

**Examining the performance of the supply chain for potatoes in the Red
River Delta using a pluralistic approach**

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Abstract

Using an analysis of marketing margins and the key dimensions of long-term buyer-seller relationships (satisfaction, trust, power-dependence and the willingness to make relationship specific investments), it is possible to demonstrate that the supply chain for potatoes cultivated in the Red River Delta (Vietnam) is surprisingly efficient. While the price paid to farmers is ultimately determined by supply and demand, the price farmers receive from traders and collector agents is influenced by tuber quality and the costs of transportation. Contrary to expectations, farmers are generally satisfied with the exchange and display considerable trust in their preferred trading partner. Farmers are seldom dependent upon their preferred trading partner and indicate that numerous alternative traders are available to purchase the potatoes they have harvested. While the traders similarly enjoy a strong positive relationship both with farmers and collector agents and their down-stream customers, wholesalers report that they are much less satisfied in their exchange relationship with both the traders and the retailers. Wholesalers are more dependent upon both their up-stream and down-stream trading partners and are more dissatisfied and less trusting of their exchange partners.

Key words: market performance, relationships, satisfaction, trust, dependence.

Introduction

In the developing countries there has been much discussion about the potential exploitation of small farmers by various market intermediaries. In most developing countries, the agricultural marketing system is characterised by a highly atomistic production side and an oligopolistic marketing system (Mendoza and Rosegrant, 1995). Marketing costs are high because of an inefficient transport system, inadequate cool storage capacity and significant variations in product form, variety and quality (Harris-White, 1995). The supply chain itself is often long and protracted, involving a large number of market intermediaries (Lele, 1981). Furthermore, information and locational factors potentially limit the number of intermediaries available to transact with primary producers (Pomeroy and Trinidad, 1995). In other instances, various credit arrangements may lock farmers into long-term relationships where the farmer is, to varying degrees, more or less dependent upon the market intermediary (Mendoza and Rosegrant, 1995; Tagarino *et al.*, 1998).

Developed primarily by Williamson (1979, 1985), transaction cost theory assumes that various costs are associated with an exchange. These costs are comprised of the costs of obtaining and processing information, negotiating contracts, monitoring agents and enforcing contracts. These costs may become significant in the presence of information asymmetry, uncertainty and transaction specific investments.

Although there are several different approaches towards measuring the level and effects of transaction costs, Frank and Henderson (1992) employ various measures to evaluate the costs of uncertainty, transaction specific investments, the costs of co-ordination and concentration. Market concentration is a strong indicator of non-competitive pricing behaviour and of inefficient market performance (Mendoza and Rosegrant, 1995). Ordinarily, the presence of a few large market agents within a market is sufficient evidence of market power and price collusion. However, in order to verify the extent to which various actors have been exploited by unfair trading practices, the net returns and marketing margins at each step in the supply chain need to be estimated (Pomeroy and Trinidad, 1995).

Markets are said to be efficient if the price consumers ultimately pay adequately reflects storage costs, transportation costs and differences in price due to product form (Harris-White, 1995). Since price data is usually the most readily available and most reliable source of market information in the developing countries (Goletti and Christina-Tsigas, 1995), the performance of the supply chain is most often evaluated using price margins. However, a large marketing margin may result in little or no profit for an actor and may even result in a trading loss, depending on the buying and selling prices and the costs of marketing (Mendoza, 1995). Marketing margins may also fluctuate due to the perishability of the product, the number of actors involved in the exchange, the marketing services provided and the risk and uncertainty borne by each actor (Pomeroy and Trinidad, 1995).

More important however, is the growing recognition that exchange is embedded in various overarching social institutions including locality, class, ethnicity, religion, gender and age (Zucker, 1986; Fukuyama, 1995; Harris-White, 1997). The importance of trust and social capital as a means of reducing risk and facilitating exchange is becoming more evident (Fafchamps, 1996; Humphrey and Schmitz, 1998; Lyon, 2000).

Social capital facilitates exchange in at least two ways. Trust and the emotional attachment to a group, society or association can improve the efficiency of the market. Benefits may also arise through the formation of networks (Fafchamps and Minten, 1998). These relationships greatly reduce search costs and facilitate the exchange of information on market conditions and prices, trade flows and credit and reduce perceived risk.

While there are obvious parallels between the concept of social capital and the emerging body of literature on long-term relationships in business-to-business markets, there is little evidence of any serious attempt to integrate these theoretical frameworks. This is unfortunate, for while a precise definition of social capital remains elusive, the key relationship constructs of satisfaction, trust, power-dependence and relationship specific investments are adequately defined.

Social capital

Defined by Putnam (1995) as the “features of social organisation such as networks, norms and trust that facilitate coordination and cooperation for mutual benefit”, social capital provides a valuable resource for the conduct of social exchange (Nahapiet and Ghoshal, 1998). With the majority of the capital embedded within networks of mutual acquaintance and recognition, social capital resides and is reinforced by the pattern of linkages and the relationships that are built within the network.

