
Electronic commerce in Greater China

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Abstract

The Greater China region (China, Taiwan and Hong Kong) has more than 1.2 billion people, about one fifth of the world's total population. This incredibly large market continues to modernize rapidly, and over the last five years, the region has maintained a very high economic growth rate in comparison to the rest of the world. The combination of market size and economic growth makes Greater China the most promising place in the world for Internet products and services. China, Taiwan and Hong Kong recognize the opportunities and via public and private initiatives are investing in the development of information technology (IT) and the Internet infrastructure. This paper outlines the key electronic commerce (EC) trends and events in the region. Further, the research analyzes the current impediments to Internet commerce in China, Taiwan and Hong Kong and provides strategy and directions for the region's EC development.

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Introduction

This paper approaches the study and analysis of electronic commerce in the Greater China region from three perspectives. The first perspective looks at the elements driving the growth of electronic commerce, including the development of the information infrastructures, the growth in sales of personal computers, the status of various forms of electronic businesses and systems emerging in the marketplace, and a description of government policies being instituted. The second perspective analyses the interrelationship between ideas in published reports and articles that focus on the development and limitations of the Internet and e-commerce in Asia and Greater China. Thus, the first part of this paper presents facts about the development of e-commerce and the second part presents the prevailing ideas and assumptions that may limit or hinder e-commerce growth and development. The third and final perspective of the paper integrates the facts, ideas, and limitations into a table that projects the priorities for developing business-to-business e-commerce, business-to-consumer e-commerce, electronic based delivery services, and electronic payment services in Greater China. The end result provides managers with a view of the different types of e-commerce applications evolving in the region and a tool for strategic planning.

The Internet economy in China, Taiwan and Hong Kong

The Internet economy in Greater China is interrelated and interconnected because of well-established business ties between private sector firms throughout the region. The area of greatest difference lies in the area

of public policy, specifically the regulation of the Internet and extent to which foreign firms are allowed to participate in the market. Mainland China has very different rules about foreign exchange, business investment, and freedom that consequently create barriers to free market growth of the Internet.

However, as long as the Internet is used as a tool for business within the region or to enhance exports from the region, there are few barriers to growth and development (Lemos, 1998). Following this basic premise, China takes a proactive and controlled regulatory approach to Internet business while maintaining openness to innovative applications and technology. Hong Kong offers a less regulated environment but the private sector is sometimes more conservative and less proactive than the private sector in China. For example, Hong Kong's privately held banks are reluctant to grant merchant licenses for Internet retail trade (Mailoux, 1998), a demand that would be quickly satisfied in China if only there were privately held banks. Taiwan's privately held banks and publicly held banks are at the forefront in the region and offer many different options for Internet-based financial transactions. Taiwan is unique in the region since the Internet infrastructure has grown along with the computer and semiconductor industry and plays an active role in developing computer manufacturing technology for the world market (MOEA, 1998).

Another difference in the region is that China's public sector provides more information about the Internet (CNNIC, 1999) than do the similar public sector groups in Hong Kong or Taiwan. In Hong Kong and Taiwan, statistics are best obtained through the private sector enterprises and organizations (ITIS, 1999). Finally, China is taking the lead in opening university research centers with major international technology firms and initiating e-commerce

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test-beds in Beijing, Shanghai, Dalian, Tianjin and Guangzhou (Nathan, 1998). The statistics that underlie differences in the region are provided next, beginning with China.

China

China's information technology development, including Internet access and electronic commerce, depends on the telecommunications industry's ability to reform and to adapt to world trends. Overall, the outlook is positive, since China continues to reform policies to enter the World Trade Organization (Rosen, 1999). Personal computer sales are growing at 60 percent per year (Figure 1), although distribution is relatively low with only 2.5 percent of the households in China owning a personal computer (Huang and Bayuk, 1998). Prevailing expectations are that 25 percent of the households will own a computer by the year 2010 and that sales growth will continue if China's Internet infrastructure delivers the content and the services that make electronic commerce popular across the world. Consumers are attracted to open and dynamic information content information that is not only interactive but can be presented in a multi-media format. So far, China's Web sites are providing a sufficient mix of information and services to stimulate positive Internet growth, particularly by emphasizing Chinese language content and providing a variety of Chinese language search engines, such as Sohoo (US Embassy Beijing, 1998).

