supply chains may be delimited based on the types of assets that support the supply chain: location or place assets; place/product assets; and place/product/process assets. The asset defines participation rules and opportunities that may be

exploited in the supply chain. The asset types also define the extent of intellectual property protection that the supply chain may use to guard itself against the exploitation of the assets by competitor as well as internal governance controls that may be used to enforce behavior among participants (Figure 2).

{Editor Note: Figure 2 goes about here}

Location or place asset-driven entrepreneurial supply chains are those that are organized around the unique characteristics of a location. This is the typical asset that drives tourism supply chains because the participants are able to leverage the unique characteristics of the location to provide idiosyncratic experience for their customers. Thus, the primary source of the participants' competitive advantage is the unique, valuable and unsubstitutable location asset they all share.

An example of a place-driven entrepreneurial supply chain is the Finger Lakes Wine Trails in upstate New York which are organized to maximize tourist traffic to the Finger Lakes region of New York by exploiting their individual diversity and the geographic beauty of their location. Included in the Wine Trails are vineyards, wineries, restaurants and bed and breakfast accommodations as well as event organizers and tour bus operators. Individual participant's sources of competitiveness are in how they organize their own production and utilize the common assets to leverage their ability to delight their customers. It is not uncommon to have a member in this relationship direct a potential customer to another partner in the supply chain as a better provider of a solution or product. This behavior of *marketing each other* elevates the common asset by first knowing their disparate strengths and then bringing their collective strengths together. A similar governance mechanism is found in the wine and tourism region of Southwestern Ontario region of Niagara-on-the-Lake, on the shores of Lake Ontario. Likewise,

the ski resort towns of Whistler, British Columbia and in the Swiss Alps as well as resort locations like Acapulco, Mexico have place-driven entrepreneurial supply chains that leverage the location's assets to enhance the participants' competitiveness in their industries.

In all these examples, the immobility of the common asset is the primary intellectual property protection opportunity available to the supply chain. As such, the participants' ability to establish and secure a first mover advantage is usually a critical source of their ability to sustain their competitive advantage. A good example of this outcome is how Las Vegas, Nevada has successfully maintained its market share position, measured by gross gaming receipts, over a major late comer like Atlantic City, New Jersey despite the latter's efforts over the years to topple the former (Eadington, 1999).

The place/product asset-driven entrepreneurial supply chains are those organized around a product that *naturally* occurs in a particular location, city, region or country. They also cover entrepreneurial supply chains that are organized around products that, while they may not occur exclusively in a particular location, have been there for such a long time that it has come to be associated with the place. The participants in the supply chain gain their advantage by this natural barrier to competitors who are unable to replicate the product because they are unable to replicate the location. Therefore, the place name becomes the embedded intellectual property that separates the product from the identified location from all others.

Italian suits and fashion are good examples of place/product type of supply chains. The participants recognize that quality is a distinguishing factor and they owe each other the responsibility of maintaining this perceived quality associated with the product from the identified location. So, while many fine suits may be obtained from many places, being Italian elevates it above the others due to the history of quality products from that industry. The same is

true of Cuban cigars or California wines. Another example is Saskatoon berries, which is produced by a shrub that grows throughout the Canadian prairies and the northern plains of the United States (Harris, 1972). However, by the fortuitous naming of the fruit, Saskatoon and Saskatchewan have claimed it as their own and market it as being authentic if grown in Saskatchewan. The growth in Saskatoon berries' production and marketing has resulted from the scientific evidence of its high levels of antioxidants (Hosseinian and Beta, 2007; Hellstrom, et al., 2007) and the increasing appreciation of the role of nutriceuticals in health protection and promotion (Morris, 2003).

The final type of entrepreneurial supply chains is place/product/process asset-driven entrepreneurial supply chains. This type of supply chains are organized around a product that is produced in a particular place using a specific process, inputs or production technology. The products produced within this type of entrepreneurial supply chains tend to be more controlled in terms of the processes or inputs that qualify them as meeting the expected characteristics of the underlying asset supporting the chain. This control is premised on the fact that most of them have some form of intellectual property protection that provides them with the legal support from infringement from competitors.