Unlike other forms of capital, social capital increases with use (Nahapiet and Ghoshal, 1998). However, not only is social capital intangible (Murphy, 2002), no one actor has, or is capable of having, exclusive ownership (Burt, 1992). Moreover, although it has value-in-use, social capital cannot be easily traded. Social capital facilitates cooperative behaviour and the transfer of information and resources (Sharp and Smith, 2003). Social capital makes it possible to achieve desired outcomes that would be impossible without it or could only be achieved at considerable cost. In a sense, social capital facilitates the governance of economic exchange (Annen, 2003), reducing the potential for opportunism and the need for costly monitoring processes (Nahapiet and Ghoshal, 1998).

As Putnam (1995) has observed, social capital is not a unidimensional construct. Nor is there any accepted definition of social capital; different authors seem to focus on different facets of the construct. However, Nahapiet and Ghoshal (1998) provide the most comprehensive definition to date, defining social capital as “the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit” (p 243). While differentiating between structural embeddedness, relational embeddedness and cognitive elements, Nahapiet and Ghoshal note that social capital developed in one context cannot always be readily transferred to another. Similarly, Putnam (1995) indicates that the measures of social capital relevant for one culture may be irrelevant in another. More recently, Murphy (2002) has criticised the lack of definitional clarity, noting that issues such as social, political and economic power are omitted

from most discussions of social capital. Social capital remains unable to adequately explain the precise role an individual may play in the development process.

However, it is generally accepted that trust and trustworthiness are central to the concept of social capital (Fukuyama, 1995). Trust is developed both from the generalised norms of morality and personalised sources embedded within the social network (Lyon, 2000). Putnam (1993) and Fukuyama (1995) suggest that people who know and trust one another are more likely to cooperate and find solutions to problems that are mutually acceptable to everyone.

Trust is also paramount in the development of meaningful long-term business relationships (Dwyer *et al.*, 1987; Han *et al.*, 1993; Morgan and Hunt, 1994; Wilson, 1995). However, whereas the measurement of trust remains elusive in the social capital literature, numerous measures have been tested and validated within the relationship literature.

Trust

Anderson and Narus (1990) view trust as the belief that an exchange partner will perform actions that will result in positive outcomes for the firm and will not take unexpected actions that may result in negative outcomes. Moorman, Deshpande and Zaltman (1993) define trust as the willingness to rely upon an exchange partner in whom one has confidence.

While both of these definitions view trust as a behavioural intention that reflects reliance upon the exchange partner, both definitions, in part, capture quite different aspects of the construct. Moorman *et al.*, (1993) definition of trust as a belief, a sentiment or an expectation about an exchange partner, results from the partner's expertise, reliability and intentionality. This component of trust, which Ganesan (1994) describes as credibility, is based on the extent to which the focal firm believes that its exchange partner has the necessary expertise to perform the activity effectively and reliably.

However, trust also relates to the focal firm's intention to rely on their exchange partner. Ganesan (1994) describes this component as benevolence, because it is based on the extent to which the focal firm believes that its partner has intentions and motives beneficial to it. A benevolent partner will subordinate immediate self-interest for the long-term benefit of both parties and will not take actions that may have a negative impact on the firm. Singh and Sirdeshmukh (2000) describe trust as a belief that an exchange partner will act in a manner that is responsible, with integrity and without injury to the focal firm. While this aspect of trust is also behavioural because it focuses on the partner's tendency to act, there is a structural component that refers to the trust fostered by mutual hostages (Madhok, 1995).

When an actor trusts its exchange partner, it feels more secure that the actions of its partner will result in positive outcomes (Geyskens *et al.*, 1998). With the attainment of desired goals and accumulated evidence of non-renegeing behaviour, satisfaction will increase (Frazier, 1983; Dwyer *et al.*, 1987; Anderson and Narus 1990).

Satisfaction

Satisfaction (or dissatisfaction) arises from the focal firms feelings in response to an evaluation of one or more use experiences with the product (Woodruff, 1997). According to the disconfirmation of expectations model, customer satisfaction is the result of a comparison between a supplier's performance and customer's expectations (Oliver, 1980; Fornell, 1992). Whenever performance exceeds expectations, satisfaction will increase. Conversely, whenever performance falls below expectations, customers will become dissatisfied.

Expectations are beliefs about the likelihood that a product is associated with certain attributes, benefits or outcomes (Spreng *et al.*, 1996). However, since different customers may be either satisfied or dissatisfied by the same experience, customer satisfaction will be influenced by the pre-experience standards against which performance is ultimately compared.

Fornell *et al.*, (1996) believe that overall customer satisfaction has three antecedents; perceived quality, perceived value and the customer's expectations. Perceived quality or performance is the customer's evaluation of their most recent consumption experience. Such is derived from two primary components; products must not only perform adequately on various instrumental dimensions (technical quality), but customers must also be satisfied by the manner in which they receive those products (functional quality) (Gronroos, 1990). Swan and Combs (1976) argue that for customers to experience satisfaction, products must perform adequately on the key instrumental dimensions. If performance here is sufficiently good, then customers can experience satisfaction from the functional dimensions.

Customer expectations will also relate either favourably or unfavourably to whatever prior consumption experience the customer has had of the firm's offer and a forecast of the supplier's ability to deliver in the future. Especially in mature, stable markets, expectations should accurately reflect the quality of the firm's current product offer. Customers should have expectations that are largely rational and reflect their ability to learn from experience and accurately predict the levels of quality and value they will receive (Fornell *et al.*, 1996).

