

## 5. Trade and Logistics: An East Asian Perspective

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Why focus on logistics? The case is simple. Reducing the cost and improving the quality of logistics and transport systems improves international market access and leads directly to increased trade, and through this to higher incomes and the scope for significant reductions in poverty.

East Asia's progress on logistics has failed to keep pace with its growth in trade. Developing countries in other regions are now catching up, so faster progress on logistics development will be crucial to sustaining East Asia's competitive advantages. High logistics costs for East Asian countries derive from poor transport infrastructure, underdeveloped transport and logistics services, and slow and costly bureaucratic procedures for dealing with both exported and imported goods. The balance among these three varies among countries, but in each country a complementary approach to address all of them will be needed to produce a sustainable improvement in competitiveness.

Recent studies have indicated the importance of efficient ports (in terms of both operational efficiency and document facilitation) for trade competitiveness,<sup>1</sup> but the arguments presented in this chapter show that ports are only one aspect of the connection between logistics and trade growth. Looking at the total cost of getting products from producers to markets, land transport to ports accounts for a higher proportion than processing within the port or the maritime voyage itself, and it is improvements in land access that offer the greatest scope for increasing trade competitiveness.

For countries that have moved beyond the export of basic agricultural and mining commodities, logistics requirements become more onerous, not less. Manufacturing firms, especially those integrated into global production chains, seek not only low transport costs but also a host of sophisticated logistical needs: short transit times, reliable delivery schedules, careful handling of goods in cold storage chains, certification of product quality, and security from theft. Basic transport infrastructure does not meet the logistics needs of manufacturing firms. Thus the requisite policy agenda extends broadly to stimulating the evolution of transport services, promulgating product standards, licensing imports, and encouraging foreign investment.

This chapter reviews the logistics issues facing East Asia and proposes a policy agenda to address them. We first briefly outline the macroeconomic connections between logistics and trade, and, because the economies of the region differ fundamentally in their levels of development, extent of openness, and composition of trade, then discuss the logistics needs

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<sup>1</sup> Wilson and others (2002).

specific to each of three broad groupings of economies. This is followed by a description of the benefits that follow from improvements in logistics, and the channels through which this happens. We then review the current situation in different aspects of logistics across the region and offer policy recommendations

## **Trade and logistics nexus**

The literature offers substantial evidence linking improvements in transport and logistics directly to improvements in export performance. The effects are especially strong when importers have access to multiple suppliers of highly substitutable commodities. Comparing sales by manufacturers of similar products, Hummels (1999) estimates that exporters with 1 percent lower shipping costs will enjoy a 5-8 percent higher market share. Limao and Venables (2001) estimate that differences in infrastructure quality account for 40 percent of the variation in transport costs for coastal countries and up to 60 percent for landlocked countries. Fink and others (2001) estimate that liberalizing the provision of port services and regulating the exercise of market power in shipping could reduce shipping costs by nearly a third.

A World Bank study by Wilson and others (2002) shows that the APEC (Asia Pacific Economic Cooperation) countries differ substantially in the quality of their logistics and trade facilitation across a broad range of measures, including ports infrastructure, customs clearance, regulatory administration, and e-business use. They find that these differences are significantly related to differences in trade performance, and conclude that substantial growth in trade within their block could be accomplished by bringing lagging countries up to median performance levels.

Further, improving access to international markets raises incomes. Frankel and Romer (1999) show that countries that are closer to world markets enjoy higher levels of trade, and that a 1 percent rise in the trade to GDP ratio increases income per person by at least 0.5 percent. Redding and Venables (2002) estimate that more than 70 percent of the variation in per capita income across countries can be explained by the geography of market and supplier access. Better access to coasts alone raises incomes by 20 percent.

As to income differences within countries, internal and effectively landlocked regions have systematically lower levels of income than coastal regions. Comparing China's regions, Wei and Yi (2001) show that trade levels, trade growth, and income growth rates all drop as one gets further from coastal areas.<sup>2</sup> The evidence on inland regions makes an especially strong case for the importance of access to international markets, as within-country differences control for institutional characteristics that cross-country regressions cannot.

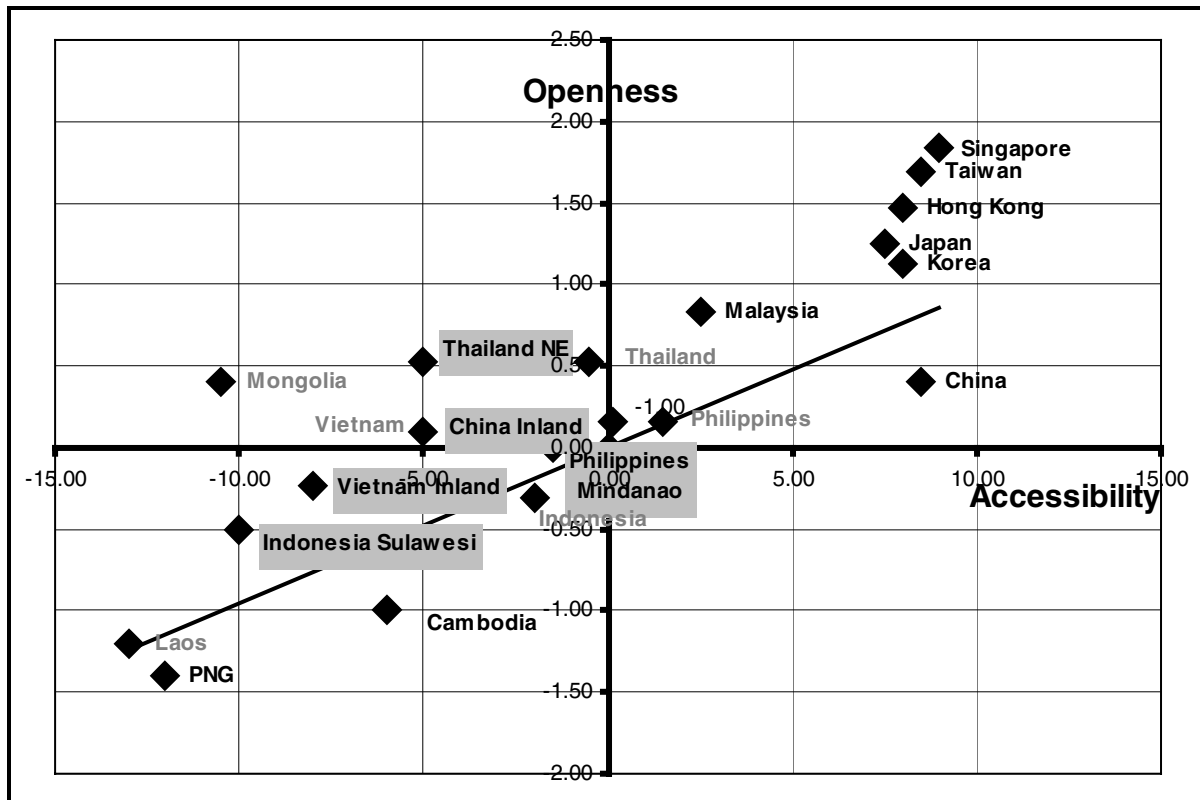
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<sup>2</sup> Gallup, Sachs, and Mellinger (1999) point out that "core" coastal regions worldwide contain 10 percent of world population but contribute 35 percent of gross world product

