STRUCTURAL CHANGES IN PORTS AND THE COMPETITIVENESS OF LATIN AMERICAN AND CARIBBEAN FOREIGN TRADE

CUADERNOS DE LA CEPAL

UNITED NATIONS
Dear Reader:

The substantive units of the ECLAC Secretariat must periodically prepare reports for presentation to United Nations Headquarters, in which they evaluate their performance in fulfilling their work programmes, and in which they reflect the opinions of people who use the products of those programmes. In order for us to carry out this evaluation, we would like to request your cooperation in dedicating a few minutes of your valuable time to the completion of the enclosed questionnaire about one such product, the publication entitled *Structural Changes in Ports and the Competitiveness of Latin American and Caribbean Foreign Trade* (Cuaderno de la CEPAL No. 65).

The Transport and Communication Division's work programme has been focused on two closely-related areas. On the one hand, it deals with transportation policy, including strategy formulation, information systems, and planning of such diverse aspects as services, technology, and the legal framework. On the other hand, it provides for support of individual modal subsectors in order to foster the development of transport services that are both efficient and responsive to users' needs, especially in respect of exports.

The objective of the work programme at the national level is to collaborate with the countries with a view to increasing the effectiveness of processes aimed at formulating and applying policies that are consistent with local conditions, in order to ensure the best possible use of national resources allocated to transportation, from each country's overall economic perspective. In the past, most countries were concerned primarily with investment in infrastructure to permit them to satisfy their most pressing needs for basic facilities. More recently, there has been a tendency for them to take greater advantage of existing infrastructure, with emphasis on better maintenance and use, which in turn requires an effort to improve their administration of the transport sector. This makes it vital to clarify the role of the State as regulator of the transportation system, and as operator of State-owned transport enterprises when such exist.

At the international level, the objective of the work programme is to support initiatives for regional integration by seeking to minimize non-tariff barriers to intraregional trade. In doing so, it is important to take into account the experience of other regions, especially Europe, which has experienced problems similar to those encountered in Latin America and the Caribbean and has
developed solutions that have often been embodied in international agreements within the framework of the United Nations. Such agreements can provide guidelines for this region, not only for solving intraregional problems but also in achieving greater uniformity with regard to international trade procedures. The intimate relationship that exists between international trade and economic growth has become increasingly evident as a result of the world economic crisis of the past years, which causes international transportation to play an ever more important role in the economic development of all countries.

EVALUATION

For the evaluation of this publication, we would be grateful if you would answer the attached questionnaire and return it by airmail to the following address:

TRANSPORT AND COMMUNICATIONS DIVISION
ECONOMIC COMMISSION FOR LATIN AMERICA AND THE CARIBBEAN
P.O. Box 179-D
SANTIAGO, CHILE

We would appreciate receiving your reply before 1 March 1991, so that we may take it into account in future studies. Our most sincere thanks for your co-operation.
QUESTIONNAIRE

Name of the publication: Structural Changes in Ports and the Competitiveness of Latin American and Caribbean Foreign Trade (Cuaderno de la CEPAL No. 65).

Purpose of the publication: Inform governments, public authorities responsible for decision making in respect of the maritime/port sector, and users of maritime transportation and port services in general about the vast technological and organizational changes occurring in these areas, and the importance they have for the countries and their foreign trade.

1. Please give us your opinion about the extent to which Cuaderno No. 65's handling of its subject matter satisfies the purpose of the publication as described above:
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2. Please give us your opinion about the extent to which Cuaderno No. 65 complies with the objectives of the work programme as outlined on the previous pages:
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3. Please give us your opinion about the quality of Cuaderno No. 65 with respect to:
   - Scope of the topic Good [ ] Average [ ] Poor [ ]
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Please tell us your name and position: __________________________________________

Institution and country where you work: ________________________________________
CUADERNOS DE LA CEPAL

STRUCTURAL CHANGES IN PORTS AND THE COMPETITIVENESS OF LATIN AMERICAN AND CARIBBEAN FOREIGN TRADE

UNITED NATIONS
ECONOMIC COMMISSION FOR LATIN AMERICA AND THE CARIBBEAN
Santiago, Chile, 1990
This study was prepared by the Transport and Communications Division as part of a project carried out with financial support from the Government of the Netherlands.
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SUMMARY

At the beginning of the sixteenth century, ports were no more than 50 nautical miles apart. Due to inexact navigation systems, vessels limited themselves to daylight sailing along coast lines between that city and other communities in the Mediterranean, Western Europe, the Baltic and to the Red Sea via the Suez landbridge. With the development of accurate marine navigation vessels began to call at ports with better facilities and larger volumes of cargoes, and this initiated the trends toward cargo concentration and port consolidation. In the 1890s, dock workers began to respond to the casual nature of port employment and labor-saving technologies by organizing into unions and making strenuous efforts to avoid the adoption of such technologies. These cargo, port, labor and technology trends are stronger today, as ports face specialized scale-economy vessels, high-capacity cargo-handling equipment, long-distance inland transport, privatization, decentralization and deregulation of transport, computers and communications systems.

A composite Latin American and Caribbean port is developed to illustrate common infrastructural, operational and institutional problems facing governments and port administrations. It was utilized by explorers during the sixteenth century because of its natural harbor, ready access to fresh water, wood for vessel repairs and food. Today, due to deforestation, the port accumulates a large amount of sedimentation in the harbor and access channel from the surrounding area. This was a minor concern until large-scale vessels began to call during the 1970s. Cargo-handling equipment operates at slow uneconomic rates when compared with major competitors of other regions. Rail lines connect producing areas and the port, but they are in an advanced state of disrepair and not competitive with road transport. Its institutional environment is the result of an accumulation of government policies over the last 50 years.

The director of the composite port is a political appointee in most cases who acquiesces to the demands of labor representatives so as to avoid work stoppages. The wages of dock workers consume almost all revenue generated by the port. User groups have begun to express their dissatisfaction with the
monopoly control of cargo-handling and storage operations by port administrations and dock labor, as well as with the monopoly control of inland transport services by rail and road carriers. Since the onset of mechanization of port activities, institutional arrangements have been modified not to reflect the capacity of new cargo-handling equipment, but to ensure that vested interests are preserved. A point of departure for the composite port is the reform of legal regimes to eliminate monopoly control of various activities by the port administration, Customs, labor unions and inland transport enterprises.

Turning to the world situation, the modernization and integration of port services encompass numerous institutional and operational problems. Ports must organize the services of a wide range of enterprises and institutions, but organized complexity does not imply efficiency, cost-effectiveness nor productivity. In many Latin American and Caribbean countries there are multiple ministries, agencies and unions involved in port activities. This institutional density leads to a vacuum in the control of port operations by management. Port labor has been pulled into this vacuum and utilizes its dominant position to obtain more wages and greater benefits. For ports to better support trade policies, it is essential that they avoid monopoly control, whether by labor, management or governments, of any service and preserve an open, competitive environment.

The structure of port employment has changed from the “you, you and you” ad hoc hiring practice to the union controlled “rotation quota” job system. For ports with a sufficiently foreseeable labor demand, the “permanent or enterprise employment” system has come to be utilized. However, ports without such a demand have evolved the “stratified employment” system which permits the employment of dock labor under permanent, contractual and casual conditions. Many port-labor agreements seek to avoid the specter of casual employment and labor-saving technologies through various work preservation and creation schemes. Examples of these measures would be the 50-mile rule of the International Longshoremen’s Association (ILA) on the U.S. east coast, the Registered Dock Labour Scheme of the U.K. and numerous efforts in Latin America and the Caribbean.

The 50-mile rule reserved to ILA members the right to fill and empty containers which carried goods for more than one consignee, moving to or from points located within 50 miles of a port where the union had representation rights, while the Dock Labour Scheme required that anything definable as dock work had to be carried out by registered dock workers. These schemes were abolished in 1988 and 1989, respectively. The 50-mile rule was estimated to have cost the port of New York-New Jersey US$1 000 million over two decades, while the Dock Labour Scheme cost the U.K. economy more than US$800 million in its 42 years of existence. Many Latin American and Caribbean ports utilize formal and informal employment
systems, in which formal system workers subcontract with their informal counterparts to effect undesirable tasks. This unnecessarily increases ports costs to users and the national economy.

The import substitution policies utilized by Latin American and Caribbean countries from the end of the Second World War until the early 1970s created a bias against international trade. Labor practices which increased the cost of port services were viewed as a non-tariff barrier to competing foreign products, and many of them became institutionalized and exert a negative influence on the region's exports in international markets. Following the first oil crisis, many Latin American governments adopted export-oriented macroeconomic policies and such practices have become intolerable. This brought to light the need to restructure their public sector ports, which were inefficient, grossly overstaffed, under the monopoly control of dock worker unions and unnecessarily expensive. The options they might consider include private stevedoring companies, management contracts, leases, conversion of the governmental port administration into a publicly held company, authorizing single-user marine terminals to handle third-party cargoes and the outright sale of ports. To create a competitive environment, governments often combine privatization with a package of normative regimes which deregulate and decentralize ports, as well as balance their labor-management relations.

In a global economy governments and enterprises search worldwide for technical capacities, least-cost inputs and market-access advantages. This means that factory locations and their sources of inputs depend on factors such as cost, competitiveness and market access. In contrast, ports find themselves tied to a particular location and if that site is not appropriate vis-à-vis major producers and markets in a global economy, investments in new facilities and rate reductions will bring about only minimal changes. Thus, the growth, stagnation or decline of ports in a global economy is often due to factors over which they have virtually no control.

Intermodalism, or the integration of activities in a distribution chain, is utilized to facilitate business transactions that move goods from origin to destination. The major objectives of intermodalism are to increase the speed of goods distribution and reduce the amounts of unproductive capital, whether in inflated inventory levels, inactive railcars or vessel delays at ports. Intermodal operations make use of long-distance inland transport services which greatly extend the hinterlands of ports. Such extensions have created discretionary cargoes, or those that can utilize any one of a number of ports. As a consequence, ports serving the same hinterland have become interchangeable.

In this changed environment, ports are no longer able to assert control over the trade activities of a hinterland, and must redefine their service and cost structures in the light of manufacturing trends, as well as the strengths, weaknesses, strategies and market shares of not only competing ports, but
also of shipping lines, railways and road carriers. Even though long-distance inland transport has accelerated the trend towards the concentration of cargoes at major ports, many governments have adopted measures which seek to avoid the commercial pressures behind it. Ports serving the same hinterland can cooperate in the development of specialized terminals, with each addressing a different market segment, and offer tariff discounts and increases to manage vessels arrivals, cargoes and information.

Air and air-sea transport services influence the demand for port services. Air-cargo shipments can be delivered in a few days rather than weeks, and letters of credit accepted and paid much faster. If the goods can absorb higher air-freight rates, its advantages are undisputable. Air-sea transport services are utilized to reduce such rates. Freight forwarders have found that such services reduce all-water transit times by 75% and all-air transport costs by 50%. The most common air-sea routes from Asia to Europe are by ship to the U.S. west coast, from which cargoes are flown to Europe, or by ship to either Singapore or Dubai (United Arab Emirates) and then by air to Europe. Very little can be done to increase vessel, train and truck speeds to more effectively compete with air transport, but much can be done to increase the efficiency and productivity of ports.

The choice of physical infrastructures for ports is largely determined by the need for carrier access, specialized terminals and cargo-handling requirements. The physical infrastructures of ports must be constructed to facilitate not only the ready access of ocean and land transport operators but also the cost-effective receipt, dispatch and handling of cargoes. With increasing vessel sizes, ports must dredge entrance channels and berths, and enlarge existing installations or construct new ones. Specialized terminals require large investments as well as frequent and large volumes of cargo, adequate water depth, high-capacity cargo-handling systems and low-cost inland transport services, and are usually constructed at each end of a trade.

The major trend in cargo-handling equipment has been from small to larger units and then to continuous ship-to-storage systems. To justify the considerable investment in such systems, cargoes must be uniform as well as presented in sufficiently large and frequent volumes. Continuous systems are utilized for free-flowing commodities, but they have been extended to standard cargo units such as fruit boxes and pallets, and their employment in handling even-larger units appears inexorable. The use of continuous cargo-handling systems could lead to the construction of docks as open structures which have spaces only for crane rails and loading ramps. General cargo piers might be converted for container handling by constructing a narrow “strip” dock for the front rails of the gantry crane, with shock absorbing systems to protect it, parallel to existing piers.

The advent of standard marine containers has permitted the transport and handling of general cargoes as neo-bulk goods. The International Organization for Standardization (ISO) adopted standard dimensions for
such units in 1964. The growing importance of inland transport in origin to destination movements has emphasized the role that maximum land transport dimensions of major trading nations play in the determination of those for marine use. At present there is an initiative to adopt a new series of larger marine containers. This has placed the investments of many ports and carriers at risk, but the initiative would be best evaluated from the point of view of its impact on the above two groups as well as on shippers and consignees.

Probably the most important innovation in land transport technologies in recent years has been the development of articulated railcars which permit containers to be stacked two high for carriage. These railcars or double-stack wagons are 42% more cost-effective than conventional container on railway flatcar (COFC) operations. When combined with block-train operations, they permit the carriage of containers from a U.S. west coast port of entry to U.S. east coast destinations in less than 87 hours. While originally considered applicable only to high-volume east-west trades, a growing number of carriers have recently extended their use to north-south movements between Mexico, and Canada and the U.S.

Computers and communications systems are part of an information revolution that began with the telegraph. Computers permit ports, carriers and cargo owners to not only communicate, but to integrate activities and enjoy enormous cost reductions as well as productivity increases. The success or failure of ports will come to depend on the speed of receiving, processing and delivering both cargo and information. The interchange of information between computers on the basis of standard electronic documents, or electronic data interchange (EDI), requires internationally recognized standard messages and the United Nations Electronic Data Interchange for Administration, Commerce and Transport (UN/EDIFACT) Board has been established under the jurisdiction of the United Nations Economic Commission for Europe and the United Nations Conference on Trade and Development as a global forum in which they might be formulated.

The establishment of a single EEC market at the end of 1992 will eliminate all physical, technical and fiscal barriers to trade in goods and services between member States and should initiate a period of high economic growth in Europe. Many non-EEC countries are concerned with the possible impact that it might have on their commercial relations. An increasing number of non-EEC enterprises are establishing European branches or joining with European companies to have a presence in the EEC and ensure the access of their products to that market. Certain European ports have initiated efforts to increase the size of their terminal operators in order that they might better respond to the growth in competition after 1992. With the globalization of trade, enterprises of industrialized nations are constructing factories in developing countries which offer low-cost inputs and/or market access advantages. The increased need for efficient ports in those countries could lead to direct foreign investments in their ports.
Most Latin American and Caribbean ports do not have a body of port regulations as such, but rather an incongruent group of rules which arise from the controls placed on each of the organizations and enterprises that carry out their activities in ports. Those organizations and enterprises exert such an enormous amount of control over national port administrations that they determine working hours, which cargoes are dangerous, which investments might be made, where cargoes might be stored and many important aspects that would appear to be the prerogative of management. Their port regulations treat the most minute matters of daily operations and have created a lethargy in the port community that almost precludes problem solving, unless a solution can be found in those regimes.

Numerous efforts have been taken at both the national and international levels to stem the growing traffic of illicit drugs. Customs authorities in most Latin American and Caribbean countries readily admit that their ports and transport systems are utilized for the movement of drugs between producing and consuming nations. In 1988, the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances was adopted. A Special Session on narcotic drugs was convened by the United Nations in 1990, and suggestions were made that States should ratify the above convention, as well as consider the adoption of bilateral, regional and multilateral agreements to suppress illicit drug movements. Also, proposals have been made to amend the International Maritime Facilitation Convention so as to reduce the use of vessels for such purposes. At the national level, the U.S. Government has adopted legislation through a programme called Carriers' Initiative Agreements (CIA) under the Services Vessel Narcotics Control Programme, which requires carriers to exercise the highest degree of care and diligence on their vessels and in ports to reduce illicit drug traffic.

For the 1990s, the ports of Latin America and the Caribbean should have three objectives: increasing productivity, containing costs and becoming part of international distribution chains. A port cannot increase its productivity nor contain costs without reducing excess labor, and offering intermodal connections and modern technologies. In a fiercely competitive global economy there is no way that the fragile links between producers and consumers can tolerate ports which are costly, inefficient and unproductive. To function successfully in a global economy composed of an increasing number of multi-sovereign trading blocks and demanding international markets, ports must be freed from the constraints of an overregulated, centralized and public sector dominated commercial environment. At the same time, ports must extend the scope of their operations by becoming an integral and, therefore, larger part of the commercial activities of the customers they seek to serve.

The majority of the institutional problems facing Latin American and Caribbean ports are a consequence of the conflicting framework of economic goals, labor agreements and legislation under which they are required to
operate. The resolution of institutional problems at ports often involves the establishment of strategic alliances between all those involved in a particular activity to ensure that services are personalized, that those who want a particular service are ready in all respects to receive it, and that those providing services are cost-effective, efficient and productive in their operations. As for new infrastructures, the major problem facing Latin American and Caribbean countries is not the financing of evermore sophisticated, capital intensive cargo-handling systems, but their slow adoption and inefficient utilization rates which arise from inadequate management authority and monopolistic control of ports by unions.

Port investments in specialized terminals and cargo-handling equipment have not been accompanied by parallel alterations in port labor regimes. To create a new consciousness on the part of both management and labor, Latin American and Caribbean governments might consider the adoption of legislation which clearly distinguishes between personnel practices of state-owned enterprises such as ports, which must satisfy commercial objectives, and their national civil services. This legislation must give port managers the means to deal with labor in areas such as their number and composition, remuneration, interchangeability of tasks and productivity. Moreover, due to variations in the demand for dock workers, labor representatives must recognize that carefully guarded jurisdictions or boundaries between skills should be eliminated and training programs undertaken to create a multi-skilled workforce. In this way, port employers can afford permanent employees because they are continuously working.
PREFACE

At the III Ordinary Meeting of the Latin American Maritime Transport Commission (COLTRAM), held at the headquarters of the Latin American Economic System (SELA), Caracas, Venezuela, 22-23 May 1989, a work program was approved for 1989-1990. Resolution No. 2 of that work program, which incorporates an earlier resolution adopted at the II Ordinary Meeting of COLTRAM, requests ECLAC to prepare a study on ports with reference to legislation, management, services, the market and technology in order to permit them to better contribute to the competitiveness of Latin American and Caribbean foreign trade.

The above resolution reflects a growing understanding in Latin America and Caribbean that ports must have an institutional framework and physical infrastructures which permit innovative responses to the needs of users, as well as the authority to control costs, increase efficiency and raise productivity. Port users are no longer willing to accept that port management and labor remain tied to institutions and technologies which respond to earlier economic policies, past financial crises and pressures of particular groups. Port institutions and infrastructures have traditionally been structured to achieve certain commercial, political, social, and strategic objectives. However, with the transformations now occurring in port services, markets, technologies and the legal environment, their utilization to fulfill those objectives must be reevaluated.

The evaluation of such transformations constitutes the basis of this study and is presented in three parts: first, a conceptual framework; second, analyses of the service, market, technological and legal changes; and third, conclusions and recommendations. The conceptual framework encompasses a brief overview of the evolving role of ports since the sixteenth century and a composite Latin American and Caribbean port so that the principal challenges facing those of this region, such as the need for competitive labor regimes, carrier access, specialized terminals and electronic information systems, might be understood as contemporary expressions of century-old trends. The conceptual framework is followed by individual analyses of the
service, market, technological and legal changes in order to identify directions in which the industry is moving. For example, in today's rapidly changing, interdependent world, a passive attitude on the part of ports towards factors such as inland transport, Customs, labor cost and productivity can result in a reduction of the competitiveness of a nation's exports in world markets, a decrease in foreign-exchange receipts and a higher rate of domestic unemployment. Finally, the conclusions and recommendation make suggestions for port policies and plans that Latin American and Caribbean countries might consider.
Chapter 1

HISTORICAL SETTING

At the beginning of the sixteenth century, the world economy was centered at Venice (Italy). Of the many factors that contributed to the economic rise of that city-centered economy, those most relevant for this document include its favorable geographical location as a terminal for the camel caravans which transported spices, silk and drugs from China and India to Europe, and its tideless natural harbor with an extensive network of waterways to the immediate hinterland. Due to inexact navigation systems, vessels limited themselves to daylight sailing along coast lines between that city and other communities in the Mediterranean, Western Europe, the Baltic and to the Red Sea via the Suez landbridge.

Ports were no more than 50 nautical miles apart and were either open roadsteads or constructed in sheltered waters by local communities or feudal lords for trade in a limited range of goods such as timber, metals, alum, grain, fish, wine, beer, furs, wool and cloth. One commodity was often the key to buying another, which could be exchanged for a third and so on. Ports were an integral part of the surrounding village and when a vessel would arrive purchasers and sellers of goods would arrange for casual workers to assist the ship's crew with loading and discharge operations. Such operations were accomplished by carrying individual sacks, bales and barrels between docks and holds of vessels, but, even at this early date, certain ports began to utilize manually-operated wooden cranes for such operations.

The Mediterranean Sea remained the center of international trade activities for a century after the New World was discovered in 1492. With the advent of accurate marine navigation in the seventeenth century, the demand for port services in the Mediterranean began to change. As vessels were no longer limited to daylight sailing along coast lines, they ceased to view ports as a daily refuge and began to call only at those with larger volumes of cargo. Producers and purchasers responded to this change by concentrating cargoes and commercial activities at central locations and, as a consequence, the first steps toward port consolidation were taken. In 1669, for instance, the port of Amsterdam (the Netherlands) offered not only services to vessels but also
storage, redistribution and banking for shippers and consignees, and was recognized as the most important entrepot in Europe. Numerous communities sought to defend their ports by compelling cargo owners to utilize them, constructing installations with public funds and employing subsidies to reduce costs.

