Determinants of Competitiveness in Logistics: Implications for the Region*

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ABSTRACT

Logistics is expected to grow by 3 to 10 percent per annum promising tremendous economic opportunities for the countries in the ASEAN region. In the midst of these opportunities, several countries have undertaken concerted efforts to upgrade their infrastructure and technology to get a bigger slice of the market. In the light of this increasing competition and potential economic benefits in the logistics sector, the objective of this paper is to examine the determinants of competitiveness in logistics and identify the key factors that are required for a successful a logistics hub. For the logistics hub, the analysis on the determinants of competitiveness is made using Singapore as a case study before drawing some implications/lessons for the countries in the Southeast Asian region.

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Determinants of Competitiveness in Logistics: Implications for the Region

The international environment faced by countries in Asia and in particular Southeast Asia is increasingly becoming more competitive. This growing competition is not only between firms in the same country but also between countries across many industries. The inter-country competition is especially intense in the area of logistics where the economic benefits are becoming significant as a result of the increasing trade and investment flows between countries. A number of factors are responsible for this increasing international trade and investment flows including the increasing growth and openness of countries in Asia and the Pacific, increasing globalization and deregulation, continued industrialization of the newly emerging economies and improvements in transportation technology.

With the sophistication of the industry and the rapidly growing demand for a specialized supply chain management services, the logistics industry is expected to grow at an annual rate of 3-10%, which is valued at US$320 billion[1]. This expectation is a strong stimulus for countries to develop their logistics industry and position themselves as a regional logistics hub to gain from the enormous growth in demand. Competition has been particularly tense in the Asia where many countries have launched new initiatives to position their economy as the leading logistics hub in the region.

Singapore, which has assumed the status of a logistics hub of Southeast Asia, has been intensively challenged by its competitive neighbors who are eagerly upgrading their technology and infrastructure in an effort to compete as a more effective and cost efficient distribution hub of the region. Particularly, pressure has been mounting from its countries such as Malaysia, Taiwan, Hong Kong and South Korea. Many of the have come up with new institutions that are set up especially to boost the growth of the industry and many others are eagerly upgrading their labor force and infrastructure. The changing global economic climate has also affected the industry's development, particularly with the increasing number of firms relocating to other markets especially China.

In the light of this increasing competition and potential economic benefits in the logistics sector, the objective of this paper is to examine the determinants of competitiveness in logistics and identify the key factors that are required for a successful a logistics hub. For the logistics hub, the analysis on the determinants of competitiveness is made using Singapore as a case study before drawing some implications/lessons for the countries in the Southeast Asian region.

1. Determinants of Competitiveness

There are several factors that determine international competitiveness in logistics, such as costs of production in which wage costs constitute an important component particularly in labor-intensive production, management quality, prices, quality of the service, exchange rates, government policies, political stability, investments in human

[1] The report of the working group on logistics. "Developing Singapore into a Global Integrated Logistics Hub". Economic Review Committee, September 2002.

and physical infrastructure and other factors that set a country ahead of its competitors. These factors can be classified into macro and micro factors.

At the micro level, the most relevant factors are **costs** and **service quality**. Michael Porter in his book, *The Competitive Advantage of Nations,* has identified these factors as the key to the success of a particular firm or particular industry. According to Porter, the success of a firm in the international market depends on the following major factors:

a) cost-based advantage in the production of relatively standardized products and
b) product-based advantage in the development of differentiated products.

An industry or firm can break into new markets or increase its shares in its existing markets based on its cost advantages. These cost advantages are usually relevant in a price-conscious consumer market, but quality also plays a significant role in consumers' buying decisions. There are consumers who can sacrifice quality for a lower price, but this preference for a lower price, at the expense of quality, has certain limits. For some consumers there is a minimum level of quality, below which, poor quality cannot be accepted even at lower price. This imposes a minimum benchmark on the quality variable.

Porter's evidence also suggests that it is not possible for a firm to pursue both strategies simultaneously. This is because strategies to develop differentiated products almost always increase costs and it is believed that cost-based advantages are not sustainable unless successfully converted into a differentiated product-based advantage subsequently.