## Country group perspective

A useful way to organize thinking about logistics in East Asia is to place economies on a graph of trade openness and accessibility (Figure 5.1). Those lying above the horizontal axis score high on measures of openness. The economies to the right of the vertical axis are accessible to world markets, in the sense of having superior logistics and low transport costs.<sup>3</sup>

**Figure 5.1: Potential contribution of transport to economic growth in East Asia**



Source: Carruthers and Bajpai (2002).

The combination of these two measures groups economies on the basis of their current logistics status, as well as on the value of improved openness and logistics services in the future. That is, economies with fewer political barriers to trade can enjoy greater returns to logistics investments than those whose tariff structures would prevent much trade growth even with world-class infrastructure. Similarly, WTO accession may be of limited value if logistics services are too weak to support trade growth.

<sup>3</sup> The measures of openness are based on those indicated in the Global Competitiveness Report 2001-2002 (World Economic Forum, 2002). Values for countries not included in that report have been added using World Bank assessments of the three indices used in the report ("Technology, Public Institutions and Macroeconomic Environment"). All values have been normalized for the countries of East Asia. The measures of accessibility are based on the cost of transporting a standard container from the metropolitan region of the largest port to Hamburg. For inland regions, the land transport cost to the metropolitan region has been added.

Figure 5.1 also suggests two additional correlates: per capita incomes and the commodity structure of trade. The economies in the upper-right quadrant enjoy higher incomes than those in the lower left, and their exports are high-technology manufactures rather than resource-based commodities. Causality probably runs both ways. Economies like those of Singapore and Hong Kong have grown rich in part because their past investments in superior logistics have facilitated trade. Meanwhile, Mongolia, Lao PDR, and Cambodia still suffer from poor basic road access (Table 5.1). Similarly, while sophisticated logistics facilitate the move up the manufacturing quality ladder, demands from advanced manufacturers may push the private sector to improve logistics.

**Table 5.1: Availability of transport infrastructure**

	<i>Total roads Km/ 1000 km<sup>2</sup></i>	<i>% of roads that are paved</i>	<i>Railways Km/1000 km<sup>2</sup></i>	<i>No. of airports with paved runways longer than 1523m/ 1000km<sup>2</sup></i>
Cambodia	78.6	11.6	3.3	22.1
China	146.3	28.3	7.1	27.4
Indonesia	178.5	46.3	3.4	32.8
Lao PDR	59.1	24.0	0	25.3
Korea	888.9	74.7	31.7	375.7
Malaysia	196.1	75.3	5.5	63.7
Mongolia	2.2	46.1	1.2	4.5
Philippines	6665	19.8	3.0	113.3
Thailand	125.7	97.5	7.9	75.9
Vietnam	283.1	25.1	9.5	45.5
Argentina	78.6	29.5	12.3	32.8
Brazil	234.0	9.3	3.6	21.3
Mexico	167.9	29.7	9.3	64.8
USA	695.4	90.1	23.2	190.7
France	1,621.8	100.0	58.1	138.1
Poland	1,218.6	65.6	74.9	236.7

*Source:* Policy Research Corporation (2003).

Using Figure 5.1, we place the economies of the region into three groups and discuss each in turn:

1. Outward-oriented, highly accessible: Singapore, Hong Kong, Korea, Taiwan
2. Outward-oriented, accessible: China, Indonesia, Malaysia, the Philippines, Thailand
3. Less open and accessible: Cambodia, Lao PDR, Mongolia, Papua New Guinea, Samoa, Vietnam.

### ***Group 1: Outward-oriented, highly accessible***

In these higher-income economies—Singapore, Hong Kong, Korea, and Taiwan exports have shifted toward high-technology manufactures and services. Logistics costs are at very competitive levels, transport volumes are high, and multimodal linkages are well developed. Given the strength of global competition, however, these economies need to keep their logistics costs competitive and improve quality in line with the evolution in technology and with recently introduced security requirements.

Hong Kong and Singapore have specialized in providing logistics services as transshipment hubs for neighboring states. While Singapore was the main transshipment stop for much of Southeast Asia, Hong Kong specialized in direct shipment to and from neighboring Guangdong Province, the manufacturing region that produces nearly 40 percent of China's exports. These two megaports now face competition from emerging regional ports: Singapore from Tanjung Pelepas in Malaysia and Laem Chabang in Thailand, and Hong Kong from the rapidly expanding container ports of the Pearl River delta on China's southern coast. The major success factors for these and other newly emerging ports are their transactions-cost and time-cost advantages; other advantages include their efficient auxiliary services (particularly customs and freight forwarding), less congested road and rail access, and better links to national and international transport networks. Relative to Singapore, the competitive advantage of Tanjung Pelepas will increase as Malaysia expands its rail network and links the port to Thailand, Vietnam, and Cambodia. Likewise, growth in traffic through ports in southern China is expected to accelerate with the dismantling of restrictions on direct imports of goods from the United States and Taiwan.

### ***Group 2: Outward-oriented, accessible***

These countries (China, Indonesia, Malaysia, the Philippines, Thailand) face daunting problems in addressing the logistics impediments to higher pro-poor economic growth. They are still in the early stages of designing national policies and institutional structures that encourage rather than inhibit the growth of the multimodal transport services that they need for increased external and domestic trade. Many parts of these countries have inadequate and inefficient port and shipping facilities, transport services, and land infrastructure. Poor rural roads cause long transport times and high transport costs, which in turn hamper the development of domestic markets and lead to substantial interregional price differences, particularly within China, Indonesia, and the Philippines. Local authorities and other agencies charge quasilegal and illegal road tolls, often as a desperate way to raise revenue, but always to the detriment of market access.