During this period, land transport was mainly by pack animals, and carts or wagons were used in very few countries, as roadways were either frozen and slippery, rutted and slow, wet and unusable or so dry and dusty that only goods impervious to damage could be moved. Land transport was so slow and costly that it was cheaper to burn coal carried by vessels from the U.K. to the U.S. east coast than to transport fire wood by land 30 miles to the same destination. To any significant degree regular commercial inland movement of ocean-transported goods really began with the use of rivers and canals, and experienced an enormous period of growth following the appearance of the first steam locomotive in 1814. Railways were the great technical advance of the 1800s and by the middle of the century they had become almost the sole carrier of passengers overland. Even though railroads played a dominant role in land cargo movements, where waterway transport was available it provided, in most cases, a less costly, more efficient alternative.

The first steam engines in vessels were adapted from railroads, but it was not until the 1860s that they were widely employed in ocean vessels as the principal means of propulsion. The utilization of iron in vessel construction permitted an enormous increase in their sizes. Instead of ships averaging 300 to 400 tons in the 1850s, almost overnight they increased in size to 1,500 tons and more. Advances in land transport, and vessel propulsion and construction inaugurated the modern era of applying new technologies to ports and accelerated their geographical consolidation and the concentration of cargoes. The volumes of liquid- and dry-bulk cargoes transported by sea were increasing rapidly and the first specialized vessels were constructed in the late 1880s.

Vessels began to be equipped with steam winches which permitted enormous increases in cargo-handling productivity. During the latter years of the nineteenth century dock workers reacted to such productivity increases and the casual nature of their employment by organizing themselves into unions. They made strenuous efforts to avoid the adoption of labor-saving technologies. For example, the practice of “jumping-out cargoes” where men would use their weight to raise individual items of cargo from a ships’ hold by means of a line passed through a block on the mast which they would hold in their hands while jumping off a platform on the dock lasted well into the early years of the twentieth century at certain British ports. Such efforts had a negative impact on port productivity and costs, created an overdimensioned dock labor force and led to an increase in single-user ports with labor regimes which more clearly reflected commercial needs.
The continuing improvements in naval architecture and marine engineering permitted the construction of larger and faster ships with more productive cargo-handling systems, and by the 1950s ports had become congested with cargoes and vessels. This led to cargo unitization, in the form of pallets, preslinging and marine containers. Since that time, ports have responded to the trend towards ever larger, more productive and specialized vessels by dredging, expanding into locations closer to the open sea with greater water depths, and by building larger docks, facilities and storage areas for unitized and bulk cargoes.

In comparison with ocean and rail transport operations, truck transport is a relatively new means of carriage. It experienced a period of rapid growth between the first and second world wars, but the real breakthrough occurred in the 1950s. At that time, there was a convergence of efficient truck technologies, modern road design and construction and low prices for petroleum products, all of which contributed greatly to its efficiency and the increase in the volumes of cargo transported by that means. The growing use of inland transport services initiated a shift away from coastal shipping services and an expansion in the hinterlands of major ports. A similar convergence is now occurring with scale-economy vessels, high-capacity cargo-handling equipment, long-distance inland transport, privatization, decentralization and deregulation of transport, and computers and communications systems.

The greater scope of inland transport services in the 1950s enlarged the hinterlands of ports, but the latest convergence is bringing about a transformation of the industry. In 1956, for instance, when the first voyage of a vessel carrying containers took place, few could have conceived of the influence such units would have not only on liner shipping and ports but also on manufacturing and consumption patterns. Just as a growing number of liner vessel operators no longer sell space in cargo holds, but inventory support systems, ports can no longer be defined as a collection of docks, equipment, and cargo-handling and storage services. Ports reach inland as far as cost-effective land transport services can carry cargoes and face a competitive environment where historical relationships are practically meaningless. Vessels do not have to call at a port to serve its hinterland and ports are not the only place where the wide range of services which support international trade can be carried out. As a consequence, ports can no longer center their thinking on the operations occurring between shipside and port gate, but must explicitly take into account the effects of activities on their operations which occur from the time goods are produced until they are consumed.
A number of Latin American and Caribbean countries have sought to respond to commercial pressures for modern port facilities by making numerous infrastructural improvements. After cutting the traditional inaugural ribbons, however, it has been found that there was insufficient electrical power to run the new capital-intensive, cargo-handling equipment, that the dock workers' union had not been consulted when the loan was granted to purchase the equipment, that there is a chronic shortage of terminal trailers, tractors and railway wagons needed to support such equipment and that personnel have not been trained to operate it.

Like pieces of different puzzles that do not fit together, the wide range of governmental agencies involved in ports seem to lack the agility needed to plan, organize and execute institutional and infrastructural improvements. Such agencies cannot discard the time-honored doctrine that the country will only work properly if everything is regulated and centrally directed. In the last decade of the twentieth century, governments face a fundamental choice: either they identify and define appropriate roles for the public and private sectors in ports vis-à-vis international trade or accept a reduction in the competitiveness of their exports in world markets, a contraction in foreign exchange receipts, a decline in domestic investments and a higher level of national unemployment.

The composite Latin American and Caribbean port which is developed in this part illustrates common infrastructural, operational and institutional problems facing governments, port administrations and all those providing and receiving services. Its purpose is to provide a basis for understanding the transformations required of ports of the region so that export-oriented macroeconomic policies might be better supported. For governments and the entire port community, the composite port demonstrates the risks involved in not solving problems: endless labor disputes, lack of overall planning, out-of-date institutions, monopoly control of port services, cargo pilferage, high costs and low productivity. The composite port should be considered in relation to the individual analyses presented in parts III to VI, as well as the
conclusions and recommendations in part VII, so as to stimulate reasoned, constructive and convergent discussions which, hopefully, lead to needed changes.

A. A COMPOSITE LATIN AMERICAN AND CARIBBEAN PORT

A port is an anchorage, bay, haven or refuge where installations have been constructed to facilitate commercial operations related to the loading and discharge of vessels, cargo handling and storage, Customs inspections of goods and cargo transfers between ocean and land transport modes. However, when one looks more closely at the characteristics and volumes of cargoes handled as well as the port's interfaces with inland transport services, that broad definition begins to change. On the one hand, ports which handle bulk cargoes are usually single-user facilities, highly specialized, owned and operated by the owner of the commodity being handled and major users of low-cost rail, waterway and pipeline transport systems. On the other, general cargo ports are usually owned by governments, often operated by the private sector, equipped to handle a variety of cargoes and cargo units, and served by road and rail transport systems.

Ports which handle the same types and volumes of cargoes and utilize the same land transport systems are strikingly similar, but major differences arise from the ways in which governments and enterprises providing services at ports create institutions, the distinct functions carried out by each and the relations among them. Latin American and Caribbean ports are usually owned and operated by governments, with many in the port community occupying dominant positions and receiving monopoly rents. Vessel operators usually contract, through shipping agencies, with port labor unions for dock workers. The number of dock workers required for any given task is determined by labor agreements which are often approved by governments. Labor unions represent their members in wage and benefit negotiations with port administrators, and occupy the position of maritime employers. As employers, unions make payments to dock workers for wages and benefits and, thereafter, are reimbursed by vessel operators. For their part, government port administrations seek to carry out national policies in areas such as trade, employment, health and Customs, and to coordinate activities of the entire port community.

The public sector of many industrialized nations also retains ownership of ports, but private sector interests are permitted to invest in and operate marine terminals on a long-term basis. In this context, dock workers are hired by maritime employers, whether stevedoring companies or marine terminal operators, to provide cargo-handling services. Stevedores were an outgrowth of a labor-intensive environment in which the need for large investments in cargo-handling equipment was minimal, and vessels were equipped with their own cranes which permitted cargoes to be loaded and discharged. Marine
terminal operators represent a response to the increasing technological sophistication of ports, and they make major investments in shoreside cranes, cargo-handling equipment and other needed installations. Stevedores are able to carry out their activities at any dock, whereas marine terminal operators are more “site specific” and usually restricted to those in which they have invested. Port labor unions represent dock workers in their negotiations with stevedores and marine terminal operators.

1. Location and physical infrastructure

The composite Latin American and Caribbean port was utilized by explorers during the sixteenth century because of its natural harbor, ready access to fresh water, wood for vessel repairs and food. Today, due to deforestation, the port accumulates a large amount of sedimentation from the surrounding area. The accumulation of sedimentation in the harbor and access channel was a minor concern until large-scale vessels began to call during the 1970s. As a consequence, dredging services are required with increasing frequency, but water depths remain around 30 feet and are less than those required by large-scale vessels.

The port is surrounded by a city and without the possibility of any major expansion. The time for navigating a merchant ship between the pilot station and the port is seven hours. Another location five-hours closer to the ocean has been identified for a new port, but pressures from commercial interests in the city, the maritime authority and dock worker unions have nullified all efforts to undertake its construction. The feasibility studies prepared for the new port have shown that for a general cargo vessel with 4 000 tons of cargo the new port would be 71% (286-167/167) more productive than the old port without any change in tons handled per dock worker hour.

<table>
<thead>
<tr>
<th>Port</th>
<th>Time in</th>
<th>Time out</th>
<th>Dock worker time</th>
<th>Total time</th>
<th>Tons per hour</th>
<th>Tons per dock worker hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old</td>
<td>7</td>
<td>7</td>
<td>10</td>
<td>24</td>
<td>167</td>
<td>400</td>
</tr>
<tr>
<td>New</td>
<td>2</td>
<td>2</td>
<td>10</td>
<td>14</td>
<td>286</td>
<td>400</td>
</tr>
</tbody>
</table>

Source: Based on information provided to ECLAC by ports and shipping lines.
The fact that the port is seven hours navigation from the ocean is not, by itself, a disqualification. There are many ports in other regions with long access channels which successfully handle international trade. However, the additional costs of the extended passage must be offset by competitive port charges, high productivity, specialized terminals and efficient distribution systems.

A substantial part of the port infrastructure was constructed at the beginning of the twentieth century for the export of bulk commodities and the import of manufactured goods. With increasing industrialization of the country, however, the port infrastructure has been expanded and specialized facilities were constructed in the latter part of the 1950s. All cargo-handling equipment operates at very slow, uneconomic loading rates in comparison with that utilized by major competitors of other regions. While there is handling equipment for general cargoes, the majority is not in use. The reason is due to purchases of a wide variety of equipment from different manufacturers, which precludes appropriate training of personnel for repair and maintenance services, and unnecessarily inflates the budget for spare parts. A gantry crane was purchased for loading and discharge of containers, but handling rates are substantially less than its design capacity.

Rail lines connect producing areas and ports. A schematic map of rail routes and terminals between the port and major producing and population centers would seem to indicate the existence of a developed intermodal transport system. However, the rail infrastructure is in an advanced state of disrepair and is not competitive with road transport. On the other hand, road carriers have an adequate transport infrastructure, but utilize a monopolistic pricing structure through strong unions that is supported by government regulations.

2. Institutional considerations

The institutional environment of the port is the result of an accumulation of government policies over the last 50 years. The port activities carried out by dock workers, banks, ships' agents, truckers, freight forwarders, Customs agents, port authorities, Customs administrations and other groups are interdependent, but carried out in an inefficient, sequential manner. Notwithstanding the need to coordinate the execution of their individual tasks, they have no common communication links nor central coordinating body. This has resulted in an average storage time for goods in port of 45 days. Port labor unions are one of the better organized groups and they exercise monopoly control over their own activities and influence those of many other groups. User groups have begun to express their dissatisfaction with the monopoly control of cargo-handling and storage operations by port administrations and dock labor. Port labor representatives seek to justify their
monopoly by indicating that it is necessary to provide them with a large enough cargo volume so as to reach scale economies with new equipment.

Probably the greatest problem facing the port is its out-of-date institutional infrastructure. Since the onset of mechanization of port activities, institutional arrangements have been modified not to reflect the capacity of new cargo-handling equipment, but, rather, to ensure that vested interests are preserved. Such interests have always been precise in the measures they need to avoid competition, but have never attempted to jointly draft a strategic plan to meet it. The accumulation of such modifications throughout the years has created an enormous network of unnecessary tasks and costs which exporters and importers must pay, and lost opportunities the economy must accept. The port has plans for investments in high-capacity, cargo-handling equipment, but they do not contemplate any restructuring of its institutions.

For many years, the country has had a political environment in which the economic realities of international trade have either not been taken into account or were covered over with import tariffs, multiple exchange rates and subsidies. This has led to an overstaffing of the composite port, inefficiencies and a waste of resources. Frequent changes in port management has resulted in an abdication to labor of its planning responsibilities. Labor, in turn, is not adequately trained to perform these functions effectively. From a simple comparison of container handling rates, for instance, labor productivity is from 20% to 40% of that found in the average port of an industrialized country. The low productivity, inefficiency and waste of resources have made this port a burden on the economy of its hinterland for decades. With the evolution towards a global economy, there is a growing recognition that the value of ports is based on their contribution to the competitiveness of exports and imports.

3. Operational environment

The port director received his position as a political appointment and views it as part of a public service career that might lead him to others of greater distinction. The operation of the port largely depends on the leaders of dock workers' unions, but there are a number of persons within the national port administration that have years of valuable experience. These persons are seldom utilized by the director to control port operations. Rather, the director relies on union leaders so as to avoid labor conflicts and, as a consequence, usually responds to their demands for higher wages, better working conditions and more social benefits. In recent years, the unions have come to be dominated by the principal political parties of the country, with each seeking to obtain more and better benefits for its followers.

The union demands for higher wages translates into more money for less work; better working conditions mean barbers cutting dock workers' hair, buses picking them up at their homes to go to work and dropping them off
after work; and more social benefits means an expansion of the medical program to include all members of dock workers' families, including those beyond the bonds of matrimony, and limiting port work to a maximum of two shifts per day with no work on Saturdays, Sundays and national holidays. All of these benefits have created a privileged class within the country and any openings for new workers are implicitly reserved for family members of existing dock workers.

In common with many ports of the world, there is a small and well-organized group of dock workers at the composite port that form part of what is commonly referred to as the "rats nest". This group of workers has pilfered cargoes with impunity for a number of years. The "rats nest" has let it be known that if the uninvolved dock workers inform authorities, their families will be harmed. Certain road carriers have begun to refuse to load stolen goods on their trucks unless the "rats nest" allows them to participate in their ill-gotten gains. For its part, the national Customs administration has had certain of its functions retained by the central bank in an effort to reduce the possibility of corruption among its inspectors.

The wages of dock workers consume almost all revenue generated by the port, so cargo handling equipment is quite old and is either inoperable or in a general state of disrepair. To respond to the needs of ship operators, private companies such as ship's agents and freight forwarders have begun to purchase modern equipment to load and discharge vessels as well as to move cargoes between vessels and port warehouses. Due to the sophisticated nature of this equipment and its high cost, such companies are unwilling to permit its operation by union dock workers. Instead, they utilize their own personnel to operate the equipment and charge vessel operators for the service. Port users are faced with two sets of dock workers, one formal and the other informal, and must pay for both.

B. COMMERCIAL IMPACT

The situation at the port was described by the minister of transport as difficult and, at times, chaotic, with an excess of regulations controlling every activity and an overdimensioned work force which is militant, without competition and has been on strike 146 times since 1988. The overall impact of this environment is to create a very expensive port with extremely low productivity. As an illustration, a general cargo vessel of 8 500 GRT calls at the port to discharge 2 000 metric tons of general cargo from three cargo holds and 50 twenty-foot-equivalent units (TEU—a measure based on the size of ISO Series I freight containers that is the standard indicator of container capacity for vessel and rail transportation and port productivity) of containerized cargo. It then loads 300 metric tons of general cargo and 50 TEU of containerized cargo. The following table summarizes the costs and time needed for such operations in two ports: the composite Latin American and Caribbean port and another in North Europe.
COST AND TIME SUMMARY FOR CARGO OPERATIONS IN PORT

<table>
<thead>
<tr>
<th></th>
<th>Days</th>
<th>Cargo costs</th>
<th>Vessel costs</th>
<th>Dock worker days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composite port</td>
<td>8</td>
<td>US$50 000</td>
<td>US$40 000</td>
<td>540</td>
</tr>
<tr>
<td>North Europe port</td>
<td>2</td>
<td>US$25 000</td>
<td>US$10 000</td>
<td>180</td>
</tr>
</tbody>
</table>

Source: Based on information provided to ECLAC by ports and shipping lines.

The composite port works only two shifts of five hours each per day and assigns 15 men to each cargo hold, for a total of 90 dock workers per day. The vessel at this port requires six working days to carry out discharge and loading operations, but must remain in port over a weekend for a total of eight days. In contrast, the North European port operates three shifts of eight hours each per day and assigns 10 men to each cargo hold, for a total of 90 dock workers per day, and the vessel is loaded and discharged in two days. This means that the 3,300 metric tons of cargo cost US$50,000 or US$15.15 per ton to handle at the composite port, and US$25,000 or US$7.58 per ton at the North European port. If daily vessel costs are added, these cost rise to US$27.27 and US$10.61 respectively.

The preceding calculations reflect the costs of formal dock workers. To the above amounts must be added the costs paid by ship operators for services provided by informal dock workers. At the composite port, informal dock workers carry out approximately 20% of the cargo handling operations with 75% less personnel than the formal dock workers and at half their wage rate. During the eight day period, 23 informal workers are employed 1.6 days at US$3,000 per day or US$4,800 total cost. Thus, the total cargo, vessel and informal worker costs amount to US$94,800 or US$28.73 per ton.

As a consequence, numerous groups, both within and outside of the government, have begun to suggest the privatization of port services and that existing private bulk terminals should be permitted to handle third-party cargoes. The national Customs authority believes that privatization of port services would permit it to have greater control over port personnel and, hence, trade flows. Shippers and consignees consider that ports should be owned by municipal governments and operated by the private sector, which would allow both to participate in the revenues earned from port operations and should provide an incentive to solve common problems such as access,
contamination and the use of valuable waterfront properties. Finally, port labor representatives are very much against the privatization, as it would dramatically reduce the demand for dock workers.

C. A POINT OF DEPARTURE

The comparative advantages enjoyed by the country, such as low factor costs in manufacturing and agriculture, have permitted the hinterland of the port to produce goods which are highly competitive in international markets. However, due to excessive port costs these comparative advantages are increasingly being eroded. Such erosion decreases the competitiveness of exports, increases the cost of imports for domestic consumers, diminishes receipts of foreign exchange and reduces domestic investments in productive capacity. It is necessary to identify a scheme of policies which are capable of reversing this situation. The major problem facing the port is monopolistic control of various activities by the port administration, Customs, labor unions and inland transport enterprises, which has eliminated all vestiges of competition. It is generally agreed that such control has created inefficient work practices, unsatisfactory industrial relations, ineffective supervision and management, high costs and widespread unreliability, all of which indicate fundamental reform rather than incremental change is required.

A fundamental reform of port activities need not be viewed as a source of confrontation between those seeking change and those wishing to preserve their dominant positions, but, rather, an acceptance by both of the economic realities which govern international trade in the last decade of the twentieth century. Such realities mean that all those receiving and providing services at the port must transform their activities to reach the common goal of progressively greater cost-effectiveness and productivity. As illustrations of this point, the port cannot achieve that goal unless its managers are selected for their knowledge of the challenges facing the industry and proven abilities, and not for their political affiliations. Port labor must acquiesce to the elimination of work preservation schemes, undertake training that will permit them to carry out more than one task and accept working hours which are compatible with trade requirements. Finally, Customs must change from a fiscal to a commercial orientation so as to facilitate trade activities. Once the port has a competitive institutional structure, is operating efficiently and equipment is being properly maintained, decisions can be made as to future investments.
Chapter 3

SERVICES

Ports around the world face a major crisis brought on by the failure of individual services to reflect contemporary requirements and the inability of port managers to integrate their execution so that the resulting system might enhance productivity and reduce costs. Today, those providing services at ports find themselves: remotely-deployed-from-one-another, yet they depend on each other; governed by conflicting legal regimes, yet they rely on common business practices; unwilling to accept institutional and technological changes, yet they are controlled by them; inexpert at communicating, yet they urgently require more and better information from each other; and incapable of competing independently in the emerging global economy, yet they lack a strategic vision of their shared roles in that new environment. These contrasting messages indicate the breadth of the problems involved in the modernization and integration of port services. Of the many changes required to achieve those goals, the most important encompass numerous i) institutional and ii) operational considerations.

A. INSTITUTIONAL CONSIDERATIONS

1. Organizational structures

A wide range of enterprises and institutions carry out their activities to support trade flows at ports. Each institution and enterprise has its own organizational structure. For example, dock workers, Customs administrations, freight forwarders, Customs brokers, banks, insurance companies and carriers operate with different unions, contractual arrangements, government regulations and international conventions. Ports must organize this complexity, but organized complexity does not imply efficiency, cost-effectiveness nor productivity. As is often the case, the organizational structure of a port is not an optimal choice, but rather a reflection of the structures of all those providing services at its facilities.

If this diversity were not enough, most Latin American and Caribbean ports have extensive socio-political responsibilities. Political leaders may see
the port as a means to create a constituency, absorb unemployment and assign prominent positions to major supporters. If uncontrolled, these socio-political responsibilities can become part of such an enormous network of benefits, cross-subsidies and welfare that the possibility of a port operating on a commercial basis is placed at risk. Just as increasing inflation drives funds towards ever shorter term investments and public-sector financing crowds out that from the private sector, port policies with demanding socio-political objectives can limit and even preclude a port's capacity to support trade flows in a cost-effective manner. There will always be competing needs for scarce port resources, but they will be able to provide greater benefits to a nation as a whole if operated as business entities with socio-political responsibilities which are both defined and limited.