Roquefort cheese is an example of this group of entrepreneurial supply chains. It is a blue cheese that is made from the milk of Lacaune, Manech and Basco-Béarnaise breeds of sheep and matured in the natural caves near the town of Roquefort in the Aveyron region of France, where it is infected with the spores of *Penicillium roqueforti*, a fungus that grows in these caves. The intellectual property associated with this production method was recognized as far back as 1411 when the village of Roquefort-sur-Soulzon sought and obtained the rights of aging the cheese in its caves from King Charles VI (Aussibal, 1983). There were only seven Roquefort producers as

of 2003, and the largest is the Société des Caves de Roquefort (a subsidiary of Lactalis), which accounts for about 60 percent of all production and owns several caves. The entry barrier to the Roquefort cheese production is the cave, the place asset that determines the product and the process.

Another example of entrepreneurial supply chains is Vintners' Quality Assurance (VQA) employed by Ontario, Canada wine producers. This is not a product, per se, but a label that allows the chain participant to claim a mark of quality. To qualify for this label, the bottled wine must be produced by a winery located in Ontario and from at least 75 percent of grapes grown in the Province of Ontario (Wine & Vines, 2007). Participating wineries are audited every six months to ensure that they are following VQA regulations and all volumes of VQA wines are substantiated with respect to origin and other requirements. For example, the wineries must provide official Grape Growers of Ontario records including a "weigh slip" with the results of an independent test for brix. Additionally, participating retailers are audited at least annually for their use of the VQA labels as well as their sales of VQA wines for authenticity. This supply chain's governance system, thus, encompasses grape growers, wineries, retailers, the Liquor Control Board of Ontario (LCBO), and government agencies that audit the industry for compliance. It is important to note that the self-regulatory system that the VQA started with was replaced with government regulatory oversight as the niche Ontario wine industry expanded to become a global player and the participants themselves got large and numerous.

Another example of place/product/process asset is Vidalia onions and grown only in 20 counties of Georgia, U.S., get their name, like most place/product/process entities, from being first grown near Vidalia, Georgia, in the early 1930s. It is characterized by being unusually sweet and that comes from the low amount of sulfur in the soil in which the onions are grown. The

Vidalia Onion Act (1986) was passed by Georgia's state legislature, authorizing a trademark for "Vidalia Onions" and limiting their production to the 20 counties in Georgia. The industry petitioned the U.S. Department of Agriculture and received a Federal Marketing Order No. 955 in 1989 which provided federal protection for the product (Costa and Epperson, 2003; Boyhan and Torrance, 2002).

The role of government in the place/product/process category of entrepreneurial supply chains is, thus, almost deemed necessary—either to provide enforceable intellectual property rights or prevent opportunism. The Canadian VQA process focuses on preventing opportunism among the participants while the European Community's Council Regulation 1383/2003 (The Council of the European Union, 2003) provides protection from infringements for products that are granted place/product/process rights. This regulation focuses on customs action and measures that may be taken against goods suspected of infringing certain intellectual property rights that have been granted to specific products. It is an expansion and strengthening of national laws such as the French *Appellation d'origine contrôlée* (AOC), the Italian *Denominazione di origine controllata* (DOC), and the Spanish *Denominación de Origen* (DO) system. Infringements, such as selling products not meeting the location and process qualifications, are treated as counterfeit goods, misleading advertising or even a public health issue. The regulation is weighed in favor of those who have been granted the rights, and allows for a "a more flexible procedure allowing goods infringing certain intellectual property rights to be destroyed without there being any obligation to initiate proceedings to establish whether an intellectual property right has been infringed under national law" (Article 9, L 196/7). The extent of the regulation's favor for right holders is also evidenced in Article 7 (L 196/7): "Even where no application [for rights] has yet been lodged or approved, the Member States should be

authorized to detain the [infringing] goods for a certain period to allow right-holders to lodge an application for action with the customs authorities." Similar protection is offered under geographical indications— Protected Designation of Origin (PDO), Protected Geographical Indication (PGI) and Traditional Specialty Guaranteed (TSG)—are offered in the European Union laws to protect the names of recognized regional foods and beverages. Examples of these are Italian Limone di Sorrento, Scotch Whiskey and French Coquille Saint-Jacques des Côtes-d'Armor.

Bagòss Cheese: An Entrepreneurial Supply Chain

The reason why governments deem it necessary to participate in entrepreneurial supply chains is the positive externalities that entrepreneurial supply chains create in support of local economic development. We hypothesize, therefore, that entrepreneurial supply chains have inherent characteristics that facilitate community economic development because they depend on place assets that they need to preserve, conserve and protect. In doing this, entrepreneurial supply chains combat global challenges that confront them by focusing on local solutions.