Since satisfaction is defined as a positive affective state resulting from an appraisal of all aspects of a firm's working relationship with another (Frazier *et al.*, 1989), Geyskens *et al.*,

(1999) propose that satisfaction should capture both the economic and psychosocial aspects of the exchange. Economic satisfaction is derived from the channel member's positive affective response to the economic rewards that flow from its relationship with its partner (Frazier, 1983). An economically satisfied channel member considers the relationship a success when it is satisfied with the effectiveness and productivity of the relationship with its partner and the resulting financial outcomes. Social satisfaction is derived from the channel member's positive affective response to the non-economic aspects of the relationship in that interactions with the exchange partner are fulfilling, gratifying and easy. A channel member satisfied with the social aspects of the exchange appreciates the contact with its exchange partner and, on a personal level, likes working with the partner because it believes the partner is concerned, respectful and willing to exchange ideas (Geyskens *et al.*, 1999).

Conversely, conflict has a direct negative effect on satisfaction (Frazier *et al.*, 1989). Firms that are able to lower the overall level of conflict in their relationship experience greater satisfaction (Anderson and Narus, 1990). Conflict in channel relationships most often occurs over economic issues. Channel members that are satisfied with the economic rewards that flow from their relationship perceive their partner to be advancing their goals as opposed to impeding or preventing them. Satisfaction then, is determined by the congruence between the firm's goals for entering into the relationship, compared with what the firm actually achieves (Hakansson and Sharma, 1996).

Power-dependence

When the outcomes obtained from the relationship are important or highly valued the focal firm is more dependent (Heide and John, 1988). Dependence is also increased when the outcomes from the relationship are higher than or better than the outcomes available from alternative relationships and when fewer alternative sources of exchange are available to the firm.

Dependence refers to a firm's need to maintain a channel relationship in order to achieve desired goals (Frazier *et al.*, 1989). Resource dependence theory suggests that firms engage in transactions because they require resources from other firms (Pfeffer and Salanick, 1978). When a channel member controls resources that the other channel member wants, various power relations emerge that enable the party controlling the resource to exert some influence or power (Andaleeb, 1996).

Nevertheless, Anderson and Narus (1990) propose that it is the firm's perception of its dependence relative to its partner that is of most interest in channel relationships. Relative

dependence determines the extent to which a firm will have influence over or be influenced by its partner. With increasing dependence comes greater vulnerability (Krapfel *et al.*, 1991) for the more powerful partner may be in a position to create more favourable terms of trade for itself (Heide and John, 1988; Frazier *et al.*, 1989).

In general, firms will seek to reduce their dependence on other firms (Heide and John, 1988) and to increase the dependence of other firms upon itself (Lohtia and Krapfel, 1994). Firms may either seek to reduce and manage dependence by purposely structuring their exchange relationships with other firms (Heide, 1994) or to deal with multiple entities (Ganesan, 1994). However, the need to interact with a specific exchange partner will depend on the number of alternatives available (Hakansson and Wootz, 1979; Anderson and Weitz, 1986). Where there are many alternatives, the need to interact is reduced, but as the number of alternative suppliers declines, the need to interact will increase (Andaleeb, 1996).

Relationship specific investments

In industrial markets, the role of interpersonal contacts and social networks is a crucial element in exchange transactions (Cunningham and Turnbull, 1982). Every person has some traits that may potentially interest an exchange partner and which will affect perceptions of value in the exchange. The cost of establishing this perception can be regarded as an investment that will facilitate exchange in the future (Easton and Araujo, 1994).

Investments are a process through which resources are committed in order to create, build or acquire other resources to be used in the future (Easton and Araujo, 1994). As such, buyer-seller relationships can be regarded as an investment. Through interacting with other firms and committing resources to specific relationships, firms have the opportunity to use relationships as a resource for the creation of other resources, product adaptations and innovations, process improvements, or to provide access to third parties (Hakansson and Snehota, 1995). Relationships produce something that neither firm can produce in isolation and something that cannot be easily duplicated. Relationships have important effects on the development of technical competence and the capabilities of a firm. They affect the firm's productivity, innovativeness and competence and thus its performance potential.

However, relationships are mutually demanding as well as being mutually rewarding (Hakansson and Snehota, 1995). If a company wishes to improve its relationship with a partner (or partners) to achieve future benefit(s), then in all probability, the firm will need to commit various resources to the relationship, whether expressed in terms of managerial or

sales force time, product or service development, process, financial or administrative adaptations (Ford *et al.*, 1996).

Since most relationships are based on some kind of match between the operations of two firms, one or both firms may find it necessary to adapt to the needs and capabilities of the other (Hallen *et al.*, 1991). Adaptations can be seen most clearly by such things as a supplier's modification of a product to suit a customer, delivering to meet buyer's production schedules rather than the supplier's, or the joint establishment of a stock-holding facility (Ford, 1984). The supplier may also modify production processes, use alternative logistics systems such as just-in-time and adopt various systems, including quality management, to meet the demands of a customer (Ganesan, 1994).

Such investments may be described as being relationship specific, for they are, by their very nature, customer specific and are therefore vulnerable to potential loss should the relationship be terminated. Williamson (1985) suggests that making idiosyncratic (or relationship specific) investments helps to stabilise relationships by altering the firm's incentive structure. By investing in the relationship, a channel member creates an incentive to maintain the relationship, for engaging in opportunistic behaviour and risking the dissolution of the relationship may be contrary to their long-term self interest (Anderson and Weitz, 1992).

