E-COMMERCE IN TAIWAN’S AGRICULTURAL MARKETING

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ABSTRACT

This Bulletin analyzes the opportunities and challenges faced in promoting e-commerce for agricultural marketing, and discusses appropriate policies to take advantage of opportunities. In 2000, the market share of the fruits, vegetables, hogs, flowers, and aquaculture products sold through the cooperative marketing system via wholesale markets in Taiwan was 32%, 35%, 68%, 75% and 55%, respectively. In the same year, the produce marketed through the e-commerce system was less than 5%, in terms of total value. A dual system, including both traditional channels and the e-commerce marketing systems, may complement each other in the market system of Taiwan, at least in the short and medium term.

INTRODUCTION

The “Information Revolution” began well before the creation of the Internet. It has inspired lofty rhetoric about how it will change our way of life. It has also created several new concepts and terms. This Bulletin reports briefly on what is known about the type, use, and impact of e-commerce in Taiwan’s agricultural marketing.

In its broadest sense, e-commerce includes all transactions which use Information Technology (IT). It encompasses everything that allows us to electronically gather, generate, store, analyze, distribute, or otherwise use information. Although the Internet has received the most attention, it includes other technology such as microchips, monitors, hard drives, and software. It also includes more traditional telecommunication technologies, such as cell phones and fax machines – anything related to the electronic use of information. More recently, it has begun to include broadcast technologies such as cable TV that are offering access to the Internet (Chambers 2001).

At present, there are two major type of computer networks that are used for e-commerce: electronic data inter-change (EDI) and the Internet. EDI is older than the internet (see Appendix). While EDI networks are private, the Internet is open to the general public. Any firm or individual with the right equipment may access it. The Internet can be used for transactions between firms, as well as transactions between firms and individuals. Another network technology, “extranet” is a hybrid of EDI and the Internet (see Appendix). An extranet uses the Internet to transfer information, but encodes the information to maintain privacy.

In 1996, the famous book “The Digital Economy”, written by the economist, Don Tapscott, described the new economic system created as a result of the widespread use of the information superhighway, and announced the coming of the Digital Economy Age.

The Digital Economy (or New Economy) is a consequence of the economic principles of the age of networked intelligence. New thinking and social responses, as opposed to the familiar economic principles of the past, stem from the digital economy, driven by computers and the Internet. For example, the Law of Diminishing Returns of traditional economics states that in the real world, similar production investments bring about diminishing returns. But in the digital economy, all information can be created, transmitted, and stored in digital form. The coming of the Internet has turned many industries into

Keywords: agricultural marketing, B-to-B, B-to-C, digital economy, E-business, E-commerce, extranet, information technology, Internet, intranet, Taiwan, traditional economy
knowledge-based industries, at least to some extent. After a certain point, returns increase with each unit of investment. As a result, the Law of Increasing Returns is becoming a common phenomenon of the digital economic age.

It is estimated that the global “B-to-B” (business-to-business) market in EC countries will reach US$327 billion this year (2003). In the United States, it is estimated that it will reach US$1,370 billion, with a composite annual growth rate of 99%. It is likely to grow much faster than “B-to-C” electronic commerce (business-to-consumer).

We have identified four different functions that e-commerce firms perform in the agricultural sector in Taiwan, including many farmers’ organizations. These functions are

- Information distribution;
- Input supply;
- Commodity trading; and,
- Logistics/supply chain management.

This paper provides a general discussion and review of e-commerce in Taiwan’s agricultural marketing.

THE CURRENT AGRICULTURAL MARKETING SITUATION IN TAIWAN

Marketing is the performance of all business activities involved in the flow of goods and services, from the point of initial agricultural production until they are in the hands of the ultimate consumer (Kohls and Downey 1972). Consumers are interested in getting what they want at the lowest possible cost. Farmers are interested in obtaining the highest possible returns from the sale of their products. The various merchants, including shippers, wholesalers, jobbers, and retailers engaged in doing the various marketing tasks, are interested in the profitability of their particular business operation.

One method of classifying the activities that occur in the marketing process is to break the processes down into functions. A marketing function may be defined as a major specialized activity performed in accomplishing the marketing process. The following classification of functions is fairly widely accepted.

Exchange functions.
- Buying (assembling).
- Selling.

Physical functions.
- Storage.
- Transportation.
- Processing.

Facilitating functions.
- Standardization.
- Financing.
- Risk-bearing.
- Market intelligence.