Generally, Latin American and Caribbean liquid- and dry-bulk ports are controlled by the private sector, while general cargo ports are government-owned and operated. Most public sector ports have complex organizational structures which are shared with government and private sector groups. As illustrations of this point, in Argentina there are six ministries and 18 state agencies involved in port activities. In addition, there are 10 unions representing different groups of workers. For its part, the port of Veracruz (Mexico) must renegotiate dock worker wage rates with seven port labor unions each time the national minimum wage is increased, which occurs several times a year. This dense organizational arrangement is complicated even further by the existence in many ports of two parallel groups of port laborers, formal and informal. The formal group is represented by unions and employed by the port, and the informal group is utilized by their formal counterparts to replace them or to carry out certain heavy, dirty or undesirable tasks.

Such dense organizational structures mean that procedures for making decisions are complex and exceedingly slow. For example, a grain terminal at the port of Bahia Blanca (Argentina) was damaged by an explosion on 13 March 1985 and the national grain board (JNG) has been unable to obtain permission for its reconstruction. The delay could be the result of a deliberate decision by the Government of Argentina to avoid making new infrastructural investments so that the private sector might become involved. Indeed, due to the pressing need for additional grain loading facilities at the port, a private company invested US$2 million in an unused pier of the department of energy of Buenos Aires and has been operating since May 1986. To simplify the decision-making process and clarify responsibilities, a new legal regime for Argentine ports has been proposed. For its part, in June 1988, the Government of Brazil announced that it was to adopt a new legal regime to modernize the administration and operation of its ports. In October 1988, two decrees were adopted, one that enlarged port administrative councils to include port users and another which placed port laborers under their
control. Dock workers responded by threatening a two day strike, 24-25 October 1988, and the decrees were repealed.

In addition, organizational density creates uncertainty and indecision for port managers, carriers, cargo owners and unions. For example, on 29 November 1989, the national ports holding company of Brazil, PORTOBRAS (Empresa de Portos do Brasil), agreed to the demands of dock workers at 10 major ports of that country for a 23% wage adjustment for inflation, a 4% productivity increase and salaries equivalent to their counterparts at the port of Santos. PORTOBRAS delayed the increase until 1 January 1990, in order that it might raise port charges 27% to have sufficient income to satisfy the new wage levels. However, on 24 November 1989, the Ministry of Finance issued a decree which transferred the authority for increasing port tariffs from an interministerial price council (CIP) to port users councils, the latter of which have yet to be established in many ports. To complicate matters even further, the newly elected Government of Brazil adopted a package of measures on 16 March 1990, one of which abolished PORTOBRAS, but without indicating how the ports are to be administered in its absence. Thus, managers at those ports and unions are unsure as to when and how charges can be legally increased to meet new salary levels.

This institutional density and fragmentation have led to a bureaucratic lethargy and a vacuum in the control of port operations by management. The better organized groups have been pulled into this vacuum and exercise varying degrees of control over port activities. Such control was given to a cooperative of unions at the port of Tampico (Mexico) and a similar arrangement is being studied for use at the port of Santos (Brazil), where unions already have de facto control over many management functions. Cooperatives are a valid organizational structure for ports if they include and balance the interests of all those involved. At the port of Bahia Blanca (Argentina), for instance, a cooperative of port workers was established in 1961 and functions quite well because of the competition for cargoes from nearby ports and because of its willingness to participate in a commission to improve productivity and coordinate port activities. However, without some mechanism to balance a dock worker's cooperative, their dominant position often results in claims for greater benefits, shorter working hours and preservation of overlarge gang sizes.

For many Latin American and Caribbean ports, certain institutions and enterprises providing services have become so strong that they can no longer operate in a competitive manner. As illustrations of this point, the Government of Uruguay recently recognized that dock workers have such complete control of cargo handling operations that a new labor regime should be elaborated by Congress so that productivity might be improved and costs lowered. The national port enterprise of Peru (ENAPU) finds that minimum wage guarantees for 3,000 dock workers, when it needs only 1,000, have created an incentive for high-value cargoes to be routed through the port of
Guayaquil (Ecuador). Numerous others find that overstrong unions have transformed them into a "no-man's-land", thereby reducing cargo-handling efficiency and increasing costs. Finally, in April 1990, Argentine pilot costs were US$23 200 for a PANAMAX bulk carrier which commenced loading at the port of Rosario and completed the operation at the port of Bahia Blanca, while those for the port of New Orleans (U.S.) are only US$4 200.

2. Port and trade policies

Due to the inverse relation between port costs and foreign exchange earnings, the intimate link between them must be taken into account when considering measures to modernize and integrate port activities. If port technologies are inappropriate, if Customs' regulations are onerous, if union agreements create an overdimensioned workforce or if inland transport enterprises exact a monopoly rent, they will increase the price of port services, reduce the competitiveness of a country's exports in world markets, limit sales, decrease foreign exchange earnings and diminish the effectiveness of trade policies. The essential factor is the avoidance of monopoly control, whether by labor, management or governments, of any service and the preservation of an open, competitive environment.

There is a direct relation between the cost-effectiveness and productivity of a country's ports and the health of its import and export trades, but that relation assumes even greater importance for island nations. Most islands are totally dependent on one port and lack continental alternatives, such as the choice U.S. mid-west shippers and consignees have between Canadian and U.S. east coast ports. Any work stoppages at island ports have a direct and important impact on the nation's economy. If such work stoppages are prolonged and island inventories of goods become depleted, the level of economic activity of an entire nation can be reduced. In March 1989, for instance, a port labor dispute concerning an elimination of overtime led to an 80% reduction in productivity of Bermuda's 63 dock workers and caused panic buying of retail goods among its 58 000 inhabitants.

In common with many other Latin American and Caribbean countries, the island nation of Trinidad and Tobago found its trade controlled by the dominant position enjoyed by the port of Port of Spain and its dock workers. The neighboring port of Point Lisas was constructed as part of an industrial park so that use might be made of the country's abundant supply of natural gas. To avoid the high costs, slow working rates and pilferage at Port of Spain, temporary berths were constructed for the import of factory and construction equipment, buildings and other materials. The major tenants of the industrial park are fertilizer, steel, ammonium and urea plants. Each constructed private deep-water berths to receive raw materials and distribute finished goods. Once the plants were completed, the temporary berths then began to
be utilized for the handling of general cargoes in competition with Port of Spain. 

The ports of Point Lisas and Port of Spain must negotiate with the same dock labor unions and comply with the same government regulations. The difference between the two ports lies in the application of that common framework to create totally distinct commercial environments. Point Lisas is part of an industrial port and must ensure the competitiveness of the products of its tenants through a highly productive, cost-effective dock labor force and a minimal bureaucratic interface, as well as actively marketing its facilities to increase the number of tenants in order to lower its overhead costs to each. For example, the competition facing the tenants of the industrial park at Point Lisas led to negotiations with unions and a reduction in gang sizes, three shift operations, weekend work without overtime and elimination of container-lashing gangs. On the other hand, Port of Spain commenced as the country’s only port, and has a more restrictive labor agreement, high overtime rates for weekend work and a requirement that container-lashing gangs be utilized. Port of Spain has begun to react to the loss of its dominant position through, for instance, the nomination of its first director of marketing in January 1989, a reduction in the number of dock workers and the initiation of various training programs.

The port of Santos (Brazil) employs 11,000 formal-system dock workers. Historically, that port was operated by the private sector, but such activities are now carried out by the state of São Paulo under a concession from PORTOBRAS. Dock workers at the port successfully negotiated the preservation of their 32% private sector premium wage differential. Due to these and other costs, the tariffs at Santos for handling instant coffee, a major export commodity, are 647% greater than those at the port of Vitoria and 430% more than at Paranagua. Vessel operators and exporters have begun to consider using the ports of Paranagua and Rio de Janeiro (Brazil), and both ports are engaged in marketing programs to attract cargoes from Santos. The Santos Commercial Association (ACS), which includes 71% of Brazilian coffee exporters, recently warned that port that such costs could make the utilization of its installations financially unwise, even though the port currently handles 63% of Brazil’s coffee exports.

The Government of Chile has defined its role in ports from the viewpoint of fostering trade. Before 1981, when the Government adopted laws 18 032 and 18 042, which ended vessel and landside cargo handling monopolies as well as the distinction between those activities, the port was controlled by 15 port labor unions. The balance of negotiating power favored dock labor unions and they sought to establish the number of workers required for each task and their remuneration. Labor requirements were inflated and wages so high that registered dock workers often subcontracted their tasks to a large number of informal workers. When this system was audited in early 1981, it
was found that some 3,200 registered dock workers were “employed” 400-600 days per year and earned more than US$2,000 per month.

To reform this system, in 1981, the Government of Chile adopted the above-mentioned legislation. Dock workers were compensated with around US$30 million for the revocation of their cargo handling monopoly and port employment was opened to all workers meeting minimum age and physical requirements. Payments to dock workers averaged US$14,300, and ranged from US$10,000 to US$200,000. Private stevedoring companies were established and negotiations undertaken between each and individual unions concerning manning levels and salaries, and the central hiring hall was replaced with three categories of port workers: permanent employees who receive a salary whether or not there is a ship in port; special contract workers who, in addition to a minimum income guarantee of four shifts per month, are paid on a daily basis according to the volume of cargoes handled; and casual workers who have no income guarantees.

Law 18,032 created competition among stevedoring companies in each port, and integrated ship and landside cargo-handling operations. Other than the removal of warehouses to create an open storage area for containers, no other infrastructural changes were made in Chilean ports until 1984, when a multipurpose crane was purchased by private sector shipping lines. One measure of the support given by Chilean ports to that country’s trade policy would be the change in output per meter of dock for the years 1967 and 1986. As can be seen from Table 1, between those years the tons handled per meter at Valparaiso rose from 776 to 1,222 and the occupation of berths decreased from 65% to 40%. The decrease in berth occupation permitted the port to utilize those which were better equipped and, again, increase its cargo handling productivity.

Law 18,042 sought to create independent authorities for each of the nation’s ports and to transform the national port enterprise (EMPORCHI) into a holding company. The implementing decrees and resolutions to bring law 18,042 into force were never adopted, but the law required EMPORCHI to give up its monopoly over landside cargo handling operations so that private stevedoring companies might carry out some of those functions. On 10 March 1990, law 18,042 was repealed through the adoption of law 18,966. The new law establishes a general rule that EMPORCHI cannot store cargoes, load or discharge vessels, or move cargoes between ships and storage areas. Thus, the general rule requires that such activities be carried out by the private sector.

However, there are three exceptions to the general rule established by law 18,966. First, EMPORCHI is allowed to deliver trade documents and merchandise as well as offer storage services within the port area, but cargo owners are not required to utilize its storage services and may choose those outside of the port. Second, EMPORCHI is allowed to offer non-exclusive storage services and to move cargoes between ships and storage areas for
international transit traffic, principally that of Bolivia. And third, EMPORCHI is allowed to store cargoes and move them between ships and storage areas where those provided by the private sector are insufficient or non-competitive until the ministry of transport has authorized a subsidy to rectify the matter. Thus, law 18 966 clearly defines the activities that EMPORCHI can engage in and the competitive environment in which they will be carried out.

Table 1
PORT OF VALPARAISO, CHILE

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<td>1 455 350</td>
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Source: Economic Commission for Latin America and the Caribbean, *La cadena de distribución y la competitividad de las exportaciones latinoamericanas: Racionalización portuaria en Chile* (LC/G.1597), 29 December 1989, p. 35.

* Historically there was a mechanized plant at the berth for unloading coal.

The Chilean port experience demonstrates that the major obstacles to such modifications are not the lack of modern technologies or funds for investments, but an unresponsive port administration and a workforce which is overdimensioned and unproductive. Due to competition between stevedoring companies within each port, Chilean ports have become progressively more efficient and better able to attend that country's foreign trade. In fact, if 1981 productivity levels had been maintained, it has been estimated that around 2.1 million tons of fruit, general cargo and forest products could not have been handled without the enlargement of port facilities not only at Valparaiso but also at San Antonio and San Vicente at a cost in excess of US$500 million.
The benefits from restructuring Chilean ports are most noteworthy, but there remain a number of areas which might be the subject of additional analyses. For example, the compensation awarded dock workers did not consider their age, port tariffs were not immediately restructured to reflect the new labor regime, cargo-handling arrangements have come to be negotiated for each ship and a normative regime was not adopted to protect dock workers. The latter two factors combined to largely eliminate any incentive for port employers to offer the dock workers permanent positions. The key to port productivity is a motivated, well-trained and appropriately paid laborforce, but it is difficult to motivate and train dock workers who do not work for a port employer on a continuing basis. Thus, a normative regime from the Government might structure employment for dock labor so that, for instance, casual positions utilized 50% of the time would be filled on a contractual basis and contractual positions utilized more than 80% of the time would be filled on a permanent basis.

B. OPERATIONAL CONSIDERATIONS

The environment in which ports operate is changing so rapidly and completely that one can no longer identify the activities they carry out by referring exclusively to their docks, warehouses and cargo-handling equipment. Today, ports cannot be viewed as mere interfaces that transfer cargoes between ocean and inland transport modes, as they are increasingly becoming catalysts that can initiate a wide range of commercial endeavors in surrounding cities and adjacent hinterlands. As a consequence, vessel operators have begun to join with exporters and importers in the evaluation of a wide range of factors when selecting a port. Such factors include i) management performance and port productivity, ii) port labor, iii) the role of the private sector in ports, iv) Customs and v) diversification activities of ports.

1. Management performance and port productivity

The president, manager or chief executive of a port should be a port professional. This does not mean that such a person must be a cargo handling expert, but rather that he is familiar with port operations and has an understanding of the challenges facing the industry. This might mean, for instance, that a freight forwarder, ship operator, port accountant, admiralty attorney, marine insurance broker or a person involved in financing port improvements could be chosen for the position. Without such a person as head of the port, some port management functions will inevitably be carried out by pressure groups, especially dock labor unions. In an effort to avoid this situation, the Superior Council of the Venezuelan Merchant Marine
(CSMMV) requested the President of that country to consider the selection of merchant marine professionals for positions at its ports.

The productivity or the speed with which goods move through port facilities directly influences its capacity to attract cargoes. However, productivity is not limited to vessel and cargo handling activities, but includes all services such as Customs, drayage and even the speed with which banks act on letters of credit. All those providing services at ports carry out their activities in a complex pattern of interdependency. For example, no matter how fast a container gantry crane can load and discharge vessels, its maximum speed is usually determined by how rapidly containers might be transferred between ships and storage areas, the speed with which information must be given to Customs and the speed with which truckers can deliver and receive goods. Each is crucial to the next, and the productivity of each depends not only on its own efficiency but also on its interface with others. As a result, port productivity or the lack of it is transferred from one function to the next, thereby decreasing or increasing costs and customer satisfaction.

Latin American and Caribbean governments are directly involved in ports. Their involvement encompasses detailed labor legislation, limitations on the use of earnings and restrictions on the activities of private interests, all of which limit the flexibility of port managers to make commercial decisions. The management of public sector ports cannot escape such influences, because governments should and do represent a wide range of political, economic and social interests, and it is almost impossible to preclude the transmission of their ambitions and requirements to ports. As a result, many public sector port managers are responsible only for a limited range of day-to-day activities. Strategic decisions relating to investment policy, personnel, market development and tariffs are usually made at the ministerial level and subject to pressures from interest groups. To avoid the transmission of such pressures, a growing number of governments throughout the world have begun to privatize port operations, a topic that is considered in greater detail in section 3 of this part.

The impact of overstrong dock labor interests can be seen from a number of ports in the region. As illustrations of this point, the port of Veracruz (Mexico) has only one terminal operator, Servicios Portuarios de Veracruz (SERPOVER), which is 70% owned by the dock workers' unions and 30% by the Government. In 1979, SERPOVER purchased a ship-to-shore container crane and three rubber-tire yard gantries, but they were abandoned when its debt for that equipment in Mexican pesos doubled following the national debt crisis of mid-1982. The absence of that equipment led to an average port time of 70 hours for container ships. Such port times have resulted in the dissolution of the joint service of Gulf Container Line, Hapag-Lloyd and Compagnie Generale Maritime (SAGUMEX) to Veracruz, with each line now serving it by feeder services through other ports.
The port of Santos (Brazil) is estimated to be one-third as productive as those of Europe and only one-half of those in the same country. The reasons most frequently cited for this are that its installations are on two sides of an estuary, the unnecessarily large amount of time lost in transferring workers from one side to the other by boat and the de facto control of operations by dock workers. A cost analysis prepared by the port of Paranagua (Brazil) indicates that an 11,000 dwt dry-bulk carrier would have greater earnings after waiting 30 days to load at its facilities instead of receiving immediate service at Santos. With reference to liner shipping, during 1988 the specialized container terminal at the port of Santos handled seven units per hour and the port of Paranagua moved 12, while those of Europe attained an average of 22 per hour. In an effort to rectify this situation, the company which administers the port of Santos, Companhia Docas do Estado de São Paulo (CODESP), has established a commission with two members from its own staff, two from labor and two from the business sector.

2. Port labor

Probably no area of port operations has been the scene of so many conflicts, controls, changes and corruption as that related to port labor. Even in the first decade of the twentieth century, the arrival of a ship in port was a festive occasion with many persons going to the port area to see the vessel and to look at merchandise from far away. Traditionally, the discharge, loading and storage of cargoes created sources of employment. During the last three decades, however, there have been enormous changes which have irreversibly transformed ports and their demand for labor. To understand labor's reaction to those changes as well as its role therein, this part evaluates the i) structures of port employment, ii) work preservation and creation schemes, and iii) their economic implications.

a) Structures of port employment

With some degree of variation, all those engaged in the handling, storage and stowage of cargoes in ports and aboard ship, referred to collectively as dock workers in this document, are at one or a combination of four stages of evolution. The first stage dates from the sixteenth century to the early part of the twentieth, and is characterized by ad hoc dock worker hiring procedures known as the "you, you and you" job system. Under this system, dock workers were employed as casual laborers when vessels were in port and when they were selected by port employers. Once hired, dock workers usually remained on the job to the point of exhaustion, knowing that employers, encouraged by shipping companies to discharge and load vessels quickly, would replace a tired worker with another from the waiting crowd. With a surplus of men always available for cargo-handling operations, corrupt practices such as
workers giving part of their wages or pilfered cargoes to the man hiring them often surrounded this system.

Dock workers' unions were established to eliminate the casual nature of port employment and corrupt hiring practices. Their efforts led to the second stage or “rotation-quota” job system. Under this system, unions usually provide a central hiring hall and allocate dock workers according to previously agreed quotas. Dock workers must report to the hiring hall and are assigned employment as their names come to the top of a list. The rotation of employment ensures that all union members will have an equal work opportunities, but it limits the possibility of acquiring greater skills for operating increasingly sophisticated equipment. If the number of union members exceeds the demand for port labor, unions usually seek to reduce sling-load sizes, shorten work-shifts, obtain exclusive job demarcations for different subspecialties, avoid labor-saving technologies and increase the size of dock labor gangs. Certain unions have withdrawn their requirement for unconditional rotation of all employment and permit, for instance, gantry crane operators to be assigned on a continuing basis to specific terminals.

The third stage or “permanent or enterprise employment” job system is a natural outgrowth of the increasing technological sophistication of port operations, the concentration of cargoes at certain ports, long-distance land transport services and the stable itineraries of many ocean carriers. These factors reflect a dynamic trade environment and make a major contribution to dampening variations in the demand for port labor. This stage often permits port employers to closely reflect the employment practices of other industries in terms of stability of demand and career growth. Dock workers are seen as skilled technicians whose problem-solving abilities and enthusiasm are fundamental to the achievement of high productivity. In this context, certain terminal operators, such as the European Combined Terminal (ECT) at the port of Rotterdam (the Netherlands), negotiated with dock worker unions to have permanent employees. At ECT, an entirely new team of dock workers was recruited, with whom it signed a separate collective bargaining agreement, providing for higher pay than under the “rotation-quota” job system and full-time employment.

A number of port managers recognize that they will probably never have sufficient volumes of cargoes to create a stable demand for port labor. They have responded to this situation by formulating a “stratified employment” job system. This is a variation of the third stage and accepts the need to fill certain positions on a continuous basis with highly-skilled persons, whether or not there is a ship in port, as well as the need to have a source of non-permanent workers to absorb variations in demand. As was mentioned earlier, in Chile the “rotation-quota” job system was replaced with three categories of port workers: permanent, special contract workers and casual workers. A middle ground between stratified and permanent employment would be the system used by terminal operators at the port of Hamburg.
(Federal Republic of Germany). They have permanent employees but rely on a separate company to provide temporary workers so that variations in demand might be absorbed. All terminal operators are joint owners of the company and make contributions to a fund which ensures that temporary workers will receive their salaries even when there are no cargoes to be handled.

b) Work preservation and creation schemes

Port-labor contracts seek to avoid the specter of casual employment that has plagued ports since the sixteenth century. Numerous technological advances have changed the role of ports and brought about a major reduction in the demand for port labor. The most striking technological advances have been the use of continuous loading and discharge systems, specialized vessels, unit-load systems, double-stack railway wagons or those which permit the carriage of containers one on top of another, computers and communications systems. These and other technologies have intensified competition between ports by eliminating monopoly positions vis-à-vis hinterlands and cargoes, and between trading nations by vastly reducing overall distribution costs. The capital costs associated with these technologies have intensified pressure on ports to reduce the number of workers and to avoid work-stoppages.

An early technological innovation that had far-reaching effects on port labour was the vessel specially designed to handle bulk products. The first vessel of this type was the oil tanker, introduced in 1886. Prior to that time, petroleum products were transported on general cargo ships in barrels which required extensive handling by dock workers. Tankers, however, could be loaded by pumping the products aboard, so the need for dockhands was reduced to those few required to manage the hose connections. With the increasing use of bulk vessels, terminals themselves became highly specialized, since port facilities designed for general cargo cannot handle petroleum, and tanker installations in turn cannot handle iron ore nor grain.