Data collection and analysis

To gain a greater understanding of the efficiency of the supply chain for fresh potatoes in the Red River Delta (RRD), a pluralistic approach was adopted.

Beginning initially with an examination of the transaction costs, market intermediaries were asked what quantity of potatoes they purchased during which months, from who they purchased those potatoes and how much they paid to purchase those potatoes. Respondents were then asked a series of questions about the various value-adding activities they undertook including grading, packing and storage and the various costs incurred to undertake those activities. Finally, respondents were asked to indicate the prices at which those potatoes were sold to down-stream customers.

Recognising that exchange in business-to-business markets generally occurs within the context of rich and stable relationships (Easton and Araujo, 1994), respondents were asked to indicate the extent to which they agreed or disagreed with 28 prepared statements describing the nature of their relationship with their preferred up-stream supplier and their preferred down-stream customer.

Satisfaction was evaluated by seven measures adapted from Anderson and Narus (1990), Anderson and Weitz (1992), Ford (1984), Frazier (1983) and Ganesan (1994). Although satisfaction is most often measured using a rating scale anchored at one end by satisfaction and at the other by dissatisfaction (Dorsch *et al.*, 1998; Frazier *et al.*, 1989; Ganesan, 1994), there is growing concern that the existing measures of customer satisfaction are too simplistic and mechanistic (Tikkanen and Alajoutsijarvi 2002). Geyskens *et al.*, (1999) argue that satisfaction is comprised not of one but two quite distinct dimensions: economic satisfaction and social satisfaction. Tikkanen and Alajoutsijarvi (2002) describe the need for measures of satisfaction to capture various elements of adaptations, cooperation and conflict resolution.

Trust was assessed by eight measures based on the literature reported by Anderson and Narus (1990), Anderson and Weitz (1992), Doney and Cannon (1997), Ganesan (1994), Kumar (1996), Moorman *et al.*, (1993) and Morgan and Hunt (1994). Given that close personal friendships are of great importance in facilitating trust in the developing countries (Fafchamps, 1996; Lyon, 2000), an additional measure was included to capture this dimension.

Power-dependence was evaluated by five measures developed from the literature reported by Frazier *et al.*, (1989), Ganesan (1994), Heide and John (1988) and Heide (1994). A single measure was used to capture the construct (CL_{alt}) described by Anderson and Narus (1990) as “the outcomes given comparison level for alternatives” (p 43), which represents the overall quality of the outcomes available from the best alternative exchange relationship. Although not derived directly from the power-dependence literature, an additional measure was included to evaluate the extent to which the preferred exchange partner sometimes acted opportunistically (Anderson and Weitz, 1992; Gundlach *et al.*, 1995).

Relationship specific investments were evaluated by six measures developed from the literature reported by Anderson and Narus (1990), Anderson and Weitz (1992), Athaide *et al.* (1996) and Ford (1984)

Detailed interviews were conducted with 60 potato farmers. Twenty farmers were interviewed from each of the three major potato producing provinces in the RRD (Hai Duong, Thai Binh and Bac Giang). Enumerators interviewed 4 farmers from a minimum of 5 districts, interviewing no more than two farmers from any one village. Interviews were conducted by research staff from the Food Crops Research Institute, Gia Loc.

At the conclusion of the interview, farmers were asked to identify the trader with whom they most frequently interacted. Based on the number of names received, ten traders in each province were selected for interview.

In turn, at the conclusion of the interview, traders were asked to identify the potato wholesaler with whom they most frequently interacted. From the names received, ten wholesalers were selected for interview in Hanoi.

Finally, a total of 10 interviews with retailers were undertaken in Hanoi, with 5 additional interviews being undertaken with retailers in each of the three provincial centres.

Examining the price margins in the supply chain

Since few farmers and market intermediaries maintain any written records of the prices at which they buy and sell potatoes, some errors in reporting are inevitable. Furthermore, since there is a degree of commercial confidentiality associated with the reporting of market prices, respondents may deliberately choose to over value the prices at which they have purchased potatoes and to under value the prices at which they have been sold to reduce their perceived profit margin.

Farmers in Hai Duong indicated that they sold potatoes to traders for an average price of VND1,385 per kg (USD0.092 per kg). Traders indicated that they purchased potatoes from farmers for an average price of VND1,470 per kg and sold those potatoes to both wholesalers in Hanoi and retailers in Hai Duong for an average price of VND1,770 per kg. In Hai Duong, retailers indicated that they purchased potatoes from traders for VND1,795 per kg and then sold those potatoes for an average price of VND2,150 per kg. However, in Hanoi, wholesalers sold these potatoes for an average price of VND2,180 per kg to retailers who sold the potatoes for an average retail price of VND2,920 per kg (Table 1).

Table 1. Buying and selling prices along the supply chain (VND per kg).