Basically, most countries in the world have two sets of marketing choices open to agricultural producers. One set permits a maximum amount of freedom of decision-making by the individual farmer or producer. Another set involves putting one or more aspects of decision-making on a group basis, thereby providing an alternative outlet or channel for individual farmers.

Usually, the individual marketing strategy adopted by a farmer can use open-market strategy, closed-market strategy, or a combination of the two (Branson and Norvell 1983). The major marketing alternative in Taiwan are as follows:

Open-market channels and strategies
- Direct sales to individual buyers;
- Sales through auction markets;
- Sales through commission agents or brokers.

Closed-market channels and strategies
- Forward contracts;
- Crop contracts for future delivery;
- Forward integration.

Mixed marketing strategies
- Open market and forward contracts.

Farmers in a small-scale farming system of the kind found in Taiwan generally prefer using group marketing strategies, rather than individual ones. Exceptions are when crops have a guaranteed price, or when the planting area is limited by a quota system.

Group marketing by growers in Taiwan is an attempt to balance the influence of many small-scale farmers on the one hand and that of the shippers, wholesalers and processors on the other. The competitive balance and efficiency of agricultural marketing are continuing issues. Based on forty years’ experience in Taiwan, the cooperative marketing systems for fruits, vegetables, hogs, flowers, aquaculture and fisheries, are very successful. In 2000, the cooperative marketing system comprised 32%
of the fruits sold. Comparable figures for vegetables were 35%. Similarly, the cooperative marketing system handled 68% of the hogs, 75% of the flowers, and 55% of the aquaculture and fisheries products sold in wholesale markets in Taiwan.

Thus, the cooperative marketing system has already proved itself to be a market force for farmers in Taiwan. However, setting up a large number of auction markets was a prerequisite for both group and individual marketing. There are now 63 fruit and vegetable wholesale markets, 24 livestock auction markets, 61 fisheries wholesale markets, and four flower auction markets in Taiwan.

Because of the auction markets, commodity prices can be determined openly, fairly and transparently. This is the basic infrastructure for a more effective and equitable marketing system. The 303 Farmers’ Associations and 200 Cooperatives in Taiwan were formed mainly to assist small-scale farmers to obtain reasonable prices through cooperative sale of their products.

Most of the Farmers Associations and Cooperatives offer a wide range of marketing options to members. Some of them have aggressive marketing strategies, including vertical integration into processing and direct marketing e.g. of fluid milk, vegetables, banana, onion and watermelon.

### THE GOVERNMENT’S ROLE IN PROMOTING E-COMMERCE

#### The development of information technology

Most people think of e-commerce as buying goods over the Internet. Certainly, any search engine, if asked to look for e-commerce sites, will find thousands of relevant websites. Even back in May 2000, one search engine found more than a million webpages containing the word e-commerce. The use of WAP (Wireless Application Protocol) standard, a global specification for providing information content to wireless devices, including mobile phones, TV sets, etc., will soon be commonplace. It is expected that by 2005, mobile Internet access will communicate at speeds up to 200 times faster than today. Emerging technologies have redefined business by erasing traditional boundaries of time and geography. They have created new virtual communities of customers, distributors and suppliers, linked by a demand for products and services.

Taiwan is one of the top three information technology markets in the world (Ministry of Economic Affairs, Industrial Development Bureau 2000). In 1998, laptop computers made in Taiwan had 40% of the global market. The sale of Internet services rose by 42%, from US$350 million in 1999 to US$4.500 million in 2002. For some years, various policies, including tax reduction, low interest loans and training, in IT have been adopted by the government’s Ministry of Economic Affairs to encourage the development of the IT industry. The Education Ministry has integrated IT into the teaching process to promote IT skills among the population (Chang 1999). In 1999, the number of Internet users in Taiwan reached 4.5 million (Wei 2000).

