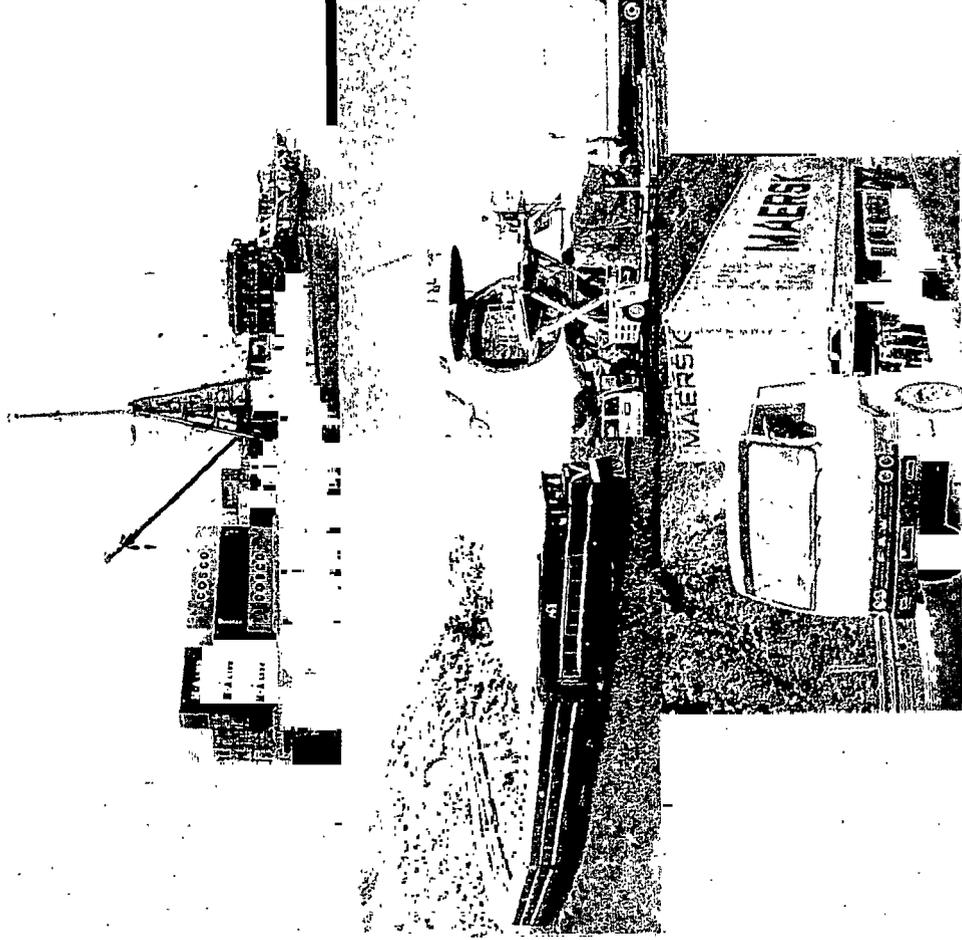


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# Trends in Trade and Logistics An East Asian Perspective

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## ACRONYMS

ADB	Asian Development Bank
AFTA	Asia Free Trade Area
APEC	Asia Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
B2B	Business-to-Business
B2C	Business to Consumer
EDI	Electronic Data Interchange
ECE	Economic Commission for Europe
EU	European Union
ESCAP	Economic and Social Commission on Asia and the Pacific
FDI	Foreign Direct Investment
FOB	Free on Board
GDP	Gross Domestic Product
GATS	General Agreement on Trade in Services
ICD	Inland Container Terminal
ICT	Information and Communication Technology
IMO	International Maritime Organization
NAFTA	North American Free Trade Area
2PL and 3PL	Second Party Logistics and Third Party Logistics
SPC	Sydney Ports Corporation
TEU	Twenty Foot Equivalent Unit
WTO	World Trade Organization
WHO	World Health Organization



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Economists from a wide range of political perspectives have long recognized the importance of the role of transport in trade (see below). Despite this, other considerations, such as tariffs, had overshadowed the significance of this role for a long time and it was not until the last decade that “new economic geography” revived the interest in this field. While not drawing specifically on the work of any one of the contributors to this new field, the authors would like to acknowledge their debt to all of them.

*“Good roads, canals and navigable rivers, by diminishing the expense of carriage, put the remote parts of the country more nearly upon a level with those in the neighborhood of the town. They are upon that account the greatest of all improvements. Though they introduce some rival commodities into the old market, they open many new markets to its produce”*

An Enquiry into the Nature and Causes of the Wealth of Nations, Adam Smith, 1776

*“The more perishable a commodity and the sooner after its production it must be consumed and sold, the more localized are the markets where it can be sold. Such a commodity can come within the grasp of populated districts only to the extent that improved transportation eliminates distance.”*

Das Kapital, Volume II, Karl Marx, 1867

*“A deterioration of infrastructure from the median to the 75<sup>th</sup> percentile raises transport costs by 12% points and reduces traded volumes by 28%.”*

Infrastructure, Geographical Disadvantage, and Transport Costs,  
Nuno Limao and Anthony J. Venables, 1999

*“The death of distance as a determinant of the cost of communications will probably be the single most important economic force shaping society in the first half of the century. It will alter in ways that are only dimly imaginable, decisions about where people live and work, concepts of national borders and patterns of international trade.”*

Frances Cairncross, The Economist, London, September 30<sup>th</sup>, 1995



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## SECTION ONE: GROWTH, POVERTY REDUCTION, TRADE AND LOGISTICS

### Economic Growth and Sustained Poverty Reduction<sup>1</sup>

The *World Development Report 2000/2001. Attacking Poverty*<sup>2</sup> - a report published by the World Bank, highlights the link between economic growth and sustained poverty reduction. Analyses in this report indicate that the proportion of population living in absolute poverty declines as average income rises. Hence, sustained high economic growth can usually be deemed *pro-poor*. The recent reductions in the incidence of absolute poverty noticed especially in the fast growing economies of East Asian countries are often cited as evidence that a significant improvement in the standard of living is primarily driven by high rates of economic growth.

Poverty, a state in which the quality of a person's life falls short of recognized and accepted standards of well-being, is characterized by deprivation and isolation or lack of accessibility to facilities, services (e.g., school, health, public transport), supplies, networking, and marginal or complete absence of participation in a wider socio-political environment. Despite the limitations of data on poverty and deprivation, initial studies indicate that a stimulus in economic growth reduces the incidence of absolute poverty.<sup>3</sup> A number of studies have examined the impact of changes in per capita income on quantitative summary measures of poverty such as the standard headcount rate (as used in the Millennium Development Goals) and have resulted in the following important findings:

- *Economic Growth tends to reduce poverty.* For nearly every accepted indicator of material well being, including accessibility, the incidence of absolute poverty falls unequivocally as per capita income rises;
- *There is great variation in the impact of growth on poverty.* Although growth is a precondition for sustained poverty reduction, its effects vary significantly across countries in a given period and across periods in a given country. Typically, no more than 50 percent of the variation in the poverty measure is explained by income growth; and
- *Policies that are pro-growth also tend to be pro-poor.* Policies believed to encourage economic growth usually allow the benefits of growth to reach the poor and hence reduce the incidence of absolute poverty. Four policies, in particular, that appear to be conducive to economic growth and hence ensure that the benefits of growth reach the poor are:

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<sup>1</sup> This section relies extensively on *Empirics of the Link Between Growth and Poverty*. PREM Note Number 45 on Economic Policy, World Bank (October 2000).

<sup>2</sup> World Bank. "World Development Report 2000/2001. Attacking Poverty." Washington, D.C. (2001).

<sup>3</sup> Kruger, A and A. Borg, World Bank, "Trade, Growth and Poverty," Annual Bank Conference of Development Economics, Washington, D.C. (April 2002).

- keeping inflation low, preferably below 10 percent;<sup>4</sup>
- restricting unproductive government consumption;<sup>5</sup>
- upholding property rights and the rule of law; and<sup>6</sup>,
- maintaining a high degree of openness in trade.<sup>7</sup>

The premise that sustained economic growth and poverty reduction go hand-in-hand is reinforced by the results reported in a recent World Bank publication *Globalization, Growth and Poverty (2002)*.<sup>8</sup> Analysis in this report indicates that the incidence of poverty fell more, on average, in the high-growth developing countries than in the low-growth developing countries. The non-income dimensions of poverty - including life expectancy, extent of infant mortality, and levels of schooling - improved at a faster rate in the high growth developing countries, indicating that growth has *pro-poor* advantages as well.

Although most studies indicate that growth is a prerequisite for sustained poverty reduction, they also reveal a need for strong supporting policies from governments in developing countries to accelerate the dissemination of the benefits of growth within countries.<sup>9</sup> These policies include those that encourage low-cost transport services to remote interior regions that are largely insulated from national and international commerce, and that often include a disproportionately large proportion of the poor. This leads us to our next premise, that increasing trade can set off economic growth.

### **Trade: The Driver of Growth**

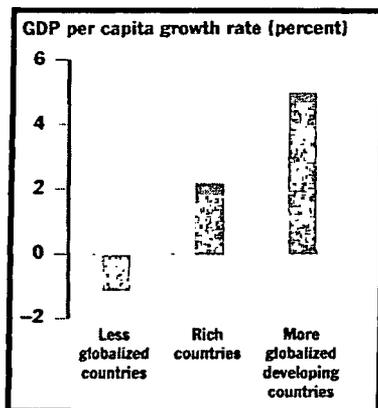
International trade economists have long postulated about the inherent superiority of outward-orientation as compared to inward-orientation for sustained economic growth in economies that depend on given world prices for their products. Outward-oriented economies are more resilient than inward-oriented economies in dealing with adverse external economic shocks. To the proponents of outward-orientation, open trade encourages growth by:

- 
- <sup>4</sup> Ghosh., A. and S. Phillips, "Inflation, Disinflation and Growth". IMF Working Paper 98/68, (1998).
- <sup>5</sup> Easterly, W. and R. Rebelo, "Fiscal Policy and Economic Growth. An Empirical Investigation". *Journal of Monetary Economics*, 32 (3), (1993), 417-458.
- <sup>6</sup> Knack, S. and Keefer, P "Institutions and Economic Performance. Country Tests using Alternative Institutional Measures". *Economics and Politics*, 7, (1995), 202-227.
- <sup>7</sup> Frenkel and Romer."Does Trade Cause Growth?" *American Economic Review*. Vol 89, No 3, (1999), 417-458
- <sup>8</sup> World Bank. *Globalization, Growth and Poverty: Building an Inclusive World Economy*. Washington, D.C., (2002).
- <sup>9</sup> Collier P. and D. Dollar, "Can the World Cut Poverty in Half? How Policy Reform and Effective Aid can meet International Development Goals?" *World Development Vol 29, No 11*, (2001). 1787-1802.  
Dollar. D and A, Kraay, "Trade, Growth and Poverty". *Policy Research Working Paper 2199*, World Bank, 2000.  
Winters, A., "Trade and Poverty. Is There a Connection?". *Mimeo*. Presented at the World Trade Organization, (1999).

- Influencing the efficiency of investment, and enabling countries to benefit from specialization on the basis of comparative and competitive advantages;
- Enhancing technical progress, through the transfer and adaptation of new technologies and knowledge diffusion;
- Forcing fiscal discipline and monetary prudence on countries so as to maintain their level of export competitiveness; and
- promoting transparency and predictability in decision making and preempting ad hoc policy intervention.

The theoretical supposition is corroborated by several recent country-specific and cross-country studies using different indicators of openness showing that trade goes hand-in-hand with faster growth.<sup>10</sup> A recent World Bank study<sup>11</sup> that ranked countries as “more-globalized” and “less-globalized”- with globalization measured as a rise in the ratio of foreign trade (sum of exports and imports) to national income. It found that the more globalized developing countries showed a consistent increase in their per capita growth rate - from 1 percent in the 1960s, to 3 percent in the 1970s, 4 percent in the 1980s and 5 percent in the 1990s. The more globalized developing countries grew faster (5 percent) than even the industrial countries (2 percent) over the last decade, while the less globalized developing countries had declining real GDP per capita.

**Fig 1: Divergent Paths Of Developing Countries In The 1990s**



The non-income poverty dimensions were noticeably higher in the more globalized developing countries indicating that trade-led growth is also pro-poor. Despite their higher growth rate, the absolute difference in income between the more globalized developing countries and the industrialized countries indicates an increasing gap in income between the two. In order to narrow the gap, the present unbalanced distribution of the benefits of international trade in favor of developed countries needs to be reversed (only about one third of the benefits of increased trade between developing and developed countries goes to the former).

Source: Dollar and Kray, 2001

The better growth performance of some emerging countries, especially in the East Asian region, during the last two decades, is largely attributed to their success in penetrating foreign markets in labor-intensive manufactured goods. To a large extent (though not in all cases) this has come from exploiting the comparative advantage of low-labor costs. However, the advantage of low-labor costs may not be sufficient for maintaining or gaining external

<sup>10</sup> Frenkel, J and D. Romer, “Does Trade Cause Growth?” *American Economic Review* (1999), Vol 89, No 3, 1-16.

Frenkel, J, Romer, D. and T. Cyrus, “Trade and Growth in East Asian Countries Cause and Effect.” Working Paper 5732, National Bureau of Economic Research, Mass (1996)

<sup>11</sup> World Bank. *Globalization, Growth and Poverty. Building an Inclusive World Economy*. Washington, D.C., (2002).

market access in an increasingly integrated global economy, unless supplemented by trade-related transport and logistics efficiency increases.

### **The Logistics and Trade Nexus**<sup>12</sup>

The strategic role of the transport sector in enabling sustained economic and social development has long been recognized. The assumption that transport and logistics efficiency are critical in influencing competitive advantage and hence the trading prospects of competing developing countries is, however, recent. The commercial viability of exporting firms - particularly from countries that face pre-determined world prices for their products- is dependent on trade-related transport costs. These costs include:

- those imposed by conventional trade barriers (such as tariffs);
- those associated with guaranteeing door-to-door cargo delivery times;
- The time taken for moving products from factory gate to the final destination; and
- The transaction costs of passing through inter-modal transport interfaces, including fees, tariffs, levies, handling and storage charges

A recent estimate suggests that a 10% increase in transport costs typically reduces trade volumes by about 20%.<sup>13</sup> Higher transport costs affect profit margins, and the impact on profit margin is magnified if exports have a significant import-content, as is usually the case with exports from developing countries, including those of East Asia. In most labor-intensive processing activities where profit margins are typically thin, small differences in trade-related transport and logistics costs can easily determine whether export ventures are commercially viable or not.

Recent developments in theories of location of economic activity, drawing on inputs from trade theory, economic geography, and spatial economics, highlight the importance of logistics costs in influencing the locations of enterprises, both between countries and between regions within countries.<sup>14</sup>

The main indications derived from these developments are that:

- (a) Logistics costs, unlike tariffs, vary widely across countries and therefore also in their impact on trade. With the rapid dismantling of conventional trade barriers and their declining impact on influencing trade volumes, transport efficiency will increase its relative importance in determining the ability of firms to compete effectively in the world economy. Estimates that compare countries' transport cost incidence of exports to the US (the share of international shipping costs in the value of trade) and the tariff incidence of

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<sup>12</sup> This section draws extensively from the Global Economic Prospects (GEP 2002).

<sup>13</sup> Quoted in GEP (2002).