In his more recent article (Porter, 1990), he stressed that the only meaningful concept of competitiveness at the national level is productivity. Productivity depends on both the quality and features of products (product quality) and the efficiency with which they are produced (technical efficiency). Porter comments that a nation's standard of living depends on the capacity of its firms to achieve high levels of productivity, and sustainable productivity growth requires that an economy continuously upgrades itself. This is done by raising product quality, adding desirable features, improving product technology and of boosting production efficiency.

It should also be pointed out that the government plays an important role by promoting a competitive environment conducive for improving quality, efficiency and innovation.

To illustrate the critical importance of *efficiency* and *service quality*, an attempt is made to choose one important sub-sector within the logistics industry to study the effects of the determinants of competitiveness – the port industry. Since the environment in which ports operate has changed dramatically, ports are affected by various new forces driving global competition, including the far reaching unitization of general cargo, the rise of mega-carriers, the market entry of logistics integrators, the creation of network linkages among port operators, the development of inland transport networks, and so on (Notteboom and Winkelmans, 2001).[2]

[2] Although the port environment generally has become increasingly competitive, it varies between

In this context, eight key determinants of competitiveness are proposed based on the existing literature. These determinants include:

1. Port (terminal) operation efficiency level
2. Port cargo handling charges
3. Reliability
4. Port selection preferences of carriers and shippers
5. The depth of the navigation channel
6. Adaptability to the changing market environment
7. Landside accessibility
8. Product differentiation

Port (terminal) operation efficiency level

Since carriers view ships' time at ports as an expensive activity, the speed of container handling and consequent vessel turnaround time is a crucial issue in terms of competitiveness for port authorities and port operators (Peters, 2001). Thus, substantial productivity improvements are generally required to enable ports to meet the stringent service requirements of their customers and to obtain competitive advantages. Productivity is a measure of the efficiency of port or terminal operations, and accounts for the amount of resources usually required to perform a given task in a given time. Therefore, the level of efficiency can represent how quickly containers are handled and how quickly vessels are turned around at ports. The higher the efficiency level of a port or terminal operation, the more port users are likely to choose it as their port of call, which, in turn, will make the port gain more market shares.

Port cargo handling charges

The price of goods or services is always an important factor that consumers will consider when selecting products with similar characteristics. This rationale will also happen, or even more likely, to the services provided by port authorities or port operators since carriers or shippers think that port charges constitute a significant part of their total transportation costs. In addition, carriers are also confronted with severely competitive environment in shipping market and must pursue the ways to reduce the total shipping costs to gain competitive advantages. Nowadays, port charges become a major source for shipping lines to cut down total operation costs. Therefore, they usually prefer ports that can offer relative lower service charges[3], which means that a port with a lower charge is more competitive than its rivals, holding other factors constant. Since the cargo handling services are most important for port users in terms of total charges, these charges significantly affect a port's competitive position (Trujillo, L. and Nombela, G., 1999).

Reliability

That price is an important factor for producers to attain more market shares does not mean that price can decide all things. Reliability of port operations also influences a port's performance (Tongzon, 1995), which in turn will affect the choices of shipping

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regions and places depending on the extent to which these forces have impacted the nature of the port environment.

[3] The geographical aspect of port choice is certainly important which goes above and beyond pricing. Thus, the choice discussed in this paper is among ports that can equally reach the final destination.

lines and shippers. Reliability means a steady and predictable performance adapted to shipping lines' schedules. If a port authority or port operator always makes delays during operation process due to strikes, equipment breakdown, weather, etc, shipping companies and shippers will suffer huge losses due to these kinds of unreliability. Definitely, carriers and shippers will bypass this kind of ports even if they provide the most attractive price among their competitors.

Port selection preferences of carriers and shippers

Globalization of industry is fast breaking down the traditional practice whereby shipping companies favored certain ports. Increasingly, carriers and shippers are showing less loyalty to specific ports. Ports face the constant risk of losing important clients, not because of deficiencies in port infrastructure or terminal operations, but because the client has rearranged its service networks or has engaged in new partnerships with other carriers (Notteboom and Winkelmans, 2001). Thus, this variable is not fully correlated with port specific variables, such as efficiency and reliability, so it should be included as an independent port competitiveness indicator.

