Non-attractiveness of Modern Supply Chains

E. Obeth, P.J. Batt and B. Butler
Curtin University
Perth
Australia

Abstract
  In comparison to traditional supply chains, modern supply chains potentially allow supply chain actors, including smallholder producers and traders, to improve their productivity and overall performance. While one would expect smallholder producers and traders to join modern supply chains at every opportunity, there is growing evidence to show that not all participants are willing to switch. Through open-ended interviews with banana traders, the unwillingness to participate in modern supply chains is based on perceived risk, additional workloads and a current state of comfort. Apart from that, as supermarkets still source bananas from the traditional market, there is no need for traditional retailers to switch as they can still participate in modern supply chains.

INTRODUCTION

  Modern supply chains have increased in number due to the rapid growth of modern retail formats such as supermarkets and hypermarkets in the transitional economies (Keltner, Gruenfeld, & Anderson, 2003; Maruyama & Trung, 2007; Reardon & Berdegue, 2002). There are several reasons behind the astonishing development of modern retailers: (1) with higher incomes, consumers are able to purchase the brands they prefer (Banerjee & Dasgupta, 2010; Faiguenbaum, Berdegue, & Reardon, 2002; Maruyama & Trung, 2007); (2) the increasing number of working women leaves families with less time to prepare meals, which leads to the greater consumption of processed food and the desire for more convenient food products (Faiguenbaum et al., 2002; Maruyama & Trung, 2007); (3) greater urbanization encourages consumers to do the majority of their shopping in malls (Faiguenbaum et al., 2002; Maruyama & Trung, 2007); and (4) the easing of government policies on foreign direct investment (Maruyama & Trung, 2007).

  In most developing countries, despite the increasing number of modern retail formats, traditional supply chains continue to dominate the retail sector because of the high number of low income consumers (Wang, Dong, Rozelle, Huang, & Reardon, 2009), the wider choice in terms of price, quality and quantity in the traditional markets (Abraham, 2009), and in most developing countries, smallholder growers are the dominant producers (Christin Schipmann & Qaim, 2011). Nevertheless, the rapid growth of modern supply chains has influenced the way agricultural supply chains operate and affected the way in which traditional supply chains operate.

REVIEW OF LITERATURE
Traditional supply chain vs modern supply chain

  Traditional supply chains imply various meanings depending on the context or approach. In relation to information usage, Mason-Jones and Towill (1997) distinguish traditional supply chains from enriched supply chains. In traditional supply chains, the

retailer is the only actor who has direct contact with consumer demand, while other actors only have orders from their immediate customer. Thus market information is distorted as it moves further upstream. On the other hand, in an enriched supply chain, all members receive marketplace data directly from the consumer irrespective of the number of upstream actors. (Cachon & Fisher, 2000) associate the lack of information sharing with traditional supply chains as opposed to full information sharing in improved supply chains. Traditional supply chains only exchange information between immediate exchange partners, while improved supply chains implement information technologies that allow actors to share demand and inventory data.

In terms of logistics management, (Lianguang, 2011) differentiate modern supply chains from traditional supply chains by identifying the key features of each supply chain. Traditional supply chains are characterized by: (1) the disconnection between production and demand, where production does not reflect the true demand because the producer does not have accurate data on marketing; (2) excessive numbers of market intermediaries lowers trade efficiency and increases cost; (3) poor information refers to the absence of an information platform between chain members which leads to a poor understanding of the market demand and fragmented information both upstream and downstream; and (4) poor product quality. On the other hand, the features of modern supply chains include: (1) new product innovation and market development that integrates production and marketing in accordance with the supply and demand situation and resource availability; (2) the transformation of product into improved, specialized and large scale industrial production; and (3) the integration of processing, supply and sale, export and import trade. These supply chains are market oriented, make a rational allocation of production factors and involve specialized distribution and logistics, integrated management and entrepreneurship.