We use the entrepreneurial supply chain for Bagòss cheese in the village of Bagolino, Italy to illustrate the local solution that emerges as a result of participants acting in concert to address their own global challenges. It shows how the purposeful pursuit of individual economic objectives (Mises, 1963) lead to environmental protection and conservation, community economic development and enhanced cultural education and preservation. It will become obvious after presenting the Bagòss case that the same is true to different degrees for Saskatoon berries, Roquefort cheese, Italian suits and the Great Barrier Reef.

Bagolino and the Participants

The dairy producers producing Bagòss cheese are small, with no more than 45 head of cows, and their village in the Caffaro Valley in the province of Brescia in the Italian alpine region, Bagolino, is also small: its 2007 population is estimated at 3,916 (ISTAT, 2007)). About a decade ago, the per capita income per taxpayer in Bagolino was lagging significantly behind that of the Brescia province and a lot more behind the Lombardy region. However, unlike many small alpine communities that are losing population and economic activity and their natural resources becoming wasted, the traditional Bagòss production method seems to be contributing to the sustenance of Bagolino. For example, the traditional Bagòss production rules stipulate that cows should be put on pasture land during summer and fed only hay grown in the region during the winter months. This provides the economic rationale to continue the upkeep of the mountain pastures and in so doing, protect the environment from degradation.

Bagolino has two historic assets: the Bagòss Carnival; and the Bagòss cheese. The Carnival, with its masks, colorful costumes, dancers and folk music, is described as "…a one of its kind phenomenon in Italy, with few competitors in Europe" (Sordi, 1976). For most of the people coming to Bagolino for the Carnival, there also is the attraction of Bagòss cheese, a semi-cooked cheese that is produced under strict processing methods that have been practiced for centuries. While both of these place/product assets are important to the community, it is obvious that Bagòss cheese is a unique, valuable, and inimitable resource for the community as a whole. For this reason, the dairy producers and the community joined forces to secure a trademark for their cheese, allowing them to prevent infringements under European Community laws.[1]

Being artisanal, Bagòss cheese is produced mainly by dairy producers; there is one processor serving a number of dairy producers who do not produce enough milk per day to

[1] It is estimated that about twice as much *fake* Bagòss cheese is produced as authentic Bagòss cheese.

produce their own cheese. The farmers and the processor form the direct handlers of the Bagòss production system. Other participants in the Bagòss entrepreneurial supply chain are Valle di Bagolino Cooperative, its hotels and restaurants, and the local government. Valle di Bagolino was formed by the dairy farmers to protect the Bagòss cheese trademark and promote and market Bagòss cheese domestically and internationally as well as oversee and enforce the production processes that ensure the authenticity of Bagòss cheese. The seventeen hotels and guest houses and a dozen restaurants in Bagolino are active participants in the Bagòss entrepreneurial supply chain because they all depend on this asset to drive traffic to their establishments. In all, it is estimated that about 300 people participate directly in the Bagòss entrepreneurial supply chain, encompassing feed suppliers, vendors of critical ingredients such as saffron, logistics providers, marketing and distribution services as well as event organizers and promoters. The local government supports and promotes Bagòss because it attracts tourists, which creates revenues for local businesses, and generates tax revenues to support government activities. The interests of all the participants are, therefore, aligned, eliminating the risks of moral hazard, opportunism and adverse selection that is common in traditional supply chains. This collaborative effort to grow the local economy by leveraging a common asset may explain the 16.5 percent increase in the income per taxpayer in Bagolino between 1999 and 2007 compared with increases of 2.7 percent in the Province of Brescia, 7.5 percent in the Region of Lombardy and 2 percent in the whole of Italy.

Bagòss Cheese Production

Of the 130 farmers in Bagolino, 28 produce Bagòss (National Institute of Statistics (ISTAT), 2007). For Bagòss cheese to be authentic, it must be produced with milk from brown cows that live in Bagolino and are fed only feed that is grown in Bagolino. To achieve this, the

farmers are expected to put their 1,100 cows on 22 developed pastures in the mountains during the summer months and feed them hay from the valley during the winter months. Due to labor shortage, it is not uncommon to find farmers in the mountains taking care of each other's cows during the summer months. And because they depend on the mountain pastures for their feed, the dairy farmers of Bagolino maintain these pastures and conserve the environmental quality of their mountains. For example, the dairy farmers keep goats for weed control in their pastures, thus reducing labor and avoiding the application of pesticides. This contrasts with other areas where these mountain pastures have been abandoned, leading to adverse social and environmental consequences (Suttini, 2008). The farmers also supply their cows' manure to the farmers in the valley from whom they purchase hay for their winter feed. Veterinary services and milk quality inspection services are provided by the government and by the provincial milk producer association (Stagnoli, 2008).