The depth of the navigation channel

To accommodate trade growth and to offer economies of scale in a highly competitive market, many shipping companies intend to increase the size of their container ships from Panamax[4] to Post-Panamax, or even to the Super Post-Panamax. Increasingly large tonnage, especially of vessels deployed in the container shipping market, will have significant effects on port competition. These larger size container ships are always used among loading centers or hub ports, the kind of port that most ports want to be, to enhance the amount of total throughput. In many cases, however, insufficient water depths in access channel and port basins prevent some ports from being a transshipment center (Peters, 2001).

Adaptability to the changing market environment

The market environment in which ports operate has changed significantly, and this continuous process of change raises the question about the role of port authorities. A successful port must constantly be prepared to adopt new roles in order to cope with the changing market environment (Notteboom and Winkelmans, 2001). For instance, in order to improve terminal operation performance and to integrate door-to-door transport, many shipping lines want to expand their scope to include terminal operation. If port authorities cannot realize the importance of this trend, they will lose certain competitive advantages. That Port of Singapore Authority (PSA) has recently lost its two most important clients is a convincing example. Thus, seaports that will succeed in the 21st century will be those that are "consumer- led", with a good understanding of customer needs.

Landside accessibility

Originally, ships loaded and discharged their cargoes in towns or cities where

[4] Panamax refers to those ships whose sizes can pass through the Panama canal, whereas post-Panamax ships are ships whose sizes are so huge that they can no longer transit through the Panama canal..

producers and consumers are located. Expansion of land transport systems has altered things somewhat. The days when ships were forced to call at city terminals blocked in on the landside by congested city street are long gone. New remote coastal terminals with good landside connections, and ports strategically located close to the main global trade lanes, increasingly offer carriers and shippers a more appropriate option (Fleming and Baird, 1999). Efficiency of inland transport to serve an increasing and most often disputed hinterland has become a critical factor of ports' potential future as well as of their overall trade growth prospects. Since ports have become a prominent node in integrated logistics chains, quick and safe access to port facilities from an inland transport system becomes a basic requirement for port users to evaluate their port selection options.

Product (service) differentiation

A differentiation strategy aims at providing specific port services in market niches distinct from those provided by other ports, offering greater value to the port users. This is so-called economies of scope. If a port authority or port operator has some specific competencies (e.g., advanced information system and high service quality) that are inimitable and durable, it is easier to achieve competitive advantages than his competitors (Notteboom and Winkelmans, 2001). Studies on priority systems [for example, Holguin-Veras and Jara-Diaz (1999) and Holguin-Veras and Walton (1997)] have shown the need for product (service) differentiation in an environment in which total number of containers is steadily increasing and terminal expansion becoming increasingly difficult.

The findings of Tongzon (2002), as shown in table below, provide empirical support for the above argument that competitiveness is determined by some factors, some of which are beyond the control of the government authorities and operators such as the selection preferences of carries and shippers that are decided by their service network instead of performance. However, two most statistically significant variables, *operation efficiency* and *adaptability*, can be controlled by the operators. We can easily understand their importance in determining competitiveness since these two variables represent the quantity and the quality of the services provided by services providers, respectively.

Table 1 Determinants of Container Port/Terminal Competitiveness
(Dependent Variable: the natural logarithm of port/terminal throughput)

Variables	coefficient	t-ratio	p-value
Constant	-7.118	-1.450	0.1633
ln (EFF)	3.433	4.239	0.0004
ln(DEP)	-0.747	-0.493	0.6277
ln(NDC)	0.355	4.722	0.0001
ln (LAN)	1.650	1.691	0.1072
ln (ADA)	3.336	3.035	0.0068
R-squared	0.8497		
F-test	21.489		0.0000
White Test			0.2713
NORM	0.066		

Note: White Test is the test for functional mis-specification. NORM is the Jarque-Bera test for the normality of the residuals. Ln = natural logarithm.
Source: Tongzon (2002)

2. Determinants of Competitiveness as Logistic Hubs

Apart from operation efficiency and adaptability, there are other factors that will determine a country's competitiveness as a logistics hub.

Firstly, it should be strategically located, for example, in the main shipping and air routes. It should have an air terminal that provides extensive linkages and connectivity to the world. Its seaport should be the focal point of shipping lines and have good linkages to other ports worldwide. It should have good capabilities in warehousing and related services. On top of all these, there must be adequate and highly efficient infrastructure available.