In response to the surge in Internet use, TV cable, which offers high-speed, high-quality data transfer, was first applied to the

### Table 1. Sales in Taiwan of electronic network services, 1998 - 2002

<table>
<thead>
<tr>
<th></th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
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</thead>
<tbody>
<tr>
<td>Electronic database services</td>
<td>27.06</td>
<td>40.00</td>
<td>52.35</td>
<td>62.65</td>
<td>78.24</td>
</tr>
<tr>
<td>Internet network provider</td>
<td>96.18</td>
<td>120.29</td>
<td>151.47</td>
<td>161.76</td>
<td>240.88</td>
</tr>
<tr>
<td>Other added-value services</td>
<td>98.24</td>
<td>111.18</td>
<td>147.65</td>
<td>226.18</td>
<td>305.29</td>
</tr>
<tr>
<td>Data network renting</td>
<td>91.18</td>
<td>176.76</td>
<td>272.06</td>
<td>367.94</td>
<td>457.06</td>
</tr>
<tr>
<td>Others</td>
<td>47.65</td>
<td>59.41</td>
<td>106.76</td>
<td>162.65</td>
<td>262.35</td>
</tr>
<tr>
<td>Total</td>
<td>357.35</td>
<td>507.65</td>
<td>730.29</td>
<td>981.18</td>
<td>1343.82</td>
</tr>
</tbody>
</table>

Source: Marketing Intelligence Center (2000)
Note: 1US$ = NT$34

3
network market in 1999. According to Taiwan’s Marketing Intelligence Center, the ratio of personal users to business users will gradually change, from the current 4:1 to 1:1 in the coming three years. As business-to-business (B-to-B) transactions are the driving force of e-commerce, such a change means business-to-customer (B-to-C) services will also increase.

Much of the research on marketing in general, and small firm marketing in particular, has been conducted in a Western context. Increasingly, it is becoming clear that the basic principles and practices which apply in one environment may not be applicable in another. Accordingly, Siu and Kirby (1999b) carried out a comparison of Eastern and Western small-firm marketing practices. They found that the dramatic growth of e-commerce provides great opportunities in Taiwan, where small firms play an important role in the development of the economy.

The role of the government in e-commerce in Taiwan

Developed countries all over the world have drawn up measures to meet the rapid developments in information technology and e-commerce in recent years, as they jockey for leadership in world markets. According to the analysis in the OECD’s book “Electronic Commerce-Opportunities and Challenge for the Government”, the government should play a role in the promotion of e-commerce. The major roles of the government can be described as follows:

Provide an environment conducive to the development of e-commerce

- Governments must quickly open up e-services, including information, telecommunications, and electronic financial exchanges, and should encourage the use of these services.
- Promote the standardization of solutions dealing with electronic trade, to prevent copyright from becoming a hindrance to new businesses or an impediment to e-commerce.
- In regard to information exchange, with the assistance of the private sector, the government should promote the use and development of cryptography technology, and negotiate with other countries to accept encrypted data to facilitate the use of e-commerce in economic and trade activities. Furthermore, governments should stipulate and enforce data protection laws, so that the public can have confidence in electronic transactions, and there is no abuse or theft of personal data about consumers.
- E-commerce is being widely used for the sale of consumer products. Governments need to set up a comprehensive transportation infrastructure to support this. This will prevent inefficient transportation or distribution systems from delaying the rate of e-commerce development.
- Governments need to announce what action they intend to take in regard to e-commerce, so that industry and government can have a common understanding and consensus in regards to the objectives of this development.

Increase the visibility of e-commerce, and promote electronic interaction between industry and government agencies

- Government agencies responsible for activities related to e-commerce should coordinate the activities of the public and private sectors, while reporting as widely as possible on e-commerce to promote public confidence and trust.
- Industry and government should maintain a dynamic and harmonious relationship as they develop e-commerce and information policies. Sound e-commerce promotion policies adopted by the government will assist industry in dealing with the impact of e-commerce.
- Incentives, training, and technical promotion should be used to stimulate all potential industries to use e-commerce.

Redefine management principles of governments in the digital economy environment

- Governments must be cautious when revising laws and regulations, for
example when liberalizing telecommunications, so that they do not unintentionally protect existing monopolies.

- When revising laws and regulations, governments should modify them to cover trade in both the physical world and cyberspace. These laws and regulations should also protect the rights of e-commerce consumers.
- Government should regulate anything that could potentially affect the implementation of e-commerce, such as international protocols covering intellectual property rights.
- With regard to the taxation of e-commerce, the OECD recommends that, to avoid unfair taxation, taxes should not be levied against electronic trade. However, the OECD recommends that taxes be levied against the source and destination of traded goods.