<sup>14</sup> Baier and Bergstand (2001), Cuckrowski and Fisher (2001), Vernon *et al* (1999), Bougheas *et al* (1999), Hummels (1999), and Limao and Venables (1999).

the same products (the trade-weighted ad valorem duty actually paid) show that for 168 out of 216 US trading partners, the incidence of transport costs far outweighed that of conventional trade barriers.<sup>15</sup>

- (b) The cost structures of export enterprises are affected by the quantity and the quality of logistics infrastructure and services. These include road, railway, and internal waterway networks, seaports and airports, warehousing facilities, and supporting communications systems. If services are unreliable and infrequent, or if a country lacks logistics providers that can efficiently handle shipments, firms are forced to maintain excessive inventories at every stage of the production chain. At the wholesale and retail level, firms depend on high quality transport services for distributing products to their final- and often - geographically dispersed locations. Typical inventory holdings maintained in the manufacturing sector in developing countries are estimated to be two to five times higher than in the US.<sup>16</sup>
- (c) The amount of time saved in moving cargo is increasingly important in influencing the trade prospects of competing countries.<sup>17</sup> This would impact the sourcing decisions of multinationals and consequently also the countries that would benefit most from inward foreign direct investment (FDI) in the future. The time factor, associated with moving cargo, can delay final payments to sellers if exporters are responsible for moving freight from the factory gates to the importers' premises. Alternatively, if the importers bear the responsibility for transporting cargo, they may demand a time discount for the time incurred in transit. A recent estimate, based on comparisons between air and ocean freight rates for US imports, puts the per day cost due to shipping delays at 0.8 % of the value of trade in manufacturing goods.
- (d) Transport costs represent a barrier to development of trade in price-sensitive tourism related services. Though difficult to quantify, this is important for countries interested in exploiting their tourism potential. An estimate shows that doubling the travel costs can reduce tourism demand by as much as eight-fold.<sup>18</sup> The price of international passenger transport also affects the mobility of business people, who are key to the formation of multinational production networks.
- (e) Domestic transport costs are important in determining the spatial location of production activities within countries. New economic geography views

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<sup>15</sup> The estimates based on US Bureau of Census are quoted in GEP (2002).

<sup>16</sup> GEP(2002)

<sup>17</sup> Hummels, "Time as a Trade Barrier." *Mimeo*, Department of Economics, Purdue University (2000).

<sup>18</sup> GEP(2002).

agglomeration of economic activity between and within countries as the outcome of the interaction between two opposing economic forces.<sup>19</sup> The “centripetal” forces favor concentration and the “centrifugal” forces encourage diffusion of economic activities. The forces favoring concentration of economic activities are usually specified as:

- Internal economies arising from access to final markets and products;
- Benefits accruing from labor market pooling effects; and
- External economies which might arise from the backward and forward linkage effects that firms create among themselves.

The countervailing forces favoring dispersion are the external diseconomies of agglomeration, including:

- Excess travel time and costs in congested centers, and/or inefficiency costs arising from bans on commercial traffic during workdays in downtown areas. A recent study in France found that a 30 percent transport reduction cost resulted in a 21 percent decrease in the concentration of production and a 32 percent decrease in the concentration of employment;<sup>20</sup>
- Rising real estate values and labor costs, as demand for both outstrips the limited supply; and
- Air and water pollution and other environmental costs associated with over-burdened metropolitan areas.

The balance between these forces determines the spatial location of the economic activity and also indicates the potential role of transport and logistics in facilitating the dissemination of the benefits of economic growth.

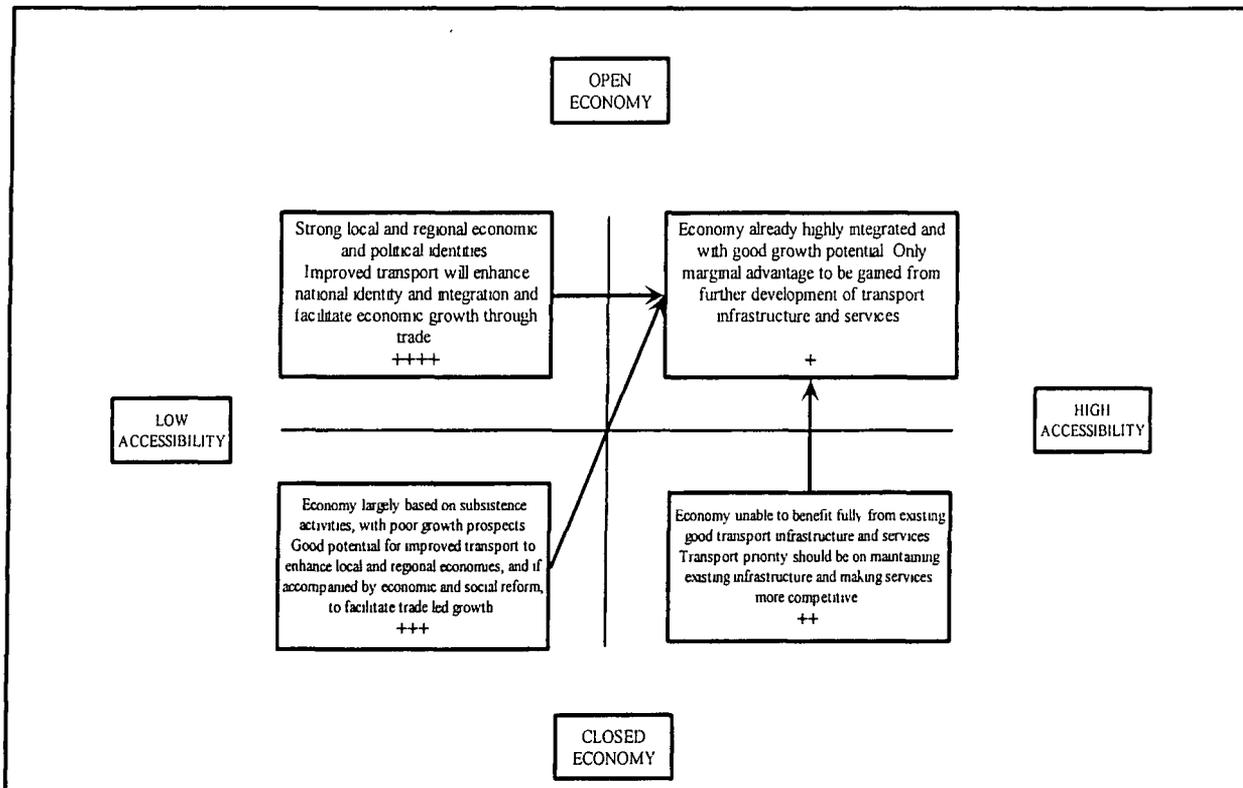
The role of transport in stimulating trade is also dependent on the current state of development of transport infrastructure and services, and the openness of the economy to increased trade. In countries or regions with an already high accessibility, any additional improvement in infrastructure and services will usually only bring marginal benefits at a high cost (relief of bottlenecks can sometimes bring worthwhile benefits, even in these countries). But not so in countries and areas with low accessibility, where improvement can bring high rewards at a low cost. The potential benefits of increased accessibility will not be obvious in closed economies, where investment in better infrastructure and services might not be justified. Trade liberalization and increase in accessibility need to go hand in hand for trade to become a facilitator of poverty reduction in these circumstances.

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<sup>19</sup> Krugman, P., “*Urban Concentration The Role of Increasing Returns and Transport Costs.*” Proceedings of the Annual Conference of Development Economists. World Bank, Washington, D.C. (1994).  
Krugman, P., “*The Role of Geography in Development*” World Bank Conference on Development Economists. World Bank. Washington, D.C. (1998)

<sup>20</sup> Combes and Lafourcade, “*Transport Cost Declines and Regional Inequalities Evidence from France.*” Discussion Paper Series No. 2894. Center for Economic Policy Research.

**Fig. 2: The potential contribution of transport to economic growth**



Source World Bank, based on Bamster and Berechman (2002)

### **Economic Structure, Poverty Reduction and the Role of Logistics**

Four categories of industrial activities - two in primary production and two in secondary production - are relevant to an analysis of the impact of logistics costs on poverty reduction.

#### *Primary production*

The two primary production activities considered are extraction of minerals, and agriculture. Extraction of minerals used in energy production and as raw material in industrial processes is one of the two primary production activities. Although a part of the output of extractive industry is consumed domestically, it is the output for export that merits attention, from a trade and poverty reduction perspective.

These minerals typically have: (i) given world market prices, (ii) low unit values; and (iii) involve transportation of high volumes of output. The extractive process rarely involves high labor input, so the impact on poverty reduction usually comes from revenue generated through taxes that can be levied on the output or export of the extracted minerals. However, the revenue from taxation is seldom earmarked for poverty reduction measures and is not

necessarily allocated to the region from where the mineral is extracted or to the regions with high incidence of poverty.

The location of the extractive industry is predetermined by the geographic occurrence of the minerals – hence the impact of transport and logistics is determined by profitability in terms of location and the prevailing or expected world prices. However, the proportion of the final price taken up by logistics costs can be quite high, reaching 40% for some low unit value minerals. Given this, the role of logistics in production decisions can be important, as can the positive impact of relatively small reductions in such costs.

Agricultural production is often more geared to national consumption than extractive industry, but again it is the output aimed at export markets that is more important from a perspective of poverty reduction through increased trade. While the prices for primary agricultural outputs are also determined by world markets, the producing countries can influence the revenue they obtain by controlling the quality and other physical characteristics of their products. Also, world market prices for many products vary by season, thereby increasing the scope for logistics to influence gross revenues by allowing storage of output until more favorable prices prevail.

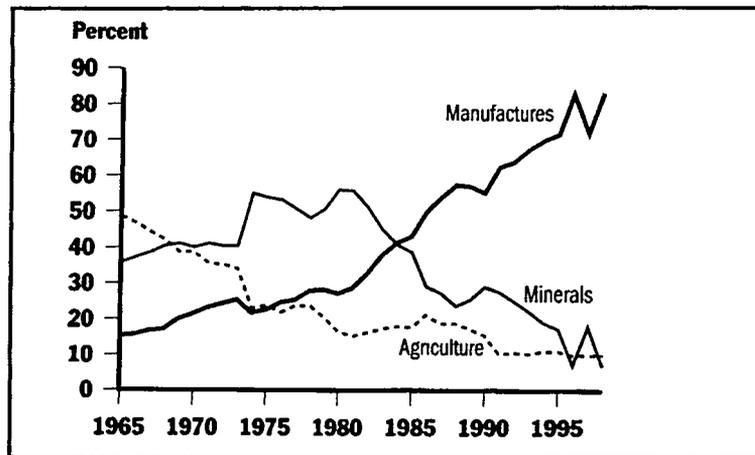
Location of agricultural production, unlike the extractive industry, can be influenced by logistics costs and production-related decisions. With higher labor inputs than the extractive industry, any increase in agricultural output will have a more direct impact on poverty reduction. Also, the proportion of final price that is taken up by logistics costs is generally lower than that for minerals, thereby lessening the influence of logistics costs on production decisions.

The proportion of GDP and exports from the primary economic sector in developing countries is much lower than in the recent past, and is falling most rapidly in economies that are growing the fastest. However, reversing any trend of reduced volume of output, and increasing the proportion of the final price that reverts to the workers directly involved in production can be an important component of a poverty reduction strategy. Reduction in logistics costs should be an important part of either approach.

### *Secondary production*

Most successful recent poverty reduction strategies have concentrated on increasing output in the manufacturing sector, while overall development strategies tend to focus on moving to production of higher value-added products for export. From a transport and logistics perspective, it is the costs of delivering inputs and of getting outputs to their markets that is most important. The location of manufacturing for domestic markets is also influenced by logistics considerations, but the location of markets relative to production facilities bears more weight than for exports, for which access to ports is the equivalent consideration.

**Fig. 3: Shares in merchandise exports of developing countries**



Source. Martin, *Trade Policies and Developing Countries*, World Bank, 2001

### *Industrial location*

The location of industrial processing of domestic materials for local or export markets depends partly on the relative labor and land costs in different locations, but mostly on the relative transport costs of the input and output materials. Where the transport costs of inputs are relatively high, locations closer to the source of those materials are preferred, while higher transport costs of outputs necessitates a manufacturing location closer to the final market. Manufacturing for national markets favors sites that are accessible to large population centers, whereas manufacturing for export prefers locations accessible to ports.

Most of the recent growth in exports of developing countries has come from the globalization of manufacturing, and has been made possible by improved efficiency of international logistics. The high costs of domestic transport and competition from other countries, determines location decisions in favor of sites adjacent to or accessible to ports. These choices are often reinforced by tax incentives that give preference or even tax-exemption status, to specially designated zones close to ports.

Manufacturing industries are often labor intensive and their location in developing countries is dependent on their low unit labor costs. Though the wages paid are low by the standards of developed countries, they nevertheless reduce poverty by generating significant levels of employment. Labor employed in the processing zones of port cities often comes from rural areas, and the remittance of a large proportion of their income back to their families can help stimulate the economies in these areas. Their physical absence from their area of origin can cause counter-productive social impacts, including population depletion and retarded economic development, in addition to the congestion and pollution their employment creates in the port cities.

In order to minimize the socio-environmental problems associated with concentration of export industries in port cities, developing countries need to establish a low cost and a highly reliable logistics systems that can give confidence and incentive to manufacturers to locate away from the ports (or airport for electronics and industries producing high value for weight products) to locations that offer the advantage of even lower unit labor and land costs. They would also benefit from similar tax incentives as given to free-trade zones located close to ports. Although the logistics costs of manufacturing industries are low, often only as 2% to 3% of their final price, their highly competitive nature makes their geographic location and production profitability highly susceptible to relatively small changes in these costs.

## SECTION TWO: GLOBAL TRENDS IN TRANSPORT AND LOGISTICS

Efficient transport and logistics are important for determining the competitive advantage and thereby the growth performance of trading nations in a global economy. Transport efficiency is also important for integrating inland areas within countries, which have largely been insulated from international commerce. Unfortunately, the transport sector also contributes to negative externalities through pollution and congestion that can have serious welfare implications for the poor. In this section we examine the significance of recent worldwide developments in transport infrastructure and logistics, and how they have impacted on congestion and pollution in port cities.

Transport and logistics infrastructure have benefited from dramatic technological and institutional changes that have resulted in cost and time savings for the door-to-door shipment of goods. These developments have been in maritime transport, warehousing facilities, communications, and supporting auxiliary services especially customs clearance and other documentation requirements. The net result has been to facilitate globalization.

### Maritime Developments

More than 90 percent by volume of worldwide cargo movement is by sea and recent decades have seen rapid changes in shipping industry. Maritime services consist of three types of activities: international maritime transport – the actual transportation service performed for moving freight and passengers; Maritime auxiliary services- maritime cargo handling, storage and port services; and activities pertaining to port management.<sup>21</sup> The recent trends in maritime transport have been:

- An increase in sea-borne trade that is faster than growth in globalization and, until recently, has also been faster than air-borne trade in terms of volume;
- A relatively slow growth of non-containerized trade; and
- An upsurge in the growth of containerized trade

The value of sea-borne trade increased 37% between 1980 and 2000, while the world GDP increased by more than 50 percent - the difference being made up by the growth in services and high-value, low-bulk airborne trade.

Bulk sea trade increased 1.3% per year in the last two decades, of which bulk liquid grew at 0.8% per year (mostly oil growth), and bulk solids (mostly minerals and grains) grew at an average of 1.9% per year. General freight increased at 3.2% per year.