Other authors differentiate between traditional supply chains and modern supply chains based on the type of retailer. While modern supply chains supply modern retailers such as supermarket and hypermarkets, traditional supply chains supply the traditional or wet markets (Chowdhury, Gulati, & Gumbira-Said, 2005; Obeth & Dunne, 2008; Christin Schipmann & Qaim, 2011; Shepherd, 2004; Suryadarma et al., 2010). Compared to traditional supply chains, modern supply chains are usually the first to introduce innovations in product and technology, they trade high-value produce, are more concerned with food safety and quality standards, are more likely to transact with preferred suppliers, to engage in special marketing channels and engage in written contracts between actors (Chowdhury et al., 2005; Christin Schipmann & Qaim, 2009; Christin Schipmann & Qaim, 2011).

Challenges with modern supply chain

The increased presence of modern retailers has affected the marketing systems in developing countries through the introduction of more sophisticated procurement systems (Boselie, Henson, & Weatherspoon, 2003; Chen, Shepherd, & Silva, 2005; Lin & Wu, 2011; Pritchard, Gracy, & Godwin, 2010). A competitive price, consistent product quality and product safety are the major issues in modern retail procurement (Lin & Wu, 2011). Supermarkets are very strict in making sure their standards of quality are consistently met through specific rules imposed upon their suppliers. This does not only affect immediate suppliers but the supply chain as a whole. For instance, smallholder growers often face the challenge of delivering consistent produce to supermarkets (Kaliappan, Alavi, Abdullah, & Zakaullah, 2007), and to apply specific production procedures including the

installation of washing facilities, safe water systems, toilets and cement floors in packing sheds (Berdegue, Balsevich, Flores, Mainville, & Reardon, 2003; Boselie et al., 2003).

For other actors such as wholesalers, the challenge is just as great as modern retailers are more likely to purchase from preferred suppliers (Shepherd, 2004). Under their preferred supplier schemes, wholesalers are required to efficiently manage purchasing and to quickly respond to unanticipated needs such as accelerated or decelerated volume, changes in product or delivery specification and service problems (Batt, 2004; Louw, Nhemachena, & Zyl, 2008).

The literature discusses several negative impacts arising from modern procurement practices on smallholder growers. Supermarkets' increasing concerns about food safety make it difficult for smallholder farmers to comply with food safety standards because they lack capital (Berdegue et al., 2003). Moreover, farmer associations face difficulties in meeting supermarkets strict requirements in terms of product consistency, product uniformity and financial arrangements (Balsevich et al., 2007; Reardon & Berdegue, 2002). Consequently, smallholder growers constantly risk rejection from modern retailers. As such, participating in modern supply chains poses a great challenge for smallholder farmers and market intermediaries which may lead to their withdrawal from modern supply chains.

Attractiveness of modern chain

Participating in modern supply chains provides an attractive alternative for supply chain actors because modern retailers usually offer higher returns for superior quality. According to Balvesich et al. (2007), growers' returns from selling to supermarkets were 50% higher than those achieved from traditional markets. In Kenya, kale farmers participating in supermarket channels experienced a 105% increase in land utilization compared to only 10% for traditional channel famers, due to higher returns, lower transaction costs and a more stable trading relationship with supermarkets (Neven & Reardon, 2006). Participating in modern supply chains brought about a significant increase in production capacity and an increase in annual sales, despite only a modest increase in net profit (Kaliappan et al., 2007). Another significant impact of modern supply chains is that it enables supply chain actors to become more innovative. For example, in Thailand, modern supply chain farmers were the first to grow sweet peppers before they penetrated the traditional market (Christin Schipmann & Qaim, 2009).

Furthermore, the presence of modern supply chains has become a promising alternative since supermarkets and hypermarkets attract more customers. Studies on fruit and vegetable supply chains in Indonesia report that the net income of vegetable retailers and fruit retailers in traditional markets went down to 27% and 20% respectively due to the presence of supermarkets (Hutabarat, 2009).