	Farmer	Trader		Wholesaler		Retailer	
	Sell	Buy	Sell	Buy	Sell	Buy	Sell
Hai Duong	1,385	1,470	1,770			1,795	2,150
Thai Binh	1,420	1,280	1,450			1,465	1,950
Bac Giang	1,170	1,370	1,680			1,535	1,920
Hanoi				1,785	2,180	2,305	2,920

In Bac Giang, there was a difference of VND200 between the reported price at which farmers sold potatoes and traders purchased potatoes. No doubt this was the result of intervention in the market by collector agents. Collector agents were responsible for sourcing the potatoes from many small farmers and arranging for the transportation of those potatoes to some

central collection point. Farmers were paid in cash for their potatoes when the collector agent took possession of the product. The potatoes were then graded and stored for between 5-7 days until the trader came to pick them up. Depending upon the level of services provided by the collector agent, traders appear willing to pay an additional VND50-200 per kg. While there was a difference of VND145 per kg between the price at which traders indicated they sold the potatoes and retailers purchased the potatoes, this was attributed to sampling error, for the retail margin of VND385 per kg was consistent with the other estimates.

In Thai Binh, it is apparent that farmers grossly over reported the prices at which they sold potatoes, for both the trader's margin and the retail margin were consistent with the other two potato growing districts. This was supported by anecdotal evidence and various unstructured interviews with farmers undertaken during the preliminary phase of this research project. Furthermore, and similar to Bac Giang, the majority of potato farmers transact not with the traders, but with collector agents.

An examination of the marketing margins along the supply chain reveals that the marketing margin increases as the product moves closer to the consumer. Traders were able to extract an average marketing margin of VND260 per kg (or 19%). In the rural areas, retailers extracted an average marketing margin of VND410 per kg (or 25%). However, in Hanoi, wholesalers were able to extract a marketing margin in the region of VND395 per kg (or 22%), and the retailers were able to extract a marketing margin of VND615 per kg (or 27%).

However, the marketing margin market intermediaries were able to extract was not consistent over the season. At both the beginning (December) and the end (February) of the harvest season, the marketing margins declined. Conversely, in January, during the peak harvest period, the marketing margins for all market intermediaries increased. Such pricing behaviour has been reported by Batt and Parining (2000) who accredited the reduced marketing margin during times of reduced supply to the increased competition between traders to secure the farmers produce. At the consumer level, research undertaken by Batt (2002) reveals that the consumers in the rural areas seldom purchase potatoes for more than VND2,200 per kg and in Hanoi, consumers are unlikely to purchase potatoes at prices exceeding VND3,500 per kg.

While traders may be able to extract an average marketing margin of VND260 per kg, the traders must not only grade and store the tubers they have purchased, but also pay for the costs of transporting the tubers from the farm to the various wholesale and retail markets. Even although most of the potatoes purchased by traders had been graded by farmers or collector agents (59%), a significant proportion were purchased ungraded. Furthermore, over half (54%) of traders indicated that they regraded the potatoes they had purchased prior to

resale. Although the costs of grading ranged from VND10-50 per kg, the market was willing to pay a significant price premium for larger tubers.

At the farm level, farmers received an average price of VND1,385 for the large tubers (5-8 tubers per kg)(Table 2).

Table 2. Prices at which tubers were purchased by tuber size (VND per kg)

	Farmers Sell	Traders Buy	Wholesalers buy	Retailers Buy
Extra large	+ 185	+ 170	+ 240	+ 450
Large	1,385	1,595	2,180	2,550
Medium	- 180	-170	-480	-885

For the extra large tubers (3-4 per kg), farmers received a price premium of VND185 per kg and for the medium sized tubers (9-15 per kg) the price was reduced by some VND180 per kg. For the small tubers (more than 16 tubers per kg), farmers received only VND500 per kg hence most farmers retained the small tubers for feeding livestock.

As the product moved through the supply chain, not only did the price premium increase for the larger tubers, but the disincentive for smaller tubers became more pronounced.

Despite the differences in price, the majority of wholesalers (74%) and retailers (70%) reported that they did not regrade the potatoes they had purchased prior to resale. Presumably, having purchased the tubers from traders and collector agents, wholesalers and retailers had no recourse; what they could not sell, they would either have to eat themselves or incur the loss. No doubt, in the absence of any formal quality standards, wholesalers and retailers sought to reduce the perceived risk by transacting with reputable traders and collectors agents. However, the ability of the market intermediaries to meet these expectations depended upon the quality of the potatoes they were able to source from the farmers.

While the majority of traders (70%) stored potatoes for 5-7 days, no doubt as an integral part of the process of consolidation, the majority of wholesalers (63%) indicated that they did not store potatoes. Conversely, some 57% of retailers indicated that they stored potatoes for up to one month. Presumably such storage practices were undertaken to accommodate the abrupt reduction in the supply of potatoes in February-March. Storage losses generally ranged from 1-5% and quite surprisingly, were not related to the storage duration. This would suggest that the storage losses incurred were the result of either damaged or diseased tubers being placed in storage, rather than tubers becoming contaminated during the storage period.

Transportation costs consumed a significant proportion of the traders marketing margin. Of the three areas studied, Hai Duong was the closest to Hanoi, hence traders were able to pay a significantly higher price and to transact directly with the farmers. Since both Bac Giang and Thai Binh were located at a greater distance, farmers were paid lower prices to accommodate the higher transportation costs. While it is unclear whether prices in Hanoi are set at the wholesale level or the retail level, traders apparently work backwards, subtracting the costs of transport and the profit margin they seek to achieve, to arrive at a price they are prepared to pay the farmers and collector agents.