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<sup>21</sup> Fink, C. , A. Mattoo and I.C. Neagu, "Trade in International Maritime Services. How Much Does Policy Matter?" *Policy Research Working Paper No 2522*. Development Research Group. World Bank (January 2001)

**Table 1: Global Sea Freight**

Shipping Type	World Increase over 20 years (Volume)	Annual Growth	Maritime Trade (1998) million tons
Bulk	29.5%	1.3%	
Bulk Solid	45.7%	1.9%	1,806
Bulk Liquid	17.3%	0.8%	
General	87.8%	3.2%	1,429
Non-Container	12.7%	0.6%	932
Container	392.7%	8.3%	497

*Source: World Bank estimates, based on Peters (2001)<sup>22</sup>*

Non-containerized general freight has been the slowest growing sector of maritime transport, with an annual growth of 0.6 percent as compared to over 8 percent for containerized general freight the highest growth category. While future growth in non-containerized general freight is likely in the smaller ports that still have not been completely given over to containers, the large hub ports are likely to see growth only in transshipment of general freight for consolidation into containers. This raises the possibility of underutilization of capacity of general freight berths in large ports while the demand for container berths is outstripping their rapidly growing capacity. Since conversion from general freight to containerized freight is less costly than building new berths and terminals or even new ports, many of these under-utilized general freight facilities are likely to see such conversion to container handling.

### **Containerized Cargo Shipping**

Probably the most important maritime development has been the growth of containerized cargo shipping, permitting investment in larger and faster ships, and the globalization of production technology. Today, more than 60% of cargo is containerized, with over 80% of trade between industrialized countries moving in containers. However, the growth rate has varied from region to region. In Europe and North America, the average annual growth has been around 5 percent whereas between Asia and North America it has been closer to 10%, compared to marginal growth in trade between North and South America. Many specialists foresee that containerized trade will continue to grow at between 6% and 8% per year, more slowly than in the past, but still enough to see a doubling of the volume within 10 to 12 years.<sup>23</sup> Growth in East Asia is likely to be higher than world.

Global container shipping companies are under intense pressure to provide shippers with services that include high frequency, faster transit times and low costs. This has led to two distinct trends. The first has been the deployment of large ships for obtaining economies of

<sup>22</sup> Peters, H.J., "Developments in Global Seatrade and Their Effects on the Port Industry and Private Sector Involvement", Baltimore Maritime Advisors, Port Development International (January 2001)

<sup>23</sup> Port Development International, September 2000.

scale, and the second to the formation of alliances through mergers/acquisitions of carriers, for spreading risks and reducing administrative costs.

**Table 2: Actual and Projected Global Container Traffic**

Year	Container traffic million tons	Total TEU million	Trans-shipped TEU Million
1995	403	62	15
2000	565	81	21
2005	792	112	30
2010	1,060	146	40

*Source. World Bank estimates, based on Peters (2001)*

Increase in vessel size is not new in container shipping as evidenced by the progressive increase in maximum vessel size throughout the history of containerization. In the mid 1970s, the 1,000 and 1,500 TEU ships of the first and second generation were replaced by ships of 2,000 TEU, followed by 4,000 TEU plus Panamax vessels that most major lines were acquiring in the 1990s. By 1997, vessels of around 6,000 TEU were already in service, with some carriers considering deploying even larger ships.

By the end of 2001 the world container fleet comprised almost 4,000 vessels with a total capacity of about 5 million TEU, and was increasing at a rate of more than 7.5%. The growth in the largest category of vessels, those greater than 4,000 TEU, was growing at more than 20% per year. The slowest growth was in the smallest category, vessels less than 1,000 TEU. The growth in the larger vessels was reflected in the 24% capacity growth on the routes from East Asia to North America, while the East Asia to Europe routes increased capacity grew by almost 12%.<sup>24</sup>

The implications of such increases in ship size will focus on the hub and spoke system, in which the biggest ships will call at only a limited number of efficient ports on the main trunk routes, with other ports being linked by extended feeder networks. The landside storage of containers from these large vessels will be a major constraint for many ports.

The second major change in container transport has been an escalating trend towards consolidation of ownership through mergers and acquisitions, which is replacing the earlier practice of collaboration between owners. The 20 largest carriers now control around 56 percent of the world container fleet while the top five lines own or operate more than 25 percent. East Asian shipping lines have made the greatest impact, controlling just over half the total capacity. Larger, merged carriers now have worldwide and round-the-world operations, having moved away from single market operations. This offers significant additional advantages in container logistics and the rationalization of port terminals, while allowing shipping lines to retain their distinctive marketing identities and ownership.

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<sup>24</sup> Container Management, November/December 2000

### ***Large Container Ships***

The largest container ships in operation have a capacity of about 6,000 TEU, while ships of 7,200 TEU are under construction. Shipping companies have been constrained, until now, by the standard parameters of port, berth and terminal design - in the same way as aircraft manufacturers have been bound by runway and terminal constraints in designing new aircraft. The standard shipping parameters for maximum access channel depth and maximum berth length are 14m and 300m respectively, but the new large container vessels exceed these limits.<sup>25</sup> A 6,000+TEU vessel requires a depth of 15m and some have a length of 350m but remain within the beam (width) limit of 43m. The width limit is largely imposed by the reach distance of dockside gantry cranes. Constraints on ship size are determined by the power of a marine engine and requirements for speed, and the length/width/depth ratio for navigation stability. It appears that, given the limits of existing engine efficiency, any further increase in ship size will require multiple diesel engines – a transformation that will make it possible to operate 15,000 and even 18,000 TEU vessels. The size limit of a new mega-vessel in South East Asia will be constrained by the depth of the Malacca Straits.<sup>26</sup>

Containerization, combined with developments in information and other technologies has also expanded the range of trading possibilities- the most obvious instances being in the transportation of highly time-sensitive goods. Greater transportation flows allow service providers to operate large vessels and to spread fixed route costs over a large number of shipments.

While this has been to the benefit of larger countries the relatively low trading volumes and uneven loading of containers, has resulted in low-income countries facing longer travel times, less frequent services and higher costs, as ocean carriers require a larger number of stops to fill vessels or operate through hub ports served by feeder services.

### ***Time Sensitive Products***

While larger container ships can reduce the maritime component of total logistics cost, they will not significantly reduce the total transit time of containers between the origin and destination of the goods transported. Even with direct terminal-to-terminal operations, the time taken for the sea voyage makes up less than half the total transit time for most containerized freight. With larger vessels making even fewer calls at a minimum number of hub ports, the main voyage might be reduced to less than a third of the total time. While the relatively long total transit time is acceptable to many, there is a growing market segment of products (for example fashion garments) for which shippers are willing to pay considerably more for a faster delivery time. Any time savings on the main voyage being offset by more and longer trans-shipment stops.

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<sup>25</sup> Lim, S.M., "The Economics of Container Ship Size: A New Evaluation," *Maritime Policy and Management* (1994), vol 21, No.2, 149-160

<sup>26</sup> Strategies for Container Ports, *Cargo Systems*, London (June 2000).

Until recently, the only current alternative for these products has been airfreight, the cost of which can be a major constraint. However, there are two maritime solutions to circumvent prohibitive costs and longer transit times - both depend on sophisticated logistics operations and software. Some global shipping lines are now offering integrated sea-air services from East Asia to Europe, using regular container ships as far as the southern end of the Red Sea, and then providing a direct air transfer for goods to reach their final destination in European cities within half a day of being off-loaded from the container ship. This service gives a door-to-door delivery time of about two weeks, about one week faster than conventional services, and is significantly less costly than air.

The other new option involves two new ship designs that will carry up to 1,000 TEU at about twice the speed of existing container ships, being planned for the North Atlantic routes within the next year. When combined with faster unloading and transportation of containers to their final destination, through a new berth and terminal design that involves containers being loaded and offloaded from both sides of the ship simultaneously and onto waiting rail trains, the door-to-door time will drop to ten days at a cost that will match the sea-air service. The essential element to the whole process is a new concept of logistics planning, with the objective of minimizing non-movement time for containers. Even before the concept has been introduced and proved its viability in the North Atlantic market, it is being considered for the trans-Pacific route, where it could reduce the door-to-door time for a container from inland East Asia to the mid-west of the US by two weeks.

### ***Ports & Port Operations***

Ports are critical nodes facilitating trade flows, and to a lesser extent, tourism flows.<sup>27</sup> Most of the efficiency and competitive gains in port operations have come not from technological changes but from *dramatic changes in who operates them*. A little more than a decade ago, a national port agency or a municipality operated most ports, but pressure from shipping lines for higher investment and more flexible operations made this unsustainable. Port operations are increasingly concentrated in the hands of a few specialist private operators.

The first generation of these new operators came from the private operation of single berths in public ports and their subsequent expansion into concessions for similar berths in other ports. Most of the operators of large networks of ports began this way, but some shipping lines started their own berth-operating subsidiary. The operational and financial success of the first generation operators has attracted the attention of large transport and industrial companies, some of which are now developing competing networks of container berths. The six major terminal operators now own or manage more than 25% of the global port container capacity, and within the next decade the role of common-user public ports can be expected to decline in favor of the continued expansion of private networks.

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<sup>27</sup> World Bank, "The Evolution of Ports in a Competitive World". *Port Reform Toolkit, Module W*. 2000 (Available at <http://www.worldbank.org/transport/ports/toolkit.htm>).

**Table 3: Concentration of Container Berth Operation**

Terminal Operator	Global Port Capacity (million TEU)	Share of Global total (%)	Global Number of terminals	Asia and Middle East - No. of terminals
Hutchinson (Hong Kong)	25.3	11.0	29	17
PSA (Singapore)	19.8	8.6	11	7
APM Terminals (Denmark)	13.0	5.7	28	9
P and O Ports (UK)	8.3	3.6	27	11
Eurogate (Germany)	7.7	3.3	9	0
SSA (USA)	6.0	2.6	14	0
CSX World Terminals	3.5	1.5	9	5
Top seven operators	83.6	36.3	127	49
Other	146.4	63.7	n.a.	n.a.
Total	230.0	100.0	n.a.	n.a.

*Source: American Shipper, February, 2002*

The volume of container movements is being handled increasingly by the largest ports, though there is some evidence that the very largest ports, at about 20 million TEU per year, are now close to reaching the limits of size efficiencies. The combination of ownership consolidation in both the container shipping and container berth markets is reducing the choices available to their clients. But this concentration is also essential to muster the financial resources needed to fund investments in port expansion and modernization, vital to an increase in efficiency.

Some of the major costs of port expansion, including those for land and basic services, for new and improved land access, and sometimes for improved access channels for larger ships, fall on the landlords of the ports and not the terminal operators. These costs, together with the direct investment costs incurred by the terminal operators, if passed on to users, will make port-handling costs an even greater proportion of total logistics costs than the 10%-15% they do at present. Given the strengthening competition between container ports, port landlords (typically the municipality or province in which the port is located) are reluctant to pass all their costs on to users. Instead the costs will become part of their own debt to be financed from local taxes, but with the expectation that the resulting lower charges will attract more business to the port and eventually contribute to a stronger local economy.

### **Ports in Their Urban Context**

Ports in downtown areas face a number of conflicting issues when considering expansion of their container handling facilities. While ports are still seen as substantial direct and indirect employment generators, this advantage can be more than offset by their low utilization of valuable downtown land and their contribution to traffic congestion. This problem can be addressed by reducing their land utilization (for example by conversion of no longer used

bulk facilities), restricting the hours of road access to the port, or by maximizing the use of road and waterways as alternatives to road access.

**Box 1: Ports as responsible neighbors**

A recent study on the economic impact of the port of Fremantle in Western Australia looked into how best to use the disused bulk grain and sugar terminals. The port authority wanted to clear them to enlarge the existing container terminal, and cited the employment generation impacts as the main benefit. In contrast, local interests wanted to convert some of them to commercial and residential use and demolish others to improve the urban environment. Similar arguments are being used in Melbourne and Sydney, but the port authorities there have learned that it is more productive to cooperate with their neighbors than try to fight them, and have instead opted to move non-essential activities away from the downtown area.

The main negative externalities of the remaining port activities would be the noise impacts on residential development that is making use of redeveloped port assets, and traffic generation resulting from container trucks entering the port area. The Melbourne port public relations manager recognizes that "you have to be aware of your responsibilities to the public when you occupy 500 ha in the middle of the city."

*Source. Adapted from Regional Impact of Ports (April 2000)*

Traditional approaches to creating additional capacity, such as the creation of new land through reclamation, relocation or development of another port away from downtown in a less developed area of the city, or some combination of these, may no longer be feasible. Environmental constraints may limit the ability to reclaim significant amounts of water area because of the impact on wildlife habitat and fisheries. Waterfront areas are already often fully built up, precluding both further significant port expansion and release of obsolete port land for city revitalization. Because of this space shortage, cities and ports may compete for the use of proposed reclamation areas for their own purposes.

The development of new ports outside the city, that can retain high quality access to the urban area, may be the only way to fully address the port capacity and congestion problem. Coastal, rather than river locations, are preferred because of their reduced dredging requirements. Typically, coastal ports require less and lower cost dredging to accommodate increasing vessel sizes. New ports outside the city promise reduced land use conflicts and fewer social and environmental issues, including noise impacts on residential areas, thereby avoiding calls for restricted hours of port operation and road access, and the negative impacts of such measures on port operations.

Development of a new out-of town urban port releases city waterfront space for high-revenue-generating uses, public access and enjoyment of the waterfront, and more aesthetically pleasing uses. It brings relief to the environmental problem of degraded air quality caused by urban traffic congestion and concomitant relief to the social and economic problem of the cost of the health impacts of air pollution.

**Box 2: Sydney's Botany Bay - Making best use of an existing port**

The Sydney Ports Corporation (SPC) is addressing the region's projected port capacity problem by coupling land reclamation with inland port development in a program that will keep the port in the city, while relieving city-port tensions. It has proposed the expansion of its primary container port facilities at Port Botany by creation of 173 acres of new land. This is to be combined with development of a new 116-acre inland port some 70kms away, but near existing manufacturing and distribution centers and the end of a dedicated freight rail line connecting it to Port Botany

Maximizing rail use will further reduce road congestion in the vicinity of the port, thereby both reducing impacts on residential areas in this city location and the cost-effectiveness of road transport, further improving inland transport costs. The project is the first part of a long-term strategic plan to redevelop a network of inland ports with a strong reliance on rail that is seen as critical to improved logistics. Decentralization of cargo marshalling, increased speed in the flow of cargo from coastal port to satellite inland port, and customs clearance at inland ports, enabled by electronic commerce, are key elements of this strategy

Source: Adapted from <http://www.sydneyports.com.au/home.asp>

However new port developments are not without their own environmental, economic, and social problems. Replacing an existing port results in a loss of existing infrastructure investments and significant new costs are incurred. As existing ports are the *raison d'être* for their surrounding cities, development of a new port with associated land, industrial and commercial developments; these in turn need a whole range of support utility and access facilities that can involve high investment costs.

Increasingly, ports in urban contexts are looking at *productivity enhancements*, and not simply the conversion of redundant bulk berths to container terminals, to meet expansion needs. These enhancements, by making better use of available space, can help reduce the need for additional waterfront terminal acreage. Every aspect of the marine terminal operation is now seen as an opportunity to increase cargo velocity, from berth occupancy to crane utilization to container dwell times to gate operations. Potential productivity enhancements include:

- changes in terminal configuration (e.g., access channels, yard layout and land access);
- new equipment (e.g., cranes with longer reach and faster cycle time);
- operation changes (simultaneous vessel loading and unloading, container stacking and sorting, advances in automated gate inspection);
- information technology to track and schedule freight transport activities;
- intermodal ship, rail, and truck transfers; and
- multiple terminal data-sharing to provide facility sharing at peak capacity periods.