Indonesian banana supply chain

Banana is the most popular fruit in Indonesia, contributing up to 40% of national fruit production. Banana production in Indonesia has been characterized as lacking in farm management and the control of banana disease, the infrequent use of agricultural inputs, the absence of fundamental banana cultivation practices such as pruning and fruit protection, and the lack of appropriate post-harvest treatments. Banana is traded primarily for domestic consumption. Bananas are sold unripe through local or inter-island traders in bunches without special treatment or packaging (Direktur Budidaya Tanaman Buah, 2008; Tukan, Roshetko, Budidarsono, & Manurung, 2006).

Banana supply chains typically consist of smallholder farmers, village collectors, local or inter-island wholesalers and retailers in traditional markets. During transportation, bunches of banana are stacked roughly onto the bed of a truck and fastened with a rope or covered with plastic tarpaulin. In contrast, banana in modern supply chain are transported in hands. They are cleaned and packed in cardboard boxes during transportation to avoid bruises (Wiwaha, 2007). As the number of modern retailers is predicted to increase, the potential of modern supply chains to allow actors to be innovative and to generate higher revenue is expected to make participation in modern supply chains more attractive for actors in traditional banana supply chains.

METHODOLOGY

Data for this study was gathered through open-ended interviews with two middleman of Yellow Ambon banana supply chain in February 2013. The first middleman is a collector agent in Lampung Province (Sumatra Island) and the second is a wholesaler in Banten (Java Island) of Yellow Ambon banana in. The two middlemen have been in a relationship for over ten years. The interview was transcribed and translated into English. The data was analysed using inductive approach since this study is still at preliminary stage. The inductive method allows us to develop categories from the themes identified in the data.

FINDINGS

The relationship between the collector and the wholesaler had been going on for four years. The collector in Sumatra Island received banana from hundreds of smallholder farmers. Each farmer brought approximately six to nine bunches of banana on motorcycles to the collector's warehouse. Each bunch had seven to eight hands. Collectors normally kept bananas for two to three days in a shed or open warehouse until there were sufficient for shipping. The warehouse was not equipped with a cooler and there was no cement floor. The bananas were then shipped to a wholesaler on Java Island.

The collector had been aggregating Yellow Ambon banana for twenty years. During that time, the collector had received multiple offers to be a preferred supplier for a modern supply chain. To achieve that, the collector had to upgrade her operation by incorporating processes such as cutting the hands off the bunches, washing and packing. However, the collector admitted that she had turned down the offer for three main reasons: (1) her comfort with her current trading relationship; (2) the additional workload related to upgrading; and (3) the perceived risk associated with the change.

Current comfortable state of relationships

"Yes, but I am already faithful to my current business partners (buyers) so I don't want to risk it by taking that offer" (Collector)

In traditional supply chains, farmers, collectors and wholesalers transact under one common rule that the buyer must take everything from the supplier. In other words, the collector must not reject any banana from farmers and wholesalers must take all the bananas collectors deliver, irrespective of the quality and quantity of the fruit. For suppliers, although the price is flat, regardless of the quality of banana, being able to move all the bananas gives peace of mind because they do not need to worry about the disposal of fruit that does not meet specifications.

Without any cold treatment, banana is very perishable. The longer the banana sits in the supplier's warehouse, the lower its value as the banana continues to ripen. Under

the current rules of transaction where the customer must take all, the supplier's risk is lower. In addition to that, suppliers do not need to grade or sort banana for different customers. As such, suppliers are able to minimize transaction costs.

Another form of comfort the collector gained through the relationship with the wholesaler was attributed to the collector's dominance in the relationship. The collector was not bound to deliver banana on any particular day or time, but rather, the collector determined the shipping schedule as long as she could maintain weekly regularity. One or two day's variation was acceptable. In addition to that, the collector was the one who initiated price negotiations with both farmers and wholesalers.