Data from 1998 show that China has about 2.1 million Internet subscribers (predicted to reach 6 million during 1999) and 750,000 computers connected to the Internet (BDA, 1999; Zhao *et al.*, 1998). The January 1999 statistics of Chinese Internet development provided by China's Internet Network Information Center (CNNIC, 1999) indicate

that China's total bandwidth capacity for international connections to USA, Canada, the UK, Germany, France, Japan and other international locations is about 143Mbps as shown in Figure 2.

China's e-business is at a very early stage of development. Businesses are using the Internet primarily as a means to reach out to foreign companies and secondarily as a means for conducting business-to-business (B2B) or business-to-consumer (B2C) e-commerce. The Internet has limited search functions, document transmittal, and authentication, as well as restrictive government rules and regulations. Businesses and consumers are using the Internet to a large extent for e-mail, advertisements, homepages, electronic trade fair advertisement, and limited business document exchange.

China's approach to e-business is to link domestic companies on a closed network sponsored by the China International Trade Network (CITN) which in turn is linked to the United Nation's global trading program for developing nations. MOFTEC, China's Ministry of Trade, uses the China International Electronic Commerce Center (CIECC) to promote the use of electronic data interchange (EDI) to member companies. The use of dedicated networks allows China to retain centralized control and closely monitor its international trade. However, over-dependence on value added networks (VANs) and proprietary EDI restricts China's competitive position and discourages businesses from accepting methods that are the norm. Global firms are switching from

Figure 1
Annual sales of PCs in China (in thousands of units)

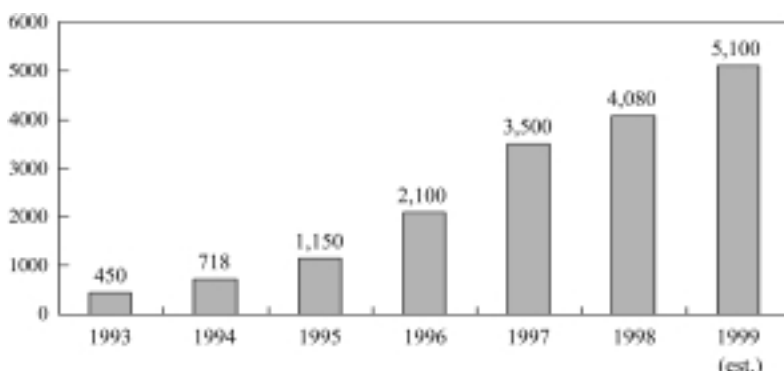
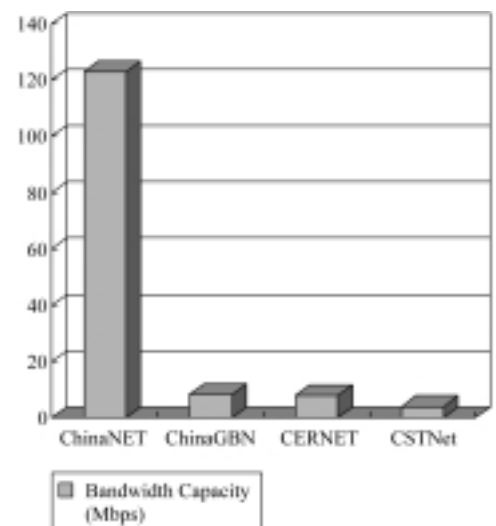


Figure 2
China's total bandwidth capacity (Mbps) for international connections



dedicated networks to open, Internet-based methods of procurement and sales, particularly for small volume and real time transactions.

Retail trade over the Internet (B2C) has been slow because few consumers use credit cards. Even if a Chinese consumer holds a credit card, many are valid only for purchases in Chinese currency. Thus, international retail Web sites are not likely to receive many orders from China. The majority of China-based Web sites have no means to receive electronic payment from consumers, so the standard approach is to shop on-line and pay off-line. Consumers must either pay cash on delivery or go to a store or a bank to pay for the merchandise.

There are two factors slowing the growth of China's Internet economy and e-business. China's Internet lacks influence from the marketplace, owing to government regulations and restrictions that limit the ability of private firms and individuals to contribute to the Internet infrastructure. Finally, China's banking system cannot support Internet-based online transactions. Too few businesses use credit and too few consumers hold credit cards. On a positive note, given investment in and liberalization of China's Internet infrastructure, there is great potential for B2B and B2C e-commerce (Zhao *et al.*, 1998). For the time being though, viable electronic retailing and integrated supply chains are just concepts. Changes in government policy, increases in capital investment and fast technical transfers have the potential to turn China into an Internet boomtown.