In the countries of this group, the form of contracts used for international trade and transport discourages multimodal use. It is common for the purchaser of exports to contract free on board in the port of the exporting country, with the seller (producer) being responsible for contracting landside delivery to the specified port. Because no one agent assumes responsibility for the whole logistics chain, the full advantages of multimodal transport are not realized. Third-party logistics (3PL), in which an industry contracts out its logistics functions to specialized suppliers of logistics services, are uncommon in East Asia except in Thailand. In some cases, however, such as large international agroproduct companies in the Philippines, large exporters have developed their own well-integrated logistics. Trade documentation is a particularly difficult hurdle for international trade with an inland origin or destination, with a great reluctance on the part of customs and health authorities to allow inland clearance.

Interviews with freight forwarders in the interior of China suggest that inland transport costs can account for about two-thirds of the total transport costs from Chinese producers to overseas markets. In the context of the WTO requirements, customs fees will be reduced. China's recent liberalization process has led to an influx of foreign shipping services (foreign

carriers transported almost 60 percent of export trade cargo in 2002). In some cases, shipment costs for exports are subsidized by imports.<sup>4</sup>

**Table 5.2: Composition of logistics costs of container transport from Inland China (Chongqing) to U.S. West Coast**

<i>Activity</i>	<i>US\$ per TEU</i>	<i>% of total cost</i>
Land access to port	2300	63%
Port handling	200	5%
Maritime transport	750	21%
Port handling	150	4%
Land access to final destination	250	7%
<b>Total</b>	<b>3,650</b>	<b>100%</b>

*Note:* A TEU is a twenty foot equivalent unit, the size of a standard container.

*Source:* Carruthers and Bajpai (2002).

### ***Group 3: Less open and accessible***

These mostly low-income countries—Cambodia, Lao PDR, Mongolia, Papua New Guinea, Samoa, Vietnam—are either former centrally planned socialist economies or small island states, dependent on a small number of commodities and tourism. Their regimes, recent history, and geographic position are largely responsible for the small role of international trade in their national economies. Except for Vietnam, they have low population density, small domestic markets, and primarily subsistence agrarian economies.

Many logistical constraints hamper these countries' economic growth, the most fundamental being the lack of adequate infrastructure. Roads are often closed and services suspended, and the state of infrastructure requires the use of small and inefficient vehicles and vessels, which have high operating costs. In Cambodia, for example, truck rates for distances over 100 km vary from 137 to 467 riel/tonne/km depending upon road conditions. In Lao PDR, almost 40 percent of villages are more than 6 kilometers from a main road, half are inaccessible during the rainy season, one-quarter of the district centers lack year-round road access, and a quarter of provincial and local roads cannot be used during the rainy season. This not only makes it difficult to get outputs to markets, but also increases the import costs of essential consumer products and inputs such as fertilizers. In Papua New Guinea the Highlands Highway, the prime road corridor used for the export of minerals and coffee, is inadequate for container movement by trucks; it suffers from poor maintenance and frequent closures, causing enormous losses in trade.

Government policies in the realm of logistics tend to lack stability, consistency, and transparency, creating many additional problems for the processing, storage, transport, grading, marketing, and sale of products. Policy coordination between central and provincial authorities is poor. Many countries in this group suffer from highly distorted prices as a remnant of their previously centrally planned economies. National standards on product quality, packaging, storage, and transport conditions are often rudimentary, and farmers lack

<sup>4</sup> For example, in Thailand, the inbound rate for a 20-foot container is around US \$380 compared to a total of US\$168 for an outbound container.

management, marketing, and logistics capabilities. In Vietnam, overall port, cargo handling, trucking, and rail tariffs may not be excessive, but relative inefficiencies impose high costs in terms of inventory and unproductive time of vessels and road vehicles.

The intermodal transport systems of most of these countries are poorly integrated, with no streamlined procedures to support the seamless movement of containers between coastal and inland areas. Many countries lack container freight stations, yards, and trucks in their inland regions. Container tracking capability is particularly poor, with shippers often unaware of their containers' whereabouts. The potential impact of improved multimodal transport is well illustrated in a recent study on the time and costs of container movements from Lao PDR to Europe, which showed that alternative multimodal routes could reduce the present high door-to-door cost from Lao PDR to Europe (through Danang and Singapore) by almost one-third.<sup>5</sup>

Border procedures are also cumbersome and time-consuming in these countries. One reason is excessive and ad hoc regulatory requirements. In Cambodia, which experiences enormous competitive pressures from its neighbors, customs clearance takes 8 days for imports and 10-14 days for exports, while informal payments are necessary to handle vessels after 5 p.m. in its main port, Sihanoukville. Port charges at Sihanoukville are the highest in the region, almost four times those at the comparably sized Songkhla port in Thailand.<sup>6</sup> For landlocked countries, land border crossings invariably involve delays and costs arising from the inefficient application of national regulations, difficulties in cargo and document clearance, unnecessarily long storage, high insurance premiums, and long waiting times. For example, Mongolian rail freight arriving at the border with China often waits for days for Chinese rail wagons to complete its journey to the port of Tianjin. Documentation is often inadequate for lack of qualified staff at the relevant ministries or government departments. Border delays lead to extra storage charges, which cannot always be properly controlled. Detailed customs statistics are often collected at a high cost to traders, but data that might be of use to them are not compiled, published, or analyzed.

### ***Remote regions within countries***

Many of the East Asian countries have vast remote areas with poor connections to other domestic markets, as well as to international sea and air gateways. The problem begins with low population density and geographic remoteness, but it is worsened by the lack of basic transport infrastructure. Of course, where markets are distant and trade volumes are low, it is difficult to justify building and maintaining even basic infrastructure. But this creates a vicious cycle, resulting in transport costs so high that these remote areas become nearly autarkic. Remoteness is not limited to landlocked regions. In the Philippines, Mindanao is very poorly connected to population cores, with limited containerized cargo services.