These strict centuries-old production traditions affect productivity on Bagolino dairy farms. For example, while the average milk production in Brescia province in 2007 was about 6,451 kg, Bagolino dairy farms averaged between 3,600 kg and 3,800 kg (ANARB, 2008). At any point in time, Bagolino's dairy farmers are milking about 800 of the 1,100 cows and the dairy farms may be divided into two distinct groups: Those with enough cows to produce their own cheese, at least one head of Bagòss per day; and those without enough cows to produce their own cheese. The farmers in the second group sell their milk to the only processor in town who consolidates the milk to produce cheese using the same traditional methods that the dairy producers are using.

Bagòss is produced year-round and because it is artisanal, each head may be slightly different in flavor, aroma and weight. About 10,000 heads of authentic Bagòss cheese are

produced per year and 80 percent of these are produced by individual farmers and the remainder is produced by the sole processor in the village. The production process begins with the immediate filtering of the milk after milking using conifer branches placed at the bottom of a bucket with holes in it (Figure 3). The filtered milk is skimmed and poured into 40-liter vats and left for a day. Rennet, dissolved in spring water, is added to the skim milk and poured into a copper vat and warmed on a wood-built fire to a temperature of between 37°C and 39°C for about 20 minutes before adding powder curd to the warm milk. The mixture is then heated to between 48°C and 50°C to produce an appropriate consistency. It is then cut into the size of grains of rice and saffron is added to the mixture and reheated to form curds.[2] The curds are separated from the whey, wrapped in canvas, and placed into molds of 40 cm diameter and heights between 12 cm and 15 cm. These are then placed on wooden planks, and stones placed on top to drain excess water from them, a procedure that lasts about three days. The cheese is released from its wrappings after this period and brought to the valley, where it is aged from a year to three years. In the first five weeks of the aging process, the cheese is dry salted twice a week by hand, and during the first six months of aging, it is turned periodically, scrapped, cleaned and greased with linseed oil. The final head of cheese weighs between 16 kg and 18 kg depending on how long it is aged and is produced from between 260 kg and 290 kg of milk.

{Editor Note: Figure 3 goes somewhere about here}

A Local Solution to a Global Challenge

The challenge confronting small communities such as Bagolino in an increasingly global marketplace is how to maintain their traditions as well as their economic independence. Bagolino, like many others, have discovered that leveraging their unique assets into desirable

[2] Some of the producers add the saffron when they add the rennet to the skim milk. It is the saffron that gives Bagòss its characteristic yellow color.

products in the global market to compete with mass-produced products without history and tradition can be an efficient approach to attaining the goals of maintaining traditions and securing economic independence. Bagòss retails at between €22/kg and €26/kg and higher in service organizations such as hotels and restaurants. Under the production information above, and assuming 80 percent of Bagolino's Bagòss is sold at retail and the remainder at 20 percent above retail in service organization, we estimate that Bagòss cheese brings gross revenue of between €3.7 million and €4.3 million into Bagolino economy. Given that there are 28 dairy farmers involved in Bagòss production, this is equivalent to between €130,742 and €154,514 per farmer, between six and seven times the average household income in the community in 2007.

For this governance system to remain effective in value creation, it is imperative that all participants, especially dairy producers, see themselves as independent entrepreneurs who are collectively expanding the market for Bagòss cheese by producing a unique product using historic traditional processes consumers consider a differentiating variable. If they cease to be independent entrepreneurs and institute instead a traditional supply chain which replaces the independent entrepreneurs with a hierarchical structure with a chain champion, the producers will have an incentive to shirk whenever it is warranted. Furthermore, if the product is not limited in supply, it is conceivable to see its price elasticity of demand adjust to the supply until it becomes a mere commodity. It is also imperative that the difference between the authentic Bagòss and imitation one is maintained through continued education of consumers about the difference and prosecution of violators of the trademark. We illustrate the effects of the foregoing using a system dynamic modeling approach under three scenarios: (1) Base scenario, which describes the entrepreneurial supply chain governance system currently in place; (2) Traditional Supply Chain scenario, where the entrepreneurial chain is replaced with the asset

being privatized and dairy producers supplying milk to a processor who does all the marketing; and (3) Intellectual Property (IP) Erosion, where the cooperative becomes ineffective in protecting the Bagòss trademark so that it becomes diluted over time. The assumptions associated with these scenarios are presented in Table 1. For example, it is assumed that capital constraints will prohibit expansion of cows in milking regardless of the governance system in place. However, producers will compensate for this constraint by making adjustments to feed and nutrition, i.e., increase cow productivity.