"With suppliers (farmers) I set the price. Between me and buyer (wholesaler), I set the price and quantity, the amount of banana I ship to each of my buyer" (Collector)

"The variety of banana she sends me is a mixture. Regarding the composition, the variety and the quantity of each variety, it's not up to me to decide. It's up to her to decide. I accept whatever she says and she has in her warehouse. Time of delivery is also up to her to decide. I cannot tell her to for instance, bring me certain amount of Ambon, Raja, or Kepok bananas. Bottom line is, I accept whatever she sends me" (Wholesaler)

Generally each actor in a modern supply chain has to play according to a set of rules concerning the logistic arrangements, lead times, quality of product and payment terms. However, in the current supply chain, collectors do not have to comply with any rules established by customers. Rather, the customers adjust to the collector's terms. This explains the reason why the collector preferred to stay with her current customers.

Additional workload

"I don't process banana. Around here, there are processors who box the bananas and put label on them. I don't want it because the processes are rather complicated. I reasoned it needs more labour. I heard the boxes and labels are supplied from Jakarta. But it's too much work as the bananas need to be washed. My bananas are not like that. Without washing process, once they are weighed, they are loaded unto the car, covered, that's it" (Collector)

In traditional supply chains, the procurement, storage and shipment of bananas was very simple. The collector received bunches of bananas from farmers and kept them in an open earth-floor warehouse. When there was enough banana to ship, the bunches of banana were weighed and loaded onto an open truck. Once all the bunches were on the truck, the piles were covered with a plastic tarpaulin and the truck departed. The bananas received from farmers were shipped to the wholesaler without any cleaning, sorting or grading.

Currently, the collector only has three people working for her and one of them is her own husband whose main job is to ship the bananas. Upgrading supply activities, which include sorting, washing, boxing and labelling, means more work for the collector, which automatically means the collector needs to employ more labour and supervise more workers. In other words, the collector will need to plan and organize more things.

Perceived risk

"There were people from Jakarta who came here and offer me to be their partner. They were even willing to lend me capital (money) to start the business and they will install all the equipment for it. I rejected the offer. Besides, regarding

borrowing money, I don't want to be in debt if unwanted things happen later in the future, I am afraid of being in debt" (Collector)

The collector lives in a village, receiving bananas from farmers around the village. The collector relies entirely on banana trading to support her household needs. From the farmer's perspective, a collector is often referred to as the boss or a richer person, since a collector pays all the farmers in cash. However, collectors generally only focus on banana trading when they do not have other forms of investment. As such, their capital is limited. Access to credit or capital has been one of the major constraints in adopting new methods of transacting (Aikens, Havens, & Flinn, 1975; Shampine, 1998; Uaiene, Arndt, & Master, 2009).

In this study, the collector admitted that a future exchange partner was willing to provide credit so the collector could upgrade her banana operation from traditional methods (no food safety assurance, no grading, rough handling) to a more modern method (grading, washing and packaging). In other words, the collector had access to credit, but the collector chose not to be in debt, for she would then have to deal with the risks associated with non-payment and her subsequent inability to settle the debt.

On the other hand, participating in modern supply chains was a completely new experience to the collector. Although the supplier base did not change, the customer base was completely different. The collector had to comply with the terms and standards as dictated by the customer, rather than to have the customer comply with the collector's terms as was the current situation. This put the collector at risk should they be unable to comply with the customer's standards.

Risk aversion and loss aversion are significant factors affecting the probability of technology adoption. More risk averse individuals are more likely to adopt new technology once they have witnessed the success of the new technology (Ward & Singh, 2014). However, the collector admitted that she was aware of other collectors who had upgraded their operation by packing bananas in boxes and labelling them. This implies that the collector was aware that such improvements were profitable and such risks were worth taking. Yet, it was not sufficient to motivate the collector to upgrade her operation.