SCHEDULE FOR THE GOVERNMENT TO PROMOTE E-COMMERCE IN AGRICULTURE

The years 2000 and 2001: The foundation period

The main measures can be listed as follows:

- To construct a demonstrative e-business system from selected farm marts, outlets, associations or organizations.
- To assist farm-product organizations in realizing e-business operations.
- To propagate e-business concepts and cultivate needed personnel.
- To help the industry to frame the product specifications and data standards required in the electronic trading.
- To improve the foundation-constructing environment for e-agriculture.

2002 to 2004: the promotion period

The core measures are as follows:

- Provide consultation and guidance by means of technical service teams and the Internet.
- Enhance the operations of electronic supply chains, to expand business by effectively integrating market demands.
- Help farmers and farmers’ organizations to apply e-commerce or information technology.

In general, the development of e-agriculture will take advantage of existing technical resources to establish mutually beneficial strategic alliances. The goal is to create an e-agriculture environment for modern farmers, so they can integrate and become highly competitive suppliers of farm products on the market.

ACHIEVEMENTS THE DEVELOPMENT OF E-COMMERCE IN TAIWAN'S AGRICULTURE

Under the plan begun in 2000, there are already a number of achievements

- There is an Information Network for Farm Products, that includes six major farm products: flowers, vegetables, fruits, poultry, meat and fisheries products.
- Establishment of an e-commerce system for demonstration purposes, made up of selected farmers’ groups.
- Workshops to train farmers and marketing staff in e-commerce, plus exhibitions, and handbooks and other publications about electronic agriculture.
- Various community networks have been established. These provide technical and marketing information, including existing farm production technology, skills from agricultural institutes, and research and marketing groups.
- Farmers are being encouraged to join associations for e-commerce.

DEVELOPMENT OF E-COMMERCE FOR AGRICULTURAL MARKETING IN TAIWAN

Firms and agribusiness that do business on the Internet may take part in “B-to-B” transactions or B-to-C transactions (see p. 2). The two categories are not of equal importance. According to U.S. Census Bureau data, in 2000, 90% of e-commerce consisted of B-to-B transactions. These transactions take place through either an EDI system or the Internet. B-to-C transactions occur almost exclusively on the Internet.

E-COMMERCE IN TAIWAN

There are many Internet companies actively engaged in business-to-business e-
commerce through a network of partner companies and farmers’ organizations in Taiwan. The primary goal is to increase efficiency and reduce costs. The eight main e-commerce systems in Taiwan for agricultural production are:

- The Agricultural Marketing Information System (www.amis.gov.tw);
- The website run by Council of Agriculture, with links to other e-commerce sites (www.brandfoods.org.tw);
- The Taipei Agricultural Products Marketing Co. (www.tapmc.com.tw);
- The Farmers’ supermarket (www.tpcfa.org.tw)
- The Ubox site (ttp://www.ubox.org.tw),
- The Twelve-flower site (www.12flower.com);
- The E-farm (www.efarm.org.tw)
- The government information site for agricultural marketing information (www.amis.gov.tw).

All offer free information, although since this is intended for use in Taiwan, most of it is in Chinese only. A detailed description follows of two of these e-commerce sites.

**Joint farmers’ and fishermen’s e-commerce network (www.efarm.org.tw)**

This e-commerce network offers fresh produce and a daily delivery service for Taipei, and several other cities and counties in the north of Taiwan. In 2000, this marketing network sold US$3 million worth of products, and served more than 2,500 community customers and institutional buyers.

The web-based, business-to-business and business-to-consumer channel was established in 1996. It is designed to facilitate trading between fruit and vegetable producers and consumers, through the food packing centers of local Farmers’ Organizations.

**Chain stores of the Farmers’ Associations (www.tpcfa.org.tw)**

There are more than 120 shopping centers in Taiwan which belong to various Farmers’ Associations. They sell goods to Association members and their families. The main purpose in setting up of these stores was to reduce the cost of food and household items for farmers, and protect the quality of their food.

This system was established to connect the nation-wide Farmers’ Associations Shopping Centers with the sale of food, general merchandise and drugstores. In 2000, sales were worth US$1,500 million. Anticipated benefits for participants include increased sales, lower inventories, decreased operational costs, increased asset utilization rate, shorter lead time and better customer service. Ultimately, both farmers and fishermen will benefit from access to a more reliable, efficient and responsive supply chain.

**Total sales**

In 2000, the value of produce marketed through the e-commerce system in Taiwan was less than 5% of the total. However there is great potential for a future increase.