{Editor's Note: Table 1 goes about here}

The productivity improvement need will become real under the Traditional Supply Chain scenario, where the objective of producers shift from making the best Bagòss cheese possible to maximizing their milk production for the processor champion of the supply chain. They do this by using concentrate in their feed even if it is outside the criteria for Bagòss production. As more farmers seek to gain from scale economies through technology, i.e., nutrition, the volume of milk being processed into Bagòss increases and price begins to decline. Under the IP Erosion scenario, the brand is not effectively protected and imitators are able to push their products into the market without any penalties. This leads to supply exceeding demand, the uniqueness of the product becoming irrelevant to buyers because they are unable to distinguish the real ones from the imitated ones. In the final analysis, the dairy producers in Bagolino go head to head with their imitators in price competition, driving their revenues further down as they attempt to make up for lost revenues through higher productivity. As in the case of the Traditional Supply Chain scenario, the positive feedback between competition and the need for scale economies exacerbates the decline in revenues. Because milk production is a biological process, and because the market is uncertain, both cow productivity and Bagòss price are randomized (within

the high-low bounds presented in Table 1). Price responses are further constrained to reflect the underlying price elasticity of demand for cheese in Italy estimated at -0.118 (Soregaroli and Trévisiol, 2005) when Bagòss production exceed an assumed threshold of 11,000 heads.

The simulation results show that entrepreneurial supply chain (Base Scenario) is more likely to produce a more stable production environment because of the lack of negative competition among producers and other players in the supply chain. As a result, the average number of heads produced per annum is 10,859 with a standard deviation of 398 heads. This contrasts with the Traditional Supply Chain scenario which averaged 12,956 heads over 20 years with a standard deviation of 2,150, and the IP Erosion scenario with an average production of 12,358 and a standard deviation of 1,450. The trends in production under the alternative scenario are presented in Figure 4.

The gross revenues obtained under the alternative scenarios are presented in Figure 5. With each producer and chain participant focusing on creating value without expending resources on head-on competition, the organization is able to create the highest gross revenues under the prevailing assumptions of the entrepreneurial supply chain governance system. Participant's creative energies are directed towards their own benefit and improvements in any participant's situation are not detrimental to the others. In other words, the entrepreneurial supply chain system creates a positive sum outcome, where gains by any members are gains for the whole system. This contrasts with the traditional supply chain outcomes where the existence of champion invariably creates a hierarchy of distribution of gains that may not commensurate with contribution to gain. This potential risk of injustice in the distribution of gains underscores the opportunism risks that cause participants to gain from the system at the expense of everybody else (Amanor-Boadu and Starbird, 2005). Similarly, the inability of the system to protect its

intellectual property erodes premiums and forces producers to pursue head-on competition with imitators. This leads to low gross revenues despite the higher levels of production that producers have to assume in their futile attempts to reverse revenue dissipation. In the end, average gross revenue per annum ranged from a high of €4.4 million over 20 years under the entrepreneurial supply chain system to €2.5 million under the Traditional Supply Chain scenario and €2.3 million under the IP Erosion scenario. Thus, entrepreneurial supply chain governance structure has about 76 percent advantage over traditional supply chain governance system under the conditions defined in the system dynamic modeling presented here. It is assumed that the prices that are paid for Bagòss cheese under the entrepreneurial supply chain governance system reflect the "story" of Bagòss in its community and environment. However, the spillover benefits from tourism and other associated events are not included in these estimates.

{Editor's Note: Figure 4 and Figure 5 go about here}

Conclusion and Further Research

This research was motivated by the need to develop a theoretical framework for explaining the emerging inter-organizational relationships that are connecting seemingly unrelated organizations around natural assets such as places and connecting those to products and production processes. We noted that the principal characteristic of these relationships is that unlike traditional supply chains, they do not have a champion or an "owner." As a result, all participants in these relationships recognize their need and dependence on the identified assets for their success and work to protect, conserve and promote them through nurtured trust and trustworthiness. We called this emerging relationship entrepreneurial supply chains. We defined these relationships as being characterized by a mutual recognition of need for and dependence on a valuable asset that is inexhaustible in use but is easily depreciated with misuse or abuse.