Traffic congestion is one reason why port activities are slowly moving out of the cities in industrial countries. While addressing these issues and retaining the port in its existing location can be expensive, the cost is usually only a fraction of that needed to build a new port. The State of California and the ports of Long Beach and Los Angeles have recently completed a new rail access to the port that dramatically reduces the traffic congestion. The 32 km long Alameda corridor is a railroad expressway with a potential capacity of up to 100

trains per day operating at 60km/hr rather than the 20km/hr of the previously used road links.<sup>28</sup> The project consolidates four existing rail lines with more than 150 km of rail and 200 highway crossings into a single high-capacity corridor with no road network interfaces, equipped with a centralized traffic control. The cost of over US\$3 billion is justified if the port is to continue expanding, and if traffic congestion is to be significantly reduced. The corridor will relieve the road network of some 20,000 truck movements per day. The costs were distributed between the beneficiaries, with users repaying the bond and loan costs through a user fee of US\$15 per loaded container. This provides a useful example not only for other cities in the US but also for those in developing countries that want to create more space for port-related activities without creating traffic congestion in their urban area.

**Table 4: Funding Sources for the Alameda Corridor**

Source	U\$million	
Port of Los Angeles	394	Grant
Port of Long Beach	394	Grant
County of Los Angeles	347	Grant
Alameda Corridor Bonds	1,160	Revenue Bond
Federal Highway Administration	400	Grant
Other federal funds	400	Loan
Total	3,095	

Source World Bank estimates, based on Washington Post, May 21, 2002

**Box 3: Rotterdam - Port expansion as part of a regional plan**

Since its initial development on the Rhine delta, the **Port of Rotterdam** has expanded 26 miles westward towards the seacoast, releasing obsolete dockyards for City revitalization in the process. After a lengthy national debate and a study, the Dutch government agreed that the reclamation project could go forward in stages, with implementation governed by a planning process adhering to the principle that the additional land was to meet both the port and the city's spatial needs. An important part of the planning process was the specification of the operational meaning of this second objective; operationalization was to provide the means to measure and communicate performance in achieving the objective, and decision-making in light of performance. Joint decision-making through a public participation process and involvement of key stakeholders was a critical feature of the planning process.

The plan became regional, covering the greater Rotterdam area. A further example is the promotion of water-borne freight transport over road transport to simultaneously address inland freight transport needs, while reducing truck traffic and noise, road congestion, air pollution, as well as the space needed for highway development. Today the Port is developing a new planning direction to integrate port and city uses and wants to make this integration the basis for a marketing concept.

Source: Adapted from <http://www.portofrotterdam.com/UK/index.asp>

<sup>28</sup> "Landside Problems of Container Movement: The Alameda Corridor in California," *Container Management* (Nov/Dec 2000), p74.

Moves to encourage the transportation of containers to and from the port of Rotterdam by waterway and rail are proving successful, with inland shipping having a 36% share and railways, despite capacity constraints, having 14%. The road share, which had been as high as 66% in 1993 has fallen to 50% and is expected to fall further. Barge operators are opening services that connect to the heart of Europe, and a new combined river/rail service opened in August 2000, linking barge operations to inland ports with onward transport by rail. Barges handle even container movements within the port, with shuttle services operating between various terminals.

### **Multi-modal Transport**

The volume of inter-modal freight traffic is growing worldwide. The number of inter-modal containers moving through ports worldwide doubled over the last decade, with the volume of inter-modal airfreight, inter-modal rail traffic and inter-modal freight moved by truck growing at a similar pace.

For the most part, continued growth will be handled through existing ports and terminals; however, the weakest link in the chain will not be the ports and terminals, but the reliability of highway and rail access serving them. Both truck and inter-modal rail operators are caught in - and contributing to - a spiral of congestion. Though congestion will not shut down ports and terminals, it can have devastating and disproportionate impacts by degrading the reliability and predictability of inter-modal service for shippers and receivers. These two features are the most important characteristics of freight transportation in an era of tightly integrated operations and just-in-time inventories. Unless accessibility to ports and airports is addressed, the safety, reliability, and responsiveness of the inter-modal freight system will deteriorate and its contribution to stimulating international trade will be diminished, as will the feasibility of industries based on international trade to move inland from their present coastal locations.

As a first step, the transport system needs to be viewed as an inter-modal entity, rather than being comprised of several different modes that act independently. A logistics transportation system can only improve if its modal components are efficiently combined in an inter-modal system. All international transport of freight is inter-modal to some extent, although until recently interest has largely remained focused on the maritime or air component. Even for trade related industries located in port cities, land access for the inputs and road access to the port is an essential component of their logistics structure. For industries located further away, rail or even coastal shipping or inland waterway transport can be viable alternatives to road access to the port.

Trade documentation is a particularly difficult hurdle for international trade with an inland origin or destination. There is a great reluctance on the part of customs and health authorities to allow inland clearance. If containers have to be loaded or unloaded in the port, the principal advantage of container transport, keeping the goods in a door-to-door secure environment is lost, as well as a higher transport cost is often incurred. Unless inland clearances can be made, international trade related activities are unlikely to locate away from port cities.

## **Logistics and Production Technology**

The emergence of independent logistics operators providing multidimensional services - including packaging and labeling and border processing, including tracking shipments and other services - is a recent trend. Logistics evolved from considerations of physical distribution of goods in industrial countries during the 1960s. Although transportation companies initiated most of the advances, logistics in the initial stages was internal to these firms (*Second party logistics providers - 2PLs*). The firms gradually expanded their area of interest from transport to warehousing, distribution contracting, and freight forwarding, to facilitating the movement of cargo within and between countries. Many shipping lines contracted with land transport companies for the door-to-door movement of time-sensitive cargo.

The next evolutionary stage that came about in the 1980s entailed integrating transportation and storage with pre-production activities, such as material sourcing and inventory management. This transformation reflected a change in emphasis from minimizing inventory holding to speeding up the processing of inventory, but the logistics concept remained internal to the transport companies, which remained largely responsible for the risks associated with moving cargo door-to-door.

The third stage, the supply chain management, extended the principle to all participants in the production and distribution process - including suppliers, manufacturers, vendors, and distributors. A corollary to this stage has been the emergence of companies who do not necessarily participate in the supply chain themselves, but coordinate the activities of others, (*Third party logistics service providers - 3PLs*), as an *externally* provided service. The evolution of 3PLs has been associated with a retreat to the "core business" by manufacturing enterprises wishing to minimize risk by reducing the number of logistics providers with whom they contract. These changes are leading to the development of long-term strategic alliances between manufacturers and logistic service providers, with the service providers specializing in taking the risks associated with consolidation and co-ordination in moving cargo.

## **Information Technology and E-Commerce**

Alongside these changes, there have been advances in information and communication technology (ICT) and electronic commerce with its prospects for providing a quantum jump for logistics. The Internet has emerged as a vital component of the new marketplace infrastructure, with its potential for creating value on both sides - on the demand side by allowing firms to customize to suit specific requirements and on the supply side by reducing costs.<sup>29</sup>

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<sup>29</sup> Chorafas, D., *The Internet Supply Chain Impact on Accounting and Logistics*. New York, Palgrave (2001).

Unlike the traditional supply chain (manufacturers, wholesalers, retailers and buyers) - advances in Internet-based commerce promote direct business-to-business (B2B) and business-to-consumer (B2C) contact, by cutting through swathes of middlemen. This entails distributional cost savings by reducing procurement costs, both by making it easier to locate the least-cost supplier and through efficiency gains since it is easier to place orders online. A second possible saving is from the possible lower distribution cost of goods and services that can be ordered electronically.

Several sites already offer a unified source for shipment location and statutory information spanning multiple vendors, customers and warehouses. Features offered include proactive delay notification and full 3PL services, including scheduling, multi-modal coordination, price quotations, shipment costing, insurance/tax/duty requirements and full customs and health clearances. Some sites allow for fuel supply and trading, leasing of containers, swapping boxes and managing slot capacity. As this is now being combined with asset tracking systems, system efficiency improvement results in significant user cost reductions, which stimulates more trade between the globally integrated countries.

### **Air Transport**

The deregulation of the air transport industry, first in the US and then elsewhere, provided a stimulus to the growth of the industry. Competition in the industry grew as airlines were granted greater freedom to determine their routes and schedules. With continuous falling of air shipping prices, the share of world trade (by value) shipped by air has grown – from 7% in 1965 to 30% in 1998 in terms of value for U.S. imports.<sup>30</sup>

International markets are built around the gateway structure, and the few freight forwarders who control the market feed the concentration of freight business into these gateways. The top 15 international forwarders control 61% of airfreight, keeping their flows concentrated in a few airports rather than fragmenting them in larger numbers.<sup>31</sup> They do not want to experiment with new gateways, fearing it could upset competition with other forwarders. This makes it difficult for new airports to attract freight services.

To users, an attractive airport is one that can offer an around-the-clock operation, spacious ramps and aircraft parking areas, simple transfer of freight between aircraft and storage and easy access to customers logistics networks, but perhaps most of all, a location that is easily accessible to the markets they want to serve. Freight airlines are following a similar development path to that of global shipping lines, establishing their own network of gateway air freight terminals similar to the container terminal networks of the shipping lines.

Reliable, frequent, air services to multiple destinations bring significant economic and social benefits. They are major direct and indirect employment generators, with about three direct employees for every 10,000 air passengers and an equivalent number of indirect employees. In addition, local authorities see good air services as being necessary to attract new industry,

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<sup>30</sup> Based on figures quoted in Global Economic Prospects (2002).

<sup>31</sup> This section draws on “Freighter-Friendly Offerings”, Adele Schwartz, Air Transport World, May, 2002

especially that which is export oriented. When major freight users of airports search for locations for their hubs, they are frequently offered significant financial incentives by local governments who see the benefits of increased trade and operational attraction as being greater than any direct cost of the incentives.

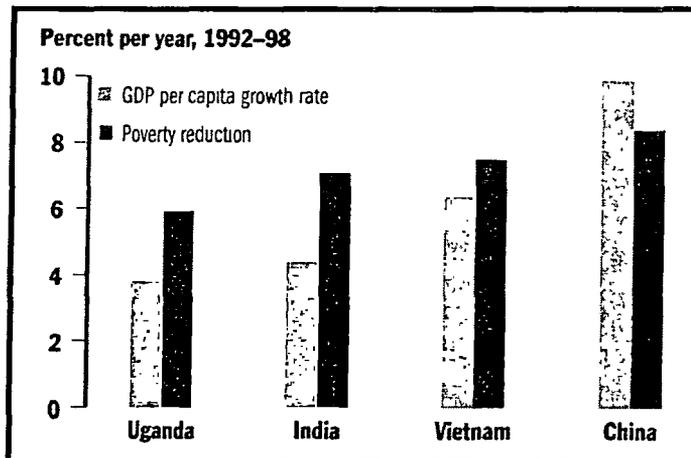
The positive attractions of well-serviced airports are seen to outweigh the disadvantages of noise and traffic generation. The former, while being a nuisance to those most affected, can have its impacts minimized by locating flight paths over water or non-residential areas. Air cargo has traditionally used older aircraft that are the most adversely affected by noise restrictions, so new airports that are isolated from urban areas can take advantage of the fewer operating constraints imposed for noise reduction.

Traffic generation is just as difficult to manage, and often results in airports being located away from the populations and industries they are intended to serve. The particular trade-offs between maintaining good accessibility while minimizing these negative externalities depend on physical and social geography as well as on local politics.

### SECTION THREE: TRADE LED GROWTH IN EAST ASIA

Over the last two decades trade-led economic growth in East Asia has been exceptionally high, broad based, geographically diverse and sustained over time, despite the crisis of the mid-1990s. The region's nominal GDP increased from about US\$100 billion in the late 1960s to more than US\$2.4 trillion in the late 1990s, an increase in wealth that most countries in the region participated in. With the exception of 1998, the region's GDP grew at approximately 7% per year, as compared to the growth rates of 5% for South Asia and 3.3% for Latin America. This increase in GDP was associated with an even greater increase in trade. Countries in the region have more or less recovered quickly from the repercussions of the financial crisis - albeit at different rates - and the quick recovery in the region has often been cited as testimony to the resiliency of outward-oriented economies.

**Figure 4: Relationship between GDP growth and poverty reduction**



The growth performance was also matched by large reductions in the incidence of absolute poverty in most countries of the region<sup>32</sup> - notably in Vietnam, China, and Thailand - and to a limited extent in Indonesia, Philippines, and Cambodia.<sup>33</sup> Though the growth estimate for the region in 2001 is lower (at 4.4%) due

Source *Global Economic Prospects, 2001, World Bank*

to the synchronous economic slowdown in US, the EU and Japan, the growth forecast up to 2010 is still higher for the region as compared to the other developing regions.

#### Global and Regional Integration

The sustained growth performance of the region is usually attributed to the region's global integration. In terms of trade, East Asia's share of world imports and exports increased from a mere 5% in the 1970s to 18% for exports and 15% for imports in 1999. While the process of global integration has been under way for quite some time in the high-income emerging

<sup>32</sup> Warr, P. "Poverty Incidence and Economic Growth in Southeast Asia" *Journal of Asian Economics*, 11 (2000). 431-441.

<sup>33</sup> Asian Development Bank, *Key Indicators for Asia and the Pacific*. Oxford University Press, Oxford (2000).

countries of the region, even the low-income and hitherto largely insulated countries like China, Cambodia, Vietnam and Laos are being increasingly integrated with the global economy, as witnessed by China's accession to WTO and other countries applying for its membership. The region is also integrated more than ever before as witnessed by the joining of Cambodia, Vietnam, Laos and Myanmar to ASEAN during the last decade and the conversion of the ASEAN to a free trade area (AFTA) by 2003, and China's proposed entry to an expanded Asian free trade area. Intra-regional trade is expected to increase much faster as a result of these developments.<sup>34</sup>

Two objective indicators of increasing global integration are the foreign trade (sum of exports and imports) /GDP ratio and the level of FDI in developing countries. The region had the highest ratio of trade to GDP in the developing world in 1999 - with trade accounting for a third of the GDP and approaching 75%, if Japan is excluded. There is evidence that the trade/GDP ratio begins to fall as GDP per capita passes a threshold of about US\$12,000 to US\$15,000. Since net capital inflows are typically no more than a few percent of GDP, rising export ratios are associated with rising import ratios. Thus the rapid rise in exports in the East Asian economies is indicative of a more general process of global integration

**Table 5: Trade and GDP of Selected East Asia Countries**

Country	Population (million)	GDP per capita US\$	Exports as a % of GDP	Imports as a % of GDP	Trade as a % of GDP	Trade balance
Cambodia	11.8	285	43.6%	34.1%	77.7%	78.2%
China	1,253.6	769	19.2%	22.1%	41.3%	115.1%
Fiji	0.8	2,250	63.1%	68.3%	131.4%	108.2%
Indonesia	207.0	631	26.9%	34.8%	61.7%	129.4%
Japan	126.6	30,016	8.7%	10.4%	19.1%	119.5%
Korea	46.9	8,414	35.3%	42.1%	77.4%	119.3%
Lao	5.1	314	48.5%	37.9%	86.4%	78.1%
Malaysia	22.7	3,590	96.6%	121.6%	218.2%	125.9%
Mongolia	2.4	375	55.4%	49.6%	105.0%	89.5%
PNG	4.7	872	41.9%	44.9%	86.8%	107.2%
Philippines	74.3	1,062	50.2%	51.1%	101.3%	101.8%
Thailand	60.2	2,100	44.9%	57.3%	102.2%	127.6%
Vietnam	77.5	342	47.1%	36.3%	83.4%	77.1%
Total	1,893.6	2,955	16.1%	18.5%	34.6%	114.9%
Total (ex. Japan)	1,767.0	1,109	31.7%	38.8%	70.5%	122.4%

Source: *World Development Indicators, 2000*

<sup>34</sup> Fukase and Martin, "Free Trade Area Membership as a Stepping Stone to Development. The case of ASEAN " *World Bank Discussion Paper No 421*, Washington, D.C. (2001).  
Tongzon, J., "China's Membership in the World Trade Organization and the Exports of the Developing Economies of East Asia." *Applied Economics*, 33 (2001) 1943-59.