The impact of specialized terminals for the handling of liquid- and dry-bulk cargoes on the demand for dock labor can be seen in almost all ports. In the early 1950s, the handling of bulk cargoes in U.K. ports required 20 men for each of the five holds of a general cargo vessel. By the mid-1970s, however, bulk cargoes were being handled at specialized terminals and the discharge of a much larger bulk carrier was effected with a total of six men for the entire ship. The introduction of unit-load systems in the 1970s had a similar impact. For example, the president of the International Longshoremen’s & Warehousemen’s Union (ILWU), which represents port labor on the U.S. west coast, reported that in 1960 dock workers used 29 million man-hours to move 29 million tons of cargo. By 1980, workers used 18 million man-hours to move 114 million tons of cargo, and in 1987 they used 16 million man-hours to move 158 million tons of cargo. During the period
1970-1982, the European ports of Antwerp (Belgium), Hamburg (Federal Republic of Germany), Liverpool (U.K.) and Rotterdam (the Netherlands) experienced reductions of 38.9%, 11.4%, 78.8% and 22.9%, respectively, in the number of dock workers employed.

New port technologies which increase labor productivity present dock workers with a dilemma. They can adopt those technologies and either reduce their numbers or face increasing pressure to do so; they can avoid such technologies to preserve their jobs and see the trade being handled at other ports; or they can negotiate labor agreements which provide them with shorter working hours, larger gang sizes and guaranteed compensation schemes. With reference to the latter measures, numerous formulae have been proposed, given government approval and later rejected. Examples of these measures would be the 50-mile rule of the International Longshoremen’s Association (ILA) on the U.S. east and Gulf coasts, the Registered Dock Labour Scheme in the U.K. and numerous efforts in Latin America and the Caribbean. The major fault with all of them is that they tried, in the name of job security, to hold back the transformation of a service industry that was moving from labor-intensive to capital-intensive cargo-handling systems.

In 1969, ILA ports on the U.S. east and Gulf coasts adopted the 50-mile rule. It gave ILA members the right to fill and empty containers, which carried goods for more than one consignee, moving to or from points located within 50 miles of a port where the union had representation rights. There were numerous successful administrative challenges to this rule, but each was rejected after a subsequent review by U.S. courts. The most recent challenge resulted in the Federal Maritime Commission (FMC) holding the 50-mile rule to be unreasonable and unjustly discriminatory against shippers, and the U.S. Supreme Court supported that decision by refusing to review it.

The U.K. adopted the Registered Dock Labour Scheme in 1947 to eliminate the casual employment of dock workers by guaranteeing them a job for life. Of the 75 U.K. main ports, 60 were covered by the Scheme and they handle around 70% of that country's trade volume. The Scheme required that anything definable as dock work had to be carried out by registered dock workers, and it kept many U.K. ports so overmanned that more than one-third of those receiving wages did not work. The average cost per metric ton for handling cargo at a Scheme port was between US$12 and US$27, while the same activities cost from US$4.50 to US$6.50 at Rotterdam and Antwerp. From the point of view of facilities needed to handle the U.K.'s flow of containers, the port of Felixstowe should never have been constructed. There were many other well equipped ports, but they were subject to the Dock Labour Scheme. Due to the desire of ship operators to avoid the high costs and strike actions at Scheme ports, Felixstowe was not only constructed but became the U.K.'s largest container port with throughput increasing 21.4% during 1988 to 1,278,499 TEU from 1,053,000 TEU in 1987.
In spite of the Scheme's socio-political character and its 42 years of existence, the U.K. Government announced on 6 April 1989 that legislation would be adopted on 4 July 1989 which would bring about its repeal. The Transport and General Workers' Union (TGWU), which represents dock workers, considered that this would be a return to casual employment in ports and sought to negotiate with the National Association of Port Employers (NAPE) to replace the Scheme with a new, but similar, regime. After the NAPE refused to negotiate a similar nationwide regime, the dock workers voted for an indefinite strike to commence 11 July 1989. Port employers were adamant that dock workers must negotiate with individual ports, and disbanded their national association to eliminate any basis for nationwide negotiations. The U.K. Government offered severance payments of up to US$58 000 for each dock worker and more than 2 500 of the 9 221 dock workers subject to the Scheme accepted them. By 1 August 1989, 41 of the 60 Scheme ports had either negotiated individual work agreements or continued working and the TGWU terminated its three-week strike.

Latin American and Caribbean dock workers are generally represented by unions which utilize the “rotation-quota” job system. Due to technological improvements in cargo handling operations, most ports of the region face four interrelated labor problems: excess, high remuneration, low productivity, and a lack of interchangeability of tasks. These problems distort both trade activities and port operations. For trade, such problems translate into higher ocean freight rates, reduced competitiveness of exports in world markets, higher prices for imports and decreases in foreign exchange receipts. For ports, they lead to a massive underutilization of cargo-handling equipment which creates a basis that is utilized to justify new investments. For example, one port in Mexico seeks to increase productivity through the purchase of a second gantry crane, even though its existing crane has a design capacity of 35 TEU per hour and is handling only 12 TEU. Many Latin American and Caribbean port directors recognize that the volumes of cargo handled at their facilities could be increased by at least 35-50% without any major investments, if the prevailing regulatory and labor environments more clearly reflected trade needs.

In response to the introduction of cargo unitization in the mid-1970s, the number of dock workers at the port of Buenos Aires (Argentina) has been slowly reduced from 15 000 to 3 488. The latest reduction in the number of dock workers was carried out with financial support from the Government. There is still an excess of around 2 000 dock workers who receive a guaranteed wage of 18 days per month, whether or not they are employed. These reductions are positive, but recent efforts to install a yard container-gantry crane were delayed by union demands that 13 men per shift be assigned to operate it. As the crane is normally operated at European terminals by only one person, port employers refused to accept such demands and finally reached a compromise settlement of five men. To pay unemployed
workers, dock workers receive a package of benefits which amounts to 499% of their daily wage rate; that is, each dock worker receives not only his own wage but also additional benefits sufficient for four other persons.

At the eight general-cargo ports administered by the national port institute (INP) of Venezuela, there were 11,209 dock workers in 1972 and by 1981 that number had risen to 28,913, or an increase of 157.9%. In 1989, the number of dock workers receiving salaries from the INP had decreased to around 15,400, which consists of 10,000 registered employees, 2,000 casual workers and 3,400 retired staff. The number of dock workers has decreased and this is positive, but the demand for their services has decreased even faster. The overall dimensions of this problem can be seen from strong socio-political policy against terminating the employment of 146 dock workers, who received US$324,138 in wages during 1987, at a port that has not had a vessel call since 1983. Moreover, the current labor agreement automatically incorporates any customs or practices of dock workers, and this permits them to cease working at 4pm in the afternoon, to not work on weekends and holidays, and to unilaterally determine which cargoes are dangerous so that higher rates can be charged. The Government has proposed a plan which would reduce the concentration of activities in the INP, decrease the number of dock workers to no more than 4,000, privatize certain cargo-handling activities and make each port autonomous.

Many public-sector ports provide work opportunities for the unemployed of surrounding cities through informal worker systems. At the port of Santos (Brazil), for instance, all formal system dock workers are registered with PORTOBRAS and organized into unions. However, a large number of registered dock workers give their identity cards to bagrinhos or those of the informal system, who can then enter the port to work. The original bagrinho passes the identity card through the port fence to another person and he passes it to another and so on. In practice, then, identity cards are usually passed to more than one person and this results in a registered dock worker simultaneously being "employed" at multiple locations. During January 1989, one registered dock worker accumulated 786 hours of remunerable work, even though there were only a total of 744 hours during the month, which means that there were three or four persons working. Port labor representatives at the port deny their existence, but management sources estimate this category is composed of from 3,000 to 5,000 workers.

The unofficial acceptance of formal and informal dock worker systems is not unique to Brazil and can be found in a variety of forms in countries such as Argentina, Colombia, Mexico and Venezuela. The port of Veracruz (Mexico) has evolved the practice of culligismo or contracting casual workers and paying them substantially less than the minimum wage for what is considered heavy, dirty or undesirable work. The port of Buenaventura (Colombia) utilizes adicionales or informal workers to carry out around 20% of those operations and are so structured that formal dock workers limit their
productivity so as to provide work for their informal counterparts, who are usually brothers, cousins and uncles. At the port of La Guaira (Venezuela) the “agency gangs” or informal system dock workers carry out approximately 60% of cargo handling operations for general cargo vessels and 100% for roll-on/roll-off (RO-RO) vessels. These parallel worker systems result in anomalies such as formal system workers watching their informal counterparts unload RO-RO vessels, under the justification of derechos de vista, while receiving their complete wages. Informal employment systems contribute to a disorganization of ports, complicate negotiations between management and labor, create greater opportunities for cargo pilferage, increase the cost of port operations and lead to a decrease in productivity.

c) **Economic implications**

Economic models that attempt to explain the level, direction or structure of international trade are often based on the assumption that port and transportation costs are negligible. Clearly, however, this is not true, especially in developing countries, where such costs may have a significant impact on the balance of payments, as well as on the competitiveness of exports. A typical case is that of Chile, where an analysis made in 1987 of a representative sample of exporters showed that, on the average, the freight charges they paid for liner transport constituted more than 20% of the CIF (cost, insurance and freight) value of their products. For certain bulk cargoes, this figure may go as high as 50%.

Although budget deficits and inefficient operations are probably the primary motivating factors for dealing with port labor problems, there are other important reasons. Port services are an input into the productive activities of many enterprises and, to the extent that they unnecessarily increase the cost of those activities, the rate of economic growth for a country can be reduced. For example, prior to the changes in Chilean port labor regimes which commenced in 1981, it was found that the cost to load pine trunks aboard a vessel was greater than the total cost of growing the trees, cutting and preparing the trees for export. If port services are subsidized, as is often the case, the result may be even higher costs not for ocean carriers, but for the economy in terms of misallocation of resources, uneconomic location of productive activities and reduced efficiency.

After the 50-mile rule was abolished, discussions were undertaken between the ILA and management of ports on the U.S. east and Gulf coasts in an effort to replace it with a new, but different, regime. At the port of New York-New Jersey (U.S), for instance, the New York Shipping Association (NYSA) and the ILA agreed to establish off-dock container freight stations (CFSs) which will be operated by ILA members under a more-flexible work arrangement. In return, ocean carriers must pay a US$0.30 per ton assessment on containerized cargoes, which should generate approximately
US$10 million a year, to subsidize half of the US$18.00 hourly wage of ILA members so that they might compete with non-union workers for the filling and emptying of containers. The port considers that the assessment is less costly than paying 2,065 men, out of a total of 5,900 dock workers, an average of US$34,200 a year to stay home. The cost of supporting the guaranteed annual wage for unemployed dock workers is estimated by the port at more than US$1,000 million over the last two decades.

The repeal of the Registered Dock Labour Scheme should lead to the creation of approximately 50,000 jobs over a five-year period. The NAPE considers that the employment of a larger number of dock workers than necessary cost the U.K. economy more than US$800 million in its 42 years of existence. For their part, numerous ex-Scheme ports now consider themselves in a position to compete for a larger share of deep-sea container traffic. The port of Liverpool estimates that ship and landside productivity have increased 20% and 25%, respectively, and plans to promote itself as a major distribution center for North Atlantic services with direct rail links to continental Europe once the Channel tunnel between France and the U.K. is completed in May 1993. The dock workers at Felixstowe, a non-Scheme port, went on a five-day strike after management requested more flexible work arrangements such as three shifts instead of two so as to meet the competition from ex-Scheme ports. On a more extended horizon, the port of Tilbury (London) predicts that 2,000 new jobs could be created around the port in the next 10 years.

The validity of eliminating work preservation and creation schemes for port labor often depends on how one frames the issues which surround them. The appropriate question appears to be: is it politically acceptable and socially responsible to separate a port from the unemployed of a surrounding city? This question might evoke one response, but it might be different if it were broadened as follows: is such a separation mandated from the point of view of the wellbeing of the national economy as a whole? The importance of such broadening cannot be overstated. As an illustration of this point, over two centuries ago the introduction of printing was delayed as much as twenty years in Paris (France) by the bitter opposition of the guild of scribes and copyists. This delay had a direct impact on the educational system of that city and required many years to overcome. The scribes and copyists were interested in preserving their jobs and had divorced the printing press from its wider purposes of informing, communicating and educating.

Union efforts to preserve jobs displaced by technological advances is not restricted to the distant past. As illustrations of this point, Associated British Ports, a publicly held company that operates 21 ports in the U.K., closed the container terminal at the port of Hull after failing to reach an agreement with the dock workers' union on manning and productivity levels, and is to sell five rubber-tired container stacking cranes. These cranes were originally constructed for the U.K. port of Southampton and it is the second time they
have been sold under the same circumstances. In a similar manner, dock workers at the port of Bridgetown (Barbados) refused to employ a container gantry crane which cost the authority US$3.15 million. The dock workers indicated that its use would reduce the work force from its present level of 400 men.

Future efforts by dock workers to preserve jobs might involve computer and communication systems, a topic which is presented in greater detail at part V. These systems can have a positive impact on the cost-effectiveness and productivity of port services, but to achieve such benefits their implementation must be based on an in-depth understanding of the impact they might have on port labor. In 1988, for instance, the ILWU was involved in an arbitration dispute concerning the preparation of dock receipts on computers by marine terminal operators in Japan and their electronic transmission to ports on the U.S. west coast for truckers to sign when picking up containers. The ILWU alleged that such activities had reduced the clerks' work at those ports. As the ILWU clerks have historically prepared these receipts, the arbitrators held in their favor.

To understand this decision one must be familiar with the career structure of port labor in the ILWU. After almost two decades of not adding any new port labor in the San Francisco Bay Area, marine terminal operators sought to register new clerks with the ILWU. This led to work stoppages and a lawsuit by dock workers who argued that only they should be considered for positions as clerks. In March 1989, the Pacific Maritime Association, an organization which represents shipping companies and marine terminal operators in their dealings with the ILWU, indicated that dock workers at ports on the U.S. west coast earn an average of US$53,507 per year and clerks US$71,243. The increase in wages and status for dock workers promoted to clerks represents a career path that the ILWU was unwilling to see eliminated. Nonetheless, the acceptance of those dock receipts might have been facilitated if an alternative career structure had been negotiated with the ILWU.

The excess of dock workers in Latin America and the Caribbean is not a port problem, but rather a political problem with important commercial and social implications. Over many years a strong network of alliances has been created between port labor unions and political parties. These alliances involve the objective of job security for port labor and the aspirations of political parties, and they make it extremely difficult to bring about labor reforms. Dock workers’ unions and political parties, for instance, may bring pressure on port managers to restrict their efforts to lease terminals to private operators, since they see such steps as part of an effort to reduce their numbers. Ports have such an intimate relation with national politics that an understanding of the political processes available to governments for resolving port-labor problems is an important first step in dealing with them.

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In summary, the dominant positions enjoyed by dock labor in many ports around the world have resulted in attempts to create permanent employment and to avoid new labor-saving technologies. Even though the experiences presented in this document might not entirely reflect the situations of ports in other countries, there are certain lessons that should be taken into account. First, neither legislation nor union agreements can eliminate the fluctuating demand for port labor, but a dynamic trade environment can make a major contribution to dampening it. Second, cargo-handling monopolies unnecessarily increase the costs of a country's exports, decrease the competitiveness of its goods in international markets, reduce receipts of foreign exchange and restrict the creation of new sources of employment. Third, those monopolies can be replaced by a commercial institutionality through the compensation of port workers. Fourth, the elimination of such monopolies can generate new sources of employment, both within and outside the port. And fifth, the increase in port productivity which flows from a well-paid, appropriately dimensioned dock labor force often reduces the need for investments in new infrastructure.

3. The role of the private sector in ports

In the decade following the first oil crisis, many Latin American governments shifted from investment-led to export-oriented macroeconomic policies as the principal means of stimulating commercial activities. The emphasis on export-promotion generated a substantial increase in the region's external trade volumes and put into sharp relief the strategic importance of ports and their pivotal role in the achievement of national economic goals. Much to the distress of Latin American governments, however, their public sector ports were quickly found to be unsupportive of such policies in the sense that they were inefficient, grossly overstaffed, under the monopoly control of dock worker unions and unnecessarily expensive. As but one illustration of this point, the cost of producing Brazilian soybeans is US$165.00 per ton and the cost of loading them aboard ship is US$65.00 per ton, while in the U.S. soybeans are produced at US$195.00 per ton and loaded at only US$20.00 per ton.

In response to this situation, Latin American and Caribbean governments have begun to consider a role for the private sector in their public ports. This represents a change in the traditional role of governments in national economic activities and is part of an effort to revitalize enterprises that have been established, owned and operated by them. Privatization is usually proposed as a means to promote non-governmental participation in the economy, reduce public sector financial commitments, improve productivity, utilize funds for other activities that were previously dedicated to ports, decrease government regulations and reduce the size of the dock labor force. For example, a shipping agency in Rio de Janeiro (Brazil) believes that with
its own terminal and workers, productivity could be increased at least five times. To achieve such levels of productivity this region's ports must reflect the fierce international and domestic competition that is faced by its exporters, importers and carriers so as to better support their commercial activities and contribute to the success of national export-promotion policies.

There is no single approach to private sector ownership and/or operation of public assets. Some of the more commonly used options include private stevedoring companies, management contracts, leases, conversion of the governmental port administration into a publicly held company, authorizing single-user marine terminals to handle third-party cargoes and the outright sale of ports. The option selected must be adapted to the particular conditions of a country's political, social and economic environment. As illustrations of this point, the State of California (U.S.) transferred port properties to municipal governments in 1968 with the broad mandate to further commerce, navigation, fisheries and revenue producing recreation activities. Following the abolition of the National Dock Labour Scheme, Boston (U.K.) was the first municipal port in that country to be sold into private ownership. The Boston Borough Council was interested in an owner who would guarantee dock worker rights and did not select the highest bid. For its part, the Industrialists' Association of Genoa (Italy) proposed that the port of Genoa be privatized because:

"where there's international competition, the public (port) model doesn't work. All port monopolies, whether public or private, are hindrances that must be eliminated." [Journal of Commerce, 15 March 1990, p. 3B]

It is almost universally accepted that state owned and operated ports lack operational flexibility and market insights, but privatization does not automatically eliminate monopolies and lead to efficiency, and public sector administration is not necessarily monopolistic and wasteful. The most successful ports, whether public or private, usually compete for cargoes in a common hinterland with others or they reflect the competition faced by the products of their tenants. To create this competitive environment, governments often combine privatization with a package of normative regimes which deregulate and decentralize ports, as well as balance their labor-management relations. After privatization of ownership, operation, or both, the two most important activities of governments are the establishment and enforcement of a regulatory regime to avoid future monopoly abuses, and the promotion of economic growth in the hinterland of the port.

Latin American and Caribbean governments recognize the possibility of monopoly abuse by both the public and private sectors, and frequently express their opposition to the privatization of port facilities and port services. Most countries permit the construction and operation of private bulk-cargo terminals, but prohibit those terminals from handling third-party cargoes. They also permit the granting of concessions to private-sector interests for activities such as the repair and maintenance of equipment, and
many others. Port labor unions strongly support such prohibitions in order to preserve jobs for their members at common-user terminals owned and operated by the public sector. Nonetheless, Colombian legislation establishes a procedure whereby private interests can solicit authorization from the National Political, Economic and Social Council (CONPES) to construct and operate private terminals, and handle third-party cargoes. As a consequence, the national shipping line of that country, Flota Mercante Grancolombiana, has obtained approval to construct a US$55 million private 43 hectare container terminal at the port of Cartagena. The Flota is to provide around 50% of the funds needed for construction of the terminal, with the remainder from both the public and private sectors, and it is to be completed in 1992.

The need to privatize port facilities and port services has been expressed by many Latin American and Caribbean governments. In 1989, the Government of Argentina adopted a law to reform public sector enterprises. The provisions related to services largely reflect the conclusions of a workshop on Argentine ports, sponsored by the stock market of Buenos Aires during August 1988, which found that it was necessary to restructure, privatize, deregulate and decentralize the entire port system of that country. The Argentine Undersecretary of Transport and Waterways has proposed a new regime for ports which would permit the private sector to participate in their ownership, management and operation, and a draft law to that effect was to be submitted to the Congress in May 1990. The major port labor unions at the port of Buenos Aires reacted to these initiatives with a series of 15 short strikes and prepared a counterproposal, which would preclude private sector involvement in ports, for consideration by Congress at that session. Even without the above mentioned legal regime, a “use permit” was granted to a group of private enterprises for a period of 10 years so that they might construct and operate a container terminal at the port of Buenos Aires. Moreover, during 1989 the 10 private bulk terminals near Rosario on the Parana River jointly handled 8 820 247 tons or 55% of all Argentine grain exports.

A study prepared by port-users councils of Brazil brought out the need for greater private sector participation in that country's ports. Reflecting that conclusion, Brazilian vessel operators agreed at their August 1989 meeting that the country's ports should be privatized and the monopolies enjoyed by dock workers should be terminated. A decision was made by the Ministry of Transport of Brazil to increase the role of the private sector in port operations as well as in investments. The reason for this decision, according to PORTOBRAS, is that the Government does not have US$4.2 billion for the construction of 210 new vessel berths which will be needed by the year 2000.

The role of the private sector in Brazilian ports is already quite substantial. In 1988, for instance, the 244 single-use private terminals in that country handled 261 million tons of cargo, or 73% of the 356 million tons
which passed through all ports of that country. The Brazilian Association of Private Terminals (ABTP) suggests that the 1988 tonnages could be increased if existing laws did not preclude them from handling third-party cargoes. At present, the lack of implementing decrees for a regime adopted in 1965 means that each privatization proposal must be considered on a case-by-case basis. Among the many conditions imposed by the Brazilian private sector for making port investments, the most important concern the period to recover their investments and the need for irreversibility of the Government's decision to privatize port facilities and port services.