On the other hand, since most wholesalers neither regrade nor store the potatoes they have purchased, a much greater proportion of the marketing margin will be profit. However, given the significant price disincentive for small tubers, should wholesalers inadvertently purchase a large quantity of small to medium sized tubers, they may be exposed to a potential trading loss.

Being the last market intermediary in the supply chain, the retailer has no recourse. Having purchased the potatoes, they must either sell them, lose them to infection by disease, or consume them themselves.

Down-stream relationships in the potato supply chain

Contrary to expectations, it is immediately apparent that most farmers had a very positive relationship with their preferred trading partner (Table 3).

The majority of farmers were very satisfied with their preferred trading partner and most farmers trusted their preferred trading partner. Farmers reported that their preferred trading partner was always honest and kept their promises. Since their preferred trading partner seldom acted opportunistically, farmers had confidence in their preferred trading partner and generally believed the information provided. With most farmers perceiving that they had been adequately rewarded and treated fairly and equitably, there was minimal conflict in the relationship. Furthermore, most farmers maintained that they had a close personal friendship with their preferred trading partner.

It is also apparent that most farmers were free to act independently of their preferred trading partner, despite the willingness of the trader to provide financial assistance and to share the risks. Most farmers indicated that they could readily choose an alternative trading partner, although most wished to maintain their relationship with their preferred trading partner because they made the best offer relative to the alternatives. Furthermore, most farmers indicated that their preferred trading partner seldom had all the power in the relationship, nor

did they control all the information. Preferred traders were more willing to provide both technical advice and market information and seldom coerced the farmer into making decisions that were not in their best interest.

Table 3. Examining down-stream relationships between market intermediaries

	F > T	T > W	W > R
Satisfaction			
Trading with preferred partner is less risky	5.82	5.83	4.20
Good cooperation with preferred trading partner	5.64	5.70	3.70
Preferred trading partner meets expectations	5.55	5.43	3.10
Treats me fairly and equitably	5.49	5.77	4.10
Adequately rewarded	5.44	5.57	4.30
Quick to handle complaints	5.22	4.10	3.10
Much conflict with preferred trading partner	2.09	2.47	2.90
Trust			
Confidence in preferred trading partner	5.58	5.03	3.90
Always keeps promises	5.54	5.20	4.00
Always honest	5.53	5.37	4.00
Good reputation	5.46	5.33	2.70
Trust preferred trading partner	5.36	4.93	4.30
Believe information provided	5.05	4.53	3.70
Close personal friendship	5.03	4.77	3.80
Trading partner always considers best interests	3.81	3.10	3.30
Power-dependence			
Free to choose another trading partner at any time	5.71	4.90	2.90
Has best offer relative to alternatives (CL _{alt})	5.31	4.57	4.30
Must adhere to partners demands	2.78	2.37	3.78
Trading partner has all the power	2.28	2.83	4.30
Trading partners controls all the information	2.21	2.40	3.00
Trading partner often acts opportunistically	2.15	2.03	3.22
More dependent on trading partner	2.07	2.37	4.50
Relationship specific investments			
Partner asks how they can improve quality of service	5.03	4.37	3.80
Trading partner advises on technical matters	4.98	3.72	3.60
Partner provides financial assistance	4.98	3.43	2.70
Trading partner advises on market prices	4.93	3.97	4.20
Willing to share risks	4.86	3.87	2.40
Trading partner advises of supply problems	4.86	4.23	3.50

where 1 is “I disagree a lot” and 6 is “I agree a lot”

F > T demonstrates the farmers’ relationship with their preferred trader

T > W demonstrates the traders’ relationship with their preferred wholesaler

W > R demonstrates the wholesalers’ relationship with their preferred retailer

Similarly, the traders relationship with their preferred wholesale trading partner was also quite positive, with most traders indicating high levels of trust and satisfaction in the exchange. However, it was apparent that the traders were more dependent upon their preferred wholesale trading partner. Traders had fewer alternative exchange partners and there was more evidence

of conflict in the relationship. Traders perceived that their wholesale trading partners had more power, controlled more of the information and generally took longer to respond to their complaints. Furthermore, wholesalers were much less willing to provide financial assistance, to share the risks or to share technical information and price information with the trader. Surprisingly, however, most traders reported that they felt they had been adequately rewarded, treated fairly and equitably and there was some evidence of good cooperation between the traders and their preferred wholesale customers. However, traders believed that their preferred wholesale trading partner did not always transact with their best interests at heart.

Unlike both the farmers and the traders, the majority of wholesalers indicated much lower levels of both satisfaction and trust in their relationship with retail customers. Transactions entailed a high degree of risk and there was a greater possibility of being exposed to opportunistic behaviour. As a direct consequence, wholesalers reported that the majority of their retail customers had a very poor reputation. However, most wholesalers reported that they had few alternative customers. Not only were the wholesalers more dependent on their existing customers but retailers wielded more power and controlled more of the information. Although there was considerable discussion on prices, there was more evidence of conflict in the relationship, with retailers taking more time to respond to the wholesaler's complaints and engaging in a less cooperative exchange relationship. Retailers were most unlikely to provide any financial assistance or to share the risks inherent in the exchange transaction. It was also apparent that the wholesaler's relationship with their preferred retail customers was the least personal experienced in the down-stream supply chain.