We identified three types of entrepreneurial supply chains based on the depth of the assets involved and the level of protectable intellectual property embedded in the assets. These are place-driven; place/product-drive; and place/product/process-driven entrepreneurial supply chains. The level of required commitment increases as the complexity of the relationship increases with additional dimensions. Similarly, the responsibilities of participants also increase as one moves from place-driven to place/product/process-driven relationships.

We showed using the simulation of the Bagòss in Bagolino that entrepreneurial supply chains can produce significant value relative to traditional supply chains because of the market-induced alignment of objectives. The producers, the government, processors, and indeed the whole community works in tandem to preserve, conserve and protect the brand because they all benefit from its enhancement. The results simulation results showed that when the intellectual property of the asset is allowed to erode, the rationale for sustaining the relationship disappears.

This research is preliminary in both theory and application. However, it advances our understanding of how inter-organizational relationships may be leveraged at the local level, in small communities and by seemingly unrelated organizations, to position communities and their businesses in competitive positions within the global marketplace that is driven by scale economies. For example, in this paper, we assumed that the dairy product drove the whole system. It will be interesting to decouple that and look at how the feedback processes between the tourism industry and the dairy industry and the effect that has on the results under alternative governance mechanism.

References

Amanor-Boadu, V. and C. Schnitz "Consumers and the Evolution of New Markets: The Case of the Ethical Foods," Dallas, TX Southern Agricultural Economics Association, 2008.

Amanor-Boadu, V., and S.A. Starbird "In Search of Anonymity in Supply Chains." *Journal of Chain and Network Science* 5 (2005):5-16.

Amanor-Boadu, V., J. Trienekens, and S. Williams "Ameliorating Power Structures in Supply Chains Using Information and Communication Technology Tools." *Chain Management in Agribusiness and the Food System.* J.H. Trienekens, and S.W.F. Omta, eds. pp. 908-918. Wageningen, The Netherlands: Wageningen University Press, 2002.

ANARB *Un anno di Bruna*. Bussolengo, Italy: Associazione Nazionale Razza Bruna, 2008.

Arce, A., and T.K. Marsden "The Social Construction of International Food: A New Research Agenda." *Economic Geography* 69 (1993):293-311.

Aussibal, R. *Les Caves de Roquefort*. France: Cahors, 1983.

Boyhan, G.E., and R.L. Torrance "Vidalia onions--sweet onion production in southeastern Georgia." *HortTechnology* 12 (2002):196-202.

Costa, E.F., and J.E. Epperson "Impacts of Advertising and Promotion on the Demand for Scanned Purchases of Vidalia Onions." *Journal of International Food & Agribusiness Marketing* 14 (2003):79-92.

Day, G.S., and D.J. Reibstein *Wharton on Dynamic Competitive Strategy*. New York, NY: Wiley, 2004.

Eadington, W.R. "The Economics of Casino Gambling." *The Journal of Economic Perspectives* 13 (1999):173-92.

Harris, R.E. *The Saskatoon*, Publication 1246, Agriculture Canada, 1972.

Hellstrom, J., J. Sinkkonen, M. Karonen, and P. Mattila "Isolation and Structure Elucidation of Procyanidin Oligomers from Saskatoon Berries (Amelanchier alnifolia)." *Journal of agricultural and food chemistry* 55 (2007):157-64.

Hosseinian, F.S., and T. Beta "Saskatoon and Wild Blueberries Have Higher Anthocyanin Contents than Other Manitoba Berries." *Journal of agricultural and food chemistry* 55 (2007):10832-8.

Kim, W.C., and R. Mauborgne *Blue Ocean Strategy: How to Create Uncontested Market Space and Make Competition Irrelevant*, Cambridge, MA: Harvard Business School Press, 2005.

Leong, W. "Culture and the state: manufacturing traditions for tourism," *Critical Studies in Mass Communication,* 6(1989): 355-376.

Lippman, S.A., and R.P. Rumelt "Uncertain Imitability: An Analysis of Interfirm Differences in Efficiency under Competition." *The Bell Journal of Economics* 13 (1982):418-38.

Mises, von L. *Human Action,* San Francisco, CA: Fox and Wilkes, 1963.

Morris, B. "Bio-Functional Legumes with Nutraceutical, Pharmaceutical, and Industrial Uses." *Economic Botany* 57 (2003):254-61.

National Institute of Statistics (ISTAT) *Resident population database*. Rome: Government of Italy, 2007.