Increasing trade/GDP ratios indicate growing integration in almost all the countries of the region, though in varying degrees. The ratio for Malaysia (and for Hong Kong and Singapore, not shown in Table 5) is over 200% and for Fiji, Philippines, Thailand, and Mongolia over 100% in 1999.<sup>35</sup> The 41% ratio for China in 1999 (up from 15% in 1982) is a sign of its increasing global participation. Japan has a low ratio, as would be expected from its high GDP per capita.

### **Foreign Direct Investment**

FDI has been one of the major factors responsible for the economic dynamism of the region by providing capital and technology. In terms of attracting foreign capital, East Asia has seen major gains in portfolio bank lending from abroad - and more importantly in attracting FDI, which has grown consistently since 1982, with East Asia's share among developing countries expanding particularly since 1990. The region attracted about US\$600 billion in FDI, representing nearly half of such flows to developing countries. Two notable features of the growing FDI in the region are an increasing share of FDI going to the transition economies of China, Vietnam, and to a more limited extent, to Cambodia, in the last decade and a change in the pattern of FDI. While the FDI going to China until 1996 was concentrated in export-oriented activities in the designated special economic zones and largely driven by the potential for exploiting the low labor costs, there are indications that the FDI since 1996 is driven more by the prospects for exploiting the internal domestic consumer market.<sup>36</sup> This trend is expected to intensify further following China's entry to WTO.

The region however, exhibits extreme differences in living standards between and within countries. It has some of the lowest per capita income countries - Cambodia, Laos, Myanmar - and some of the highest - Japan and Singapore. While many of the countries are coastal and accessible by sea, Laos and Mongolia suffer from the geographical disadvantages of being landlocked and dependent on transit through third countries for their external trade. Whereas the internal transport networks of the high-income emerging countries are comparable to international standards, many of the low-income regional countries have inaccessible hinterlands, largely insulated from the benefits of international commerce.

### **Regional Growth Pattern and the Flying Geese<sup>37</sup>**

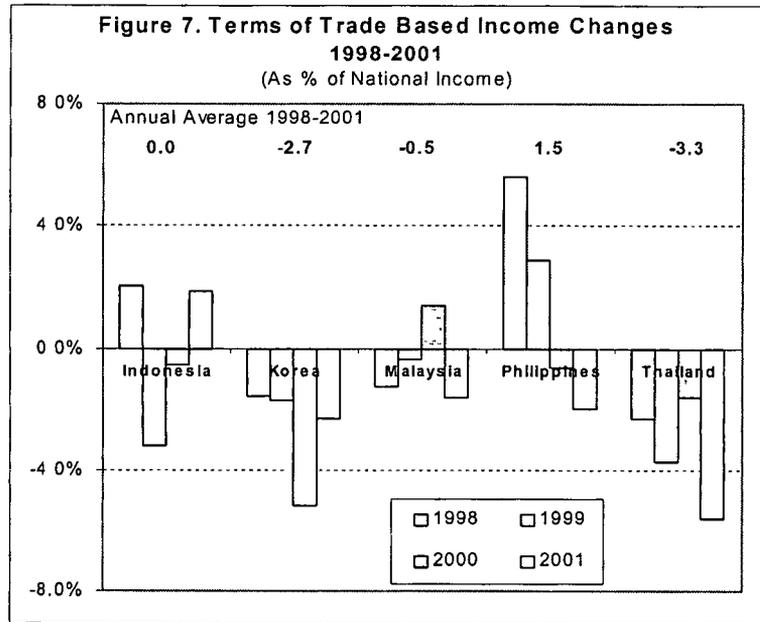
An important feature of regional development in East Asia is the transfer of general ideas and models among countries. A distinct trend can be discerned in the regional growth pattern through time in what has been termed the "*flying geese*" effect.<sup>38</sup>

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<sup>35</sup> Hill, H., "Export Success Against the Odds: A Vietnamese Case Study" *World Development* (2000), Vol 28, No 2. pp 283-300.

<sup>36</sup> Graham and Wada, "Foreign Direct Investment in China: Effects on Growth and Economic Performance". ed. P. Drysdale, *Achieving High Growth: Experience of Transitional Economies in East Asia*, Oxford University Press, Oxford (2001)

<sup>37</sup> Dowling, M., Chia Tien Cheang. "Shifting Comparative Advantage in Asia: New Tests of the "Flying Geese" Model". *Journal of Asian Economics*, 11 (2000). 443-463

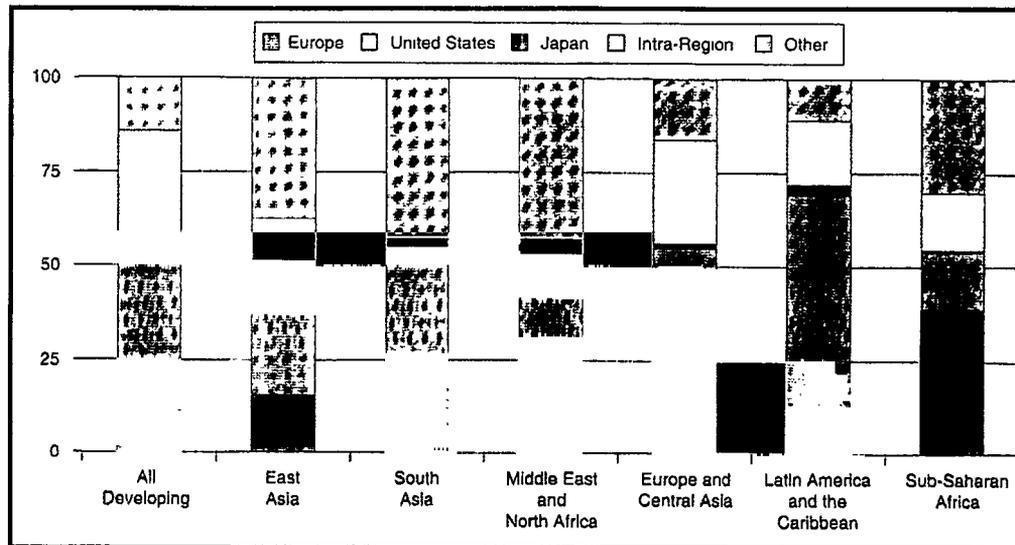


An important factor in the nascent recovery of the region is the stabilization of primary commodity prices, which started rising from late 2001, as did semiconductor prices. Even if the region's terms of trade do not improve markedly, the fact that the countries in the region did not suffer further large income losses due to changes in terms of trade is a positive factor fostering recovery.

#### *Direction of Exports*

Though the region's exports are diversified in terms of commodity composition, they are highly concentrated in terms of final markets, thereby rendering the region vulnerable to adverse external economic shocks. The market destinations for the region's exports are mainly the industrial countries. The US, EU and Japan together account for nearly half of the region's exports. While the question of external market penetration remains a concern for the low-income countries of the region, the question of gaining market share through maintaining competitive advantage in an integrated global economy is pertinent for all the countries in the region.

**Fig. 8: Major Destinations of Developing Countries Exports**



*Global Economic Prospects 2002, World Bank*

#### *Limited intra-regional trade*

Intra-regional trade between member countries, though increasing in recent years, is limited - despite the large domestic markets of China, Indonesia and Vietnam - as compared to the other regional blocs in the world - such as the EU, NAFTA and Mercosur. Even within ASEAN, a collection of countries grouped together to stimulate trade in the member countries, internal trade is limited to only 4% of their total. Though the region has emerged as an important source of diversified goods to industrial countries, trade within the region is largely commodity-based. Many of the manufactured goods imported into the region from elsewhere could be supplied from within the region at less cost. Such market concentration makes the region susceptible to adverse country-specific shocks. Greater trade diversity would provide a higher level of confidence in sustainability of trade-led growth.

One of the main reasons for the limited intra-regional trade is the pattern of logistics costs, which makes many countries of the region effectively closer to industrial countries than their geographical neighbors. Logistics efficiency is likely to enhance intra-regional trade, particularly in view of the potential offered by the opening of the Chinese economy and proposed conversion of ASEAN to a free-trade area.

#### *Agglomeration Of Economic Activity*

A feature of East Asia's trade-led growth is the growing agglomeration of export-oriented activities in and around coastal areas. The hinterland areas of many countries have been isolated from international commerce, and hence benefited much less from the trade-led

The high-level manufactured goods exports from the region can be attributed to three causes: growth of diversified manufactured goods;<sup>39</sup> concentration of trade on market locations that have a higher than average rate of growth of total imports; and a residual “competitiveness” effect due to gain in productivity associated with the export activities of the region. Almost all analyses have shown that East Asia’s export boom has mostly been attributable to the last of these.<sup>40</sup>

Though most countries have a diversified export structure in terms of commodities, some of the less accessible countries remain highly dependent on a small range of basic export products (Table 12). These countries are highly vulnerable to changes in demand for these products and would benefit from a greater diversity in products exported. Reduced logistics costs are often a necessary condition for attracting the increased FDI that is needed to bring about a more diverse mix of exported products.

**Table 7: Export Concentration Of Selected East Asian Countries**

Country	Top 3 exports	Top 5 exports	Products		
China	13.8%	21.8%	Telecoms equip.	Computer	Apparel
Thailand	20.9%	26.2%	Office equip.	Transistors	Fish
Indonesia	23.6%	29.7%	Gas	Petroleum	Veneer
Korea	27.3%	38.5%	Transistors	Cars	Telecom
Malaysia	39.9%	50.0%	Transistors	Office equip.	Computers
Vietnam	44.3%	60.3%	Petroleum	Textiles	Seafood
Singapore	48.4%	60.8%	Transistors	Computers	Petroleum
Philippines	59.9%	66.6%	Transistors	Computers	Office equipment
<b>Cambodia</b>	<b>78.3%</b>	<b>80.2%</b>	<b>Garments</b>	<b>Timber</b>	<b>Rice</b>
<b>Mongolia</b>	<b>84.5%</b>	<b>93.4%</b>	<b>Copper</b>	<b>Wool</b>	<b>Hides</b>
<b>PNG</b>	<b>64.6%</b>	<b>74.5%</b>	<b>Gold</b>	<b>Petroleum</b>	<b>Copper</b>

Source: *Global Economic Indicators, 2002*

### *Commodity prices*<sup>41</sup>

In recent years large declines in export prices and terms of trade have inflicted significant income losses on several East Asian countries. The poorer countries in particular have been adversely affected by changes in commodity prices. Dollar prices for developing countries’

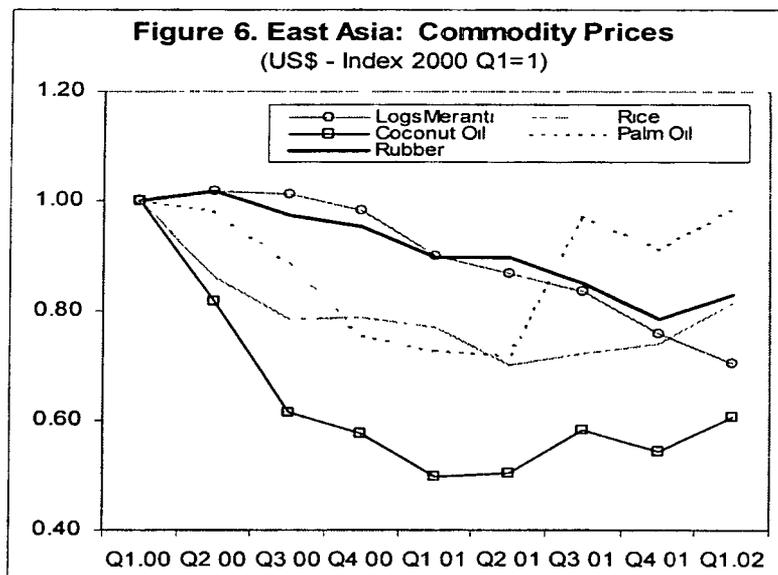
<sup>39</sup> Kohli, U., “Accounting for Recent Economic Growth in Southeast Asia. Review of Development Economics.” 1(3) (1997), 245-256.

<sup>40</sup> Funke and Ruhwedel, “Export Variety and Export Performance. Evidence from East Asia ” *Journal of Asian Economics* 12 (2001) 493-503.

<sup>41</sup> This section (b) is taken from “East Asia Rebounds, But How Far?”, East Asia and Pacific Region, World Bank, April, 2002

non-oil commodity exports fell 9 percent in 2001 and a cumulative 32 percent in 1998-2001. Agricultural prices fell by a cumulative third in this period, largely due to currency depreciations, among exporters in East Asia and Latin America. World coffee prices, for example, were affected by large production increases resulting from market-oriented reforms in Vietnam's coffee sector. Copra, coconut oil and coffee prices fell by over 50-70 percent in 1998-2001; palm oil, rice and rubber by 40-50 percent; and cocoa and lumber by 30-40 percent – all important agricultural products from South East Asia and the Pacific Islands. Meanwhile semiconductor prices also slumped with the global hi-tech recession in late 2000. The terms of trade of net oil importers in the region were also reduced by the rise in, and higher trend of, oil prices in the last few years: world oil prices averaged US\$23-24 a barrel in 1999-2001, nearly 30 percent more than the average of the preceding years of the 1990s.