Despite the increasing privatization of port facilities and port services throughout the world, there are cases in Europe and North America where municipal and state governments have had to purchase port terminals from private interests and operate them. For example, the port of Tampa (U.S.) has found that its terminal operators lack sufficient resources to finance large capital improvement projects which are needed to keep the port competitive. As a consequence, it has elaborated a strategy with two main elements: first, the purchase of terminals from private operators; and second, the financing of needed improvements from property taxes collected over a five-year period. Similarly, dock labor disputes at the port of Baltimore (U.S.) related to labor cost, jurisdiction and work rules, have led the state government to accept operational responsibilities for a new container terminal at the port. Thus, deprivatization of ports usually results from factors which create excessive risks that the private sector does not want to accept.

Bulk terminals are usually owned and operated either by the shipper or owner of the commodity being handled. On the other hand, general cargo facilities are usually operated by governments, terminal operators or ocean carriers, as no one shipper or cargo owner has a sufficiently large volume of goods to justify its own private facility. Major liner operators have found that with the increasing size of ships and volumes of cargo, as well as the intermodal services they must offer, it has become necessary for them to exercise greater control over port terminal activities. For example, at the port of Los Angeles (U.S.) the terminal operator Stevedoring Services of America (SSA) filed a complaint with the FMC alleging that the port seeks to have all of its terminals operated by either individual shipping companies or liner consortia. Another terminal operator at that same port, Overseas Shipping Company (OSC), announced that it would discontinue its services on 31 May 1989, leaving only SSA as the remaining non-carrier terminal operator. The case was subsequently dismissed, as SSA purchased the assets of OSC, but the increasing integration of distribution chain activities must be kept in mind by governments when formulating a normative regime to balance the interests of all those providing and receiving services at ports.

The need to balance such interests can also be seen where vessel operators compete in a specific trade, but one of them either owns or controls the port terminals that the others must utilize. As an illustration of this point,
for many years Cast, a Canadian liner shipping company, has operated a transatlantic service between Montreal (Canada) and Antwerp (Belgium). It reached a large hinterland behind each port through fully integrated inland distribution systems and door-to-door services. Cast recently changed its European port-of-call from Antwerp to Zeebrugge (Belgium). The reasons for this change are many, but the most important are related to: first, the port of Antwerp lacks sufficient space to build a dedicated terminal; second, Cast vessels at the port of Antwerp are loaded and discharged by the terminal operator Hessenatie, 83% of which was recently purchased by a Belgian carrier, CMB Transport, that competes directly with Cast in transatlantic trades; and third, the inland location of Antwerp 50 miles from the North Sea up the Scheldt River adds 16 hours to each vessel’s voyage time. Thus, whether in bulk or liner trades, the long-term trend is towards the operation of port terminals by those who either own or have control over cargoes.

To achieve a balance between the interests of all those offering and receiving services at ports, governments must recognize that exclusive operation of port terminals by the public sector, dock workers, shippers or carriers can result in an abuse of a dominant position by any one of them to the detriment of the others. To avoid this situation, one solution would be to adopt legislation which prohibits all of them from establishing or having interests in terminal operating companies. This measure would preclude the possibility of such abuse by them, but it would also preclude the participation of the very sectors that have the most to gain from cost-effective, productive ports. Another solution would be to allow all such sectors to participate, with governments balancing their interests through a normative regime so as to ensure that monopoly abuses do not occur.

4. Customs

The principal activities carried out by national Customs administrations are:
(1) protection of fiscal revenues through the collection of duties on imports and (2) establishment of procedures and practices which ensure that goods in transit and contraband do not enter the national economy. Compliance with these activities was relatively uncomplicated in the nineteenth century, as trade moved slowly, and goods were visible and in small volumes. Customs officials were able to thoroughly review documents, carry out procedures and inspect all goods. Since that time, however, there has been an enormous increase in trade volumes and in the speed of transport systems, but many Customs administrations continue to utilize documentation, procedures and inspection techniques which reflect that era.

Most Customs administrations look at each item of merchandise from a fiscal-control point of view and fail to see trade from a commercial perspective. Indeed, Customs documents reflect a series of bank and exchange requirements, import restriction and other formalities which must
be complied with before international trade can begin to flow. Given such control, Customs administrations should seek to ensure that imports comply with not only fiscal requirements but also international accepted standards for the facilitation of trade flows. Due to their position at the confluence of international commercial transactions, Customs administrations should have the additional task of simplifying, harmonizing and reducing their documentation, procedures and requirements so as to facilitate trade flows. These objectives—compliance and facilitation—are of equal importance and should be balanced in the application of Customs regulations so that a more commercial approach might be attained.

The benefits from balancing these objectives can be seen from the new double-stack train services being offered by Southern Pacific Transportation Company and the national railway of Mexico (FN de M) between Los Angeles (U.S.) and Mexico City (Mexico). The usual transit time for containers from Japan to Mexico City is 24 days, which encompasses a transit through the Panama Canal and the discharge of such units at the Mexican east coast port of Veracruz for road carriage to Mexico City. With recent efforts to inaugurate the double-stack train service, however, it came to light that Customs requirements substantially increase the overall transit time. To resolve this problem, the national Customs administration of Mexico agreed to carry out clearance procedures at destination for cargoes transported on double-stack trains. This change is expected to reduce the transit time for double-stack trains to 38 hours between Los Angeles and Mexico City, with the overall transit time from Japan to Mexico City reduced to just 14 days.

Ports can invest enormous sums of money in facilities, market them to bring customers to their berths and reduce their rates, only to find that trade volumes are depressed by antiquated Customs requirements and procedures. For example, Customs legislation of certain Latin American countries define International Organization for Standardization (ISO) marine containers as merchandise, which means that the same requirements for imports must be complied with each time units enter a country or that they must be emptied in ports. Moreover, the lengthy bureaucratic requirements for processing of Customs documents has long retarded the development of faster port services in many countries. The gantry cranes at the port of Bilbao (Spain) can move 25 containers per hour, but are restricted to around 10-15 per hour due to Customs requirements. The port of Venice (Italy) is working on an electronic data interchange (EDI) system, but import manifests still have to be delivered manually to Italian Customs, as it does not want to participate in the system. The national Customs administration of Spain recently refused an offer of the association of Customs brokers in Barcelona to provide it with a free computer and operator to process their data. Thus, ports handle cargoes, but Customs controls them.

To facilitate the Customs clearance of goods, many ports have begun to offer computerized information systems, a topic which is presented in greater
detail at part V. For example, in January 1990, the Customs brokers of Mexico commenced carrying out their activities through direct computer-to-computer links between their offices and the national Customs administration. For its part, the port of New York-New Jersey (U.S.) developed its Automated Cargo Expediting System (ACES) over a period of two years with a total funding of US$250,000. To develop this system, the port organized a committee comprised of representatives from each sector of the industry as well as from the port. The criteria utilized included making use of the industry's existing computers, both mainframe and personal. The major advantage of ACES is that no one has to change its computer program, as all those in the trade community utilize the computers of a third-party to translate incompatible electronic message formats so that their computers might receive and deliver information.

With increasing volumes of goods moving internationally today, it is impossible for all those providing services at ports to meet required service levels of carriers and cargo owners without electronic information transfers. The need to utilize such systems is most pressing for trade partners with reduced ocean-transit times. For example, the transit times for countries of the greater Caribbean basin with North America can be as little as 20 hours and computers and communications systems are the only means by which data on cargoes can be processed and delivered to Customs administrations before the ship arrives. This is especially true of goods moving from the ports of Bustamante (Jamaica) and Cartagena (Colombia) to the port of Miami (U.S.), where transit times are 36 and 72 hours respectively, and the U.S. Customs Service wants the data on the cargoes before the ships dock so that a determination can be made as to which cargoes will be inspected.

5. Diversification activities of ports

Many ports seek to broaden their activities to ensure an adequate demand for their capital-intensive facilities and improve earnings. The most successful diversification efforts build upon some particular strength, skill, knowledge or resource associated with the two dominate port activities - vessel and cargo related services. Probably the most important are: i) inland transport services, ii) transshipment and load-center services and iii) storage, repacking, distribution and processing services.

a) Inland transport services

Historically, ports constructed facilities for the loading and discharge of vessels, with inland transport services given only a limited afterthought. Just as ports seek to respond to vessel schedules by expediting the entrance and departure of ships, and limit their stay at docks through rapid cargo-handling services, they should also seek to ensure that inland transport operators have
ready access to the port and that waiting times for cargoes are minimized. In spite of the similarity of such needs, land carriers are often given only minimal consideration in the planning of port infrastructures. The owner-operator of a truck is usually paid a basic rate for each load transported, so his ability to make a reasonable income is dependent upon how many loads he can pick up and deliver each day. So important is the rapid turnaround of trucks that the port of Montreal seeks to dispatch trucks picking-up containers 20 minutes after their arrival. In contrast, at the port of Montevideo (Uruguay) trucks must wait four-to-six hours for cargoes, and they are utilized as temporary warehouses at numerous other Latin American and Caribbean ports.

Many port practices directly affect the productivity and, hence, profitability of inland transport operators. As illustrations of such practices, the layout of facilities and working hours for handling containers can slow the delivery and receipt of units, the delivery of cargo documentation at multiple locations instead of at entrance gates creates a need for truck parking spaces and increases overall port congestion, and an off-dock rail terminal increases the cost of cargo movements due not only to greater distances but also to the need for land transport equipment which can be utilized on public highways. So important is the need for coordination of cargo operations between vessels, ports and inland transport services that the port of Le Havre (France) considers its new “Rapid Turnaround Port” will be competitive with others on the north European continent once a system of motorways and railways is established so that cargoes can move on a cost-effective basis and without delay between the port and inland locations.

The cost of inland transport systems often determines the competitiveness of a nation’s exports in international markets. For example, both Argentina and the U.S. transport grains from farms to ports at a cost which averages 15% of the CIF value, but the average transport distance for Argentine grains is 250 km, while it is 2,000 km for the U.S. With regard to the transport modes utilized to carry grains from producing areas to ports, in 1987, trucks transported 78% of Argentine grains, rail 20% and waterways 2%, and for the U.S. it was 12% by truck, 57% by railway and 31% by waterway. For its part, 65% of Brazilian soybean is transported from farms to ports by trucks at a cost US$30.00 per ton, while major competitors utilize rail and waterway systems at half the cost. Moreover, the relative cost of land transport modes can alter the demand for port services. For example, a joint rail service between São Paulo (Brazil) and Buenos Aires (Argentina) is operated by the Argentine Railways (FA), Brazilian Federal Railways (RFFSA) and the railway of São Paulo (FEPASA). The trains take a week to complete the 2,700 km journey, including two days’ delay at the frontier for customs inspections, but are so competitive with the all-water alternative that a twice-weekly service is being considered.

Argentine ship operators and exporters have undertaken discussions with FA regarding the establishment of a system of block trains to carry goods
between producing areas and the country's principal port, Buenos Aires. Brazilian soybean producers have proposed that their annual tax contributions of US$1 300 million should be utilized to construct 5 000 km of railroad at a cost of US$4 000 million. Railways have inherent cost advantages which could be utilized to increase the competitiveness of Argentine and Brazilian grains in international markets. However, the railways of both countries are public sector enterprises which suffer many of the same ailments as public sector ports—overdimensioned workforces, low productivity and inadequate maintenance of infrastructure and equipment—that must be resolved before such benefits can be realized.

Ports usually provide cargo interface services between ocean and inland transport modes for up to three distinct markets—local, surrounding and inland—but if cargoes cannot move rapidly and at a low cost between ports and those markets their facilities will not be fully utilized. Many Latin American and Caribbean ports are similar to those of Rio de Janeiro (Brazil), Veracruz (Mexico) and Port of Spain (Trinidad and Tobago), and find themselves surrounded by cities and must contend with congested streets when moving goods to and from their installations. Ports cannot wait for the municipality to dedicate land, streets and traffic routes, for carriers to change their routes, and for exporters and importers to alter their business practices. The port must assume a protagonistic role and be the dynamic initiator of activities which harmonize the needs of each and contribute to the resolution of such problems.

b) Transshipment and load-center services

With the increasing use of large-scale liner vessels, the tendency today is for ships to call at fewer ports during a voyage and to utilize transshipment and load-center ports, and feeder services, both ocean and land, to move containers between origins and destinations, and the ports they serve. Transshipment ports provide interface services for containers transferred between main-line and feeder vessels for carriage to and from outports, whereas load-center ports transfer such units between main-line vessels and inland carriers for movement to and from the hinterland of other ports.

The most important factors ports must consider before attempting to offer either transshipment or load-center services are: i) the volume of imports and exports which utilize their facilities, ii) geographical location of the port in relation to major trade routes and the hinterlands sought to be served, iii) availability of ocean and inland feeder services which offer the desired routes, frequencies, technologies and freight rates, and iv) other factors such as conflicts and labor disputes. As an illustration of the importance of but one of these factors, certain Caribbean countries have considered establishing their own ocean feeder services to outports not regularly served by existing lines so that their ports might capture additional
cargoes. Once these factors have been satisfied, transshipment and load-center ports must harmonize their own services as well as those of main-line vessels, feeder systems and Customs to avoid congestion and to ensure cargoes arrive at their final destinations faster or at a lesser cost than if they were unloaded at closer ports. In addition, workers at transshipment, load-center and outports, as well as those employed by feeder operators, must be productive and low-cost.

Except where vessel operators seek to avoid conflicts and labor disputes, they usually call at a port because they have cargoes for its hinterland and both transshipment and load-center services are secondary considerations. If a port has a large, dynamic flow of export and import cargoes and there are nearby outports with lesser volumes which might be served with efficient ocean feeder systems, vessel operators will begin to consider the possibility of utilizing it as a transshipment center. The importance of a dynamic flow of import and export cargoes was brought out by the chairman and chief executive of the port authority of Jamaica, who stated:

"It is easier to attract transshipment cargo if the domestic cargo base is strong. When Jamaica's imports fell, due to the shortage of foreign exchange, it became more and more difficult to persuade the shipping lines to use the port for transshipment." [Hylton, pp. 57]

To become load centers, on the other hand, ports must achieve first port-of-call status for imports so that goods might reach their destinations faster than if another closer port were utilized, have cost-effective inland transport services between it and a variety of cargo origins and destinations, and the availability of sufficient volumes of backhaul cargoes, whether domestic or international, to reduce the cost of the headhaul.

The importance of a dynamic flow of import and export cargoes can also be seen from the prediction in the early 1970s that Singapore would be the transshipment center for all containers originating in or destined to Australia. This did not come about because the cargo volumes to that country were sufficiently large to justify direct vessel calls. On the other hand, direct shipping services between Europe and the Caribbean have been losing 6-7% of their cargoes annually to indirect or transshipment services via the ports of south Florida (U.S.). The reason why Australia receives direct services and an increasing number of services to the Caribbean are via transshipment ports in Florida is due to difference in the volumes of cargoes. With small volumes of cargoes entering and leaving Caribbean countries, exporters and importers of that subregion have found that indirect or transshipment rates are 20-30% less expensive than direct services and that overall transit times for both services are about the same.

Once a port has begun to be utilized for transshipment or load-center activities, affected ports will attempt to increase their cargo volumes in order to receive direct calls by main-line vessels. In attempting to do this, they will have to compete with transshipment and load-center ports in terms of cargo
volumes, infrastructure, tariffs and feeder systems. Such ports are fully aware of the potential challenges from others and are themselves constantly striving to improve services, productivity and cost-effectiveness. Moreover, as the capacity of main-line ships increase, so also will those of feeder systems. In other words, ports within the zone of influence of transshipment and load centers will find it increasingly difficult to compete in the offer of such services, as increases in transport capacity require ever-greater volumes to attract main-line carriers. For example, the volume of U.K. cargoes transshipped at continental European ports trebled in the decade between 1975-1985 to approximately 20% by weight of all non-oil trade, but the sizes of vessels increased so dramatically during the period that the larger volumes of cargoes still do not justify direct calls at U.K. ports by certain vessel operators.

c) Storage, repacking, distribution and processing services

With regard to the offer of these services, it would appear that ports face serious competition from producers and carriers. On the one hand, the ready availability of cost-effective and rapid long-distance inland transport services has shifted many cargo related functions of ports, such as storage and distribution, to various inland locations. This is not merely a general consequence of change but, in many cases, comes about as a direct result of the efforts of producers to establish more cost-effective distribution channels through an expansion of their presence in and influence over desired markets. Not to be left out, carriers now offer not only transport but also those same cargo-related services. For example, the liner operator Nedlloyd recently purchased an Italian air and ocean freight forwarder, and a German cargo groupage, storage and distribution company. On the other hand, many ports have begun to extend their cargo-related services beyond storage and distribution to include repacking and processing of goods. They all try to provide such services in the local, surrounding and more distant hinterlands, but ports usually focus them in the local and surrounding areas, while producers and carriers look to more distant markets.

Producers, carriers and ports which offer these services often combine them with “just-in-time” deliveries to support inventory-control systems. “Just-in-time” distribution services involve the integration of port, warehousing and transport systems into production and retailing activities so that goods are delivered at precisely timed intervals. This permits a reduction in inventories of raw materials, work-in-progress, finished goods, working capital requirements and the market price of goods. It relies on suppliers and their distribution centers to provide essential materials, components and merchandise as production processes and retail outlets require them. To participate in distribution activities ports must have not only appropriately located storage, repackaging, distribution and processing facilities, electronic
information systems, same-day delivery and a 24-hour service but also
contingency plans such as express air deliveries that compensate for
unforeseeable breakdowns in the system.

If ports are to offer cargo-related services which provide customers with
absolute certainty that their goods will be delivered in the condition and
volumes desired as well as when and where needed, it is necessary that
long-term partnerships be formed. A customer cannot expect a port to make
investments in specialized equipment to solve its specific problems unless
such a relationship is established. These services also permit ports to create
employment opportunities for otherwise redundant workers. Earlier in this
part it was brought out that the introduction of containers into European
trades during the period 1970-1982 led to a dramatic reduction in port-labor
requirements, but the port of Hamburg (Federal Republic of Germany) was
able to retain a higher proportion of excess dock workers than most other
ports in the same range, as they were utilized to carry out activities related to
cargo storage, repacking, distribution and processing.
MARKETS

Historically, ports occupied a monopoly position vis-à-vis hinterlands and cargoes, and gave only minor consideration to the needs of other sectors when formulating their policies and plans. With the advent of export-oriented macroeconomic policies, deregulation of transport, large-scale vessels, high capacity cargo-handling equipment, long-distance inland transport and electronic communications systems, the relation between ports, geography, carriers and trade has been transformed. In formulating policies and plans to respond to this transformation, ports must take into account numerous factors that influence the parameters of the markets they seek to serve. Some of the more important are i) macroeconomic trends, ii) intermodalism, iii) proliferation of ports serving the same hinterland, iv) port consolidation v) port cooperation, vi) port charges and vii) air and air-sea transport.

A. MACROECONOMIC TRENDS

The foundations of macroeconomics are usually presented in aggregate terms of consumption, savings and investment activities for an economy as a whole. In this part an effort will be made to go beyond these aggregate bases and look more closely at one specific area —ports— in order to identify the contributions they can make to the achievement of macroeconomic objectives. Latin American and Caribbean countries currently focus the objectives of their macroeconomic policies on expanding exports, increasing investment, creating employment opportunities and generating a positive trade balance. To understand why such policies were formulated and what they mean for ports, it is necessary to briefly consider i) the monetary-commercial environment which gave rise to those policies, ii) the globalization of trade and iii) the role of ports therein.
1. The monetary-commercial environment

The price increases in crude oil during the period 1973-1982 resulted in a massive transfer of funds from oil-consuming to oil-producing nations. A large share of these assets were in the form of deposits in foreign banks, largely in the U.S. and Western Europe. At that time, Latin American countries generally pursued a strategy of growth based on investment as the major propelling force. The success of that strategy depended in a large part on the capacity of Latin American countries to supplement domestic savings with capital from foreign banks that, in turn, had received it from oil-producing countries. Latin American countries were good candidates for loans, as they had higher economic growth rates during the 1971-1980 period than did their developed counterparts, they were relatively unaffected by the world recession of 1974-1975 and, very importantly, their governments were willing, in many instances, to guarantee the payment of loans undertaken by their nationals.

Debt servicing during the 1970s was facilitated by the increased prices Latin American countries received for their traditional primary product exports. However, when the price of Saudi Arabian crude oil fell from its level in 1982 of US$34.00 per barrel to US$17.50 by January 1987, similar strong reductions were also recorded in the prices of many of Latin America's traditional export products. By the middle of 1982, the inability of nationals to make payments on their loans and of governments to comply with guarantee agreements became fully apparent and the region was plunged into a massive debt crisis. This crisis was the major force leading Latin American governments to abandon their earlier investment-led growth strategies and to adopt export-oriented macroeconomic policies. The global debt for Latin American and Caribbean countries decreased from US$416 352 million in 1987 to US$412 986 million in 1988, but the importance of export-oriented macroeconomic policies should not lessen in coming years.

2. The globalization of trade

For purposes of this study, the globalization of trade refers to the commercial interdependence among factors of production in different countries which results from collective efforts to produce raw materials and components, as well as to provide assembly and distribution services for goods that will be sold throughout the world. Trade has always been global, in the sense of one country's goods being sold in others, but the globalization of trade alters this historical framework by establishing a basis for enterprises and governments to take advantage of complementarities between factors of production in different countries. Some of the more important changes during the 1980s which contributed to the globalization of trade include technological advances which increase scale economies, borderless capital markets, a
lowering of artificial barriers to trade, reduced government constraints on foreign investments, greater emphasis on the control of labor, inventory and distribution costs in manufacturing, and a convergence of economic objectives of countries with distinct political systems.