Taiwan

Taiwan is one of Asia's most open and developed Internet communities. The development results in part from private sector investment and government promotion of Taiwan as a regional operations center (ROC). Industry is supplying technology, locally developed computer hardware, and personnel to Internet strategic initiatives. The government, on the other hand, is providing the right environment to foster growth. A steering committee was formed in 1994 (Deng and Tseng, 1996) to integrate businesses, government services, and citizen activities via the Internet (Figure 3). The legal foundation for Internet economy and e-business is also well established with the passage of the Telecommunications Act, the Intellectual Property Rights Law, the Cable TV Act, the Satellite Broadcasting and Television Act, the Copyright Act, the Open Information Act, the Administrative Process Act, and

associated criminal laws (Chen, 1997). The objective of the legal foundation is to create a fair, open and internationally compliant trade and communications environment with reduced central government control.

As a result of the government's promotion efforts, the number of Internet users reached four million in mid-1999. The Internet content for consumers blossomed when cable television operators, radio stations, and telecommunications companies were allowed to participate in the planning of the Internet and to provide value-added services. Taiwan's Internet plays an important role in education and public welfare, with recent additions being lifelong learning on-line and network-based medical care systems. Government agencies, cities, businesses, trade associations, schools and colleges are developing Web sites and virtual organizations. The emerging virtual organizations are reminiscent of the inter-linked distributed industrial structure created during the days of the 1980s "economic miracle".

Taiwan's B2C e-business is undergoing a natural transition from mail catalog ordering and TV shopping to e-commerce. Well over 17 million credit cards have been issued and more than 10 million cards are in circulation for a population of 22 million people (*Taiwan Chain Store Almanac*, 1999). These cardholders are accessing the Internet and quickly accept on-line retailing as a viable alternative to "brick and mortar" stores.

In June of 1999, Taiwan launched a national Industrial Automation and Electronic Business (IAEB) plan to build up the B2B e-business infrastructure (IAEB, 1999). The infrastructure will be used for education, training and promotion, and particularly to assist small and medium enterprises achieve e-business competency and practices. The five-and-a-half year plan will promote B2B e-business to 50,000 enterprises (within 200 supply chains) with the goal of increasing global competitiveness of manufacturing and distribution. The initiatives encourage increasing private sector investment in e-business solutions. Given the current status of legal infrastructure and industry's eagerness to maintain global supply chain participation, both business-to-business (B2B) and business-to-consumer (B2C) EC are developing about as enthusiastically as in the USA. This fast progress is fulfilling the plans of the Ministry of Economic Affairs for Taiwan to become a leading Internet technology and computer technology provider for Asia and the world.

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Hong Kong

Hong Kong is a world financial center and a hub for international trade. Regarded as Asia's most sophisticated consumer market, the Hong Kong Special Administration Region (SAR) maintains a trend-setting wholesale and retail infrastructure. There are about one million Internet users, with a per capita usage rate about two percentage points less than Taiwan. There is a mature Internet service industry with about 100 Internet service providers (ISPs) that have businesses to extend their reach and provide new and innovative services. As an example, Hong Kong's electronic data interchange (EDI) initiative is improving banking, import/export trade, and stock trading by boosting transaction speed and by making transactions more transparent. Smart card technology (a credit card with embedded integrated circuit) is automating the way consumers do business with retailers and service providers. Hong Kong is a popular site for testing innovative products like the electronic purse that attracted 300,000 users during the first few months of introduction. Multi-function smart cards (mobile phones that provide an automatic teller function and can reload electronic purses) and loyalty club cards (cards that allow consumers to redeem bonus points accrued through purchases) have entered the marketplace with similar positive signs of consumer acceptance (Chan, 1998).

Hong Kong hopes to take the lead in Internet content development through the creation of an information harbor or

“cyberport” (China Online, 1999). Existing telecommunications networks are providing on-line delivery of some public services. The cyberport will not only advance public service offerings, it will be used to channel advanced communications technology and services into China. The cyberport will focus on the creation of movies, 3-D applications, and media services and provide the infrastructure needed to attract new companies. The successful launch of the cyberport and the early adoption by Hong Kong consumers will set the model of EC development in China, with strong participation from Hong Kong's telecommunication and media enterprises (Figure 4).