Human capital availability is vital to make a country's logistics hub successful. For example, workers must possess language skills such as English, which is an international language, be open-minded and accept changes, such as changes brought about by globalization. Workers must also be well equipped with knowledge to work in the logistics sector, for example, the availability of logistics professionals. Political and economic stability, a strong and supportive government that promotes growth of the logistics sector through implementation of transparent policies and harmonious management-labor-government relations are also critical success factors.

To confirm the importance of the above factors, a survey by personal interview was conducted by the author among selected multinational companies operating in Singapore covering a total of 12 companies: 6 international manufacturing firms and 6 international logistics firms, both functioning as regional distribution centres. Most of the companies in the sample started investing in Singapore in the 1970s.

International Manufacturing Companies

With respect to the six international manufacturing firms interviewed, one has a total asset of US$ 500 million in Singapore (Micron). Four are new investments and one (Micron) is an investment by taking over an existing industry. Other than manufacturing, all firms are also engaged in at least one more activity. Out of the six firms interviewed, two consider themselves as manufacturing firms (HP, Siemens), the other four are actively engaged in other activities, such as logistics, research and development, international trading and investment, retailing, sales and marketing, information and technology.

Their employment levels in Singapore range from 115 (Mitsubishi) to 6000 (HP) and 12,000 (Mitsubishi) to 400,000 (Siemens) worldwide. Total trade in value terms in Singapore ranges from S$13 million (Siemens) to S$10.5 billion (HP). They have as many as 1000 subsidiaries all over the world.

The main role of most of these firms includes:

- Manufacturing of their products and redistributions to their regional subsidiaries;
- Some of the companies in the sample are also responsible for redistribution to other states like Europe,
- Some provide technical and maintenance support to their subsidiaries in the region,

Table 2 **Country Selection Factors for International Manufacturing Firms**

	HP	Micron	Mitsubishi	Panasonic	Siemens	Philips	Average	Rank
a) Market Potential/ Purchasing Power	5		5	2	2	4	3.60	8
b) Domestic Economic and Political Environment	4		4	5	5	4	4.40	2
c) Related and Supporting Industries	4		3	4	3	5	3.80	5
d) Technology base	3		3	4	3	3	3.20	9
e) Government Policy and Regulations	3		4	4	5	3	3.80	5
f) Social and Cultural Environment	2		3	3	2	2	2.40	11
g) Executive Procedures and Services	2		3	4	2	3	2.80	10
h) Incentives for Foreign Investors	5		3	5	5	5	4.60	1
i) Business Practices and Operation Systems	3		3	4	5	4	3.80	5
j) Infrastructure development	4		3	5	5	5	4.40	2
k) Supply and logistics chain management strategy	4		4	3	5	4	4.00	4
l) Others				4			0.80	
(Local Partner)			5				1.00	
(Total Cost of Operationing)	4						0.80	
(Competitive Environment)				4			0.80	
(Availability of Trained People)						5	1.00	
(Financial/ Foreign Currency Stability)			5				1.00	

Table 3 **Reasons for Choosing Singapore: Manufacturing Firms**

	HP	Micron	Mitsubishi	Panasonic	Siemens	Philips	Average	Rank
a) Market Potential/ Purchasing Power	1	1	2	3	5	2	2.33	11
b) Domestic Economic and Political Environment	5	5	4	4	5	4	4.50	3
c) Related and Supporting Industries	5	3	5	4	5	4	4.33	7
d) Technology base	3	3	3	5	5	3	3.67	10
e) Government Policy and Regulations	4	5	5	5	5	4	4.67	2
f) Social and Cultural Environment	3	4	5	4	5	2	3.83	9
g) Executive Procedures and Services	3	4	5	4	5	3	4.00	8
h) Incentives for Foreign Investors	4	5	4	4	5	5	4.50	3
i) Buisness Practices and Operation Systems	5	5	4	4	5	4	4.50	3
j) Infrastructure development	5	5	5	4	5	5	4.83	1
k) Supply and logistics chain management strategy	5	5	4	3	5	5	4.50	3
l) Others							0.00	
(Local Partner)							0.00	
(Government-Led Buisness Environment)							0.00	
(regional management, language,)	5						0.83	
(Intellectual Property Protect)		5					0.83	
(Competitive Environment)				4			0.67	
(Availability of Trained People)						4	0.67	

- Others include distribution of material and parts to worldwide subsidiaries,
- A base for research and development for the region or world wide, and
- International trading and investments and wholesaling.