The lower export prices and higher oil prices of recent years have cut into the incomes of not only the small low-income commodity exporters and island economies of the region, but also of some of the larger and more developed economies. Losses due to lower terms of trade in Thailand averaged 3.3 percent of national income per year in 1998-2000 – a cumulative 13 percent in these four years. Annual terms of trade-based losses averaged 2.7 percent of national income in Korea in the same period.<sup>42</sup>



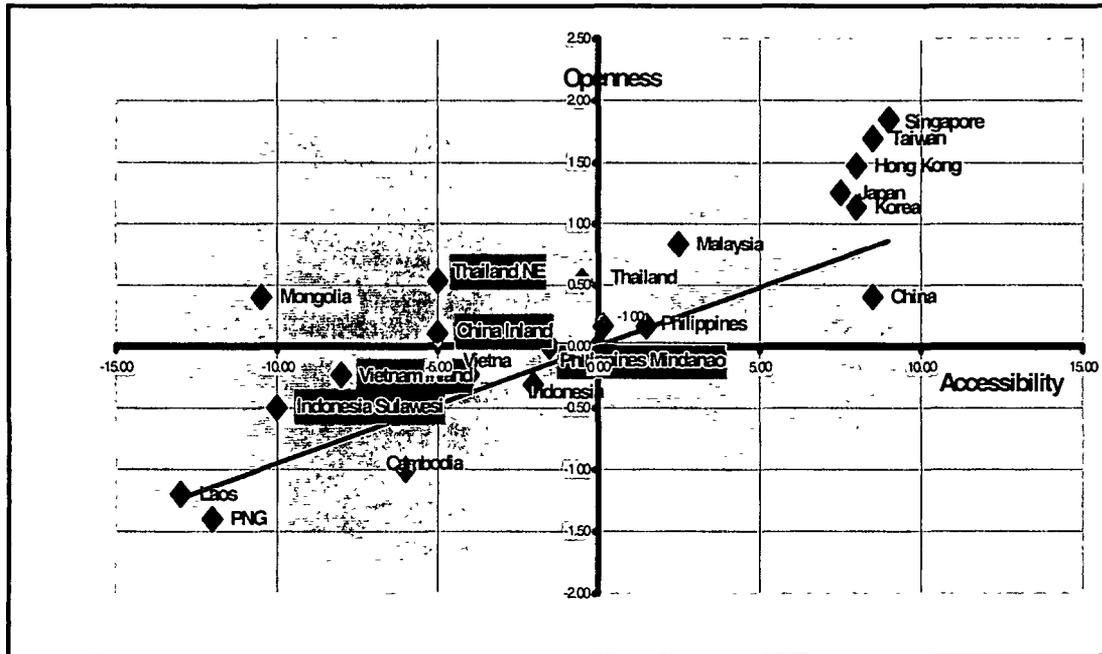
These aggregate losses of national income are composed of losses in the incomes of businesses, farmers and employees, the precise distribution between different groups depending on the economic structure of each country. Whatever their precise distributions, income losses of such magnitude are likely to have had a serious effect in depressing private investment and consumption demand in the most seriously affected countries.

<sup>42</sup> Terms of trade based income losses are measured using national income account deflators for exports and imports.

## Potential Contribution of Transport to Economic Growth<sup>49</sup>

A useful indicator of where logistics improvements could contribute to increased trade comes from a consideration of physical access to world markets and trade openness. The more advanced countries of the East Asian region have ports that are already highly accessible to global markets and have economies that are highly supportive of international trade.

**Fig. 9 Potential Contribution of Transport to Economic Growth in East Asia**



Sources: Openness measures derived from Global Competitiveness Report, 2001-2002 and Accessibility derived from Bank staff estimates

These locations continuously upgrade their logistics services and transport infrastructure to retain and improve their competitive advantage (these locations appear in the top right quadrant of Fig. 9). Further growth of the economies of these regions will create additional employment opportunities, which will essentially be taken up by migrating labor from less accessible regions.

This quadrant also includes countries that are rapidly improving their logistics, such as Malaysia and Philippines. Their measure of accessibility is low because their principal ports have few direct container services to Europe and the US, and containers need to be

<sup>49</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 this 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 TEU from the metropolitan region of the largest port to Hamburg. For inland regions, the land transport cost to the metropolitan region has been added.

transshipped at Singapore. However, their trade openness is quite high (though not as high as the trade leaders in the region) and increasing with competition.

The less accessible countries and regions (shown shaded) are to the left of the vertical axis in Fig. 9. Those above the horizontal axis have economies that are more open to international trade than those below the axis, and also stand to gain the most from improvements in their logistics services and transport infrastructure. These include Mongolia, the northeast provinces of Thailand and the inland provinces of China. All three are effectively land-locked and have poor transport infrastructure linking them to deep-water ports. They also have relatively high proportion of their population below the poverty level, and have a good potential to reduce this through increased trade once the logistics impediments have been reduced.

The countries below the horizontal axis need to increase their trade openness as well as improve their logistics services. Only Lao PDR, Samoa (not included in the Figure) and Vietnam are current candidates to the WTO.<sup>50</sup> While the analysis presented in Figure 9 relates only to international maritime trade, similar considerations apply to airfreight and the indications broadly speaking remain the same. A candidature to join WTO creates conducive conditions for opening the economic environment to international trade. These countries, therefore, have added potential for improved logistics. Papua New Guinea and Cambodia however need to move towards a level of trade openness in order to benefit from economic growth and poverty reduction.

A second indicator of the trade potential of a logistics improvement come from a consideration of trade to GDP ratios. First, countries with a relatively low GDP to trade ratio have more scope to benefit from a reduction in logistics costs than those that are already performing well on this indicator. Countries in East Asia with significantly lower ratios than the average of 26 states of Eastern Europe and Central and East Asia are Cambodia, China, Indonesia, Korea, Lao PDR Vietnam (Figure 10).

The first three of these, together with Philippines, Thailand and Mongolia also have ratios lower than those predicted by a trade regression model<sup>51</sup> that provides estimates of trade to GDP ratios based on GDP per capita, population, accessibility and trade openness.

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<sup>50</sup> ([http://www.wto.org/english/thewto\\_e/acc\\_e/workingpart\\_e.htm](http://www.wto.org/english/thewto_e/acc_e/workingpart_e.htm))

<sup>51</sup> The model uses data from 26 countries of Eastern Europe, Central and East Asia. The data comprises measures of GDP (PPP) per capita, logarithm of population (2001 estimates) and the same measures of average accessibility and openness as used in Fig. 9. All the regression parameters were significant at the 5% level and the adjusted  $r^2$  value was 0.80. More details will be provided in a subsequent working paper.

growth. For instance, in China, more than 90% of FDI 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 easily accessible to the deepwater port at Sihanoukville. Most countries in the region now want the benefits of increased trade to spread to their inland areas that have a disproportionate concentration of the poor.

There is an inherent conflict between the need to minimize the cost of delivering goods to geographically dispersed locations, to remain competitive globally and to ensure that growth has *pro-poor* advantages as well. While some of the countries in the region are coastal, others have interiors so distant that access to a port - in terms of costs and time- is even greater than the maritime transport from the port to the destination country. When goods originate or terminate in distant regions, inland transportation cost can be a significant component of door-to-door transport cost, particularly if the transport networks serving inland areas are weak.

*In sum, most East*

*Asian countries today are more dependent on trade for their sustained growth than they were a few years back. However, in many of the low-income countries of the region, the diffusion of the benefits of trade-led growth has been rather limited due to the agglomeration of production, especially export-oriented production in coastal cities or areas adjoining coastal areas. The inland regions, usually inaccessible areas with concentration of the poor, have largely been insulated from participating in international commerce and hence, have benefited disproportionately less from the benefits of trade-led growth.*

## SECTION FOUR: LOGISTICS IN EAST ASIA

The single most important impact of globalization in East Asian countries has been the integration of local production and supply chain with others in Asia or indeed with those of other regions of the world. Globalized manufacturing has evolved from the advantages of country-to-country variations in labor and material costs and also because of differences in manufacturing specializations. However, efficient integration of manufacturing across national borders depends upon the ability of the countries involved to provide logistical chains that satisfy the needs of the integrated production facilities for reliable just-in-time delivery of inputs/outputs and (where applicable) for flexible delivery schedules geared to customized production.

The productivity changes associated with providing logistics services are evident in only a few emerging East Asian countries where 3PL (third party logistics, where manufacturing industry contracts out its logistics functions) is a well-advanced concept. In other countries, the progression to the earlier stage of 2PL (second party logistics, in which companies unify their internal transportation and warehousing functions, and create their own internal logistics departments) is still under way. In industrial countries, almost a third of their logistics turnover is contracted to outside logistics suppliers, whereas in countries like China and several other East Asian countries that are less globally integrated, barely 10% of trade-related transport services are provided by independent logistics suppliers.

### **Maritime Issues**

Along with the rise in container shipping, there has been a corresponding increase in container throughputs, which have been growing more quickly at hub ports and at newly emerging ports that can offer international standards. In South East Asia, the concentration of port throughput is even more prominent, with the 10 busiest ports handling 1.6 million TEU or 68 percent of the region's total throughput in 1999.

During the 1990s the capacity of the fleet of container ships on the East Asian routes increased at an average rate of more than 20% per year, whereas the capacity of container berths to handle those ships increased at less than 8% per year and total container trade increased to just under 8.5%. However, these averages hide a wide variation, with the greatest percentage gains being made in the ports of China and new ports in Malaysia and Thailand.<sup>43</sup>

The largest increase in absolute numbers was in Singapore, Hong Kong and Shanghai, all with more than 3 million more TEU in 1999 than in 1996. Regional container ports are increasing their efficiency in handling containers, but this is insufficient to deal with the rapidly increasing demand for berth space. As a consequence, many of the ports of the

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<sup>43</sup> Frenkel, E.G., "China's Maritime Developments" *Maritime Policy Management*, Vol 25, No 3 (1998) 235-249

region are responding to this demand for added capacity and some new ports are being developed.<sup>44</sup>

**Box 4: Regional Port Competition**

The increasing competition from rapidly growing regional ports is threatening the dominance of the few current mega-ports

Until a decade or so ago, most large ports in the region had a clearly defined hinterland and markets that they served. Hong Kong and Singapore were the world's two largest transshipment hubs, each serving different catchments areas. While Singapore was the main transshipment stop for much of South East Asia including Indonesia, Hong Kong specialized in direct shipment to and from neighboring Guangdong Province, the manufacturing region where nearly 40 percent of China's exports are produced. Even China had little competition between its container ports, with Shanghai serving the Yangtze river basin as Hong Kong did for the Pearl River, Tianjin being the main container port for Beijing and North Central China and Qingdao serving the North East.

The two titans are now facing competition from emerging regional ports, Singapore from Tanjung Pelepas (TJP) in Malaysia and Laem Chabang in Thailand, while the rapidly expanding container ports of the Pearl River delta in China's southern coast are putting pressure on Hong Kong. TJP was ranked as the world's fastest growing port in 2001 with about 2 million TEU, mostly business won from Singapore. Similarly, the ports in Southern China are competing with the Hong Kong Port for transporting goods in and out of Guangdong Province, with an average growth of around 30 percent, compared to the less than 10 percent growth of Hong Kong. In order to offset the slow growth in profits at their homeports, both the Port of Singapore and Hutchinson Port Holdings of Hong Kong are rapidly expanding their worldwide network of terminals.

Transactions and time cost advantages are the major success factors for these and other newly emerging ports. Other advantages include the efficiency of auxiliary services (particularly customs and freight forwarding) and logistics efficiencies through less congested road and rail access, and better links to national and international transport networks. The competitive advantage of Tanjung Pelepas relative to Singapore will increase with the expansion of Malaysian rail network, linking the port to Thailand, Vietnam and Cambodia. Likewise, growth in traffic through ports in southern China is expected to accelerate with the dismantling of the restrictions on direct imports of American and Taiwanese goods, until now one of Hong Kong's main advantages.

*Source: Some information from The Economist, London, April 12, 2001*

A similar but more cost-effective service could be achieved by using direct ocean services between smaller ports that are closer to the origin and final destination of the freight, thereby reducing the land transport and transshipment time. Such a service could also significantly reduce transit times between East Asia and the US and Europe. The success of such endeavors would also depend on better logistics services than are presently available in most of the region. A recent study on China estimates that it will need about 1 million TEU additional berth capacity each year for the next ten years, in addition to about 8 million tons

<sup>44</sup> Vitasa, H.R. and N. Seprato, "Maritime Sector Developments in ASEAN Countries," Paper presented to the UNDP Conference on Trade and Development, Jakarta, October 1999.

of total additional bulk capacity over the same period. As ships get larger, access channels to serve them have to be deeper and berths have to get longer. Ports that are in river estuaries (such as Bangkok and Shanghai) will be in danger of becoming 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.

Shanghai is typical of this pattern. The capacity of the present sixteen container berths on the Huangpo river are severely limited by the 7.5m depth of the 32.7km long access channel, although this is being dredged to 12.5m. But this is insufficient for the largest ships already in service, so a new offshore port is being planned. Based on two-offshore islands, and with a claimed 15m deep access to the proposed first five berths scheduled for completion within four years, this new port will need new 30km long access roads including a bridge, and is conservatively estimated to cost up to US\$4 billion just for the first stage. Surprisingly no rail access is planned, which could result in severe congestion at peak times on the access bridge, even though it is planned to have six lanes. Almost all existing deep-water ports in the region are expanding their container handling capacity and hoping to compete successfully to be one of the few regional ports that will be selected to handle the mega-ships of the future.

**Table 8: Container Movements At Selected East Asian Ports**

Port	1995	1996	1997	1998	1999	2000	2001	Annual Growth
Hong Kong	12,550	13,460	14,567	14,582	16,211	17,800	17,900	6.1%
Singapore	11,848	12,944	14,135	15,136	15,945	17,040	15,520	4.6%
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 2001*

Though containerization of general cargo has been increasing in East Asia, containers are more often used only for maritime exports than for inland transport - obviating one of the main cost-saving features of container shipping. The main reasons for this are the long turnaround times for containers, risks of loss or damage to containers, and lack of inland road infrastructure needed for container loads. Truck rates for moving a container 500 kilometers inland in China are estimated to be about three times more, and the trip time five times longer, than they would be in Europe or the United States.

In many of the low-income countries of the region, including China and Vietnam, the transport systems, particularly the inland transport system, are well below international standards - lacking container freight stations, yards, and trucks in the inland regions. Border procedures are cumbersome and time-consuming, due to excessive and ad hoc regulatory requirements. Container tracking capability is particularly poor, with shippers often unaware of their containers' whereabouts. Finally, the inter-modal transport system is poorly

integrated, with no streamlined procedures to support the seamless movement of containers between coastal and inland areas.

### **Airfreight**

Airfreight accounts for only about 1% of East Asia's international trade by volume, but almost 30% by value. In terms of both volume and value airfreight trade has been growing at more than 10% per year in the last six years. The apparel and footwear category constitutes 23% of Asia to North America eastbound freight, with computers and peripherals the next largest at 21%, followed by electrical industry apparatus, telecommunications equipment and consumer non-durables (such as jewelry and sporting goods). These five commodities make up 64% of the total.

Westbound air freight consists primarily of components and materials necessary for production and is dominated by computers and peripherals, followed by intermediate manufactured goods, perishables, precision instruments and consumer chemicals. These five categories together make up 33% of all Asia-to-North America air freight. For some countries in the region other products dominate the eastbound and intra-regional market, with fresh flowers and seafood products being among the most important from South-east Asia.

Airfreight is probably more important for East Asia's international trade than that for other regions, given its distance from the two major markets of the United States and Europe. This importance is evident by its airports taking ten of the top fifteen places for air freight volume among non-United States airports in both 2000 and 2001 and accounting for more than 30% of air freight at the top thirty airports worldwide.

Good airfreight transport 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. Both Beijing (starting from a low base) and Hong Kong (starting from a high base) have experienced high growth rates, despite the opening of competing airports in Macau, Zuhai and Guangzhou (planned to open late in 2002) and massive investment in updating freight facilities at Shanghai. Both the new airports ( Zuhai and Macau) have found it difficult to attract airlines from Hong Kong. Despite the bad publicity the latter received on its opening, it has since started to earn a reputation for efficiency and for being a freight user-friendly location.

Airlines and traditional freight forwarders are both competing with and cooperating with each other to provide air transport based freight services in the context of logistics development. 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 multi-national air carriers to provide efficient air freight logistics.

Despite the apparent recovery in consumer demand in the United States - the largest market for East Asia's airfreight - there is little evidence that airfreight is taking an increasing share

of total international trade, with the growth rates of particular airports still below the rate of growth of GDP or international trade, with the exception of Beijing. However, it is possible that more direct air services are being operated to smaller airports to avoid long and expensive land access costs and the additional transaction time that often comes with a larger airport. If this is the case, it would reflect what has been happening in the US and Europe over the last decade.