Logistics difficulties associated with remoteness extend beyond the frequency and cost of transport. Many of the key outlying counties and villages in the Chinese provinces of Hunan and Yunnan are poorly connected to the main cities. It is difficult to maintain road access into interior regions and harder yet to maintain supporting facilities such as warehouses, cold

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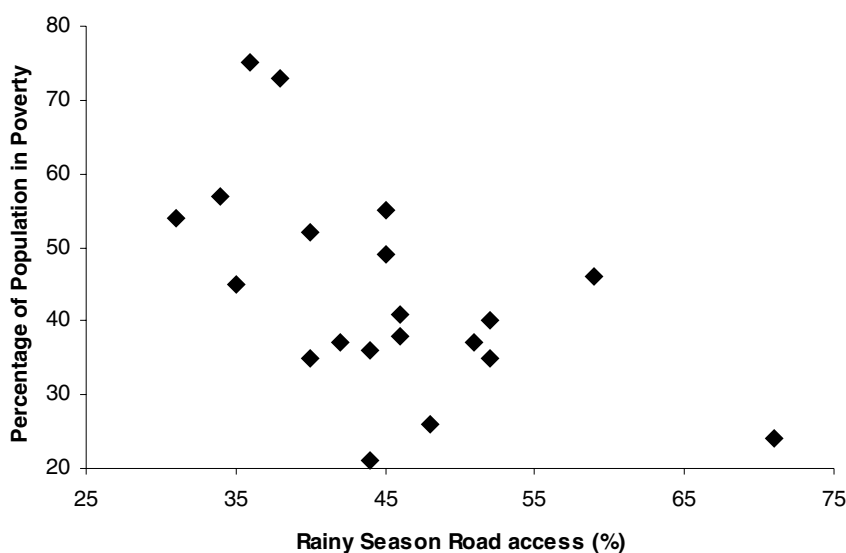
<sup>5</sup> Banomyong and Beresford (2000).

<sup>6</sup> Cambodia Ministry of Commerce (2001).

storage rooms, intermodal terminals, and information structures to control flows. As a consequence, cargo consolidation is limited, harvests cannot be stored, and perishable products do not survive shipment.

Inland regions are squeezed on two sides—by higher prices for their imported consumption items and by lower net revenues for their exported output, with resulting lower wages.<sup>7</sup> In Lao PDR, for example, regions that enjoy more days of road access have much lower rates of poverty; Figure 5.2 graphs poverty rates across Lao provinces against road access in the rainy season.

**Figure 5.2: Poverty and accessibility in Lao PDR**



*Source:* Hummels' calculations, based on Arnold (2003).

Similar arguments apply across countries. A country with high logistics costs is, in a broad economic sense, far from international markets so that it pays high prices for imports and gets low prices for its exports.<sup>8</sup>

## Benefits from improved logistics

What are the specific channels through which investments in logistics can improve welfare in developing economies? This section reviews examples and evidence taken both from academic studies and from a series of recent country studies by the World Bank.

<sup>7</sup> Transport cost incidence is a primary candidate for explaining why incomes drop off as international market access drops, as shown in Wei and Yi (2001) for China, and by Frankel and Romer (1999) and Redding and Venables (2002) worldwide.

<sup>8</sup> A manufacturer in Thailand claimed to be closer in time and cost to the United States than to Vietnam, because of the poor land access facilities from Thailand to Vietnam.

***Reduced “wedge” between consumer and producer prices***

Reducing the cost of moving goods between markets reduces the prices paid by consumers and increases the prices received by producers. On the consumer side, this effect can be seen most clearly by examining the price of goods at the port relative to the price of goods inland. Producers will not ship goods inland unless the price they receive, net of shipping, is at least as high as prices at the port. This means that inland consumers bear the full burden of shipping costs for any good that is not produced locally. This burden can be substantial. Data from Mongolia, for example, show substantial price differences between Ulaanbaatar and outlying regions, with as much as 67 percent of the higher costs in outlying regions attributable to transport costs.

A similar logic applies to exports. International markets will not pay more for goods produced in inland regions, and so the ex-factory or ex-farm prices are reduced by the full inland logistics costs of access to the port.

***Insurance against regional price fluctuations***

When agricultural output varies because of unpredictable weather, one region may experience drought and food shortages while another enjoys sufficient rainfall and ample harvests. If the regions are separated by poor logistics and transport systems, consumers in the shortfall region face very high food prices, while producers in the surplus region face a market glut. Regional variations in agricultural prices are especially pronounced within countries such as Cambodia, Lao PDR, and Vietnam, in which agricultural production is a large portion of national output, and in which interior regions are poorly connected or inaccessible.

Good internal logistics facilitate surplus commodity shipments from surplus to shortfall regions, smoothing price variations between them and providing a kind of insurance against shortage and glut. Better market access appears to dampen price volatility for a broad range of products. Engel and Rogers (1996) show that the volatility in goods prices between city pairs rises with the distance between the cities, and is especially large for city pairs across national borders. Essentially, arbitrage is necessary to narrow price differentials across locations, and this is much harder to achieve when logistics are poor.

***Reduced inventory costs***

Better transport and logistics systems not only lower the costs of delivery, but make the timing of delivery more reliable. Producers cannot manufacture goods without the inputs they need, and retailers cannot sell goods they do not have in stock, so if delivery times are uncertain, firms must hold large inventories of goods. Gausch and Kogan (2001) find that inventory holdings in manufacturing are two to five times higher in developing countries than in the United States, and estimate that halving inventories could reduce unit production costs by 20 percent.

The first reason for long and uncertain delivery times is poor infrastructure—roads may be impassable, and railways nonexistent, or roads may cause damage to trucks that involve high

costs and long delays. Another reason is peak load congestion—a severe problem in areas where population and manufacturing intensity have grown faster than infrastructure capacity. In Vietnam’s Ho Chi Minh City, for example, the government bans trucks heavier than 2 tons in the inner city between 6 a.m. and 6 p.m. to combat growing traffic congestion, and thus manufacturers must hold large inventories all day rather than delivering midday shipments, and trucks sit idle during the day. This contrasts with modern just-in-time techniques, in which deliveries are continuous, and the transport capital stock is in constant use.

Leaner production techniques require a substantial flow of information. Manufacturing firms can only run with small inventories of inputs if they are certain where and when the next shipment will arrive. In turn, this requires sophisticated electronic data interchange. Table 5.5 shows that in many countries in the region systems for this purpose are far from competitive.<sup>9</sup>

### *More developed markets*

Well-developed logistics increase consumers’ choice and producers’ sources of supply, and bring more markets within producers’ reach. Evenett and Venables (2001) show that 40 percent of trade growth in East Asia arises from offering new product lines and extending exports of existing product lines to new trading partners.

Product diversification benefits both agricultural- and industrial-based economies, since for both specialization in a narrow range of products can be dangerous because of price volatility. Recent work shows that most of the differences in trade levels between small and large economies can be attributed to differences in the range of goods that are traded, and that much of the growth in imports that results from lowering trade costs comes through expansions in the set of products available.<sup>10</sup> Romer (1994) shows that the welfare benefits from expanded product variety can dwarf those from standard calculations of the gains from trade. Manufacturing firms are also consumers; Feenstra and others (1999) show that expanding the variety of inputs in Taiwan and Korea is associated with productivity growth in manufacturing.

Better logistics allow variety expansion in several ways. First, they may directly lower the fixed costs of expansion. There are significant scale advantages to providing transport hubs, warehousing, and logistics services that many firms can share. Second, by lowering the marginal costs of serving markets, it is possible to increase sales and spread entry costs over more units.