For the strategy of logistics operations overseas, 1 (HP) outsourced all activities via 3PLs, while the rest outsourced some of the logistics activities while owning some of the facilities and assets at the same time. If 3PLs are engaged, activities outsourced mainly include transportation, warehousing, containers, invoicing, administration, manpower, sales engineering, procurement and business planning. In some cases, when 3PLs are engaged, all activities will be outsourced.

3PLs are chosen based on requirements such as economies of scale, global investments/extensive networks, price competitiveness, reliability, value-added services/ quality of services, flexibilities, IT capability and local know-how.

Country Selection Factors

Tables 2 and 3 show that fiscal incentives for investors, infrastructure development and domestic economic/political environment rank high as factors influencing their choice of countries as location for their investment.

How successful is Singapore based on the above factors is shown in Table 3. Singapore is considered very successful in terms of infrastructure development, domestic economic/political environment, incentives for foreign investors and supply and logistics chain management strategy.

Support from government

The government of Singapore has successfully created a stable, transparent and cost-effective environment for foreign business by investing in world-class infrastructure and offering tax incentives including tax concessions on profits, tax holidays, investment credits, accelerated depreciation, double tax avoidance agreement and tax exemption for venture capital. Furthermore, foreign investors have been attracted to Singapore to base their headquarters for sales, marketing and distribution because of transparent laws on foreign investments and their effective and efficient administration which has made doing business in Singapore more predictable.

Relevant laws and regulations for foreign investment

Singapore has one of the most liberal laws and regulations for foreign investment. Being an open economy with more reliance on foreign capital than any other country in Southeast Asia, Singapore has the most liberal policies on foreign ownership of business with no specific rules and regulations for foreign investors except in banking and brokerage. However, quite recently Singapore has embarked on a policy of liberalization and relaxation on foreign investment in banking. There are no restrictions on foreign participation in telecommunication and public utilities. A survey of foreign direct investment policies and incentives across the major members of ASEAN has shown that Singapore has the most liberal and pro-business policies.

Table 4 **Country Selection Factors for International Logistics Firms**								
	Avnet	CWT	DHL	EGL	TNT	UPS	Average	Rank
a) Market Potential/ Purchasing Power	5	5	5	5	5	2	4.50	1
b) Domestic Economic and Political Environment	3	4	5	5	4	4	4.17	4
c) Related and Supporting Industries	2	3	5	4	3	3	3.33	10
d) Technology base	4	4	5	5	4	3	4.17	4
e) Government Policy and Regulations	5	5	5	5	3	4	4.50	1
f) Social and Cultural Environment	3	3	3	4	3	2	3.00	11
g) Executive Procedures and Services	1	3	3	5	2	5	3.17	4
h) Incentives for Foreign Investors	5	5	5	5	3	3	4.33	3
i) Business Practices and Operation Systems	4	3	4	5	3	4	3.83	8
j) Infrastructure development	3	4	5	5	3	5	4.17	4
k) Supply and logistics chain management strategy	4	3	5	4	3	3	3.67	9
l) Others							0.00	
(Local Partner)	5						0.83	
(Total Cost of Operation)				5			0.83	
(Competitive Environment)							0.00	
(Availability of Trained People)						4	0.67	