National Institute of Statistics (ISTAT). V Agricultural Census 2000, http://www.census.istat.it

National Institute of Statistics (ISTAT). XIV Population Census 2001, http://dawinci.istat.it/daWinci/jsp/MD/index.html.

O'Hara, S.U. and S. Stagl. "Global Food Markets and Their Local Alternatives: A Socio-Ecological Economic Perspective," *Population and the Environment* 22(2001): 533.

Sordi, I. "Il Carnevale di Bagolino." *Brescia e il suo territorio, Il Mondo popolare in Lombardia.* R.L. Pianta, ed., pp. 25-43. Milano: Silvana, 1976.

Soregaroli, C. and A. Trévisiol
Demand for Dairy Products in the European Union, Working Paper 02 /2005 edEuropean Dairy Industry Model, 2005.

Stagnoli, F. *President of Valle di Bagolino. Personal Communication*. Bagolino, Italy: October 4, 2008.

Starbird, S.A., V. Amanor-Boadu and T. Roberts *Traceability, Moral Hazard, and Food Safety,* Ghent, Belgium edXIIth European Association of Agricultural Economists (EAAE) Congress, 2008.

Suttini, E. *Agronomist, consultant of the Val Sabbia Mounain Council, Personal Communication*. Bagolino, Italy: October 4, 2008.

The Council of the European Union "Council Regulation (EC) No 1383/2003." *Official Journal of the European Union* L 196 (2003):7-14.

Theodoropoulou, H., R. Mitoula, O. Astara and P. Kaldis Applied issues of agritourism cooperation and sustainable endogenous development. (Report) 2008.

Wine & Vines. Study Deconstructs Ontario's VQA. (news this month), 2007.

Figure 1: Model Structure of a Generic Agri-Food Entrepreneurial Supply Chain

Figure 2: Typology of Entrepreneurial Supply Chains Indicating Direction of Increasing Intellectual Property Protection and Control