The diversification argument also applies across markets, as reliance on a single export destination leaves firms subject to significant business cycle risk. The market destinations for East Asia’s exports are mainly the industrial countries. Intraregional trade is limited—partly

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<sup>9</sup> Certainty in delivery also requires that shipments be secure from theft and pilferage. This problem is likely to be most serious for products that are of high value but sufficiently homogeneous that gray markets exist for resale. Firms’ strategies to avoid theft can result in higher transport costs and uncertainty in delivery times. For example, manufacturers of integrated circuits in the Philippines reduce hijacking of shipments by using irregular and therefore costly transport schedules.

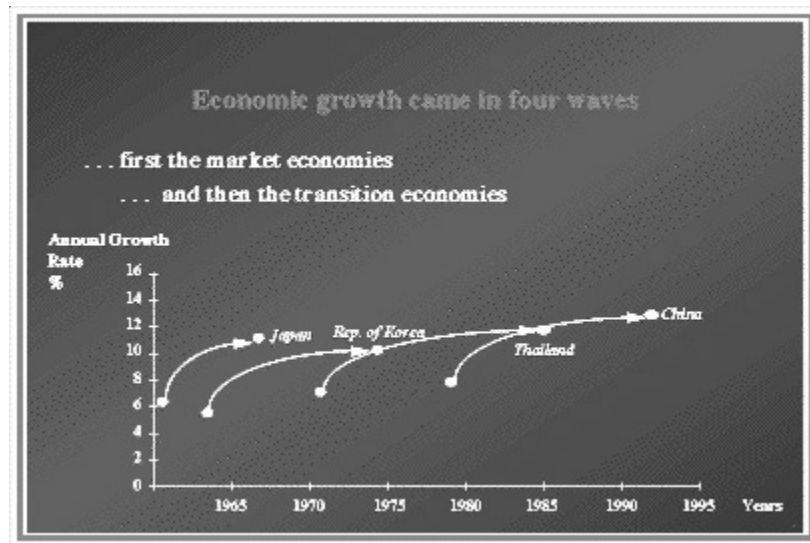
<sup>10</sup> See Hummels and Klenow (2001) for cross-sectional comparisons of small and large economies, and Hillberry and McDaniel (2002) for an examination of how trade liberalization affects trade growth.

because the pattern of logistics costs and the institutional barriers to land-based trade make many countries of the region effectively closer to industrial countries than their geographical neighbors. Hence, while the proposed conversion of ASEAN to a free trade area would do much to remove tariff barriers, the signatory countries will need to make a corresponding change in their implementation of customs and other restrictions on trade, supported by a reduction in logistics costs, if they are to realize the full benefits of tariff reductions.

### ***Faster progress in industrialization***

East Asia's development has followed a pattern termed the flying geese effect. The first wave of growth was in Japan, followed by the Four Tigers: Hong Kong, Korea, Singapore, and Taiwan, with a third wave occurring in Indonesia, Malaysia, and Thailand (Figure 5.3). China and Vietnam are expected to be the main participants in the fourth wave<sup>11</sup>

**Figure 5.3: The flying geese of East Asia**



As countries move from resource extraction to sophisticated manufacturing, they must develop their logistics capabilities accordingly. As the value:weight ratio of a country's exports rises, logistics and transport costs will fall, but only if the nature of logistics and transport services stays unchanged. In practice, the more sophisticated exports generally impose much greater demands on logistics and transport services. For example, iron ore and bulk grains may be heavy and difficult to move over land for long distances, but their shipment is otherwise uncomplicated. High-value agriculture (flowers, fruits, and seafood) requires careful handling, timeliness, and product standardization. Electronics manufacturing requires all this, as well as tightly integrated supply chains.

<sup>11</sup> The flying geese metaphor captures a progression not only in incomes, but in policies and export patterns. Successive waves copied the effective institutions, policies, and technologies of previous waves of growing economies, though changing and adapting the approaches of the leaders to suit their needs. These waves also progressed from resource-based manufacturing to labor-intensive manufacturing, and finally to high technology manufacturing.

## Regional transport and logistics issues

Despite two decades of improvement, East Asia has significant scope for further reducing its transport and logistics costs.<sup>12</sup> The following section reviews problems and opportunities in specific areas, as a prelude to the policy recommendations offered later in this chapter.

### *Maritime issues*

Ninety percent of the world's trade in manufactured goods is now carried by containers, and the use of containerized shipping has increased throughout East Asia (Table 5.3). During the 1990s, total container movements increased at nearly 10 percent a year, with the fastest growth occurring in the ports of China and new ports in Malaysia and Thailand.<sup>13</sup> The rapid growth in container usage represents both a revolution in maritime technology and a significant logistics challenge to economies in the region.

Though regional container ports are becoming more efficient in handling containers, they are not keeping pace with the rapidly growing demand for berth space. While the capacity of the container fleet on the East Asian routes increased at more than 20 percent a year between 1980 and 2000, the capacity of container berths to handle those ships increased at less than 8 percent a year. Countries are responding to the shortage by adding new berths, converting general cargo berths to container handling, and developing new ports.<sup>14</sup>

Expanded container capacity requires greater land area for use in container storage, road and rail links, and associated services; these issues are discussed later in this section.

Increased East Asian trade volumes have led liner services to introduce large container ships that require deeper access channels, which can often only be provided by voluminous dredging. Ports in river estuaries (such as Bangkok, Haiphong, Saigon, and Shanghai) may become less competitive than coastal deep-water ports (such as Laem Chabang and Hong Kong). Some existing estuarial ports are already looking for new developments on the coast to overcome this disadvantage.

There is limited scope for further reducing costs by increasing vessel size, and the next development is likely to be more direct services from what are now feeder ports. With higher volumes and more efficient smaller vessels, this could overcome the high cost penalty of transfers in the hub ports. The start of this trend can already be seen in Table 5.3 in the slower growth rates of the two regional megaports.

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<sup>12</sup> An assessment of the issues at the country and specific trade flow level is provided in a number of country studies undertaken for the World Bank in 2002. See Philippine Logistics Study (John Arnold and Theresa Villareal), Logistics Development, Trade Facilitation and its impact on Poverty Reduction in China's Lagging Provinces (International Trade Institute of Singapore), Vietnam Logistics Development and Trade Facilitation (Nomura Research Institute), Logistics Development and Trade Facilitation in Lao PDR (John Arnold, Ruth Banomyong and Nipawis Ritthironk) and Mongolia Trade Competitiveness (Infrastructure Consulting Ltd).