Table 5 **Reasons for Choosing Singapore: International Logistics Firms**

	Avnet	CWT	DHL	EGL	TNT	UPS	Average	Rank
a) Market Potential/ Purchasing Power	2	3	3	3	3	2	2.67	11
b) Domestic Economic and Political Environment	5	5	4	5	3	3	4.17	6
c) Related and Supporting Industries	3	5	2	3	5	4	3.67	10
d) Technology base	2	4	5	5	5	3	4.00	9
e) Government Policy and Regulations	5	4	5	5	5	4	4.67	1
f) Social and Cultural Environment	5	4	4	5	4	3	4.17	6
g) Executive Procedures and Services	4	4	4	5	4	4	4.17	6
h) Incentives for Foreign Investors	5	5	5	4	4	4	4.50	3
i) Business Practices and Operation Systems	4	4	4	5	4	5	4.33	5
j) Infrastructure development	4	4	5	5	5	5	4.67	1
k) Supply and logistics chain management strategy	4	4	5	5	5	4	4.50	3
l) Others							0.00	
(Local Partner)	4						0.67	
(Government-Led Business Environment)		5					0.83	
(regional management, language,)							0.00	
(Intellectual Property Protect)							0.00	
(Competitive Environment)							0.00	
(Availability of Trained People)						4	0.67	
(Government's Foresight)				5			0.83	

International logistics companies

The 6 international logistics firms hold assets with values amounting to as much as US$5.8 billion in Singapore (AVNET: the maximum value reported in the survey). Four of them are new investments while the rest (AVNET and EGL) are investments via acquisition. Their number of employees in Singapore range from 195 (EGL) to 700 (DHL), and from 600 (CWT) to 130,000 (TPG, parent of TNT) worldwide. Their total trade in value terms in Singapore ranges from S$6 million (EGL) to S$60 million (TNT) - some with as much as US$600million in Asia (AVNET). These companies have as many as 228 subsidiaries all over the world. Out of the six logistics firms, five have operations in almost all the regions in the world while one (CWT) has operations only in Asia.

The main role of these companies in Singapore is to provide a full spectrum of logistics services to companies and act as headquarters in the region. Three of the companies (EGL, UPS and DHL) own all their logistics facilities and assets, while two (CWT, TNT) outsourced some of the logistics activities. AVNET did not answer this particular issue.

When 3/4PLs are engaged in their logistics operations, services outsourced include sea freight, IT services, trucking, and cargo handling. When 3/4PLs are chosen, they are based on requirements such as local players, existing relationships and solutions that they could provide including costs.

Country Selection Factors

The ranking of country selection factors by 6 international logistics firms interviewed is presented in Table 4. The factors considered quite important to country selection include market potential/purchasing power, government policy and regulations, incentives for foreign investors, infrastructure development and technology base. The presence of related and supporting industries and social/cultural environment are the least important. Other factors that were considered important include the presence of a local partner, low cost of operation, existence of a competitive environment and availability of trained and skilled people.

Table 5 presents the reasons of choosing Singapore as their investment location. Singapore is perceived to be quite successful in terms of providing adequate infrastructure, adoption of appropriate government policy and regulations, incentives for foreign investors, supply and logistics chain management strategy, business practices, domestic economic and political environment, social and cultural environment and executive procedures/services. Other factors were also cited where Singapore has performed well such as government foresight, availability of trained people, competitive environment and pro-active role of the government. However, it is quite poor in terms of market potential/purchasing power, related and supporting industries and technological base.

Government Support

The government of Singapore is perceived to be supportive towards foreign logistics companies based in Singapore. Apart from the tax incentives mentioned in the preceding section on manufacturing firms, the government of Singapore has facilitated international trade through its efficient customs administration and by maintaining security, good sanitation and business environment and giving foreign logistics companies an easy access to funds.

3. Implications for Countries in the Southeast Asian Region

The global logistics market is estimated to grow on average by 10 per cent over the next five years to reach US$173.7 billion by 2005. Worldwide trends indicate an increasing preference by companies to opt for integrative SCM outsourcing models, encompassing the coordination of 3 flows – goods, information and funds. Demand for SCM services will likely grow against the backdrop of greater outsourcing, globalization, advent of new products, increasing sophistication in product designs and shortening of product life cycles. Further, Asia is where robust growth in demand for logistics is expected to occur with China being touted to provide a major stimulus as it is taking steps to accelerate the liberalization of its trade and logistics sectors.

Against this backdrop of tremendous business opportunities, more and more countries in Asia are positioning themselves to become the preferred logistics hubs in the region. The increasing regional competition for foreign direct investments and to take a slice in the growing logistics market make it imperative that Southeast Asia develops an effective logistics hub policy and strategy to become internationally competitive.