CONCLUSIONS

In traditional supply chain, the relationship of collector-wholesaler provides collector with flexibility in dealing with customers while leaving the current relationship and joining a modern supply chain is seen to be a very risky move as collector would have to deal with the risks associated with inability to comply with customer's requirements and settle the debt resulted from installing new equipment. However since this is a preliminary study, future research may needs to do a comparative study between collector in traditional supply chain and collector who has switched to modern supply chain.

Literature Cited

Abraham, C. 2009. Transforming the region: Supermarkets and the local food economy. *African Affairs, 109*(434): 115-134.

Aikens, M.T., Havens, A.E., & Flinn, W.L. 1975. *The adoption of innovations: The neglected role of institutional constraints*. Mimeograph. Department of Rural Sociology. The Ohio State University. Columbus, Ohio.

Batt, P.J. 2004. Consumer sovereignty: exploring consumer needs. *ACIAR Proceedings No. 119e*: 77-87.

Balsevich, F., Berdegue, J.A., Flores, L., Jano, P., Reardon, T.A. & Schuetz, P. 2007. Country Studies (Central America): Countries with consolidating and expanding supermarkets and their supply chains. In B. Vorley, A. Fearne & D. Ray (Eds.), *Regoverning markets: A place for small-scale producers in modern agrifood chains?* Hampshire: Gower Publishing Limited: 21-40.

Banerjee, M. & Dasgupta, R. (2010). Changing pattern of consumer behavior in Kolkata with advent of large format retail outlets. *The IUP Journal of Marketing Management, 9*(4): 56-80.

Berdegue, J.A., Balsevich, F., Flores, L., Mainville, D. & Reardon, T. 2003. Food safety in food security and food trade. Case study: Supermarkets and quality and safety standards for produce in Latin America. Available from IFPRI Retrieved August 4, 2011, from International Food Policy Research Institute http://www.ifpri.org/sites/default/files/pubs/2020/focus/focus10/focus10_12.pdf

Boselie, D., Henson, S. & Weatherspoon, D. 2003. Supermarket procurement practices in developing countries: Redefining the roles of the public and private sectors. *American Agricultural Economics Association, 85*(5): 1155-1161.

Cachon, G.P. & Fisher, M. 2000. Supply chain inventory management and the value of shared information. *Management Science, 46*(8): 1032-1048.

Chen, K., Shepherd, A.W. & da Silva, C. 2005. Changes in food retailing in Asia: Implications of supermarket procurement practices for farmers and traditional marketing systems. Rome: Food and Agriculture Organization of the United Nations.

Chowdhury, S., Gulati, A. & Gumbira-Said, E. 2005. *High Value Products, Supermarkets and Vertical Arrangements in Indonesia*. MTID Discussion Paper No. 83. Markets, Trade and Institutions. International Food Policy Research Institute.

Direktur Budidaya Tanaman Buah. 2008. Supply chain management pisang kepok. Retrieved 26 May 2014, from Direktorat Jenderal Horticultura, Indonesia http://www.ina.or.id/knoma-hpsp/pa/MoA-09-SCM-PisangKepokBanjar.pdf

Faiguenbaum, S., Berdegue, J.A. & Reardon, T. 2002. The rapid rise of supermarkets in Chile: Effects on dairy, vegetable, and beef chains. *Development Policy Review, 20*(4): 459-471.

Hutabarat, M.R. 2009. *The impact of Brastagi supermarket on Sei Sikambing traditional market in Medan (in Indonesian).* Graduate thesis, Sumatera Utara University, Medan.

Kaliappan, S.R., Alavi, R., Abdullah, K. & Zakaullah, M.A. 2007. Spillover effects of foreign hypermarkets on domestic suppliers in Malaysia. *International Journal of Retail & Distribution Management, 37*(3): 226-249.

Keltner, D., Gruenfeld, D.H. & Anderson, C. 2003. Power, approach, and inhibition. *Psychological Review, 110*(2): 265-284.

Lianguang, M. (2011). *Study on modern agricultural products logistics supply chain management mode based on IOT.* Paper presented at the Second International Conference on Digital Manufacturing & Automation.