Outlook and the future

Greater China is a historically inter-linked society where great emphasis is being placed on the development of Internet economy. The region's Internet usage (Table I) has grown very rapidly from 1998 to 1999 (Yang, 1999). Public and private companies in the region realize the importance of e-business for sustaining regional prosperity and competitiveness for the twenty-first century. The basic economic indicators and characteristics of the three regions (Figure 5

Figure 4

The early players of the Hong Kong Cyberport

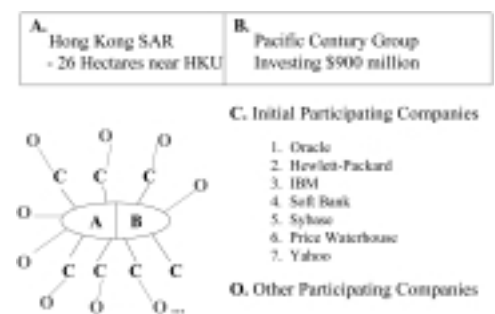


Table I

The numbers of Internet users in Asia (first quarter, 1999)

Region	Number (units: 10,000)
Taiwan	330
Hong Kong	243
China	940
Japan	1,940
Singapore	147
Malaysia	134
Philippines	90
Australia	576

Figure 3

The alliance to integrate business operations, government services and citizen activities via the Internet

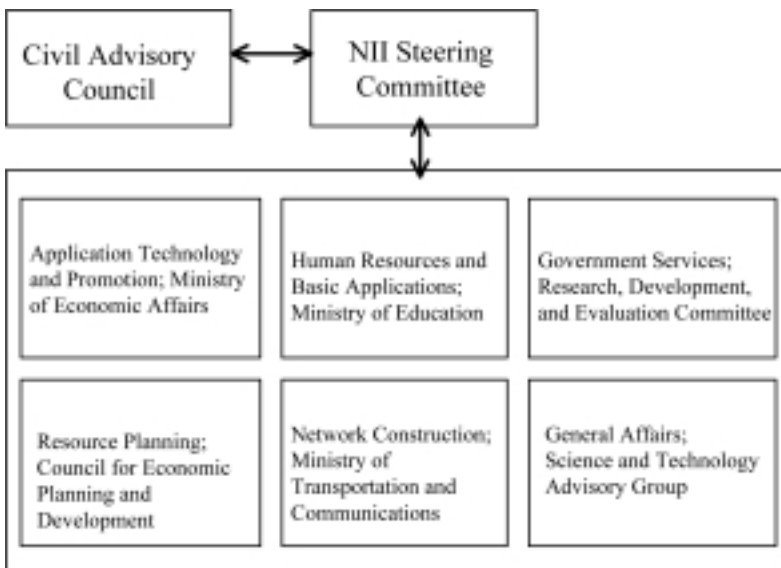
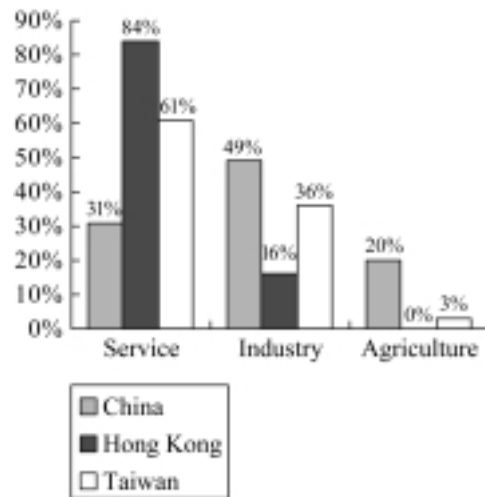