It is found that operational efficiency is very important for policy makers and operators to gain a competitive advantage and win in the competition. It also implies that the customers of logistics services do pay more attention to operation efficiency when selecting the services. The results show that another most important factor determining competitiveness is the adaptability to the customers' demand. Since logistics is in the service industry, it is reasonable that operators should well understand the requirement of their customers and make efforts to meet and exceed their expectations.

Countries in Southeast Asia should therefore focus on improving their product and service quality through innovation and improved technology, efficiency and reliability. To improve their level of technology, they should invest in strengthening the scientific and technological capability of their citizens. This is an area where more ASEAN cooperation can bring about more technological progress throughout the region. In the case of the CLMV (i.e. Cambodia, Laos, Myanmar and Vietnam) countries, technical assistance provision and other capacity-building measures from the more developed member countries should be intensively pursued so as to expedite their catching up in terms of human skills and technology development and thus expedite the process of economic integration within the region.

While joint technology (especially in the area of information technology) enhancement is important to improve their level of competitiveness, there is also some scope for cooperation instead of engaging in competition to become the logistics hub of Southeast Asia. Further cooperation and win-win alliances among the major seaports and airports in the region should be explored to make the region more competitive and attractive for foreign manufacturing and logistics firms. For example, in the area of sea and air transport, regional alliances in the form of marketing, cargo handling, training and research which lowers overhead and operational costs would be desirable and feasible and would make the region more attractive as distribution centers for logistics companies. However, alliances in terms of price fixing and profit sharing would be difficult, if not impossible, especially when these ports are government-owned due to nationalistic and political factors, apart from the tendency for countries to capture the largest slice of the logistics market.

Singapore and the rest of ASEAN have followed different industrialization paths and adopted different policy orientation due to their differences in market size and factor endowments. Thus, since its political separation of Malaysia, Singapore has adopted an export-oriented industrialization strategy with heavy reliance on foreign investments. This is in contrast to other ASEAN countries' import-substitution strategy in the early stages of their economic development.

However, the experience of Singapore as a logistics and distribution hub can be of relevance to other ASEAN countries which also aspire to strengthen their logistics sector to take advantage of the growing economic opportunities from logistics.

Especially for the less developed countries of the region, a number of institutional and non-institutional changes must be undertaken individually before economic opportunities can be realized amidst increasing regional competition, as follows:

- To make a freer trading and investment environment. They should be more outward-looking and welcoming to foreign investors by liberalizing its markets, improving the customs clearance and treating foreign and large businesses on the same footing as the local and small and medium size firms (SMEs), respectively.

- To improve the level of English proficiency and increase the number of logistics professionals. English proficiency needs to be further improved to make it easier for foreign investors to operate their businesses. More variety of short and long term English and logistics courses may be established in various universities and non-profit educational organizations.

- To improve the consistency and transparency in government policy towards the industry. Foreign investors need to have a sense of security from consistent and predictable policies since their investment is usually bulky and requires a long gestation period. Transparency also implies that the rules must be open so that they know what they can do and cannot do at the time of investments. Since the

government plays a significant role in economic development and other economic initiatives, transparency of government policy is critical.

- To have a clean government with efficient and simplified administrative processes. Clean government and efficiency in bureaucracy is one of Singapore's unique features which made the island attractive as a base for multinational corporations' regional and global operations.

- To foster harmonious relations between the government, management and labor unions. No doubt, harmonious labor-management relation is vital to the smooth functioning of transportation, distribution and other aspects of logistics operations, as shown by the 2002 long-shore labor strike at the 29 ports in US West Coast, which costs the US economy US$2 billion a day with damaging ripple effects rolling into the Pacific resulting from international trade disruption and non-just-in-time delivery of goods (*The Straits Times*, 26 October 2002, p. 29). Singapore is well known for its tripartite peace of government-union-management and political stability. Singapore has not had any labor strikes since the mid 1980s.

- To foster good partnership between the government and the private sector. Although the government sector is important for the formulation and implementation of appropriate policies, it needs the private sector to carry out and translate the overall policy direction into action. Thus, a good partnership between the government and the private sector is an important ingredient to the success of a logistics hub strategy. Based on Singapore's experience, the government of Singapore has always been pro-active and supportive to the logistics providers by providing world-class infrastructure and a broad range of logistics solutions and services including the establishment of efficient customs procedures and pro-business environment.

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