Morehart and Hopkins used the 1999 data from a 1999 Agricultural Resource Management Survey, conducted by The United States Department of Agriculture, to show that while only about 4% of all farms in the United States bought and sold on-line in 1999, on-line activity was positively related to farm size. The larger the farm, the greater the importance of on-line marketing. Farmers who bought or sold online also tended to be younger and more highly educated.

Although all farms in Taiwan are small, it is likely that younger farmers are similarly more active in e-commerce, because they are more likely to have the necessary computer skills.

**OPPORTUNITIES AND CHALLENGES**

Globalization is making the market very competitive. Farmers have to face this challenge by reorienting themselves, so that what they grow becomes more marketable. We believe that marketing and IT are very important components for the modernization of agriculture.

The government’s role is to make sure that producers and buyers meet in a marketplace. The government needs to facilitate and create market encounters and investment missions where the different producers and buyers can meet. However, this is easier said than done. With e-commerce, we can explore
the possibility of creating a virtual market place.

The future is bright for e-commerce in agricultural marketing. However, there are three main issues that need to be addressed.

**How to help farmers to access the Internet.** Telecommunications in the countryside are not as developed as in the cities. Since farmers live in the countryside, giving them access to the Internet is a major concern. Improving the infrastructure so that they have fast, reliable Internet access will be a big advance in the use of e-commerce.

**Improving the computer literacy of farmers.** Compared to the service workers or industrial workers, farmers have a low literacy rate. Relatively few farmers have computer skills. Making farmers computer literate will be a challenge.

**Ensuring that the information on a marketing website is timely and relevant.** Maintaining a marketing website is a lot of work. It requires timely information, so that farmers can take immediate advantage of opportunities as they arise.

**CONCLUSION**

Taiwan’s farming is small-scale. If Taiwan does not apply IT to agricultural marketing, to make it more efficient in today’s global environment, many thousands of farmers in Taiwan will fall behind and eventually lose to the competition.

There are problems with the Internet bandwidth and security used by Taiwan, which need to be taken into consideration. Taiwan also lacks a comprehensive environment for e-commerce, including relevant laws, regulations, and mechanisms for certification.

When the government is drawing up its promotion program for IT in agriculture, it should study global opportunities, as well as relevant IT and telecommunications applications and processes. It should promote Taiwan’s resources, and help growers identify niche markets.

Wholesaling is a very important step in the process of distributing agricultural products. In a developing country, farmers and suppliers are numerous but operate on a small scale, as do jobbers and retailer. Food processing is not yet well established. Hence, major food items, whether for domestic consumption or for export, remain mostly in fresh form or have only very basic processing.

However, fresh produce such as vegetables and meat decay within days unless they are refrigerated. They have to be sold as soon as possible, or else farmers suffer great losses. In this regard, a dual system, including both the traditional channels (producers - assembly points - wholesale markets - jobbers - retailers) and an e-commerce marketing system may complement each other, to form together a more effective marketing system.

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APPENDIX:

TERMS RELATING TO E-COMMERCE (for more details see http://whatis.techtarget.com)

EDI: EDI (Electronic Data Interchange) is a standard format for exchanging business data.

Extranet: An extranet is a private network that uses the Internet protocol and the public telecommunication system to securely share part of a business’s information or operations with suppliers, vendors, partners, customers, or other businesses. An extranet can be viewed as part of a company’s intranet that is extended to users outside the company. It has also been described as a “state of mind” in which the Internet is perceived as a way to do business with other companies as well as to sell products to customers.

Information technology: In its widest sense, IT refers to any technology controlled by a microprocessor (or computer chip). For example, microprocessors are used to control the delivery of essential services such as water and electric power. However in practice, most use of IT is limited to two types of computer systems: those that store and manipulate data, and those that provide fast and efficient communications between people and between businesses.

Microchip: A microchip (sometimes just called a “chip”) is a unit of packaged computer circuitry (usually called an integrated circuit) that is manufactured from a material such as silicon on a very small scale. Microchips are made from program logic (logic or microprocessor chips) and for computer memory (memory or RAM chips).

WAP: WAP (Wireless Application Protocol) is a specification for a set of communication protocols to standardize the way that wireless devices, such as cellular telephones and radio transceivers, can be used for Internet access, including e-mail, the World Wide Web, newsgroups, and Internet Relay Chat (IRC). While Internet access has been possible in the past, different manufacturers have used different technologies. In the future, devices and service systems that use WAP will be able to communicate with each other.