<sup>13</sup> Frenkel (1998).

<sup>14</sup> Vitasa and Seprato (1999).

**Table 5.3: Container movements at selected East Asian ports**

<i>Port</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>Annual Growth</i>
<b>Hong Kong</b>	<b>12,550</b>	<b>13,460</b>	<b>14,567</b>	<b>14,582</b>	<b>16,211</b>	<b>17,800</b>	<b>17,900</b>	<b>6.1%</b>
<b>Singapore</b>	<b>11,846</b>	<b>12,944</b>	<b>14,135</b>	<b>15,136</b>	<b>15,945</b>	<b>17,040</b>	<b>15,520</b>	<b>4.6%</b>
Shanghai	1,196	1,305	2,527	3,066	4,206	5,613	6,310	31.9%
Port Klang	1,134	1,410	1,685	1,820	2,550	3,206	3,759	22.1%
Laem Chabang	n.a.	729	1,036	1,425	1,756	2,195	2,424	27.1%
Qingdao	603	810	1,031	1,213	1,540	2,100	2,639	27.9%
Tianjin	702	822	935	1,018	1,302	1,708	2,010	19.2%
Gunagzhou	515	558	687	848	1,179	1,430	1,628	21.1%
Taichung, Taiwan	447	695	842	880	1,107	1,130	1,069	15.6%
Total (East Asia)	54,433	57,836	65,119	68,155	75,155	83,422	94,267	9.6%
HK and Singapore %	45%	46%	44%	44%	43%	42%	35%	

*Source:* Containerization International, March 2002.

### ***Multimodal transport***

Much of East Asia uses containers only for the maritime part of trips, loading and unloading them in the ports rather than at the origin and destination of their cargo. This eliminates the main cost-saving advantages of container use. Countries that can best encourage door-to-door movement of containers using multimodal transport will be best equipped to compete and to bring trade benefits to their more remote regions. To achieve this integration they will need to:

- **Match inland with maritime infrastructure.** An important reason that containers do not move inland from container ports is that road and rail infrastructure lack the right carrying capacity and vehicle dimensions for the transport of loaded containers.
- **Simplify trade documentation.** Examples include the use of through-waybills and single invoices for all modes. In customs clearance times, the economies of East Asia are quite similar to those of other developing countries, (Table 5.4) but taken together developing countries are significantly slower than developed countries. Another regulatory change—to allow containers to be cleared for tariffs, customs, health, and taxation charges at inland locations away from the ports—would help to reduce port congestion, but could raise additional security concerns.
- **Develop an efficient freight forwarding industry.** As noted earlier, third-party logistics is not a well-advanced concept in East Asia. In industrial countries, almost a third of logistics turnover is contracted to 3PL providers, but even in several industrialized East Asian economies, barely 10 percent of trade-related transport services are provided in this way. In some countries, progression to the earlier stage of second-party logistics—in which companies unify their internal transport and warehousing functions and create their own internal logistics departments—is still underway.

- **Develop effective communications systems** so that freight forwarders can take advantage of the shipping alternatives available and keep their clients aware of the status and location of their freight.

**Table 5.4: Customs clearance times**

	<i>Average days for customs clearance</i>		
	<i>Air</i>	<i>Sea LCL</i>	<i>Sea FCL</i>
France	1	4	2
Germany	1	1	1
Greece	1	1	1
Netherlands	1	2	2
Spain	2	2	2
Sweden	1	2	2
USA	2	3	3
Average sample of developed countries	1.3	2.1	1.9
China	4	30	5
Hong Kong	2	4	3
Indonesia	3	4	4
Malaysia	4	4	4
Philippines	4	5	3
Singapore	2	3	3
Taiwan	4	10	7
Thailand	5	5	5
Vietnam	5	7	7
Average sample of East Asian countries	3.7	8.0	4.6
Argentina	7	15	12
Brazil	10	10	10
India	8	10	12
Russia	10	12	15
México	4	7	4
Mozambique	5	8	8
Zimbabwe	4	5	5
Average, sample of other developing countries	6.9	9.6	9.4

*Notes:* LCL is Less than Container Load; FCL is Full Container Load.

*Source:* International Exhibition Logistics Associates<sup>15</sup> (<http://www.iela.org>).

Even the least accessible countries have improved the quality and scope of their information systems (Table 5.5) but few have been able to develop freight forwarding agencies that perform as well as those in the more accessible and trade-open countries.

<sup>15</sup> Quoted in Tay (2002).

**Table 5.5: Electronic data interchange and transport e-commerce in selected countries**

<i>Country</i>	<i>Port operators MIS</i>	<i>Traders in port EDI system</i>	<i>Customs agency MIS</i>	<i>Traders in customs EDI system</i>	<i>All parties electronically linked</i>	<i>Electronic trade in transport services</i>
Japan	X	X	X	X		
Singapore	X	X	X	X	X	X
Korea	X	X	X	X	X	X
Thailand	X	X	X	X	X	X
Philippines	X	X	X	X		
Indonesia	X	X	X	X		
Vietnam	None					
Lao PDR	None					
Cambodia	None					

*Notes:* MIS is Management Information System; EDI is Electronic Data Interchange.

*Source:* Based on "Review of Transport in the ESCAP Region 1996-2001," UN ESCAP, 2002.

### ***Ports and land access***

The high costs of land access to ports, reinforced by the effects of production agglomeration, have caused an excessive concentration of export-related activities in port cities and essentially restricted the benefits of trade growth to the areas immediately surrounding ports. In China, for instance, more than 90 percent of foreign direct investment in export-oriented activities has gone to the four main coastal provinces (Guangdong, Jiangsu, Fujian, and Shanghai). Similarly, the multiplier effect of the textile export boom in Cambodia has been limited largely to areas that have easy access to the deepwater port at Sihanoukville.

If the benefits of trade are to be more widely distributed, the penalties of inaccessibility need to be addressed. Such action could not only stimulate trade-induced growth in currently inaccessible regions, but if successful in this aim could reduce also slow the growth of trade-induced urban congestion and pollution in port cities.

The social costs of the concentration of manufacturing activities in port cities can be significant. Traffic congestion costs, in particular, can be enormous. A recent study in Bangkok estimated that moving port-related activities out of the downtown area would result in a 10 percent reduction in peak-hour trips and would entail benefits of up to US\$400 million annually.<sup>16</sup>

Reduction of port access costs depends on having adequate infrastructure, appropriate vehicles, and logistics technology that allows these to be used efficiently (Box 5.1.)

As container ports expand, municipalities find it increasingly difficult to accommodate both the added space requirements and the road congestion that results from the high volumes of truck traffic servicing the ports.