As a consequence, in many parts of the world today there is no simple economic separation between state, market and region. The term market was used to denote an economic coherence for a product or group of products within a state, but the era of semi-isolated national economies is fading fast as enterprises, governments and regions search globally for technical capacities, least-cost inputs and market-access advantages. Decisions about labor, sources of raw materials, plant location, transport systems, delivery times and distribution channels are being made on a worldwide instead of a local basis. The globalization of trade is creating new kinds of enterprises that regard the entire world as their source of raw materials and labor, and as their market. For example, the assembly of Asian, Far East and U.S. products in Mexico for the European and North American markets employs an estimated 400,000 persons and generates around US$4,000 million in foreign exchange receipts each year.

Many manufactured goods are no longer produced in a single country and shipped to another. Instead, manufacturers obtain least-cost inputs from all over the world, produce and assemble goods in multiple locations which offer the greatest commercial advantages. The international specialization which is implicit in these interdependent activities reflects a continuation of the processes that shaped industrialization from the start. With the dispersion of manufacturing, assembly and consumption, enterprises must have access to a worldwide network of carriers, ports and communications services in order to achieve economic coherence in their activities. As an example of the globalization of manufacturing, a kitchen appliance offered for sale by Faucet Queens, Inc., in the U.S. during May 1989 carried the following indication of its possible origins:

"This and all HELPING HAND (brand name) products are made to our rigid specifications in the USA, Taiwan, Hong Kong, Korea, Spain or wherever in the World lies the best consumer value. The exact country of origin is marked on the article, if possible." (emphasis added)

In a global trade environment the procedures and practices for commercial exchanges of manufactured goods will increasingly mirror those utilized for commodities. That is, with easy access to electronic information regarding comparable goods from alternative sources that can satisfy the needs of purchasers, it will become increasingly difficult for producers to isolate markets and serve them on an exclusive basis. The commodity nature of manufactured goods will increase competition between substitutes and lead to ever-greater emphasis on the control and reduction of costs, especially those related to carriers and ports.
For more than a century ocean carriers have worked within a framework of the same principles that led to the globalization of trade. That framework permitted, for instance, the establishment of consortia and bulk cargo-sharing pools. Recently, such collective efforts have been extended to the joint operation of vessels. For example, Sea-Land Service (SLS), P&O Containers and Nedlloyd jointly operate 12 container vessels in a trans-Atlantic service between Europe and the U.S. Under these arrangements, the flag or even the ownership of a vessel could become meaningless when a ship is crewed in one country, managed from another, financed elsewhere and is part of an international distribution chain which might see the ship operating between two other countries for its entire economic life.

In contrast to manufacturing and maritime transport, ports find themselves tied to a particular location and if that site is not appropriate vis-à-vis major producers and markets in a global economy, investments in new facilities and rate reductions will bring about only minimal changes. The prospect of manufacturers changing factory locations to enhance the competitiveness of their products can be seen from the decision of a major footwear company of the U.S. to shift its production back to South Korea from Thailand, after having established itself in the latter country just two years earlier in order to lower production costs. The impact of this relocation of industries can also be seen in the case of Seattle and Tacoma (U.S.). The great-circle distance from Tokyo to Seattle is 4,718 miles, while the distances Tokyo-San Francisco and Tokyo-Los Angeles are 5,135 miles and 5,433 miles, respectively, a difference that gives the Seattle/Tacoma area a two-day advantage in voyage times from the Far East. Nonetheless, these two ports have expressed concern that their advantage might be of lesser importance with respect to Southeast Asia, because cargoes from the latter region would flow just as rapidly to other U.S. west coast ports such as Los Angeles and Long Beach (U.S.). Thus, the growth, stagnation or decline of ports is often due to factors over which they have virtually no control.

3. The role of ports

From the end of the Second World War until the early 1970s, Latin American and Caribbean countries utilized import-substitution policies. These policies reserved national markets for domestic manufacturers and led to the inefficient production of many goods, an overvaluation of domestic currencies, the imposition of import and export duties, and the adoption of currency exchange restrictions. All of these factors combined to create a bias against international trade and led to low rates of economic growth as well as a chronic shortage of foreign exchange. Many costly port labor practices became institutionalized and they continue to exert a negative influence on the competitiveness of the region’s exports in international markets. The high cost and low productivity of ports was of little relevance at that time, as they
merely reinforced import-substitution policies. However, with the adoption of export-oriented macroeconomic policies by Latin American and Caribbean governments, those practices limit the competitiveness of their products in world markets.

As an illustration of such costs, the Brazilian Steel Institute (IBS) estimates for the period January to July 1988, the per ton tariffs for handling steel were US$20-22 in Santos, US$15-18 in Rio de Janeiro and US$11-14 in Vitoria, while at the port of Jacksonville (U.S.) the per ton dock labor costs amount to US$5.60, at Hamburg (Federal Republic of Germany) US$4.20, at Rotterdam (the Netherlands) US$3.80, at Antwerp (Belgium) US$3.31 and at Kaohsiung (Taiwan) US$3.18. The director of transport of the Paulist Steel Company (COSIPA) indicated that the total cost of loading steel exports at its private terminal in the port of Santos is US$33-34 per ton and that, together with the costs of unloading coal and iron ore, they increase the price of its steel by 13% and eliminate any advantage which might have been obtained from cost-saving investments. In the liner trades, major operators estimate that between 70-80% of their freight rates are utilized to pay for port and land transport services. Of that amount, around 70% corresponds to port services. Brazilian port costs for a loaded container amount to 49% of ocean freight rates, which includes 24% for container handling, 13% for dock worker supervision and a 12% surcharge for the fleet renovation fund.

The reformulation of labor regimes at ports can have a positive impact on costs and productivity. It will be recalled from part III that the labor regimes of Chilean ports were reformed by legislation adopted in 1981. As a result of those changes, cargo handling productivity at the port of Valparaiso increased from 2 060 boxes of fruit per hour in 1978-1979 to 6 500 in 1985-1986, which decreased vessel port-stay times from 129 to 40 hours and per box costs from US$0.54 to US$0.26. During the 1983-1984 fruit export season, a total of 34 million boxes were shipped from Valparaiso and by 1987-1988 the volume rose to 65 million boxes. The cost for handling tree trunks in the port of San Vicente fell from US$6.47 per cubic meter in 1980 to US$3.11 in 1986.

The Maritime Chamber of Chile has estimated that the annual savings exporters and importers enjoyed from the commercially oriented institutional reforms amounted to US$40 million during the first year after adoption and by 1989 exceeded US$88 million. These savings occurred not because port workers doubled their productivity or accepted additional adjustments to their wages, but because exporters had increased their production and, hence, use of that country's ports. These savings are not endless, however, as markets do become saturated, competitors can take all or part of a market, exporters cannot expand output if prices are less than their marginal costs of production and port labor must be allowed to participate in a growing economy. Thus, the institutional reforms at Chilean ports provided a fundamentally important support for that country’s export promotion policy.
It is axiomatic that ports occupy a pivotal role in the physical transfer of goods between different modes of transport, but the magnitude of the impact of port costs and productivity on the achievement of export-oriented macroeconomic policies is little understood. There is a cause-and-effect relationship by which the transformation of institutions and the adoption of new technologies by ports are linked to the competitiveness of a country's exports in international markets and the latter with national economic growth. The foreign exchange receipts from exports and the savings in outflows from lower cost imports translate into capital investments and the creation of new employment opportunities. These concepts represent a generalization, but a truth nonetheless: that the consequences of macroeconomic policies are determined at the microeconomic level and that the value of ports must be judged from the economic wellbeing of the hinterland served.

B. INTERMODALISM

In a computer-connected world of “just-in-time” deliveries, it is easy to forget that supply and demand were not always easily matched. Even today, goods are produced and stored at or near factories, transported to the country in which they are to be offered for sale and stored, and finally transported to the location of sale and stored until display-stored for sale. To avoid unnecessary investments in inventory and expenses in sequential storage operations, manufacturers seek to increase their inventory velocity, or the time it takes to convert raw materials into accounts receivable. The results of such efforts can be seen from changes in the ratio of manufacturing inventories to sales in the U.S., which has come down from slightly over 1.8 to 1.0 to just under 1.6 to 1.0 between 1982 and 1988.

Intermodalism is a major tool utilized by manufacturers to achieve such reductions. The president of Cast, a Canadian liner shipping company, recently defined intermodalism as “... the facilitation of a business transaction that moves the goods...”. [Journal of Commerce, 6 February 1989, p. 2B] It involves a systems approach to all activities and functions in the distribution chain in order to reduce and, where possible, eliminate interruptions in the continuous movement of goods and transport equipment from origin to destination. Intermodalism is an integrative way of dealing with the distribution chain to increase its potential. To create a basis for intermodalism, governments are removing legal obstacles to joint agreements between operators of different transport modes, and carriers are collaborating with manufacturers to improve services as well as offer “just-in-time” deliveries.

To offer intermodal services, it is not enough to control all activities in a trade route and link them together. The mere joining together of individual activities in a trade route, whether through ownership or joint operating agreements, does not create an intermodal system. Those activities first must
be modified so that when joined they do not represent parts of other systems but rather an entirely new system. For example, a major computer manufacturer redesigned each component of a printer to facilitate its assembly and the time required for that operation was reduced from 30 to three minutes. Just as the concept "design for assembly" seeks to increase productivity and reduce costs, the major objectives of intermodalism are to increase the speed of goods distribution and reduce the amounts of unproductive capital, whether in inflated inventory levels, inactive railcars or vessel delays at ports.

Intermodalism often includes the use of landbridge services. A landbridge permits the substitution of land transport for part of an all-water carriage operation. There are three types of landbridges: 1) a microbridge involves ocean and land carriage operations to an interior point, 2) a minibridge consists of ocean and land carriage operations which terminate in another coastal area and 3) a landbridge encompasses two ocean movements joined by a transcontinental land transport operation that requires the handling of cargoes at two additional ports. The use of intermodal-microbridge and -minibridge distribution systems have increased the hinterlands of ports served and reduced the number of ports of call for vessels operators. With the extension of port hinterlands, there has been an enormous increase in competition between ports which historically served different geographical areas.

As an illustration of this point, the intermodal transport of containers from Yokohama (Japan) to New York (U.S.) requires only 14 days, with the rail portion taking less than 80 hours, instead of three weeks by the all-water route, and has led to changes in distribution channels. Of all containers which historically passed through the Panama Canal en route to the U.S. east coast from the Far East, about 75% of them are now unloaded at U.S. west coast ports and moved by rail to their final destinations. To support this volume of traffic, by April 1990 there were an estimated 100 regularly scheduled double-stack container trains departing U.S. west coast ports on a weekly basis. Each of these trains carries 400-560 TEU, and the quantity of containers filled with imports which move eastbound from those ports is approximately 50 000 TEU per week, which is around 25% of all U.S. intermodal movements. Other major landbridges include those of Canada, Mexico, Panama, the Soviet Union, the U.K. for goods moving to and from Ireland and the Federal Republic of Germany for Scandinavia, and many others are under study.

Intermodal systems have eliminated the monopoly position of many ports *vis-à-vis* traditional hinterlands and created discretionary cargoes, or those that can flow through any one of a number of ports. For example, the ports in the north European range occupy approximately 1 300 km of coast and compete for cargoes in a hinterland that reaches as far as southern Europe. The marketing program of Rotterdam (the Netherlands) highlights that some
80% of Europe can be reached by road within 24 hours from its facilities, and Antwerp (Belgium) uses a centrality index to demonstrate its locational advantages. At times, however, a port can be in the position of having to provide intermodal services which can result in a reduction of its throughput. For example, if Asian imports to the hinterland served by the port of Boston (U.S.) arrive by intermodal rail services from U.S. west coast ports, it could experience a reduction in throughput. The port's major objective for the double-stack services it seeks to initiate are to attract containers from Europe destined for the U.S. mid-west so as to compete with other Atlantic ports.

As a consequence of increasing volumes of discretionary cargoes, ports are making investments, entering into joint ventures and acting as pressure groups for improvements to land transport infrastructures. For example, the port of Houston on the U.S. Gulf Coast is constructing a US$14 million cold storage warehouse so that it might better compete with the port of Philadelphia on the U.S. east coast for Chilean fruit exports, while the latter port is investing US$7 million in the third phase of its fruit discharging terminal and expects to increase its share of such fruit exports to 65% during the (1990-1991) season. For its part, the port of Genoa (Italy) believes that it might compete with the port of Rotterdam for cargoes moving to and from Milan (Italy) once the planned 250 kph train has begun to offer services between its facilities and that city. Intermodal systems allow relatively easy diversion of cargoes between ports and have increased interport competition, which is based on the time required for cargoes to reach their final destinations and cost. Thus, port services have become interchangeable.

With the inauguration of U.S. double-stack, intermodal-rail services in the early 1980s, railroads encountered numerous difficulties in obtaining sufficient volumes of backhaul cargoes for the specialized transport equipment employed. This led railroads to structure their freight rates on a round-trip basis and created an incentive for liner operators to obtain return cargoes, whether international or domestic. With limited amounts of international backhaul cargoes, liner operators turned to domestic cargo movements. In 1985, American President Lines (APL) purchased three domestic freight brokers in the U.S. to satisfy its needs, but the search for backhaul cargoes is not limited to manufactured goods. The U.S. Department of Agriculture recently published a report of stack-train services and suggests that, as the number has expanded from 54 in August 1987 to 100 by April 1990, exporters of agricultural products destined for Asian markets could take advantage of the cheaper rates available on backhauls. Intermodalism permits shippers to utilize an imbalance in land transport capacity on a marginal cost basis to change their routings, as well as for ports to incorporate such movements into their commercial strategies.

Within the Latin American and Caribbean region, intermodal systems are, as yet, only being considered by governments and transport enterprises. However, there is significant potential for increasing the efficiency of Latin
American and Caribbean trade distribution networks through greater utilization of intermodal connections in Europe and North America. In May 1990, a Norwegian liner shipping company, Ivaran, initiated a micro-landbridge service from Buenos Aires (Argentina) to Santiago (Chile) to increase the volumes of cargoes carried between the U.S. east coast and Buenos Aires. The two-to-four-day, service will utilize Argentine Railways (FA) from Buenos Aires to Mendoza (Argentina) and then trucks from the latter city to Santiago. Numerous restrictions often limit the use of intermodal services. For example, Brazilian ship operators cannot negotiate door-to-door freight rates for exports because national legislation does not permit them to transfer U.S. dollars to other nations for the land transport segment. Curiously, this restriction does not apply to intermodal air transport services.

Intermodal services can also make use of bridges, tunnels, ferries and pipelines, all of which can directly influence the demand for port services. For example, the national oil company of Mexico (PEMEX) constructed a 265 km pipeline between that country's ports of Pajaritos on the Caribbean and Salina Cruz on the Pacific to eliminate the need for ships to transit the Panama Canal and call at Pajaritos when loading petroleum. For its part, the public sector petroleum company of Brazil, PETROBRAS, plans to increase its network of oil pipelines by 1997 from the current 5760 km to 10100 km, at a cost of US$2000 million, which should have a profound impact on the demand for ocean transport and port services. Thus, the utilization of bridges, tunnels, ferries and pipelines, as an alternative to the ocean carriage of goods, has an important impact on the demand for port services and should be studied with care to determine appropriate policies and plans.

C. PROLIFERATION OF PORTS SERVING THE SAME HINTERLAND

With the exception of certain bulk commodities, the concept of a captive hinterland no longer exists. Its demise is the result of intermodal cargo movements, door-to-door services, modern transport and cargo-handling technologies, long-distance inland transport services and electronic information flows. With the loss of captive hinterlands, the lowest delivered cost of goods, the range and diversity of inland destinations, productivity of port labor and overall transit times are the major reasons a particular port is selected. These factors have also contributed to a loss of shipper and consignee identification with and loyalty towards specific ports. Ports serving the same hinterland are largely interchangeable and they must differentiate themselves on the services offered, efficiency, price and productivity. As a consequence, ports must understand the major trends in trade and manufacturing which are changing the dimensions of their hinterlands, as well as the strengths, weaknesses, strategies and market shares of not only competing ports, but also of shipping lines, railways and road transport companies.
The transformations taking place in trade and manufacturing can extend the influence of some ports and reduce or eliminate it for others. This can be seen in the case of Mexico, where numerous manufacturers have begun to locate assembly plants for their products in that country in order to take advantage of its lower wage rates and proximity to Canadian and U.S. markets. These assembly plants are supported by a new legal regime which allows 100% foreign ownership of installations. The plants are largely supplied with components from the ports of Los Angeles and Long Beach (U.S.). Recently, however, the largest liner shipping company of Mexico, Transportación Marítima Mexicana, inaugurated a service between the Far East and the Mexican west coast port of Ensenada. That port is about 65 miles from the border city of Tijuana, the location of numerous assembly plants, and goods passing through its facilities avoid problems related to the double handling of transshipment cargoes at U.S. ports and the need to comply with both Mexican and U.S. Customs regulations.

The strategies and market shares of competing ports can be based on a wide range of factors. The productivity and tariff differences between Brazilian ports, for instance, has led to competition between them and a proposal to adopt common charges for all ports of that country. PORTOBRAS began gathering information from national ports on the matter and indicated that such a tariff would mean that Brazilian ports would compete only on services and efficiency, and not on price. For over a century liner conferences have utilized the same argument to justify the cartel structure of their freight rates. That structure not only eliminated price competition, but also enormously limited the benefits to conference members who sought to compete on services. Just as liner conferences eliminated price competition and weakened it in most other areas, efforts to do the same for ports could result in equally negative results.

Ports of industrialized nations have responded to the increasing competition for cargoes in their traditional hinterlands by establishing interior cargo terminales, undertaking capital improvement projects, and offering cargo consolidation services and price incentives. For a port to enhance its competitive stance in this situation, it must constantly improve the quality and range of its services. It must search for responses to questions such as: what are the needs of all those providing and receiving services at its installations? How have those needs changed? Who do they compete against and what are those competitors doing? The responses to these and other questions might involve an identification of the physical and institutional impediments to a greater use of the port. For example, the port of New York-New Jersey (U.S.) identified such impediments when it introduced an incentive program of US$25 per import container and US$50 per export container to offset the cost of moving them between marine and rail terminals, and when it reduced the tonnage assessment paid by steamship
lines for containers moving more than 260 miles from the port from US$180 to approximately US$87.

In this changed environment ports are no longer able to assert control over the trade activities of a hinterland, but must redefine their service and cost structures in the light of the factors which are transforming them. For example, on 26 October 1988, an agreement was signed between the ministries of economy and the port administrations of El Salvador and Honduras to facilitate the movement of goods between the ports of Acajutla and Puerto Cortez. This agreement seeks to extend the hinterland of both ports and improve their access to the Pacific and Atlantic Oceans. It could lead to greater volumes of cargoes passing through both of them and increase competition with the neighboring ports of Quetzal and Santo Tomas de Castilla (Guatemala). However, its impact could be limited unless the hinterlands served by Acajutla and Puerto Cortez are economically dynamic, productive of goods for exports and users of port services. Thus, ports must ensure that such agreements include incentives for the establishment of industries, commercial parks, trade fairs and free zones.

D. PORT CONSOLIDATION

Economic activities are usually consolidated to create a larger, more cost-effective operating unit which better responds to competition, provides a greater range of goods and services or unites complementary factors of production. The Introduction to this document brought out that the consolidation of ports began with the use of accurate navigation systems, took on an enlarged dimension with steam propulsion for vessels and has accelerated at an increasing rate since that time with almost every new port and transport technology. With the handling of homogeneous cargoes at specialized ports and terminals, the advent of cargo unitization for general cargoes and the introduction of intermodal transport systems, a new impulse has been given to the historical trend toward port consolidation. For example, in 1970, North America had 17 major international Atlantic ports, of which only seven retained this function by the mid-1980s, and numerous specialists are of the opinion that by the end of the 1990s there will be only three or four.

The utilization of scale-economy vessels which call at fewer ports and cost-effective inland transport services have led to the concentration of cargoes at a small number of ports. The major liner company, Evergreen Line, provides an east and westabout round-the-world service with 25 vessels and calls at only 22 ports eastbound and 21 ports westbound. At the urging of the president of the port of Recife (Brazil), major exporters agreed during September 1988 to coordinate their deliveries to the port. By concentrating their cargoes at a specific time they could guarantee shipping lines a minimum volume of export cargoes and ensure vessel calls. The concentration of cargoes permits the construction of specialized terminals to achieve
greater economies of scale, which benefits carriers, ports and cargo owners. Thus, ports serving the same hinterland should specialize and diversify, but many seek to preserve historical roles by asserting that their loss-making operations are “socially profitable” so as to receive various forms of government support.

The liner conference system has traditionally been structured around specific ocean-trade routes. The impact on that system of fewer ports-of-call and the concentration of cargoes at major ports can be seen from the mergers of numerous liner conferences. For example, U.S. exports to North Europe flow with equal ease through ports on the U.S. east, Gulf or west coasts, but shipping services were, until recently, controlled by six different conferences. On 26 August 1989, however, they were merged into the North Europe-U.S. and U.S.-North Europe conferences (west and eastbound), with the Trans-Atlantic Associated Freight Conference acting as the global organization for both. This merger reflects the ease with which U.S. inland transport services can move goods between interior points and ports on all three coasts, as well as an earlier amalgamation of the conferences in U.S. trades with Asia and the Far East. Thus, for trans-Atlantic and trans-Pacific liner conferences in U.S. trades, the ports on all three coasts of the U.S. are treated identically and it is merely a matter of time until their operations are concentrated even more.