Up-stream relationships in the potato supply chain

In reviewing their relationship with farmers and collector agents, the majority of traders also indicated that they experienced high levels of satisfaction and trust (Table 4).

Understandably, because the collector agents accumulated potatoes from many small farmers, traders felt they could rely more upon the collector agents than they could upon individual farmers. Collector agents were more likely to keep their promises and were less likely to engage in opportunistic trading behaviour. Collector agents were more responsive to the traders complaints, more willing to investigate various means of improving the level of service offered to traders and more likely to provide both financial assistance and to share the risks. To some extent, the collector agents had to be more responsive to the trader's demands, for traders indicated that they could readily find alternative suppliers. Not only could the

traders choose to purchase potatoes directly from the farmer but they were continually searching for suppliers who could provide a better offer.

Table 4. Examining up-stream relationships between market intermediaries

	T > F	T > C	W > T	R > W
Satisfaction				
Trading with preferred partner is less risky	5.83	5.55	3.90	5.40
Good cooperation with preferred trading partner	5.70	5.68	4.10	5.45
Preferred trading partner meets expectations	5.48	5.32	4.60	5.60
Treats me fairly and equitably	5.48	5.68	3.50	5.50
Adequately rewarded	5.41	5.41	4.70	5.10
Quick to handle complaints	4.26	4.77	2.70	4.90
Much conflict with preferred trading partner	2.17	2.27	2.60	2.05
Trust				
Trust preferred trading partner	5.35	5.00	4.40	5.16
Always honest	5.17	5.29	4.00	4.90
Good reputation	4.95	4.68	4.00	4.60
Always keeps promises	4.91	5.23	4.10	5.35
Confidence in preferred trading partner	4.87	5.27	4.20	5.10
Close personal friendship	4.68	4.73	4.20	4.85
Believe information provided	4.10	4.23	4.10	4.95
Trading partner always considers best interests	3.04	3.18	3.50	2.70
Power-dependence				
Free to choose another trading partner at any time	4.77	5.10	4.40	5.80
Has best offer relative to alternatives (CL _{alt})	4.05	4.14	4.60	5.25
Trading partner has all the power	2.91	2.59	3.30	3.70
Trading partners controls all the information	2.82	2.27	2.80	1.90
Must adhere to partners demands	2.77	2.32	2.60	2.30
More dependent on trading partner	2.36	2.23	2.70	2.45
Trading partner often acts opportunistically	2.36	2.00	2.33	2.20
Relationship specific investments				
Willing to share risks	3.32	3.82	3.20	3.90
Partners asks how they can improve level of service	3.18	4.50	3.40	5.50
Partner provides financial assistance	2.91	3.18	3.40	3.70
Partner advises of supply problems	2.91	3.09	3.70	4.80
Partner advises on technical matters	2.76	3.50	3.50	5.15
Partner keeps me informed on market prices	2.50	3.95	4.00	5.30

where 1 is “I disagree a lot” and 6 is “I agree a lot”

T > F demonstrates the traders’ relationship with their preferred farmer

T > C demonstrates the traders’ relationship with their preferred collector agent

W > T demonstrates the wholesalers’ relationship with their preferred trader

R > W demonstrates the retailers’ relationship with their preferred wholesaler

Since the farmers could choose to whom they sold their potatoes, farmers generally exercised more power and controlled more information and, to a limited extent, traders had to accept whatever offer the farmers chose to make, even although it was most often significantly

below that which they ideally sought. As most farmers perceived that they had been adequately rewarded and treated fairly and equitably, there was little evidence of any conflict in the relationship. Although farmers were not expected to provide a great deal of information on market prices, traders reported that collector agents often shared price information with them. This is to be expected, for as the collector agents sought to purchase potatoes from the farmers, they would need to make an offer that was at least as good as that they could obtain from an alternative buyer. Since the collector agents had already paid the farmers to procure their crop, considerably more discussion on prices was anticipated, given that the prices in the market were extremely volatile.

Just as the wholesalers reported that their relationship with their down-stream trading partners was not entirely satisfactory, wholesalers indicated that they were equally dissatisfied in their relationship with the traders and collector agents. Wholesalers reported that traders seldom treated them fairly and equitably and on most occasions, failed to meet their expectations. Despite the longevity of the relationship (an average of 6 years), a high degree of risk remained in the exchange. In the pursuit of high prices, traders often acted opportunistically and could not be relied upon. As the quality was highly variable, traders were slow to respond to the wholesaler's complaints and seldom made any real effort to improve the level of service they provided. As a result, wholesalers reported only moderate levels of cooperation. Consequently, wholesalers had little trust and little confidence in their suppliers and there was more evidence of conflict in the relationship

With most wholesalers reporting that their down-stream relationships with retail customers were relatively impersonal, it was no surprise to find that most reported that their up-stream relationships with suppliers were just as impersonal. While Zucker (1986) describes how trust rests on social similarities because both parties belong to the same community or social group and may share a common religion, ethnic status, or family background, Fafchamps (1996) warns that non-business relationships (with relatives, neighbours, church mates) play little role in identifying trustworthy clients, and goes as far to suggest that, "selling on credit to relatives and neighbours is as good as signing a death warrant for the firm" (p 441). Personal relationships often get in the way of pressuring customers for non-payment.