**Table 9: Ranking Of Major Freight Airports In East Asia, 2001**

Rank	Airport	Code	Tons of Cargo
3	Hong Kong	HKG	2,099,605
5	Tokyo	NRT	160,938
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 thirty		29.5%

*Source. Airports Council International, 2002*

**Box 5: Flying High**

In the race to capture Asia's growing travel market, cities are competing to build airports that are bigger, better and cheaper. A battle is under way for airspace in Asia these days, with cities vying to become hub airports for particular areas. A hub airport is important because it can attract numerous cargo and passenger flights because of its large home market (or proximity to one), the offering of numerous routes and relatively low operating costs. Asia's current hubs include Singapore, Bangkok, Hong Kong, Shanghai, Beijing, Osaka and Tokyo's Narita. Over the past decade most of these airports have been upgraded.

It is hoped that air passenger and cargo traffic will experience high growth rates in the next decade and beyond. Many Asian countries have been engaged in airport planning and building. Some of the construction is already complete. South Korea's US\$5.4 billion Incheon airport opened in April 2000, as did Hong Kong's US\$10 billion Chek Lap Kok in 1998 (and is now assessed the most popular in the region), and the US\$3.6 billion Kuala Lumpur International Airport has been in operation more than four years. China has opened a new US\$1.1 billion passenger terminal at Beijing and is now building a new freight terminal, and a new US\$1.6 billion airport has opened in Shanghai. Other openings are not far away, Bangkok expects to replace its ageing Don Muang with a new Suwanaphumi Airport by 2005 and Singapore's third passenger terminal should be ready by 2006. China plans 118 new or expanded airports in the next ten years, the first of which is planned for Guangzhou.

So far Singapore stands out as Southeast Asia's hub of choice, as Singapore Airlines has been able to entice foreign airlines by offering a wide network of connections into markets for passengers and cargo. This success has come partly at the expense of Kuala Lumpur's new airport, which is struggling to attract services. But the main threat now is Chek Lap Kok, which moved more than 2.2 million tons in 2000. Other potential rivals are Macau, Zhuhai, Guangzhou and Shenzhen.

*Adapted from Far Eastern Economic Review, May 10, 2001*

## **Land Transport**

High costs of land access to ports, combined with intense competition and the effects of agglomeration of production, have resulted in an excessive concentration of export-related activities in port cities, while there has been little or no economic development away from the ports. This not only leads to increasing congestion in the port cities but also hinders distribution of the benefits of trade-led growth. Most countries in the region now want the benefits of trade-led growth to spread to the interior – areas that are typically rural with a high concentration of the poor. Moreover, these countries can ill-afford the consequences of congestion in the ports and port cities.

Estimates based on interviews with freight forwarders in the interior of China indicate that inland transport costs can account for about two-thirds of the total transport costs.

**Table 10: Composition Of Logistics Costs Of Container Transport From Chongqing To The US West Coast**

	US\$ per TEU	% of total
Land access to port	2,300	63%
Port handling	200	5%
Martime transport	750	21%
Port handling	150	4%
Port to final destination	250	7%
Total	3,650	100%

*Source World Bank estimates based on interviews with freight forwarders*

While the entire territory of some countries in the region is relatively close to a deep-water port, the interior of most countries is quite distant and inaccessible from a port. To reduce this trade and accessibility disadvantage, large investments need to be made in improving transport infrastructure, supported by a full range of logistics services.

South 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 in particular has adopted a strategy of encouraging people to live and work in the city, and has for this reason 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](http://www.pusanconsulting.co.kr/En-about%20Pusan.htm)).

The Yangsan inland container terminal has been constructed to relieve port generated traffic congestion and environmental problems resulting from the massive transport movements the port generates. Another ICD is under development 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, the ICDs are part of a logistics system based on an advanced EDI and information service. In this way, Korea will be able to maintain the competitiveness of its industrial base, while moving its manufacturing away from the congested existing urban areas and spreading its benefits more widely throughout the country.

### **Urban Congestion**

Container terminals require vast land areas and efficient access corridors, which are often incompatible with other land uses in urban areas. Most cities in the region are addressing the issue by building new ports or terminals away from the established urban areas. But this can be prohibitively expensive. A more cost-effective alternative is that of keeping the water-based activities in their existing location but moving the land-based activities to an inland location that has high accessibility to both the remaining port area and the industrial activities that will use it most. One of the principal objectives of the development of the Waigaoqiao

container terminal and Luojing coal terminal in Shanghai was to move port-based traffic out of the urban area. This was achieved between 1996 and 1998 and as a result, port traffic handled at terminals within the city was reduced by about 13 million tons, while that in the new terminals outside the city increased by about the same amount. However, the urban traffic associated with the existing port needs to be reduced even further.

Air pollution continues to be a serious issue in many cities of the region, notably Bangkok, Beijing, and Manila, where suspended particulate matter often exceeds WHO guidelines by more than a factor of two. One of the main reasons for the intense air pollution in most of the cities is traffic congestion. The rapid growth of cities, as a result of agglomeration of production in major centers, has led to an increased demand for transport facilities and supplies. The economic and social costs of the resulting congestion are enormous and a recent study in Bangkok estimated that a 10 percent reduction in peak-hour trips, by moving port-related activities out of the downtown area, would entail benefits of up to US\$400 million annually.<sup>45</sup>

### **Multi-modal Transport**

For the full advantages of multi-modal transport to be realized, the door-to-door transport of freight needs to be optimized for time, cost and reliability. If each stage of the trip from origin to destination is treated separately, many opportunities for cost and time reduction will be missed.

Some countries in East Asia – Hong Kong, Japan, Korea, Taiwan and Singapore - are among the most advanced in the world, with multi-modal capability of their transport systems. Most however are lagging far behind, in terms of the institutional structure required for multi-modal operations, in the development of the systems themselves, and in the way in which international trading contracts are executed. While the second and third of these are best left to the private sector operators and agents, they can only do so effectively if there is a supportive institutional structure that will allow all goods to be consigned from inland directly to overseas destinations under single transport contracts and allow containers to be cleared before they arrive at the port.

In the smaller and less trade-oriented countries of the region, it is the way in which international trade and transport are contracted that discourages multi-modal transport. 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. It is common for the purchaser of exports to contract FOB in the port of the exporting country, and so be responsible for arranging the maritime transport and land transport in the destination country, with the seller (producer) being responsible only for contracting landside delivery to the specified port. The choice of port is made by the buyer, independently of the costs of accessing the port, a cost often higher than that of maritime transport. It is only when the purchasers buy ex-factory and hence assume responsibility for the whole logistics chain, can the full advantages of multi-modal transport begin to be realized. When countries enter the WTO they also subscribe to the conditions of the General

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<sup>45</sup> UN ESCAP (2000). "State of the Environment in Asia and the Pacific," (ST/ESCAP/2087), 2000.

Agreement on Trade in Services (GATS), and these include right of operations of foreign freight forwarding agencies and customs service providers and these can act as a stimulus to the evolution of national operators.

The impact of improved multi-modal transport is well illustrated in a recent study on the time and costs of container movements from Laos to Europe,<sup>46</sup> which showed that consideration of alternative multi-modal routes could reduce the present door-to-door cost from Laos to Europe (through Danang) by almost one third.

**Table 11: Multi-Modal Routing Alternatives From Vientiane (Lao PDR) To Europe**

Feeder port	Hub port	Distance (kms)	Time (days)	Cost (US\$ per TEU)
Danang	Singapore	18,329	31/32	3,420
Bangkok	Singapore	17,549	30/31	2,477
Laem Chabang	Singapore	17,630	30/31	2,435
Laem Chabang	Singapore	17,624	30/31	2,450
Port Klang	-	16,905	27/28	2,270

*Source Multi-modal transport systems The case of the Laotian garment industry, Banomyong and Beresford, 2000*

Another study on the measures necessary to encourage the relocation of some garment manufacturing industry from Bangkok to other regions of Thailand<sup>47</sup> indicated that more reliable and less costly logistics services would be a pre-requisite. This study considered eight criteria that might influence a decision to relocate from Bangkok to the north-east of Thailand, including labor cost, distance from Bangkok (and access to administrative and other services), transportation cost, population (as an indicator of the labor market size) per capita income, electricity and the existence of an airport. Based on interviews with industry executives in Thailand, Hong Kong, Singapore, South Korea, Taiwan and the US, it appears that there is a general perception that delivery times from Thailand are longer and more variable than from competing countries. This characteristic would be reinforced by a move to the northeast of Thailand with its present rudimentary logistics services. However, on a straightforward cost basis, relocation to the northeast would be feasible, with the higher transport costs being more than offset by lower labor and other costs.

<sup>46</sup> Banomyong, R. and A.K.C Beresford, "Multi-modal transport systems: The case of the Laotian garment Industry.", Trois-Rivieres, France (May 2000).

<sup>47</sup> Wattanapanom, de Lombaerde and Wanart, "The Relocation of the Garment Industry as an Instrument for Regional Development in the Northeastern Region of Thailand," Centre for ASEAN Studies, Working Paper No.11, April, 1997.

**Table 12: Comparative Delivery Times (Thailand And Hong Kong)**

Garment type	Thailand (days)	Hong Kong (days)	Thailand penalty (days)	Thailand penalty (%)
Ladies fashion	164	136	28	20.6
Outerwear	179	140	39	27.9
Knitted t-shirt	101	73	28	38.4
Knitted sweater	100	68	32	47.1

*Source: Wattanapanom, de Lombaerde and Wanart, The relocation of the garment industry as an instrument for regional development in the Northeastern region of Thailand, Centre for ASEAN Studies, Working Paper No 11, April, 1997*

### **Logistics Progress In East Asia**

The trends illustrated in this Chapter indicate a small group of progressive countries gradually pulling ahead of their neighbors in reducing the logistics impediments to international trade and in encouraging a movement of trade-led industrialization away from their port cities.

Despite intensive efforts, progress so far in expanding the success of the more progressive trading countries to the rest of the region has only had limited success. ESCAP is the prime mover in the region attempting to simplify and update trade facilitation arrangements and is working with the IMO and ECE in promoting eight of the 50 or so international conventions of the movement of goods, people and vehicles across international borders.<sup>48</sup> Regional political and trade agencies, such as ASEAN and APEC, are also working to make trade and transport practices between countries of the region more client oriented, while ADB, with its Greater Mekong Initiative, is promoting cross-border linkages in the context of trade stimulation. Until recently the World Bank has been only a supporting player in most of the initiatives undertaken by national governments and other regional agencies. With the World Bank's new approach to trade competitiveness in the region as a means of bringing about an increase in pro-poor trade and thereby a reduction in poverty, it hopes to provide stronger and more practical support to the efforts being made to reduce transport and logistics impediments to this growth.

The next section indicates priorities for action, a strategy for how they might be achieved, and what some of the trade and poverty impact outcomes might be.

<sup>48</sup> *Review of Transport in the ESCAP Region 1996-2001*, Part Five, UN ESCAP, Bangkok (2001)

## **SECTION FIVE: A STRATEGY TO STIMULATE TRADE-LED POVERTY REDUCTION**

### **Trade, Growth and Poverty Reduction**

The above analysis has demonstrated the significance of the role of trade in accelerating economic growth and reducing absolute poverty. It has also established the role of improved logistics in stimulating trade-led growth and shown that countries and regions remote from deep water ports have so far failed to benefit much from increased trade, and that improved access to national, regional and global markets is a necessary condition for trade to stimulate growth.

The quality of logistics services and transport infrastructure influence the ability of countries and regions to compete effectively in the global economy. Logistics costs are still high in countries and regions with poor accessibility to international markets. The cost advantage of low labor and land costs in these locations will not be sufficient to bring the benefits of global or regional integration to remote regions if they are offset by high access and logistics costs.

### **Patterns of Growth**

The high growth performance of countries in East Asia has largely been attributed to their global integration. However, the region exhibits extreme disparity in living standards – it has some of the poorest as well as the richest countries of the world. While many of the countries are easily accessible by sea, Laos and Mongolia are landlocked and dependent on transit through third countries for their external trade. The internal transport networks of the higher-income emerging countries in the region are comparable to international standards, but most of the lower-income countries in the region have inaccessible hinterlands largely insulated from the benefits of international commerce.

In addition, the trade pattern of the region is highly focused in terms of final market destination. Intra-regional trade is quite limited, even though many of the region's imports could be supplied at low cost by neighboring countries within the region. Developing intra-regional trade and diversifying their export performance with less reliance on the major trading nations and blocs could achieve sustained growth in the region.

Trade-led growth can bring benefits to areas beyond the port cities where free-trade zones have attracted globalized manufacturing industry. This can be achieved by:

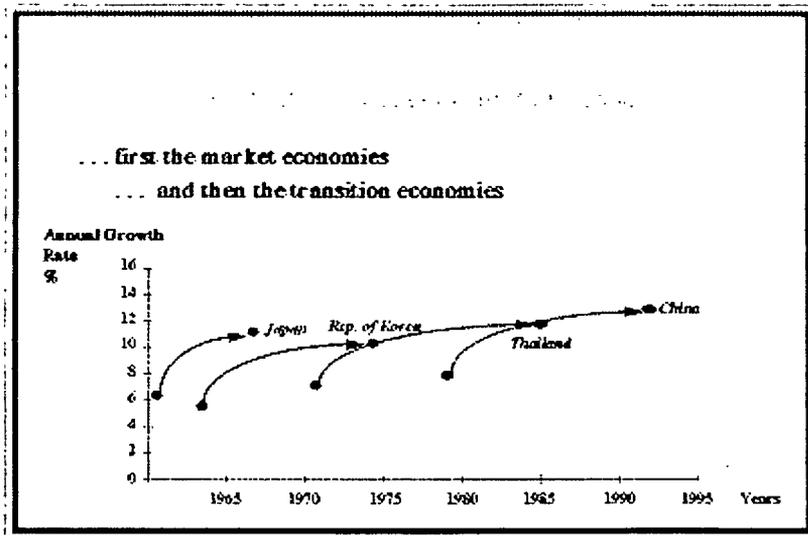
- Providing reliable, low cost access to other regions;
- Diversifying exports and encouraging value-added processing of domestically produced inputs; and
- Locating industries close to the source of their materials rather than at the port of export. This will reduce the transport cost of their outputs and simultaneously increase its reliability.

The first wave of growth was in Japan, followed by that in the "Four Tigers" - Hong Kong, the Republic of Korea, Singapore, and Taiwan/China. The next wave occurred in Indonesia, Malaysia, and Thailand. 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. For example, the first and second waves of growth made use of extensive government intervention during their industrialization process. In contrast, the third wave - Indonesia, Malaysia, and Thailand - placed more emphasis on liberalization of the private sector. A central characteristic of these highly successful economies is an ability to learn from the experience of other economies.

It appears that there were some common factors present in the countries experiencing accelerated growth, these being:

- Dynamic agricultural sector;
- Rapid growth of exports;
- Rapid demographic transition;
- High investment and domestic saving rates; and
- High investments in human capital.

**Fig. 5: The Flying Geese' of East Asia**



The transition economies of China and Vietnam are expected to represent the next wave based on their achievements in the last decade. Both countries are being increasingly

<sup>38</sup> Wild geese fly in orderly ranks forming an inverse V, just as airplanes fly in formation. This flying pattern of wild geese is metaphorically applied to the three time series curves, denoting import, domestic production and export of manufactured goods in less advanced countries.

integrated into the world economy as evidenced by China's accession to WTO and the normalization of trade relations between US and Vietnam after a long hiatus. While their economic history as state-dominated economies gives them rather different starting points than the earlier participants, their rapid growth in the last decade, together with their growing outward-orientation and attraction to foreign investors, is indicative of their growth potential and learning from others in the "flying geese" pattern.