The trend towards port consolidation and the measures used to defend the continued viability of specific ports have become evermore intense and creative, and can be found in almost every country. Many port authorities, labor unions and communities have adopted measures to avoid the commercial pressures behind this trend. In Latin America and the Caribbean such measures are visible from the efforts of one country to modernize three similar and closely located ports, the requirement of another that goods be transported long distances by land to provide work for a small port, the adoption of legislation by one country which compels vessels to make direct calls and the construction of numerous transshipment facilities in ports of neighboring countries to serve the same trade flows. The basic question concerning all such measures is whether cargoes should be allowed to follow commercial routes or be required to utilize more costly political ones.

E. PORT COOPERATION

Ports have traditionally planned their activities individually, but many are beginning to find that it is necessary to cooperate with others so that they might better respond to the challenges of a global economy. Cooperation between ports permits them to formulate joint endeavors in areas such as marketing, exchange of cargo-handling equipment, repair and spare parts supply, common electronic information systems, programs for research in improving cargo handling facilities, dredging and purchasing. The basic
objective for all of these joint efforts is to reduce costs and enhance the prospects for growth.

Probably one of the better examples of cooperation between ports would be that of the port authority of New York-New Jersey (U.S.). That authority was established in 1921 to plan, develop and operate transportation facilities and world trade projects which contribute to the promotion and increase of commerce in the New York-New Jersey Metropolitan Region. At first, it managed and operated certain bridges and tunnels between those two states. In 1949, its jurisdiction was extended to commercial ports. This extension proved most astute and led to the construction of container terminals in New Jersey, because the port of New York is surrounded by a city and lacks sufficient land for that purpose. This cooperation permitted a high degree of specialization of activities between two geographically separate ports, which then allowed each to attain new scale economies. The mutual economic benefits of such cooperation should not be overlooked. The immense trading power of the port of New York-New Jersey has extended their individual hinterlands, created additional sources of financing for new facilities and forced some smaller ports, such as Boston (U.S.), almost totally out of liner trades.

Essentially, ports that serve the same hinterland are the same port and should undertake cooperative programs directed toward areas that can benefit the entire trading community. The California Association of Port Authorities (U.S.) is to study the establishment of a statewide port commission. The reasons for this are that they may lose more of their market share to the ports of Seattle and Tacoma (U.S.) as well as to those in Mexico, and that port services should be made more efficient and cost effective to avoid such losses. The ports of Seattle and Tacoma recently entered into an agreement which will permit joint activities in areas such as trade promotion, cargo forecasting and use of a North American landbridge. Nonetheless, the ports are to remain separate so that a competitive stance with be maintained vis-à-vis those of Los Angeles and Long Beach (U.S.). Thus, cooperation between ports can be mutually beneficial, but it must be structured to maintain a competitive environment in order to achieve greater efficiencies and avoid the abuse of a dominate position.

Ports at each end of a trade route engage in cooperative activities in order to increase the volumes of cargo flowing between them, and to provide carriers and cargo owners with substantially similar port facilities, productivity and costs. The port of Miami (U.S.) is offering assistance to several Caribbean ports as part of its “Puertos Amigos” program. It is providing the National Port Institute (INP) of Venezuela with technical assistance in planning, developing, managing and operating port facilities, including container terminals. The first port to benefit from the agreement will be Puerto Cabello (Venezuela), where a number of ship-to-shore cranes are to be installed. The port of Miami will also offer assistance to the port
authority of the Cayman Islands to improve lift-on/lift-off cargo handling facilities.

Similarly, the initiation of services for the transport of fresh bananas from Puerto Limon (Costa Rica) to the port of Wilmington (U.S.), and general cargoes on the return trip, has led to the establishment of a sister port relationship so that they might formulate strategies for increasing trade between them. The ports of New York-New Jersey (U.S.) and Rio de Janeiro (Brazil) established a sister port relationship to facilitate the exchange of technical and marketing information so that they might improve the flow of trade between them. Finally, the workers cooperative at the port of Leghorn (Italy) is providing technical assistance to the port of Montevideo (Uruguay) in order to improve the latter's economic and operational efficiency as well as increase the volumes of cargo flowing between them.

Broadly speaking, the requirements for cooperative programs between ports serving a common hinterland are satisfied in a number of Latin American and Caribbean countries. Most Central American ports such as those of El Salvador, Guatemala and Honduras, as well as the ports of Cartagena, Barranquilla and Santa Marta (Colombia), the ports of Valparaiso and San Antonio (Chile), and the ports of Montevideo (Uruguay) and Buenos Aires (Argentina) either serve or have the potential to serve common hinterlands. For example, the ports of Santos and Rio de Janeiro (Brazil) share a common hinterland and have established an EDI system that permits direct communications between them and shipping agencies. With the adoption of Customs transit regimes and the increasing liberalization of land transport services between many Latin American countries, many other ports will find themselves sharing hinterlands and they should consider undertaking cooperation programs. To undertake such programs, it is necessary for governments, port managers and all those providing services at ports to recognize that they no longer have exclusive hinterlands and that they are engaged in a highly competitive international, not domestic, activity.

F. PORT TARIFFS

Ports structure their tariffs to recover the costs of services rendered, to obtain funds for capital investments and to earn a reasonable profit. However, some have begun to reduce charges on cargoes, decrease vessel tonnage assessments and negotiate volume incentive programs with ocean carriers. Price reductions are not new, and are utilized by manufacturers and retailers of goods, but what makes these efforts new is that they have been undertaken by ports which historically had a dominant position for handling cargoes in an exclusive hinterland. The reason for such a change is that efficient long-distance inland transport services provide ocean carriers with greater control over the selection of ports and places them in a strong negotiating position to obtain more favorable port tariffs. Without captive hinterlands,
ports have begun to compete with each other and their tariffs have become a major marketing tool and a means by which the demand for services might be managed.

Ports can create incentives to alter vessel arrivals through a reduction in port tariffs and priority berthing on the days when there is little demand for services. Ports on the U.S. west coast find that the major demand for services falls on specific days: Monday and Tuesday for Los Angeles/Long Beach, Wednesday for the San Francisco Bay and Thursday and Friday for Seattle/Tacoma. This corresponds to the vessel departures from the Far East and their sequence of port calls on the U.S. west coast. So predictable are vessel schedules that dock workers at the port of Santos (Brazil) held a 24-hour strike to protest shipping companies’ avoidance of weekend employment, for which they are paid five times the normal wage.

The use of port charges to manage the demand for port services can bring about not only a modification of the times and days vessels arrive, but also stimulate activities by ship operators and result in a greater coordination of specific functions. For example, vessel operators might be offered a discount on port tariffs in order to bring about the electronic delivery of cargo and vessel information, the coordination of cargo activities between vessel operators, Customs and inland transport enterprises as well as the use of equipment during non-peak hours. On the other hand, port tariffs might be increased for the handling of certain cargoes, such as those which are labor intensive, to discourage vessel operators from requesting those services. Thus, ports can manage the demand for their services through a judicious use of tariff discounts and increases.

Most ports structure their wharfage and cargo tariffs with little regard to how quickly a vessel is loaded or discharged, and very little effort is made to place charges on the persons and enterprises that exercise the greatest degree of control over such operations. If this were done, those using port facilities and services would have an incentive to improve cargo handling productivity, to shorten vessel times in port and to remove cargoes from port warehouses more quickly. For example, the same tariffs for services at Colombian ports have been utilized since 1980 and are quoted in U.S. dollars for imports and in pesos for exports. The exchange rate at that time was US$1.00 to 50 pesos, which means that, with the current exchange rate (1989) of US$1.00 to 392 pesos, port rates for imports have increased almost eight times. The reduction in port rates for exports can be seen from the cost of storage, 19.30 pesos per ton per day. In 1980 this amounted to US$0.38 per ton per day, but today only US$0.05. Thus, exporters find that it is less costly to store goods at ports than in private warehouses.

In an effort to control costs and generate funds for capital investments, many governments and port administrations have begun to restructure their port tariffs. The Government of Argentina has established a multisector grain transport coordinating committee that is to reduce by 33% its high grain tariffs.
berthing and loading costs. For its part, in December 1988, PORTOBRAS adopted decree 7 700 which created the additional port tariff (ATP). The ATP establishes a 50% surcharge on port tariffs to generate funds for the construction of port facilities and the purchase of new equipment. For 1989, it is calculated that the ATP will generate around US$250 million, which is to be utilized in the 14 principal ports of the country. The Brazilian trade community estimated that in 1989 the ATP will depress exports around US$4 billion. In March 1990, this matter was resolved when the newly elected President of Brazil adopted a number of economic measures, one of which will eliminate the ATP at the end of 1990.

Today, ports encounter two sources of competition: one from other ports serving the same hinterland and another from that faced by the products of the shippers and consignees which utilize their facilities. To properly structure port tariffs, they must reflect not only both aspects of this enlarged competitive environment but also the actual costs of providing services and the need for future capital investments. To avoid the use of government subsidies in this situation, every effort must be made by all of those providing services at ports to control their costs. This effort might be strengthened by establishing a regime which requires transparency of their activities and ensures an equitable sharing of the burdens and benefits that result from changes to increase productivity and lower costs. Probably the most significant cost is that of dock labor, and governments must unite with labor representatives, as well as with exporters, importers and carriers to create a competitive environment in which services are cost-effective and productive. This could mean that ports will be permitted to seek additional economies of scale through cooperation with other ports and that the private sector will be allowed to participate in the construction and operation of modern cargo-handling facilities.

G. AIR AND AIR-SEA TRANSPORT

Air and air-sea transport services influence the demand for port services in two ways: first, air-cargo services eliminate the need for ports entirely; and second, air-sea cargo service eliminate the need for port services at destination, but require a port in the country where goods are transshipped from vessels to airplanes. All-air cargo services are somewhat similar to those of ocean-bulk carriers; that is, neither seek to establish a liner type of service, but rather to obtain remunerative employment from every movement of their transport equipment. For example, Airborne Express inaugurated and terminated a service between Wilmington (U.S.) and Toluca (Mexico) within a three month period at the beginning of 1989 due to the lack of sufficient backhaul cargoes in Mexico to make the operation profitable.

The air-cargo industry attracts not only high-value goods, perishables and emergency shipments, but also clothing, vehicle parts, shoes, electronic
equipment and many other goods, even though it is estimated to cost three
times more than ocean transport. When an air-cargo shipment can be
delivered in two days rather than three weeks, and letters of credit are
accepted and payments made much faster, the advantages of air transport are
obvious. Air cargo services permit shippers and consignees to keep their
inventories as low as possible and to have their goods arrive in smaller
quantities with greater frequency. The cost of working capital tied up in the
greater volume of goods in transit when ocean transport is utilized may equal
or exceed the higher tariff of the air carrier. For example, when a dock
workers’ strike closed the port of Chalmers (New Zealand), nectarine
exporters chartered a Soviet Aeroflot Antonov 124 and transported 100 tons
of fruit to Sydney (Australia) at a cost of only US$0.08 per kg more than the
sea freight between those two ports.

In 1987, 24.4% of Caribbean exports to the U.S. were transported by air,
which is up from 22.2% three years earlier. If petroleum and sugar were
eliminated, the figure for 1987 would increase to approximately 36%. The
heavy demand for air cargo services in the Caribbean is a reaction to high
port costs and labor problems as well as the availability of substantial cargo
space on frequent tourists flights between that subregion and the U.S. During
the same period 14.1% of Central American exports were shipped by air to
the U.S. and 9.5% of those of countries belonging to the Latin American
Integration Association. As an illustration of the growth of air freight for one
country, the Brazilian air cargo freight market for exports reached US$120
million in 1987. In the trade between Brazil and Japan, a Brazilian air freight
forwarder achieved a 30% growth in the period 1986-1987, increasing its
revenues from US$11.9 million to US$15.5 millions. The Brazilian airline
Varig increased capacity of its cargo service to the U.S. by 200 tons a week in
order to satisfy the demand for Brazilian automobile parts, shoes, textiles and
machinery in that country.

In the early 1980s, the utilization of Dubai (United Arab Emirates) and
Singapore as air-sea transshipment centers started in response to the regular
departure of empty cargo holds of airplanes bound for Europe. These centers
shorten transport times for all-water carriage and reduce the all-air freight
rate with part of the journey by vessel. Singapore suggests that its air-sea
transit times are eight-to-nine days for movements from Taiwan to North
Europe, instead of an estimated 26 days by sea, and has experienced a growth
from 3 800 tons in 1986 to 6 600 tons in 1988. On the other hand, combined
air-sea transit times of 16-17 days are usual for goods from Taiwan to North
Europe via Dubai. From 1 500 tons of air-sea cargoes handled at Dubai in
1983, the amounts have increased to 8 432 tons in 1986 and to 16 265 tons in
1987. As a consequence, air cargo carriers have begun to increase their rates.
For example, the 1987 rate of US$0.82 per kg was increased to US$1.09-1.14
in 1988 and this reduced the growth rate to 3.5% for a total of 16 880 tons
during 1988.

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The most common air-sea routes from Asia to Europe are by ship to the U.S. west coast, from which the cargo is flown to Europe, or by ship from Asia to the Persian Gulf and then by air to Europe. This trade has grown from approximately 56,400 tons in 1986 to 95,000 tons in 1987 and to 133,000 tons in 1988. Freight forwarders of the Federal Republic of Germany have found that such services reduce all-water transit times by 75% and all-air transport costs by 50%. To participate in the growing air-sea trade between the Far East and Europe, the liner operator Nippon Yusen Kaisha (NYK) recently initiated a service with all traffic being routed through Dubai. The National Apparel and Textile Association of Seattle (U.S.) indicates that some of its members are now shipping merchandise by air from Bangladesh, India and Pakistan to ports such as Hong Kong, where the cargo is transferred to liner vessels for carriage to the U.S. west coast. For women's clothing, which has a shelf life of only 21 days before the first markdown in price, such speed is fundamental.

For many Latin American and Caribbean countries, air-sea routes can also involve a long-distance inland transport operation. A number of road carriers have established an extensive feeder services for airlines moving cargoes to and from Latin American and Caribbean countries. Using fleets of regularly scheduled trucks, they move cargoes from U.S. west coast ports to Miami (U.S.) in as little as 72 hours, where the merchandise is loaded on aircraft for carriage to the country of destination. Asian and Far East-based manufacturers which have their products assembled in Latin American and Caribbean countries are making an increasing use of such intermodal systems. For example, the demand for sea-land-air transport services of one trucking company resulted in 875 tons of cargo being carried during the month of October 1989.

A growing number of freight forwarders offer ocean carriage services to U.S. ports and air transport to Latin American and Caribbean destinations to avoid high port and inland transport costs. For example, Curaçao sees itself as a transshipment center for Bolivian cargoes. Truck rates for the trip from Bolivia to Chilean and Peruvian ports can be as high as US$2,500 per TEU. Curaçao proposes the air transport of goods direct from the new airport at Santa Cruz (Bolivia) to Curaçao (176o) and then by ship to Europe or the U.S. The ocean carriage of containerizable goods from France to Miami (U.S.) and then by air to Bogota (Colombia) is estimated to cost 20% less than if ocean and land transport had been used throughout. Recently, Airborne Freight Corporation of the U.S. and Giant Cargo of Brazil began moving heavy freight shipments from Japan to Brazil in less than 10 days, with the shipments moving by vessel from Japan to Los Angeles (U.S.) and, then, by air to São Paulo (Brazil).

Ports are but one link in the intermodal distribution chain, but they can act as catalysts when cargo routing decisions are being made. For example, in 1983 the port of Seattle and the Seattle-Tacoma (U.S.) airport instituted an
air-sea program for Far East-Europe cargoes. Total cargo tonnage at the airport has grown about 30% in the past three years, from 210,192 tons in 1985 to 277,200 tons in 1988. The port has become so involved in air-sea cargo operations that it recently purchased a 60,000 pound main-deck cargo loader and placed it at the airport for the use of any cargo airline. The demand for this service has grown beyond the cargo space available on planes bound for Europe and has led to the movement of cargoes, a volume sufficient to fill six or seven air freighters each week, by truck to airports in Vancouver (Canada), Chicago (U.S.) and Washington D.C. for flights to Europe.

In summary, very little can be done to increase vessel, train and truck speeds to more effectively compete with air transport, but much can be done to increase the efficiency and productivity of ports and to eliminate the time cargoes wait on docks for Customs clearance or the resolution of labor disputes. This reduction in time is most important when one considers that in air-sea operations approximately two days of time are lost by the need to remove cargoes from marine containers and reload them into units employed by airlines. The reason for the change in cargo-grouping units is that airlines make only minimal use of ISO standard 20 foot airfreight containers, as they weigh more than their own units and make inefficient use of the cargo space available. However, if standard ISO airfreight units were utilized, they could be moved rapidly between transport modes and avoid delays brought about by shifting cargoes from one cargo-grouping unit to another.
Chapter 5

PHYSICAL INFRASTRUCTURE

Almost without exception, ports have traditionally equated the characteristics of their installations with benefits to carriers, shippers and consignees. Historically, the major reason for this focus was the dominant position occupied by ports over their hinterlands. Vessels had to call at a port to serve its hinterland and this remains true for many of the bulk trades, but containers have altered this commandment for liner vessel operators. In liner trades, containers, not vessels, now chase cargoes. This means that hinterlands are no longer the exclusive domain of a specific port and that liner vessels can select a port-of-call to improve customer service and their own overall efficiency. Another reason is that port labor is a source of continuing problems which occupy so much management time that the cost of capital-intensive systems becomes reasonable. Such systems are seen by many port managers as a means to lower port-labor costs, to professionalize dock work and to improve labor relations.

Consulting engineers and port equipment manufacturers usually reinforce these historical justifications by recommending that modern port technologies are the best and least expensive way to increase productivity. This might seem at odds with the economist's view that capital and labor are theoretically interchangeable; that is, a port should be equally happy to have either capital intensive or labor intensive vessel loading, discharge and cargo-handling systems, and the choice between them is made on the basis of relative cost. In reality, however, such systems are seldom interchangeable and competitive pressures determine which capital-intensive technology must be utilized. Of the many pressures which influence their selection, some of the more important arise from the requirements for i) vessel access, ii) specialized terminals, iii) cargo-handling systems, iv) cargo unitization, v) inland transport and vi) computers and communications systems.

A. VESSEL ACCESS

For centuries the physical infrastructures of ports exerted a controlling influence on vessel sizes. Even as late as 1859, the Great Eastern of 692 feet
constructed in the U.K., dwarfed every other vessel built before the twentieth century, but was unsuccessful due to the lack of main propulsion engines, ports and trade flows to match her capacity. However, by the early years of the twentieth century, the physical infrastructures of ports could no longer hold back vessel sizes and the situation reversed itself; that is, vessel sizes began to exert a controlling influence on the physical infrastructures of ports. The response of ports to the continuing increases in vessel sizes created complex problems and can be seen from the divergent positions held during the years 1898-1923 by members of the Permanent International Association of Navigation Congresses (PIANC). At that time, one group of the PIANC sought to limit the maximum dimensions of ships to lengths of 275 m, widths of 32 m and drafts of 9.5 m, while another believed that such limits were unnecessary.

Today, the physical infrastructures of ports must be constructed to facilitate not only the ready access of ocean and land transport operators but also the cost-effective receipt, dispatch and handling of cargoes. For vessel access, ports must constantly take into account their changing dimensions. From the mid-1950s until the first oil crisis of October-December 1973, the size of tankers, especially crude carriers, increased enormously. For example, the T-2 tanker of 16 765 dwt was constructed in the U.S. during the Second World War and seems extremely small compared to the world's largest tanker, the Seawise Giant, of 564 739 dwt and a loaded draft of about 28 m. Dry-bulk carriers also experienced a growth in size, ultimately reaching around 300 000 dwt. With the advent of containerization in 1956, liner vessel operators have begun to take advantage of economies of scale. Since the first container vessel, a converted T-2 tanker with space for 58 containers, they have grown rapidly in size to around 4 000 TEU of 61 000 dwt and further increases are foreseeable to 6 000-7 000 TEU.

For ports, larger vessels translate into demands for numerous infrastructural changes. First, to remain competitive ports must dredge entrance channels and berths, as well as enlarge existing installations or construct new ones. For example, the port of Freeport (Texas) was unable to compete with Houston and Galveston, which are in the same bay, until its access channel was dredged to 45 feet and a new highway to the south side of Houston reduced inland transport times from two hours to one. Shortly thereafter, the port of Houston completed a project and received voter approval for funding to dredge its entrance channel to 45 feet from the current 40 feet. Second, larger vessels have considerably increased daily operating costs and operators prefer to avoid ports which are many hours steaming time from the open ocean. In this context, the European port of Antwerp (Belgium) has constructed installations outside its lock systems so that lines might avoid not only seven hours of steaming time but also payment of, among others, lock taxes and pilot fees.
In Latin America and the Caribbean, the problem of water depth in ports is even more pressing due to the lack of equipment and funds for dredging, and the speed with which larger vessels are being placed in service. In the Caribbean, the port of Rio Haina (the Dominican Republic) is currently being dredged for the first time in five years. The port of Bustamante (Jamaica) is dredging the harbor and berthing areas to a depth of 42 feet from the current 39 feet to accommodate deeper draft vessels. At the River Plate, the Paraguay, Parana and Uruguay rivers annually deposit 90 million cubic meters of sedimentation into the port of Buenos Aires (Argentina) and its access channels. Even though Argentine ports and access channels are dredged frequently, at an estimated annual cost of US$120 million, a combination of insufficient water depth for large vessels and restrictive labor agreements require that they begin loading grains at river ports like as Rosario (Argentina) and complete such operations either at an anchorage south of Montevideo (Uruguay) or at Bahia Blanca (Argentina). For its part, Bahia Blanca and its access channel accumulate sedimentation at the rate of one foot per month. Currently, the port and its 96 km entrance channel are being dredged to 45 feet by the Soviet Union, which has subcontracted part of the work to a company from the Netherlands. It has been estimated that for every foot of depth of a grain vessel is equal to 1 500 tons of cargo.