Figure 5
The GDP contributions of China, Taiwan and
Hong Kong across sectors

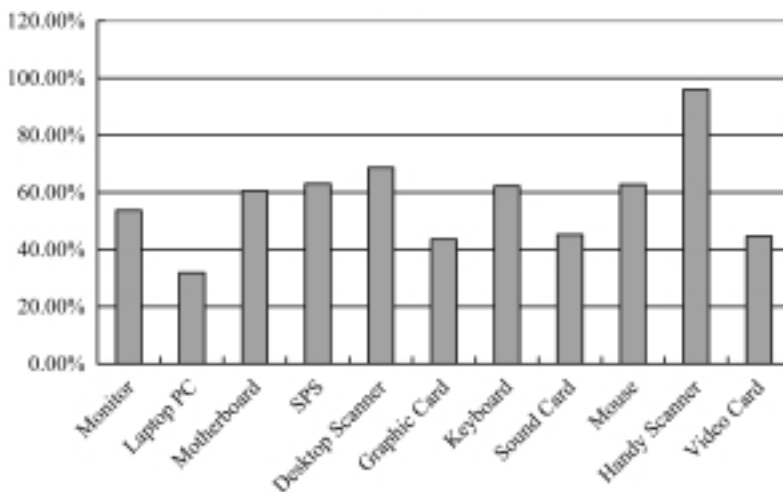


and Table II) show special market potential and opportunities. China has the greatest potential for Internet development, given its large population and sustained economic growth. Particularly in the non-service industrial sector (contributing 49 percent to

Table II
Basic economic indicators of China, Taiwan and Hong Kong

	China	Taiwan	Hong Kong
Population (million)	1,237	22	7
GDP per capita	4,000	15,000	27,000
Labor force (million)	625.0	9.4	3.2
Export (million)	182.7	122.1	180.7
Import (billion)	142.4	114.4	198.6
Telephones (million)	89	10	4.37
PCs installed 1998 (million)	4.1	3.5	1.0

Figure 6
The global market share of Taiwan's information production by categories



the GDP), B2B EC will play an important role, enabling the manufacturing industry to be “plugged” into the global supply network. Since B2B EC requires less substantial legal and banking infrastructure development to protect massive consumer transactions, these systems will enter the market more quickly than B2C EC systems. Taiwan, in comparison to China, has spent the last five years developing a sophisticated information and business infrastructure to support the rapid implementation of B2B and B2C EC. B2B e-business is critical to Taiwan’s continuing prosperity in the high tech industry (Figure 6), which relies heavily on sophisticated supply chain integration and logistics management for global competitive advantage (MOEA, 1998). However, the growth of the service sectors on the island, contributing 61 percent to the GDP, has placed Taiwan’s B2C EC at about the same level of development as Hong Kong’s.

Hong Kong has a unique role in the region as a center for international commerce and free trade. Although Hong Kong’s Special Administrative Region lacks a strong manufacturing infrastructure, it serves as the gateway to China’s consumer markets and manufacturing operations. The development in e-business in Hong Kong is essential to its banking services and logistics support operations. By working closely with China’s emerging enterprises, Hong Kong has the opportunity to establish itself as the “cyber gateway” of China.

Limiting conditions for China

Chen Yun, the guerilla fighter considered to be Mao Zedong’s economic wizard, is well known for his “bird cage theory” (Brahm, 1996). The bird cage theory posits that the economy should be allowed to fly free like a bird but only within the confines of a good strong cage. China’s e-commerce policy seeks to control Internet information, flow, economics, and key players with varying degrees of success – there is a cage but one with large gaps between the bars. Strong central control works well when there are systems in place for monitoring and enforcement.

The systems in place for monitoring and controlling the Internet are too large and unwieldy to be truly effective. The Ministry of Information Industry has full regulatory control over China’s Internet (Tan *et al.*, 1999) with four high level national interconnecting networks managed by the Ministry of Education (CERNet), the Chinese Academy of Science (CSTNet), China Telecom (ChinaNet) and JiTong Communications Corporation

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(ChinaGBN). However, the problem lies not with the competence of the decision makers, but bureaucratic conflicts over goals, policies, and laws.