### Regional Trade Pattern

Several distinctive trends can be discerned in the trade pattern of the countries of the region. These relate to the changing commodity composition of exports and also the destination of exports from the region.

#### *Commodity Composition of Exports*

There has been a significant change in the region's commodity composition of exports. The region has emerged as an important supplier of manufactured goods for the world markets. Most countries of the region export different labor-intensive manufactured goods - including textiles, footwear, and leather products - as compared to primary-sector based goods a few years back. The value of world trade in manufactured goods is about 75% of total merchandise trade, but the regional figure for East Asia is about 83% - even higher than that of Europe and the US. The region is a major exporter of electronic products for the world. Japan is now the largest exporter of manufactured goods from the region and more than 65% of Japanese exports consist of heavy machinery and transport equipment.

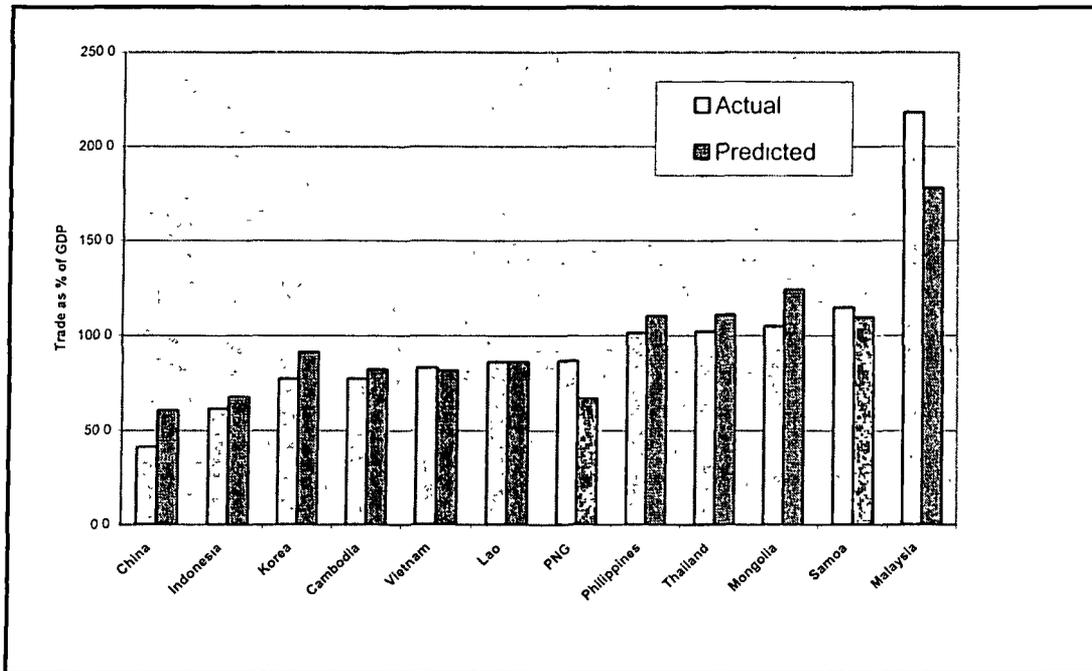
**Table 6: Structure of Manufactured Exports by Country (% by value)**

	Resource based		Low/medium technology		High technology	
	%	%	%	%	%	%
Country	1985	1996	1985	1996	1985	1996
Hong Kong	2.1	4.4	78.5	66.7	19.4	28.9
Singapore	42.3	12.7	25.4	21.9	32.3	65.4
Korea	7.8	9.4	72.1	55	20.1	35.6
Taiwan	8.7	5.1	70.6	54.1	20.7	40.8
Indonesia	72.2	34.9	25.1	50.4	2.7	14.7
Malaysia	53.7	17.8	15.2	21.8	31.1	60.4
Thailand	42.1	14.5	44.8	49.1	13.1	36.4
China	11.7	9.8	78.9	69.7	9.4	20.5

*Source. Sanjaya Lall, Exports of Manufactures by Developing Countries: Emerging Patterns of Trade and Location, Oxford Review of Economic Policy, 1998/14, 54-73*

In a few countries (notably Singapore and Malaysia), the commodity composition of exports has moved further from low value-added labor-intensive goods to high value-added knowledge-intensive manufactured goods (electronics and electrical products) and exports of financial services as well.

**Fig. 10 Actual and Projected Trade to GDP Ratios**



*Sources World Bank Country Profiles for actual data and World Bank model for predicted values*

So a further indicator of a potential for logistics to improve trade performance is the difference between actual and projected trade to GDP ratio. The predicted level of trade to GDP derived from the model only takes account of the logistics cost from the principal deep water port to international markets. So an important factor (among several others) explaining the difference between actual and predicted performances is the much higher logistics costs from less accessible regions of countries to deep water ports. These higher actual costs result in less trade than predicted by the model. The difference between the actual and predicted trade to GDP ratio therefore gives some idea of how much a reduction in domestic logistics costs could make to the level of trade. This indicator shows that China, Mongolia, Philippines and Thailand, and to a lesser extent Indonesia and Cambodia, might gain more than other countries in the region from a reduction in domestic logistics costs that leads to increasing international trade, and distributing its benefits more widely.

### **A Strategy Of Logistics Actions To Facilitate Poverty Reduction Through Trade Growth**

A strategy for action in the region needs to identify the following:

- the steps to be taken; and
- the agencies to be involved.

Though the specific actions are particular to each country, there are some trends that are common to countries and regions in need of logistics planning and strategy.

### *Ports and maritime Issues*

Competition between the declining number of shipping lines is driving them to reduce tariffs, while their growing market share is allowing them to bring in larger vessels, which will enable liner container services to be implemented within the next few years on a few hub ports served by mega-container ships.

These larger vessels will make fewer calls at a small number of very large hub ports. They require greater land area to service them and also for container storage, road and rail links and associated services. They also require deeper access channels that can often only be provided by voluminous dredging or by moving estuarial ports to deep-water locations. The opposition to the use of larger vessels comes from municipalities that find it increasingly difficult to accommodate these space requirements and resent the high volumes of truck traffic that contributes significantly to road congestion. Disposal of soil dredged from access channels is a significant environmental externality of port operations. They therefore seek to move as many port activities out of the downtown urban area, while retaining the employment and business activities that the port attracts.

Few ports in East Asia will be part of this hub system and most of them will need to become more efficient in their provision of feeder services since the costs of container trans-shipment in hub ports is the greatest penalty from the cost savings of operating mega-ships. The most efficient and well-located feeder ports will become centers for fast ship operation. Feeder ports will eventually face similar pressures to expand and relocate facilities as the hub ports. In some instances the only feasible solution to these conflicting pressures is to build new ports, but often it is possible to move the non-maritime port activities to locations closer to the industries served by the port and build rail links to provide efficient, non-road traffic generating access.

The trade development strategy for the region will therefore include measures to facilitate the relocation of non-maritime activities of ports to locations that are less constrained by space and environmental concerns, while retaining high quality access to the urban areas they serve. In extreme cases this could involve relocating maritime activities as well, but usually only where the port is on a river or estuary, which requires expensive capital and maintenance dredging. This strategy invariably requires new rail links to be built, and where possible, greater use of inland waterway access to the port.

### *Inland transport*

Diffusion of the benefits of growth away from port cities is an important part of a regional strategy for sustained poverty reduction. This is particularly important for countries with hinterland regions that are largely inaccessible, and hence insulated from international commerce. As technology changes, greater emphasis will be placed on speed and flexibility of delivery, putting even greater importance on logistics costs. Large global manufacturers are unlikely to lead the move to inland areas unless inland transport costs are reduced sufficiently. Reduction of land access costs depends on having adequate infrastructure, appropriate vehicles and logistics technology that allows these to be used efficiently.

sufficiently. Reduction of land access costs depends on having adequate infrastructure, appropriate vehicles and logistics technology that allows these to be used efficiently.

Reduction of land access costs is one of the most effective ways of tilting the balance in favor of inland development. As inland areas become more accessible, locations formerly foreclosed become economically viable and activities are free to relocate according to a field of redefined competitive advantage. Inland transportation networks - particularly roads and railways - expand the geographical reach of previously existing, usually standardized activities, and thereby enable the region to attract investment - including FDI. Improved transport infrastructure in trade corridors is another important part of a regional poverty reduction strategy that will facilitate the attraction of FDI and trade-based growth away from port cities. While infrastructure development in competing modes can be one way of stimulating inter-modal competition, it can be a costly solution in the early stages of trade corridor expansion. Coordination between agencies responsible for different modes will be an essential component in the planning of expansion of transport infrastructure in trade corridors.

#### *Multi-modal transport*

Countries that can best develop their transport system on a multi-modal basis will be better equipped to compete and to bring trade benefits to their more remote regions. All international transportation of freight is inter-modal to some extent. Rail, coastal shipping, and inland waterway transport are viable alternatives to road access to the port.

The key to successful multi-modal transport is simplified trade documentation and it works best where throughway bills and single invoices across modes are combined with the ability to clear containers for tariffs, customs, health and taxation charges at inland locations away from the ports where the containers are loaded and unloaded onto vessels. In the US and Europe, and in some of the more trade-open East Asian countries such as Korea, where inland container terminals offer these transaction facilities, multi-modal transport makes it easy for containers to reach cities far from the ports. An efficient freight forwarding industry is needed to take full advantage of such terminals so that users can find and make use of the most cost-effective combination of transport modes. Effective communications systems are essential for freight forwarders to take advantage of the alternatives available and keep their clients aware of the status and location of their freight. While there has been a revolution in the quality and scope of information systems in even the least accessible countries, few of these have been able to develop freight forwarding agencies comparable with those in the more accessible and trade-open countries.

A strategy for bringing export related industry to locations away from port cities would therefore need to include a simplification of trade and transport documentation, the development of modal interchanges and inland container terminals, as well as the encouragement of competing services.

### *Air transport*

Air transport accounts for a high proportion of export trade from East Asia by value, and increasingly by volume. Air freight carriers prefer to concentrate their trans-ocean operations on a few hub airports that provide user friendly services on a 24-7 basis and that are well connected to the national transport networks, particularly by air and road. Many new and expanded airports in the region are competing to satisfy these conditions and the excess capacity that they are providing is likely to be taken up by the rapidly increasing demand. The countries that are at the forefront of logistics development have ensured that they can fulfill this hub role, and as in developed countries, have used public resources to help achieve this.

While most of the remaining countries and regions will provide the feeder services to these hubs, feeder airports need to satisfy the same conditions of service quality and availability and accessibility. The investment in access routes and freight terminals is difficult to justify for individual freight forwarders and users and usually requires a commitment from the government, to be recovered later from user fees, concessions or rental income, justified on the basis of positive social and economic benefits over and above those to the direct users.

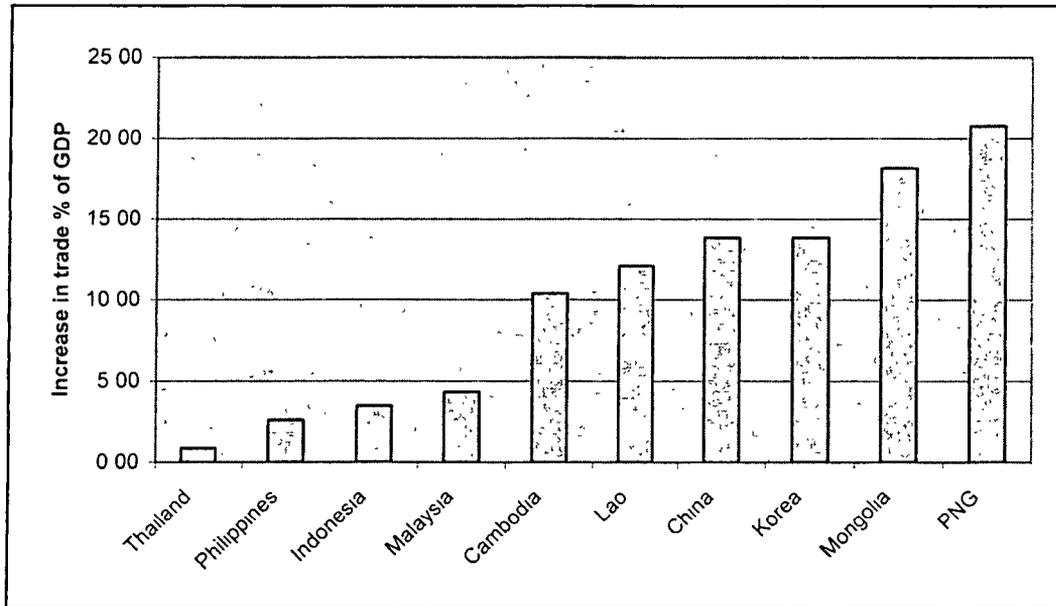
### *Institutional arrangements*

One of the greatest impediments to rationalization of providing logistics services is the institutional responsibility for regulating and supporting the various participants. Resolution of conflicting interests of different government agencies is one of the most difficult but necessary steps in the provision of efficient logistics services. While logistics providers are in frequent contact with their partners in developed countries, the same is not always true of those who design and implement the systems under which they must operate. Without this understanding of how logistics systems are managed in the more progressive countries, it is unlikely that the necessary changes will be made. So another part of the strategy is to increase the physical contacts and spread of information to and between government agencies, so that they better understand what they need to do and how best it can be done.

### **Expected Impact of Logistics Improvements on Trade, Growth and Poverty**

The recommended strategy and actions are intended to help reduce logistics impediments and hence increase trade. The main impacts of improved logistics will be on reduction in transport costs and reduction in time for products to reach their destination and also in the reliability of those times. The relative importance of these impacts will vary considerably from country to country, as will the combination of measures necessary to achieve them. The magnitude of their effect on the volume of international trade can be estimated by changing the logistics costs in the trade regression model (page 46 and footnote 51). The model indicates that a reduction in logistics costs of US\$200 per TEU could increase the volume of trade for each country by about 13%, while a 20% reduction in the same costs would have a higher impact on countries that have high costs and a smaller impact on those that already have lower costs.

**Fig.11: Impact of a 20% Reduction in Logistics Costs on the Value of International Trade**



*Source World Bank estimates*

While the impact on Thailand, Philippines, Indonesia, Malaysia and Vietnam could be an increase of less than 10% in international trade, the model suggests that other countries could attain increases of more than 10% and the smaller economies of Mongolia and PNG could achieve increases of more than 15%. Mongolia, for example, could see an increase of 18%, made up of about 10% exports and 8% imports. Based on the 2000 value of exports of about us\$625 million, this would indicate an increase of about 8% in per capita income, more if multiplier effects are taken into account.

### **Next Steps**

This report is an introduction to an approach to nurture the development of transport sector activities in East Asia. It aims to demonstrate the role of transport investment and logistics services in stimulating pro-poor trade and reducing poverty through the diffusion of benefits of trade-led growth. The next step will be to produce individual country reports that will more clearly indicate the actions most appropriate to each country and their possible impacts on poverty reduction. With the benefit of this information, the World Bank would then liaise closely with national governments and the multilateral agencies that are taking the lead in these topics, to see how the World Bank can best support efforts already under way and start new initiatives that will create the conditions to bring about trade-led growth and the consequently, poverty reduction.



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