<sup>16</sup> UN ESCAP (2000).

In some instances, the only feasible response is to build a new port. A less costly response is to move port activities out of downtown urban areas, while retaining the employment and business activities that the ports attract. For example, one of the principal reasons for developing the Waigaoqiao container terminal and Luojing coal terminal outside Shanghai was to move port-based traffic out of the urban area. This was achieved between 1996 and 1998, reducing the port traffic handled at terminals within the city by about 13 million tons, while increasing that in the new terminals outside the city by about the same amount. However, the urban traffic associated with the existing port needs to be reduced even further and this is part of the justification (together with the limited depth of the access channel) for the development of a new deep-water port away from the urban area. Based on two offshore islands, this new port will need new 30-km-long access roads, including a bridge, and is conservatively estimated to cost up to U\$4 billion just for the first stage.

When the depth of the maritime access channel is not a constraint on growth, the urban congestion problems of port growth can often be solved by moving the nonmaritime port activities (mostly value-adding production and packaging services) inland, closer to the industries that the port serves, and to build rail links to avoid generating extra road traffic.<sup>17</sup>

**Box 5.1: Successful integration of ports and land transport networks: Korea**

The Republic of Korea has one of East Asia's most developed land access networks to its ports, making use of road and rail links to the ports of Pusan and Kwangyang, the latter alongside a major steel mill and industrial complex and now in its second stage of development with a potential capacity of 2.4 million TEU. Both Pusan and Kwangyang have been planned in conjunction with major road and rail links to Korea's major manufacturing regions. Pusan has developed a new port area away from the downtown area. This has reduced traffic congestion and air pollution, and improved logistics efficiency has made the new port easier to reach from the city's industrial areas and the rest of Korea (<http://www.pusanconsulting.co.kr/En-about Pusan.htm>).

The Yangsan inland container terminal has been constructed to relieve port-generated traffic congestion and environmental problems resulting from the massive transport movements that the port generates. Another inland container terminal is being developed in the center of the Korean peninsula, to serve the growing industrial zones on the west coast and in the center of the country. Together with the ports, these terminals are part of a logistics system based on an advanced electronic data interchange and information service.

### *Air freight*

Air freight accounts for only about 1 percent of East Asia's international trade by volume, but more than 35 percent by value. More than for other regions, air freight is important for East Asia: first, because the distance from the region's major markets—the United States and Europe—makes quick delivery of sea freight impossible; and second, because a high proportion of the region's manufactured exports require timely delivery. (Because these

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<sup>17</sup> Rafferty (2003).

manufactures have high value to weight ratios, the ad valorem cost of their air transport is comparatively low.)

The importance of air freight to Asia can be seen from a ranking of cargo volumes by airport. Considering airports outside the United States, those in East Asia took 10 of the top 15 places for air freight volume in both 2000 and 2001, and accounted for more than 30 percent of air freight at the top 30 airports worldwide (Table 5.6).

**Table 5.6: Ranking of major freight airports in East Asia, 2001**

<i>Global rank</i>	<i>Airport</i>	<i>Code</i>	<i>Tons of cargo</i>
3	Hong Kong	HKG	2,099,605
5	Tokyo	NRT	1,680,938
8	Singapore	SIN	1,529,930
15	Incheon	ICN	1,196,845
16	Taipei	TPE	1,189,874
18	Osaka	KIX	871,161
19	Bangkok	BKK	842,588
23	Tokyo	HND	725,124
27	Seoul	SEL	598,620
28	Beijing	PEK	586,704
	Total East Asia		33,210,120
	% of total top 30		34.1

*Source:* Airports Council International, 2002.

Good air freight facilities are important in attracting fast growing, high-value-added industries. Hence, competition between airports in the region to act as a hub for major logistics companies is growing. The smaller and newer airports that can offer better services are growing faster than the larger ones.

Airlines and traditional freight forwarders both compete and cooperate with each other to provide air transport-based freight services. The progress of air freight forwarding and air freight logistics in Korea, Hong Kong, Japan, and Singapore compares favorably with that in the United States and Europe, while some countries of the region still depend on a few multinational air carriers for efficient airfreight logistics.

## **Policy recommendations**

Against this background, governments in East Asia need to take action to improve trade-related logistics on several fronts if they are to increase their trade competitiveness.

### ***Domestic integration***

For the less open and accessible group of countries, and for landlocked regions and remote regions within China, Indonesia, the Philippines, and Thailand, the development of more tightly integrated domestic markets and logistics systems is a high priority. Besides promoting an appropriate mix of modes—roads, waterways, and rail—complementary institutional actions must be taken to extend better transport services to remote areas and to

establish better conditions for market development—for example through postharvest services, cargo consolidation through farmer or business associations, information on prices and market demand, access to credits, and human skills.

### ***Private sector***

The transport of the outputs of very simple extractive industries may not require advanced logistics abilities, but high-value products call for services such as freight forwarding, third-party logistics, warehousing, storage, packaging, e-business use, and trucking.<sup>18</sup>

Logistics needs of this kind tend to be better served by the private than by the public sector. In many countries, government may be well advised to withdraw from direct provision of logistics services while creating the right enabling environment for competition and private investment. This may entail legalizing and deregulating freight forwarders, and allowing new entrants, including the international companies that can be a major source of the capital, technology, and new management practices needed to develop sophisticated services. Even areas such as port management and operations that are traditionally managed by government may benefit from private service provision.<sup>19</sup> Countries throughout East Asia are likely to reap a very high pay-off from a well-developed private logistics industry.

Given the fixed costs of entry, private operators are reluctant to provide services where trade volumes are low. One solution supported by the World Bank is to provide initial public funding for the development of facilities where the economic benefits indicate earlier development than the financial returns would support. The initial public investment in facilities such as inland container terminals in potentially high-growth regions distant from ports can be recovered through later concession revenues or outright sales.<sup>20</sup>

### ***Regulatory environment***

#### **Transport**

Lack of regulatory coordination across transport modes is a common problem in East Asia: One regulatory agency monitors ports, another roads, a third rail, and each may have different plans, standards, and reporting requirements. This presents problems for firms that seek seamless freight movement across modes. A transparent and uniform regulatory and legal regime for private sector participation, safety, environment, traffic rules, vehicle weight, and dimension is a prerequisite for an effective transport ministry. An obvious solution is regulatory consolidation so that businesses face consistent rules.