China's Internet development and control is also hindered by a lack of basic technology such as PCs, a poor business and government communications network, unclear

government regulations, a stagnant state sector, and a banking system in need of reform and privatization. Foreign Internet firms have the option to enter the China market in many ways, but the safest way is by building alliances with Hong Kong firms that are in turn linked to a state owned enterprises (Figure 7). This entry strategy offers advantages since China's policy makers hold the keys to the market via SOE's. They can easily lock out whomever they wish whenever they wish as long as the system remains the same. But will the system remain the same? One view by Wu (1999), Hong Kong Bureau Chief of the Japan Research Institute, supports that change is inevitable to sustain growth of the market economy:

A consensus is forming within China that support for the nation's economic growth comes largely from private businesses rather than SOEs, which actually exert opposite pressures. Given this, why wouldn't China's leadership privatize SOEs? There are two possible reasons: one is a political judgment that SOEs help enable the Chinese Communist Party (CCP) to maintain one-party rule; the other is a realization that privatization may deprive many people of employment and could thus ultimately threaten social stability. Is this assessment correct? True, to maintain one-party rule by the CCP, it is vital to control the nation's economy through SOEs; but if party leaders continue to refuse the private ownership so indispensable to the market economy, they may eventually find themselves unable to maintain the very social stability they seek to preserve through current policy.

Figure 7

China's policies act as a barrier of entry for foreign firms

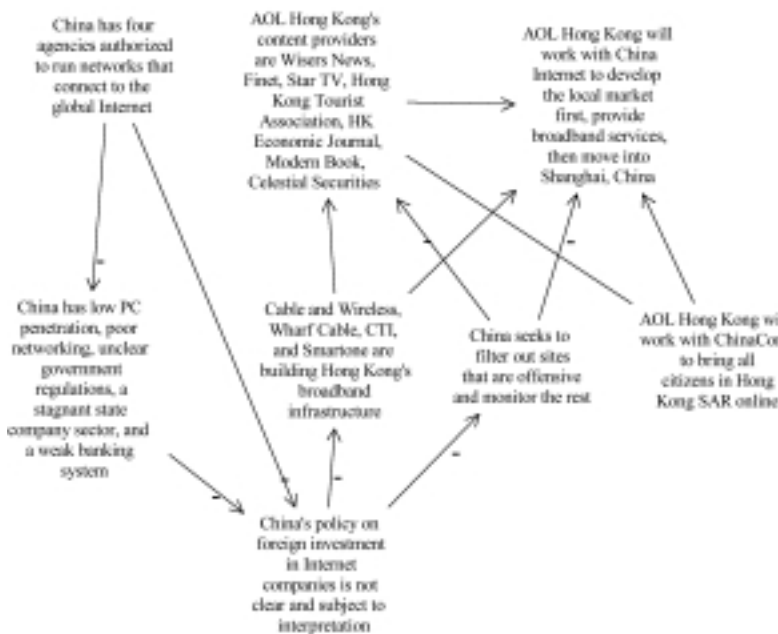


Figure 8

Taiwan's e-commerce development is building local software skills

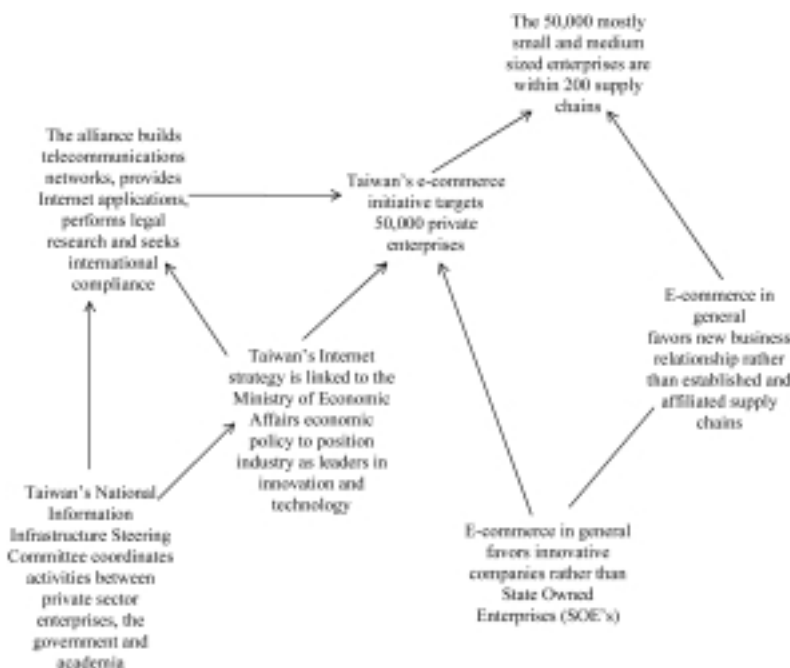


Figure 7 depicts the case where foreign firms team with Hong Kong firms that better understand the business environment. The issues of "objectionable content" and "rules subject to interpretation" are clear to Hong Kong content and Internet service providers, reducing the risk of conflict with the SOEs.