Despite their dissatisfaction with the quality of the potatoes offered for sale and the price collector agents and traders expected for their potatoes, wholesalers had few alternative suppliers. With less choice, wholesalers indicated that they were, to a greater extent than the other market intermediaries, more dependent upon their suppliers. Traders and collector agents had more power, controlled more of the information and wholesalers had to be more

willing to accept whatever potatoes trader's were able to deliver. Furthermore, although there was some evidence of price negotiation, traders were reluctant to provide any financial support, to share the risk or to provide any technical or market information.

While the wholesalers were generally dissatisfied in their relationship with their customers, retailers expressed quite high levels of satisfaction and trust in their relationship with the wholesalers. No doubt, a great deal of the satisfaction and trust retailers experienced in transacting with their preferred wholesale supplier could be attributed to higher level of responsiveness and the investment most wholesalers were prepared to undertake to maintain their relationship. Not only were most wholesalers quick to handle the retailer's complaints, but they were also more willing to improve the level of service they provided to retail customers, more willing to provide market and technical information and in some instances, more willing to provide finance assistance. While most retailers indicated that they were free to choose an alternative supplier, most retailers indicated that their current wholesale supplier provided the best offer relative to the alternatives. As a consequence, retailers maintained their relationship with their preferred wholesale supplier because they wanted to, not because they had to. Nevertheless, several retailers believed that their preferred wholesale supplier did not always act in their best interests.

Conclusions

Uncertainty is the key dimension affecting organisations, inter-organisational relationships and the costs of transacting (Achrol *et al.*, 1983; Heide, 1994). Uncertainty prompts firms to establish and manage relationships in order to achieve stability, predicability and dependability in their relationships with others (Oliver, 1990).

With the majority of the potatoes harvested in the RRD being derived from some 235,000 small farmers (Batt, 2002), there is considerable uncertainty in both the quantity and quality of tubers available. In the absence of any definitive quality standards and in order to secure a more reliable supply of potatoes, each of the market intermediaries agreed that transacting with their preferred trading partner was significantly less risky.

However, in a market where more than 85% of the crop is harvested in just one month, the market will demonstrate considerable price volatility. While a long-term relationship may reduce some of the uncertainty associated with procuring a more reliable supply of good quality potatoes, the relationship is unable to provide any price certainty. As a result, each of the actors in the supply chain may abandon their relationship from time to time to secure a better price.

While market intermediaries may find that they have occasionally paid too much to purchase potatoes, they are in a position to respond to the market and to modify their buying and selling practices in order to reduce the extent of the loss. However, for the farmers, since the potatoes are often dug immature and have only a limited shelf life, farmers must accept the prevailing market price at the time of harvest. While farmers will ordinarily transact with those traders who offer the best price, since the average farmer has less than 1.5 tonnes of potatoes at his disposal (Batt, 2002), there is some doubt as to what benefit the farmer will derive from selling to an alternative trader, especially if this involves extending credit. Unlike most of the potato farmers in Indonesia (Aji, 2001) and the Philippines (Tagarino *et al.*, 1998), most Vietnamese potato farmers are not constrained by any pre-existing credit arrangements that might limit their ability to choose an alternative trading partner. Farmers will choose to stay with their preferred trading partner because they want to, not because they have to. Furthermore, even although it may be more profitable to delay harvest, farmers seldom have the choice, for they must harvest in order to adequately prepare the field for the spring rice crop. The farmers need for cash during the Lunar New Year festival (which generally occurs in January) is also believed to be one of the factors encouraging the premature harvest of potatoes in the RRD (Batt, 2002).

Within the supply chain itself, it is apparent that the market intermediaries have adopted a cost plus pricing approach. To the purchase price, the market intermediaries add the various costs of grading, storage and transportation, plus their desired profit margin. In a market where there are many small traders, wholesalers and retailers, few switching barriers and few barriers to entry and exit (with the possible exception of the wholesalers), competitive market forces will prevent the market intermediaries at any one level in the supply chain from being able to extract an extraordinary price margin. Both Fafchamps (1996) and Lyon (2000) make similar conclusions from their respective analysis of the fresh vegetable industries in Ghana.

Nevertheless, it is at the wholesale level where most of the dissatisfaction arises in the supply chain and no doubt, it is at this level where there are the greatest barriers to entry. Perhaps, much of the wholesaler's relational dissatisfaction is derived from their inability to exercise greater market power and to extract a greater economic rent. However, despite being the most concentrated sector, wholesalers exercise minimal control over the traders that supply them. Unless the wholesalers have made some pre-existing arrangement to purchase all the potatoes from a particular trader, the trader will park their truck in a designated area in the wholesale market and sell potatoes to whoever wants to buy them, providing they buy no less than one sack (Batt, 2002). While larger retailers can also buy directly from the truck, many of these

might be better described as secondary wholesalers, for they will distribute the potatoes to various retail markets throughout the metropolitan area. That then leaves the wholesalers very much dependent upon their local customer base, who it seems may use that knowledge to their advantage.

In conclusion, it is apparent that the prices farmers in the RRD receive for the potatoes they have grown is determined more by supply and demand than it is by the exercise of any coercive power by market intermediaries.

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