Figure 3: Schematic Overview of Bagòss Production with Process By-Products

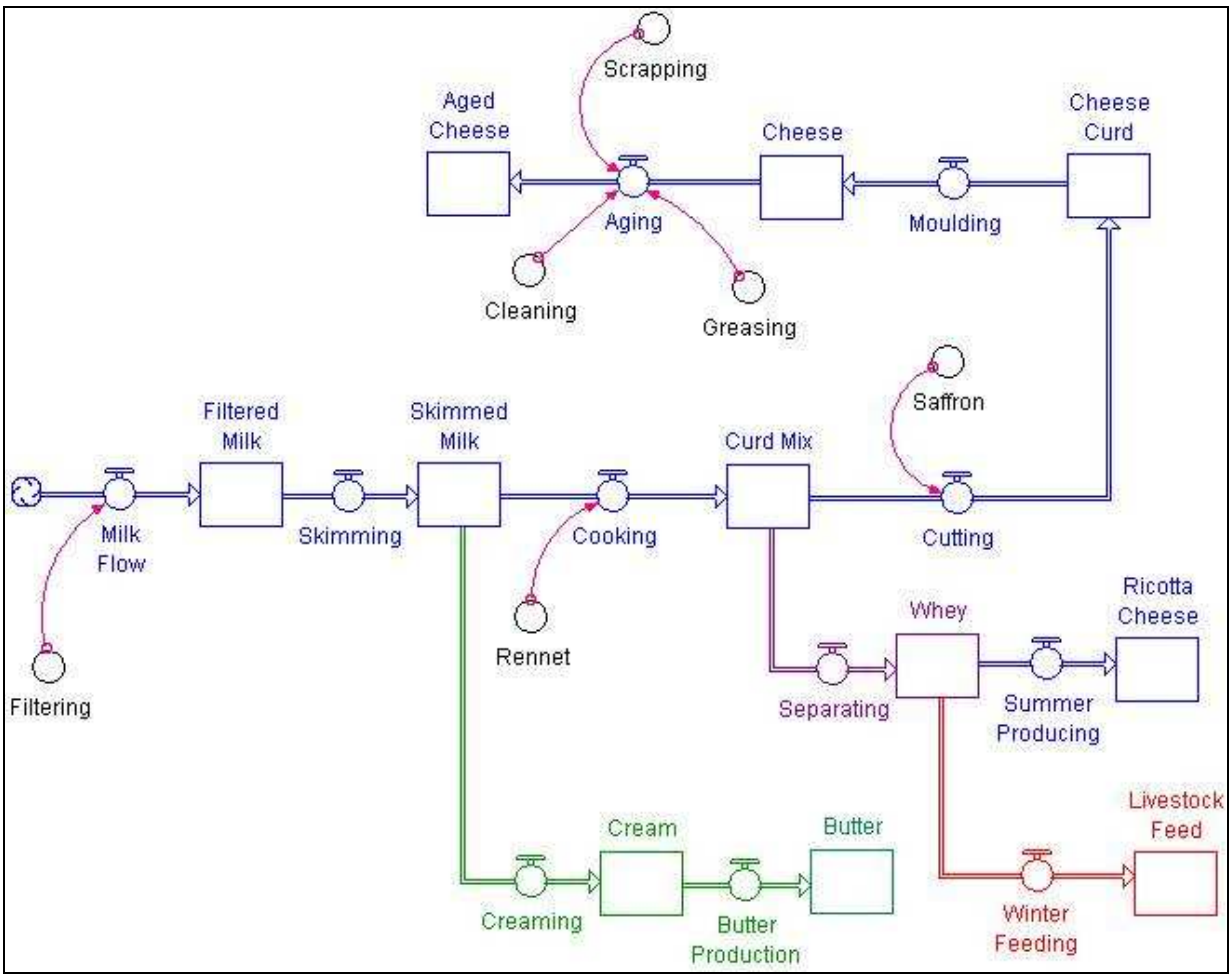

Table 1: Scenario Definition and Principal Assumptions

Scenario	Milking Cows	Productivity		Cheese Conversion		Price	
		Low	High	Low	High	Low	High
Base	800	3600	3900	260	290	19.60	26.36
Traditional Supply Chain	800	3700	4500	260	290	9.11	23.95
Ineffective IP	800	3600	4500	260	290	7.80	25.80

Figure 4: Bagòss Production in Heads under Alternative Scenarios

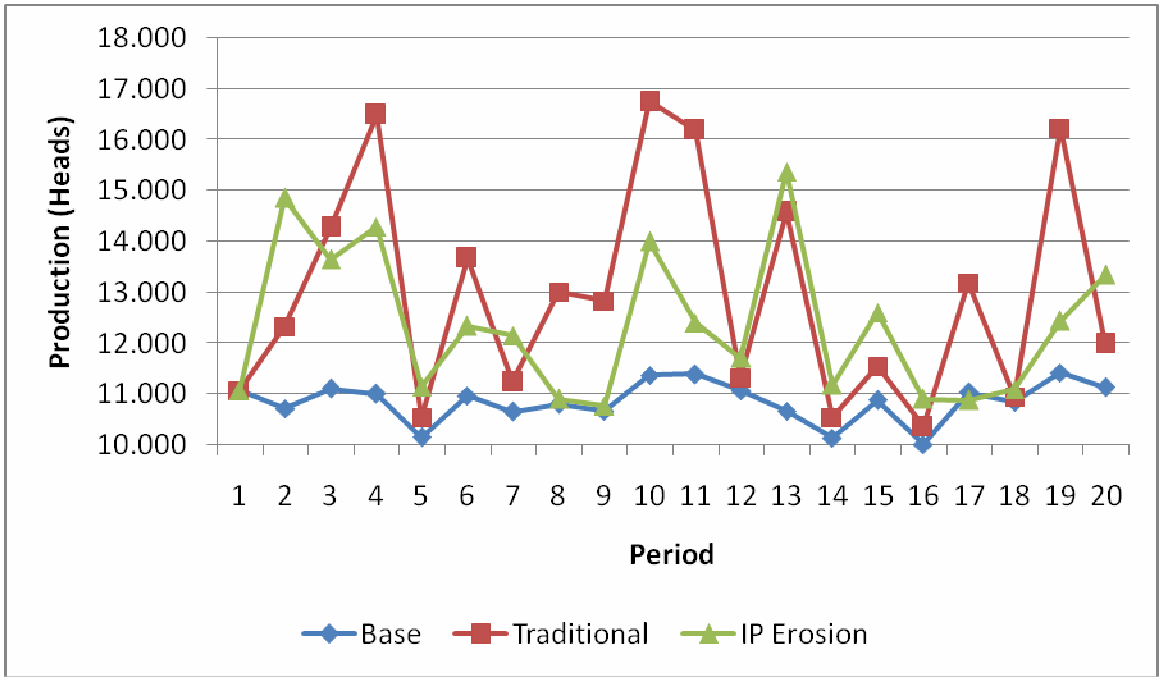

Figure 5: Gross Bagòss Sales Revenue under Alternative Scenarios