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<sup>18</sup> Domestic providers of such services may not be up to international standards. For example, because of concerns about the quality of local freight forwarders, Japanese manufacturers in Vietnam insist on working with freight forwarders that are joint venture partners with familiar (Japanese) logistics providers. Part of the reason may be a need for superior technology that the foreign logistics providers can offer; part may also be the longstanding relationship between the manufacturer and logistics provider. Freight forwarders who fail to provide reliable delivery times and careful handling jeopardize contracts not only in Vietnam, but also back in Japan.

<sup>19</sup> See Fink and other (2001) for the Latin American experience with port privatization.

<sup>20</sup> This approach is being applied in the China Container Transport Project, supported by the World Bank

Improved transport infrastructure in trade corridors is an important part of a regional poverty reduction strategy that will facilitate the attraction of foreign direct investment and trade-based growth away from port cities. While infrastructure development in competing modes can stimulate intermodal competition, it can be costly in the early stages of trade corridor expansion. Government should promote an integrated planning framework for developing these corridors, with an established hierarchy of modal interfaces (inland terminals, container stations, cargo clearance facilities with respect to customs, health inspections, and tax payments). Coordination between the agencies responsible for different modes is essential here.

A further problem is that access to publicly administered transport may not be allocated according to an efficient market-based pricing model. In central China, for example, some bulk commodities are allowed queuing priority on rail lines. Such a practice reverses the priorities that would exist if queuing were determined by market prices. Often there are public or private monopolies<sup>21</sup> that are unable to provide satisfactory services despite their high service charges.

Countries already within the WTO, such as China, and those likely to join in the near future (Cambodia, Vietnam, and Lao PDR) need to review their transport regulations and policies. This review would be aimed at bringing them into line with WTO and General Agreement on Trade in Services rules on nondiscrimination between foreign and local service providers, transparency of rules and regulations, and elimination of quantitative restrictions.

### **Cross-border facilitation**

Cross-border facilitation is a key intervention in lowering overall export and import transactions costs. It promises high returns for all East Asian countries, though less for those that are relatively advanced. It can best be achieved by harmonizing and simplifying customs procedures, sharing information, modernizing information and communications technology and customs administration, and establishing transparent transit rules and post-entry compliance audits. Plans for improvements must take into account the interests of related public and private communities—including customs, freight forwarders, shippers, port operators, shipping lines, insurers, and bankers.

### **Urban land use and management**

Urban governments need to exercise market-responsive land-use policies for locating logistics infrastructure, especially ports. This is perhaps more difficult than it sounds because of unpriced externalities. Firms move production into clusters because there they enjoy positive productivity externalities—information spillovers, access to intermediate inputs, and specialized human capital—but they do not take into account the effect that clustering has on already severe congestion. Government efforts to relieve congestion or relocate facilities must take into account the trade-offs between the positive (agglomeration economy) and negative externalities (congestion, pollution) of businesses or a facility to be displaced, such as a port or container depot. Unfortunately these externalities, especially the positive spillovers, remain difficult to measure.

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<sup>21</sup> Such as the Philippines Ports Authority, the private shipping cartels Vinamarine and Vinalines in Vietnam, or the traders' cartel for freight forwarding in Laos.

## ***Security***

The September 11 terrorist attack has heightened the importance of efficient and secure trade facilitation in supporting trade-led growth. The impact of increased transport costs related to security has already begun to affect trade volumes and the competitiveness of ports.

According to an OECD estimate, trading costs excluding the increased inventory and other “behind the border” costs have risen by about 1-3 percent, resulting in a loss of about US\$75 billion in aggregate welfare.

The increased costs and challenges in trade facilitation will depress the level of trade for countries that cannot manage them successfully. All the international agencies involved directly in international trade are acting to help exporting countries achieve higher security as expeditiously as possible. They are providing funding for the procurement of equipment, technical assistance in drafting regulations, and training for customs and security staff in implementation. The solutions that countries select are likely to vary according to country conditions (human skill and resources, technology, quality of facilities), risk profiles, and types of trade transactions. The World Customs Organization Task Force on Security and Trade Facilitation is expected to develop appropriate processes and identify the related needs for capacity building.

Recognizing that security and facilitation are two sides of the same coin, an integral approach to supply-chain management would be appropriate, though now the focus is on limiting the security risks of imports by improving a few discrete points in supply chains (customs). Security initiatives are now targeting containers as well as air cargo and passenger movements.<sup>22</sup> For security initiatives to succeed, relevant technologies and information systems need to be shared among governmental agencies, shippers, and corporations.

## ***Regional cooperation***

Such sharing is best achieved through a regional dialogue that is also a key in the harmonization of national, regional, and international rules and policies relating to trade facilitation. Cooperation is especially important in assisting landlocked countries (Mongolia, Laos PDR) and those with long land borders, mostly in the Mekong region.

Ongoing regional and subregional initiatives (ASEAN, APEC, Mekong River Commission, and Greater Mekong subregion) provide regular opportunities to cooperate on country-

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<sup>22</sup> See *Friction over Security Gaps*, Ram Reddy, <http://www.intelligententerprise.com/>.

Traditional security methods result in processes that increase the cycle time for activities, such as queuing to go through metal detectors and physical inspections. Reddy argues that the preferred approach both from security and efficiency perspectives, since goods and raw materials can be secured after inspection at the point of origin. If this approach can be implemented for the one percent of shippers that accounts for more than 60 percent of all container movements at the point of origin, then national security agencies can focus on a more thorough examination of the remaining 40 percent of containers. The overall result should be to minimize the impact on the flow of international trade. A key to this approach is the security of containers once they have left their country of origin. A number of technologies are already available that allow a container to be tracked and monitored at all times between its origin and destination.

specific investments and reforms to address the regional needs.<sup>23</sup> The World Bank's country-specific programs—and more specifically the Global Trade Facilitation Partnership<sup>24</sup> among more 100 international, public, and private agencies—can also assist countries through investments and technical assistance on trade facilitation issues, while serving as a major source for knowledge sharing in global best practices and capacity building.<sup>25</sup>

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<sup>23</sup> Including for cross-border transport links, improved customs processing, and harmonization of rules dealing with customs, vehicle standards, border crossings by vehicles registered in neighboring or third countries, movement of hazardous material, insurance coverage, safety and treatment of transit traffic.

<sup>24</sup> The Global Facilitation Partnership for Transport and Trade (GFP) aims at pulling together all interested parties, public and private, national and international, who want to help achieve significant improvements in transport and trade facilitation in Bank member countries. The partners will together agree to design and undertake specific programs towards meeting this objective, making use of their respective comparative advantage in the subject matter in a coordinated fashion. <http://wbln0018.worldbank.org/twu/gfp.nsf/>

<sup>25</sup> For example, with distance learning and toolkits on customs modernization, supply chain management, port modernization.