Limiting conditions for Taiwan

Taiwan's e-commerce strength is largely due to private sector efforts to make companies locally and globally competitive. The bulk of the e-commerce development is occurring in the high-tech sector among companies linked to Japanese, European and American technology firms. The technology companies either mandate e-commerce solutions and local companies adapt the solution or the local companies see the competition adapt the technology and there is a rush to keep up.

The shortage of existing e-commerce solutions from which to model new systems is a serious concern among Taiwan companies. MIS department managers are

caught in a running battle with other departments to justify huge budgets for software upgrades, re-design, implementation, and distribution. Since many of Taiwan's firms are global enterprises, the redesign of systems includes international business processes and different languages. Without knowing how much the best solution will cost or look like, managers are taking great financial risks implementing e-commerce in their companies.

But the opportunity to make money by providing e-commerce solutions to the private sector is rapidly building Taiwan's software industry. Within three years, not only will Taiwan have a large number of companies competing globally via e-commerce, there will be a specialized group of programmers looking for opportunities to build systems throughout Asia (see Figure 8).

Limiting conditions for Hong Kong

Hong Kong is guaranteed legal autonomy under the rules of the Special Administrative Region. The relationship between the SAR

administrators and the Mainland Chinese government officials remains stable, particularly as new business opportunities are exploited. As long as the money holders and the power brokers are making money and gaining market share, e-commerce is ready for a big step forward, through the door of Hong Kong and directly into the China market.

E-commerce diffuses best when nimble start-up companies compete for market share by implementing technology efficiently. However, Hong Kong money holders are working with the China power brokers (who are often affiliated with major state owned enterprises) and the resulting bureaucracy can stifle progress. What will happen if the new gateway companies do not rebuild enterprises electronically to engage in global competition? Companies used to controlling the market are often the first to fail in the face of innovative competition. The indicators are though that Hong Kong will not fail in playing the lead role in forming new alliances and introducing new technology and services to China (Figure 9, follows the References).