Lin, P-C. & Wu, L-S. 2011. How supermarket chains in Taiwan select suppliers of fresh fruit and vegetables via direct purchaing. *The Service Industries Journal, 31*(8): 1237-1255.

Louw, A., Nhemachena, C. & Zyl, S.V. 2008. Agribusiness linkages in Southern African region: small farmer participation. Pretoria: Department of Agricultural Economics-University of Pretoria.

Maruyama, M. & Trung, L.V. 2007. Supermarkets in Vietnam: Opportunities and obstacles. *Asian Economic Journal, 21*(1): 19-46.

Neven, D. & Reardon, T. 2006. Farmer response to the rise of supermarkets in Kenya's fresh fruits and vegetables supply system. *Journal of Food Distribution Research,* 37(1): 114-118.

Obeth, E. & Dunne, T. 2008. The comparative performance of banana supply chains in East Kalimantan, Indonesia. *Acta Horticulturae,* 794: 277-284.

Pritchard, B., Gracy, C.P. & Godwin, M. 2010. The impacts of supermarket procurement on farming communities in India: Evidence from Rural Karnataka. *Development Policy Review,* 28(4): 435-456.

Reardon, T. & Berdegue, J.A. 2002. The rapid rise of supermarkets in Latin America: Challenges and opportunities for development. *Development Policy Review,* 20(4): 371-388.

Schipmann, C. & Qaim, M. 2009. *Modern supply chains and product innovation: How can smallholder farmers benefit?* Paper presented at the International Association of Agricultural Economists Conference, Beijing, China.

Schipmann, C. & Qaim, M. 2011. Modern food retailers and traditional markets in developing countries: Comparing quality, prices, and competition strategies in Thailand. *Applied Economic Perspectives and Policy*, 1-18. Retrieved from http://aepp.oxfordjournals.org/content/early/2011/07/25/aepp.ppr018.full.pdf+html

Shampine, A. 1998. Compensating for information externalities in technology diffusion models. *American Journal of Agricultural Economics,* 80(3): 337-346.

Shepherd, A.W. 2004. *The implications of supermarket development for horticultural farmers and traditional marketing systems in Asia*. Paper presented at the FAO/AFMA/FAMA Regional Workshop on the Growth of Supermarkets as Retailers of Fresh Produce, Kuala Lumpur.

Suryadarma, D., Poesoro, A., Akhmadi, Budiyati, S., Rosfadhila, M. & Suryahadi, A. 2010. Traditional food traders in developing countries and competition from supermarkets: Evidence from Indonesia. *Food Policy,* 35: 79-86.

Tukan, C.J.M., Roshetko, J.M., Budidarsono, S. & Manurung, G.S. 2006. Banana Market Chain Improvement - Enhance Farmers' Market Linkages in West Java, Indonesia. Retrieved 26 May 2014, from ICRAF Southeast Asia Publications

Uaiene, R.N., Arndt, C. & Master, W.A. 2009. Determinants of agricultural technology adoptionin Mozambique. Retrieved 10 August 2014, from Ministry of Planning and Development
http://www.cebem.org/cmsfiles/publicaciones/Determinants_of_agricultural_technonolgy_adoption_in_Mozambique.pdf

Wang, H., Dong, X., Rozelle, S., Huang, J. & Reardon, T. 2009. Producing and procuring horticultural crops with Chinese characteristics: The case of Northen China. *World Development,* 37(11): 1791-1801.

Ward, P.S. & Singh, V. 2014. Risk and ambiguity preferences and the adoption of new agricultural technologies. Evidence from field experiments in Rural India. *IFPRI Discussion Paper 01324*.

Wiwaha, D.A. 2007. *Analisis pengendalian pasokan pisang Cavendish berdasarkan hasil ramalan penjualan Time Series terbaik untuk wilayah pemasaran Jabotabek pada PT. Sewu Segar Nusantara.* Fakultas Pertanian, Institut Pertanian Bogor.