Figure 9

Hong Kong is an important gateway for foreign firms

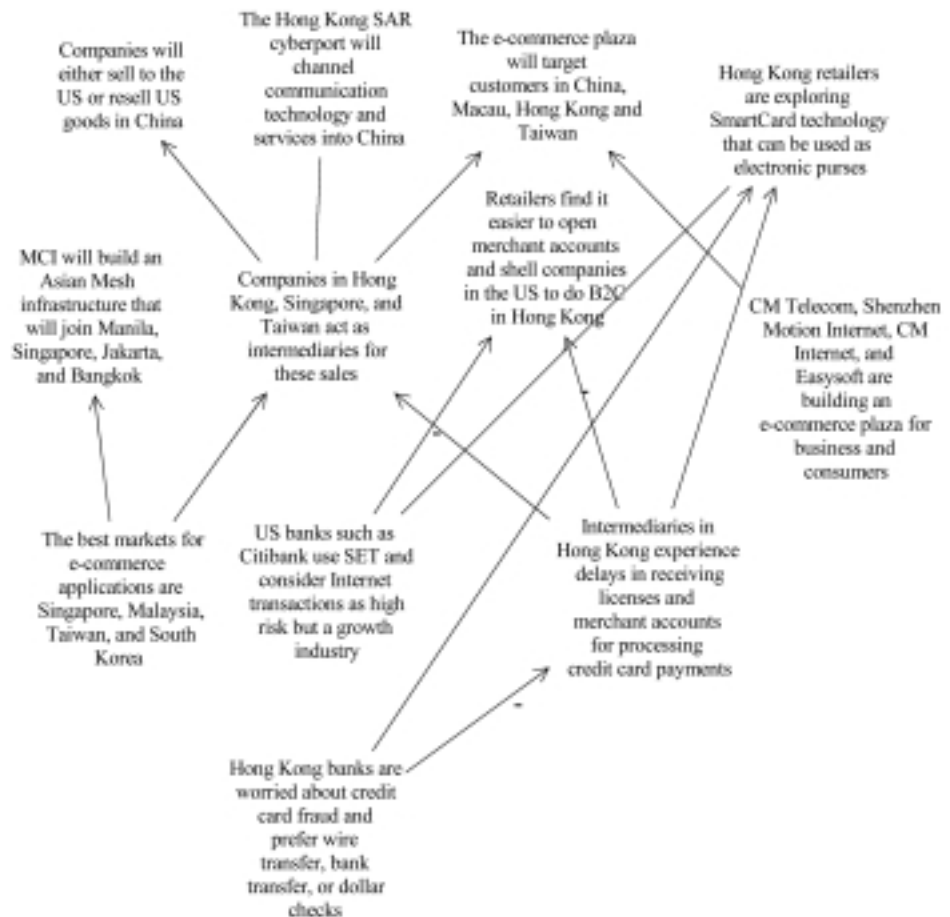


Table III

Comparison of projected EC development and implementation in China, Taiwan and Hong Kong

Type	Sub-type	China	Taiwan	Hong Kong
B2B EC	Seller side (manufacturer, supplier)	A Given its strong manufacturing base, seller-side EC is essential	A To ensure its high-tech market advantage, seller-side EC is essential	B The manufacturing base is small and the need for seller-side EC is relatively low
	Buyer side (corporate procurement, purchasing)	C Industry is still at a relatively labor intensive production. Buyer JIT procurement is not so critical	B Short lead times, tight delivery dates and material related cost controls push industry toward online procurement	C Small production base makes B2B procurement less critical
	Intermediary side (industrial broker, agent)	B With less sophisticated IT infrastructure, it is harder for China to play the intermediary role	A Serve as the region's high tech supply network window to the major OEMs	A Serve as China manufacturers' window to the world buyers
B2C EC	Seller side (consumer product producer)	C Computer and Internet usage need to be improved, as well as China's modern retail structure	A Sufficient IT sophistication and consumer purchasing power to sustain seller- side B2C EC	A Sufficient IT sophistication and consumer purchasing power to sustain seller- side B2C EC. Also has incentive to extend its service to China's huge consumer base
	Intermediary side (broker, auctioneer, agent)	B Computer and Internet usage need to be improved. Further, China's modern retail structure and its consumer credit usage need to be modernized	A Sufficient IT sophistication and consumer purchasing power to sustain seller- side B2C EC. Also has incentive to extend its business to Chinese community globally	A Sufficient IT sophistication and consumer purchasing power to sustain seller- side B2C EC. Also has incentive to extend its business to Chinese community globally, particularly China
Delivery service (logistics management, fulfillment tracing)		B Need modern transportation infrastructure to enable the development	B A small region with international shipping companies already participating in the market activities	B A small region with international shipping companies already participating in the market activities
Payment service (electronic fund transfer, online payment)		B Although is prerequisite for successful EC, China needs further banking liberalization and modernization to enable the online capability to go forward	B Prerequisite for successful EC. Not as internationalized as Hong Kong, but a good number of private banks are aggressively developing its online capability	A Prerequisite for successful EC. Has good number of international financial institutions to foster the development

Note: A: top priority; B: second priority; C: lower priority, in strategic pursuit of the EC development given the region's IT and economic infrastructure

Hong Kong is a critical link between China and international firms and can help to minimize problems with policy and regulations for service providers. Taiwan, on the other hand, is a very valuable source of knowledge workers that can quickly align with China's manufacturing sector and influence the modernization of the industrial sector.

Conclusion

Greater China is the most vibrant and promising market of Internet products and services from both the supply and demand sides. As analyzed in terms of trends, development and causal limitations, China, Taiwan and Hong Kong are quickly developing their IT and Internet infrastructures as well as the implementation of EC systems. Based on the current infrastructure, characteristics and strengths of three economic regions, Table III depicts the most likely priorities for EC development in each area of the region. Although China is less mature in B2C and B2B EC, it has the greatest potential for growth of a world-scale Internet economy. Further, China is catching up to world levels of IT and business practices. In time, China will foreseeably be advanced in all sectors of EC practices and will contribute new technologies for the world market. Taiwan, as an established high technology and IT production and distribution base, will continue to grow and leverage its position. Hong Kong is opening the window of opportunities for China's market and is building a better EC infrastructure for itself and China's manufacturing and consumer markets. All three areas in the region will reap tremendous benefits and economic success from electronic commerce if they choose the right policies, take advantage of timing and continue to dedicate efforts to the spread and implementation of solutions.

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