This problem is not unique to the above mentioned ports and can be found in those of numerous other Latin American and Caribbean countries. In 1989, the port of Buenaventura (Colombia) handled 58.2% of that country's international trade, but sedimentation deposits from the Dagua and Reposo Rivers into the port limit the maximum water depth to 32 feet. The estuary port of Barranquilla (Colombia) has a serious water depth problem due to sedimentation deposits from the Magdalena River. The state petroleum company of Venezuela (PDVSA) seeks to ensure adequate water depth for the loading of tankers up to 500 000 dwt and is to construct a new terminal. The Paulist Steel Company (COSIPA) recently has undertaken the dredging of the 5 km long access channel to its steel terminal near the port of Santos (Brazil). The normal channel depth is 12 m, but constant silting has threatened safe navigation of larger vessels using the terminal. The director of transport of COSIPA estimates that the dredging will permit larger bulk carriers to participate in the trade and, through greater economies of scale, should result in a freight rate savings of from US$0.50 to US$1.00 per ton.

Another area of concern for many ports is the environmental impact of dredging. At the port of Oakland (U.S.), dredging costs are of secondary importance to the environmental restrictions on the disposal of dredged materials. Due to the lack of dredging since 1972, vessels are restricted to a maximum depth of 35 feet. APL restricts the entry and departure of its wider-than-PANAMAX container vessels, which require 41 feet of water, to periods of high tides. The port unsuccessfully sought permission to dispose of dredged materials in the San Francisco Bay and then in the ocean. Permission
to use dredged materials to strengthen the levees in California's River Delta was given but later withdrawn on the basis of risks to the quality of drinking water. Similar obstacles at other ports of that country has led the American Association of Port Authorities to petition the U.S. Government for the designation and construction of sites which will permit the disposal of dredged materials well into the 21st century.

Charter arrangements permit larger vessels to be brought into a trade within a matter of weeks, but under the best of circumstances ports require 10-20 years and even longer to plan, finance and construct installations which can service such vessels. For example, the three-year project to dredge the port of Bahia Blanca (Argentina) and its entrance channel was evaluated in four feasibility studies, the first of which was conducted in 1964, and the dredging commenced in 1988. The 24 years from conception to commencement of the Bahia Blanca dredging might seem long, but the U.S. Corps of Civil Engineers, which carries out port infrastructure projects in that country, requires an average of 20 years. Thus, with such long lead times to respond to changes in vessel dimensions, ports must be especially receptive to the changes, events, circumstances and trends in naval architecture and trade so that they might be able to anticipate and respond to them in a timely and appropriate manner.

B. SPECIALIZED TERMINALS

There were no specialized terminals until large volumes of homogeneous commodities began to be carried by ships. If one begins with the construction of the first tanker in 1886, which initiated the bulk carriage of petroleum, the impact of increasing volumes of such cargoes on port terminals can be seen. Prior to the construction of that tanker, all cargoes were carried in liner vessels and handled at general purpose terminals. When petroleum, other homogeneous commodities and neo-bulk goods such as automobiles, pipes, paper rolls and lumber reached appropriate volumes, they began to be carried in specialized vessels and the need for equally specialized terminals became evident. The neo-bulk concept was extended to general cargoes in the late 1950s with the advent of marine containers and, since that time, many ports have constructed specialized terminals to facilitate their handling.

Each commodity has characteristics that determine which cargo-handling systems, storage arrangements and terminals are most appropriate. With a growing concern for air quality, for instance, coal purchasers have increased their demand for blends of different grades. This translates into the need for extensive areas to separately stockpile individual types. In addition, most coal purchasers utilize it as a fundamental input into their productive activities, like steel manufacturing and electric power generation, and they can, only at a great cost, stop such processes. Coal purchasers, therefore, enter into long-term contracts to ensure its uninterrupted supply. Price is an important
factor in the negotiations of such contracts, but not as important as a guarantee of continuous supply. To ensure that obstacles are not created which might interrupt scheduled deliveries, contracts include provisions for the repair and maintenance of inland transport systems, dredging of ports, working hours and many other aspects.

Specialized terminals can be constructed for almost any cargo, but there are numerous requirements which must be satisfied. For example, one Latin American country plans to construct a bulk coal export terminal even though its water depth will not permit the entry of PANAMAX vessels, ships will have to have their own cargo-handling systems and coal will have to be brought to the port by truck. Specialized terminals require large investments as well as frequent and large volumes of cargo, adequate water depth, high-capacity cargo-handling systems and low-cost inland transport services, and are usually constructed at each end of a trade. For example, the Savannah Electric & Power Company (U.S.) recently imported 23 000 tons of low-sulfur coal from Colombia and has applied for a permit to construct a specialized coal receiving terminal at its plant on the Savannah River.

Vessels and barges are sometimes used as floating transshipment centers to avoid the expense of constructing a shore-based specialized terminal. For example, self-unloading vessels are used to carry coal from the Great Lakes to a deepwater mooring outside of the St. Lawrence Seaway system and transfer that commodity to larger bulk carriers. This arrangement is efficient due to the limitations on vessel sizes that can transit the locks of the Seaway to reach the Great Lakes, but its impact on the competitiveness of coal and other transshipped commodities should be determined by comparing their prices in international markets with those of producers that do not utilize transshipment services. The multiple handling of commodities in a transshipment situation leads to an increase in costs because it requires specialized terminals to cost-effectively load self-unloading bulk carrier and transshipment locations to transfer the commodity to larger vessels. A variation of this arrangement would be the barge-to-vessel transshipment operation. Barges have a much lower cost of operation than self-unloading vessels and are often loaded at numerous small terminals. The commodities are usually transferred from barges to large bulk carriers by means of a crane equipped barge.

The use of standard marine containers presents ports with a uniform cargo-grouping unit which allows them to construct specialized terminals or convert general cargo piers. Conversion, however, is a massive undertaking which requires both dredging and the provision of extensive solid foundations for the heavy point-loading requirements of containers and their handling equipment. These terminals facilitate the rapid loading and discharge of vessels, and require easy access for inland transport operations for the cost-effective receipt, dispatch and handling of cargoes. In this context, many ports have begun to construct on-dock and off-dock rail yards. On-dock rail
yards have the advantage of eliminating all drayage costs between ships and rail terminals, while off-dock rail yards have the advantage of allowing domestic backhaul cargoes, which are carried on the same train with imports and exports, to avoid the port in reaching their final destinations.

The construction and operation of specialized port terminals has gone through two stages: cargoes and carriers. Specialized terminals began to be constructed in the late 1880s for petroleum and, since that time, have been utilized for many other cargoes. Following the original focus on cargoes, ports began to look at carriers' needs, both ocean and inland, and began to modify installations to facilitate their arrival and departure. So important are the cargo and carrier aspects of specialized terminals that, along with factors such as geographical location, productivity and costs, they contribute heavily in determining which ports will attract cargoes and have profitable operations.

C. CARGO-HANDLING SYSTEMS

The major trend in cargo-handling equipment has been from small to larger units and then to continuous ship-to-storage systems. This can be seen from the loading and discharge of grains, where the change has been from individual sacks to multiple sacks on slings and pallets, and, finally, to continuous-handling systems. To justify the considerable investments in such systems, cargoes must be uniform as well as presented in sufficiently large and frequent volumes. For many years, continuous-handling systems have been utilized for free-flowing commodities such as petroleum, minerals and grains. However, where volumes of dry-bulk commodities are small, infrequent or vary too much in their physical characteristics for continuous-handling systems, ports often employ large-unit handling systems such as a grab connected to a multipurpose crane and move from 5 to 40 tons in each lift.

Continuous bulk cargo-handling systems have been improved over many years and at Tubarão (Brazil), for instance, iron ore is loaded at the rate of 20 000 tons per hour and discharged at Rotterdam (the Netherlands) with a grab system at more than 5 000 tons per hour. Nonetheless, many Latin American and Caribbean countries continue to utilize cargo-handling systems that are much slower. For example, public-sector grain terminals in Argentina load at an average rate of 8 000 to 10 000 tons per day, requiring more than six days to load a PANAMAX vessel, while those of the U.S. Gulf can load the same vessel in a day-and-a-half. The private grain terminals in Argentina more than double the loading rate of public sector terminals and have captured 61.4% of the market between 1981-1987. As a consequence of such loading rates, as well as the need to use multiple loading locations, vessel charter rates for the transport of Argentine grains to North Europe are almost three times higher than those from the U.S. Gulf, even though the
distance is only 1,300 nautical miles greater. The annual cost to Argentina from such inefficiencies was estimated in 1985 to be US$500 million.

Continuous systems have been extended only recently to the handling of standard cargo units such as fruit boxes and pallets, but their extension to larger units appears inexorable. There are, as yet, no continuous-handling systems for containers, but Matson Terminal's mousetrap system, which eliminates the break between ship and storage-area gantry cranes, is a very close approximation. Also, SLS and European Combined Terminal of Rotterdam (the Netherlands) are constructing a container terminal which will feature, when inaugurated in January 1993, an almost unmanned container handling operation with automated stacking cranes and automated guided vehicles controlled by a central computer. Whether containers will be loaded onto and discharged from vessels by continuous-handling systems is subject to speculation, but it is known that ship-to-stacking area conveyor systems for containers have been proposed for many years and SLS constructed an operating scale model to prove that such a system is feasible.

The utilization of high-capacity, ship-to-storage cargo-handling systems creates a pressing need for abundant space not only for export and import cargoes but also for access roads, marshalling areas as well as service and administrative zones. It is generally accepted that cargoes occupy three-to-four times greater space in ports than aboard vessels. With the advent of containers, for instance, most ports face severe space limitations. From an era of general cargo ships, when 12 acres (4.8 hectares) of port backup space was considered sufficient for a ship, to cellular container ships which require 50 or more acres (20 hectares), ports have sought to remove warehouses, extend piers, stack containers five high and use multistory container warehouses to gain additional space.

The trend towards continuous cargo-handling systems has had a tremendous impact on the way in which port installations are utilized, but has had only a limited influence on their design. For centuries, port docks were constructed as massive structures to withstand vessel movements during arrival and departure as well as those caused by tides. As systems were developed to absorb such movements, docks began to be constructed on pilings driven into the ocean floor. Even though existing docks with modern cargo-handling equipment appear efficient, new and rigorous study might beneficially be directed towards determining how docks could be designed to better reflect the changes in cargo-handling equipment. With reference to container terminals, the need for cargo-handling space directly adjacent to vessels has become largely unnecessary. This might permit the construction of docks as open structures which have spaces only for gantry crane rails, with cargo-handling space provided behind the crane. General cargo piers might be converted into container terminals by constructing a narrow "strip" dock for the front rails of the crane, with shock absorbing systems to protect it, parallel to existing piers. Such an arrangement would not only lower...
construction costs but also provide the port with a larger terminal apron and deeper water for vessels.

D. CARGO UNITIZATION

In the decade following the Second World War, international trade volumes were increasing rapidly, national economies were exhibiting sustained growth rates and workers in many industries were making demands for large wage increases. For ports, it was a most exceptional time. Expanding volumes of goods had to be handled in a system that was labor-intensive, costly, inefficient and damage-prone. At that time, port workers played a pivotal role in international trade and directly influenced not only the condition and prices of goods but also the cost-effectiveness of transport modes. To avoid ports, goods began to be carried by road and rail over long distances. One land transport operator, McLean Trucking, providing services between New York and Texas (U.S.), took a revolutionary step when it recognized that, if the wheels were removed from the cargo compartments of trucks and corner fittings added to facilitate handling by capital-intensive techniques, they could be carried indiscriminately by liner vessels, trucks and railroads.

Armed with this idea, McLean Trucking purchased a T-2 tanker, renamed it the "Ideal X" and modified it to carry reusable cargo grouping units. On 26 April 1956, it departed on a voyage from New York to Houston carrying 58 containers that were 35 feet long and both 8 feet wide and high (10.67 m x 2.44 m x 2.44 m). SLS selected these dimensions because they were the maximum unit-load sizes permitted on the roads in the states of New York and Texas. Two years later Matson Navigation Company began carrying units of the same height and width, but 24 feet (7.32 m) long. As with SLS, these dimensions were chosen to utilize the maximum unit-load sizes permitted for land transport in the areas served by MNC. In recognition of the growing use of containers and the need to ensure their interchangeability between transport modes, in 1961 ISO established Technical Committee 104. When TC 104 published its Recommendation 688 in 1964, the standards adopted for marine freight containers were: lengths of 10 (3.1 m), 20 (6.1 m), 30 (9.1 m) and 40 feet (12.2 m), with uniform 8 foot (2.44 m) widths and heights, and capacity ratings of 10, 20, 25 and 30 tons, respectively.

The maximum dimensions for land transport in the U.S. have a major influence on marine container sizes. This is because the enormous trading potential of the U.S. makes it desirable that marine container dimensions be compatible with those of its land transport systems. After deregulation of U.S. land transport in 1980, road carriers found that their small cargo compartments placed them at a competitive disadvantage with railroads. In response to their requests, in 1982, the U.S. Government adopted the Surface Transportation Assistance Act (STAA) which increased the maximum dimensions for road transport on its 181 000 mile national interstate highway.
system to a trailer length of 48 feet (14.63 m) or two trailers of 28 feet (8.53 m) each and a width of 8 feet 6 inches (2.6 m). The STAA also allows the 27 states that had previously authorized trailers up to 53 feet (16.15 m) long to continue using them and, since that time, three other states have permitted their use.

In 1983, APL began experimenting with non-ISO marine containers in its intermodal transport system between Asia and the U.S. The dimensions tested were 45 feet (13.7 m) and 48 feet lengths, with 9 feet 6 inches (2.9 m) heights and 8 feet and 8 feet 6 inch widths, respectively. An increasing number of liner operators are adapting their vessels to utilize non-ISO containers, but the number of such units is limited in comparison with the almost 4 million standard ISO containers. For example, in 1987, there were only approximately 11,858 of the 45, 48 and 53 foot units, and by the end of 1989 that number had grown to around 38,092. The 11 major container leasing companies increased their inventories of 45 foot and 48 foot boxes during 1989 to around 10,200 units. Whether 48 and 53 foot units, all of which have 8 foot 6 inch widths and 9 foot 6 inch heights, will be utilized in ocean-liner services is subject to speculation, but APL currently employs them in 50% of its domestic double-stack rail services, and its international services between Detroit (U.S.) and Hermosillo (Mexico).

The use of non-ISO containers is not limited to North America. Many European short-sea carriers, such as Containerlink Limited and Bell Line, transport 2.5 m (8 feet 2.4 inches) wide Europallet units of various types and European inland containers or swap-bodies which are often 7.15 m x 2.5 m (23 feet 5.5 inches x 8 feet 2.4 inches), of light construction, usually cannot be stacked and customarily have lifting points only at the bottom corners. The European Standardization Committee (CEN) has issued standards for “C” type swap-body lengths of 7.45 m and 7.82 m, in addition to the popular 7.15 m unit. Railfreight Distribution of the U.K. has 375 non-ISO containers with the dimensions of 12.2 m (40 feet) x 2.5 m. These overwide units are the fastest-growing intermodal system in Europe, with 30% of land cargoes now carried this way, as they allow 24 pallets of 1 m x 1.2 m or 30 of 1.2 m x 0.8 m to be loaded on the floor of a 40 foot unit. In contrast, an ISO 40 foot unit would accommodate only 21 and 24, respectively, of those pallets.

In recognition of a growing trend towards the utilization of larger containers which can carry low-density, high-volume cargoes, ISO TC 104 began studying standard dimensions for a new series of containers. The June 1987 Plenary Session of ISO TC 104 accepted an ad hoc committee report proposing a new series of containers. According to that report, as well as those from meetings of its Working Group 4, the new standard should i) take full advantage of road width limits of 2.59 m, ii) permit a height of up to 2.9 m, iii) increase lengths to somewhere between 48-49 feet (14.63-14.94 m), with a half module length of 7.442 m (24.5 feet), and iv) be compatible with ISO Series I container handling equipment. In February 1989, Working Group 4
met at the offices of APL in Oakland (U.S.) and generally, though not unanimously, agreed to the following dimensions: 2.6 m width and 2.9 m height with lengths of 48 feet 6 7/8 inches (14.805 m), 24 feet 2 inches (7.365 m) and 40 feet (12.192 m).

The June 1989 Plenary Session of ISO TC 104 adopted the height of 9 feet 6 inches for 30 and 40 foot containers, but did not approve a draft recommendation for new container dimensions. There was a general consensus that a new series of containers would have to be dimensioned from the inside-out; that is, TC 104 would begin with a determination of standard sizes for packaging, such as pallets and boxes, and then determine the dimensions of containers that would permit their carriage. It was considered that the overall impact of this effort would have to be subject to not only a technical but also an economic evaluation. The ISO will carry out the technical evaluation and it requested, through Plenary Session Resolution 172, that the United Nations Economic and Social Council and its subordinate bodies such as the regional economic commissions, the United Nations Conference on Trade and Development (UNCTAD) and all relevant non-governmental organizations participate in an economic evaluation of the need for a new series of containers.

In November 1989, a seminar on the impact of increasing dimensions of containers on intermodal transport operations was convened by the United Nations Economic Commission for Europe (UNECE) at Geneva (Switzerland). The purpose of this seminar was to consider all aspects involved in the recent evolution of container dimensions and to assess the consequences of these developments on the organization of intermodal transport operations. In the discussions concerning a long-term strategy on maximum dimensions vis-à-vis inland transport regulations, participants were of the view that it should take into account the considerable investments already made in equipment and infrastructure, emerging trade needs and technological advances.

With regard to dimensions, the final report of the meeting indicated that they should follow a modular system, the basic module being compatible with internationally accepted package dimensions and providing full interchangeability between all inland and maritime transport modes. It was recognized that in some European countries and in the U.S. road vehicles with a maximum outer width of 2.6 m (8 feet 6 inches) are allowed. In the case of container heights, participants considered that there should be no problem with the carriage of 2.9 m (9 feet 6 inches) cargo units. They considered that any new container dimensions would have to take into account national traffic regulations and infrastructure requirements. The meeting resolution urged standardization organizations to not adopt any new container dimensions until the economic and technical studies referred to above were completed and conclusions drawn.
Many shippers and consignees of low-density goods view the use of non-ISO containers quite positively. A major European freight forwarder, for instance, considers that any limitation in container dimensions is a backward step. Possibly the question is not what size of unit is most appropriate for carriers and ports, but, rather, what size is most satisfactory for trade. On the other hand, ship operators are divided in their opinions on whether a new series of containers is needed. Some have been quite vociferous in their desire to not have another generation of marine freight containers, while others consider that 45 foot units with widths of 8 feet 6 inches and heights of 11 feet (3.4 m) would permit more efficient carriage of certain light-bulky cargoes.

Ports are distressed at the possible introduction of containers which have dimensions which exceed those of ISO Series I. To handle these containers would require investments in spreaders which permit such units to be rotated 90 degrees, so that they might pass through the legs of gantry cranes. However, many of the gantry cranes currently on order are designed to handle those units. Similarly, fork-lift trucks, straddle carriers and yard gantries would be unable to handle them. Both lines and ports see their investments in vessels and container handling equipment being placed at risk. For example, two terminal operators at the port of Hong Kong have announced their refusal to handle 48 foot containers, while another is actively exploring new spreader designs in anticipation of such changes. A recent meeting of the Economic and Social Committee of the European Communities (EEC) decided that it would firmly oppose any positive response by ISO to Japanese and U.S. efforts to increase container dimensions.

The growing use of non-ISO dimensions for containers creates numerous problems for Latin American and Caribbean countries with limited funds for port investments. The introduction of new ISO dimensions for marine containers would require either the acquisition of new cargo-handling equipment or modifications to existing equipment, both of which would be costly for them. For many years, the major arguments against the utilization of containers in their trades was the lack of funds to make necessary investments and the inadequacy of inland transport infrastructures, but the advantages of such units were so overwhelming that they have come to employ them. The increased commercial benefits carriers, shippers and consignees might receive from larger containers could make their use equally overwhelming. In that context, industrialized and developing countries should join forces to ensure that ocean and land dimensions are harmonized, and that neither could be modified without an agreement from the other. Such harmonization of dimensions reflects the interdependent nature of each activity in an intermodal transport system, and should ensure a longer duration for any new standards, as well as ease the investment problems faced by them.
E. INLAND TRANSPORT

In the introduction to this document it was emphasized that road transport experienced a period of rapid growth beginning in the 1950s. At that time, there was a convergence of efficient truck technologies, modern road design and construction, and low prices for petroleum products, all of which contributed greatly to its efficiency and the increase in demand for road transport services. Truck transport was considered more flexible and timely than rail services, and the latter was relegated to the transport of low-value commodities. Following the oil crises of 1973 and 1979, however, there was a renewed interest in rail transport. Such interest led to numerous technical advances, the most important for ports is related to the development of double-stack railway wagons and block-train services.

There are numerous variations in the design of double-stack container wagons, but it can be generally stated that they are approximately 280 feet (85.34 m) long and composed of five articulated platforms. Each platform carries 4 TEU each, with 20 TEU per wagon. The latest versions permit each platform to carry all container sizes from 20 to 48 feet long in the wells of the platforms, and up to 53 feet on the second level. The number of articulated double-stack wagons utilized to form trains varies between 20 and 28, which results in capacities of from 400 to 560 TEU if only standard ISO units are carried. On the other hand, if one non-ISO 48 foot unit is carried on each platform, a 20 wagon train would carry approximately 490 TEU. Containers are secured for transport on double-stack platforms by bulkheads at each end of the platforms or by the use of interbox connectors between the corner fittings of the base and stacked containers.

The articulation reduces forward and back slack movements by as much as 85% and eliminates lateral motion, as compared with conventional railway wagons. Double-stack railway wagons are 42% more cost-effective than conventional container on railway flatcar (COFC) operations. A standard railway wagon weighs approximately 31.9 metric tons, while the articulated double-stack container platform weighs only 14.6 metric tons or 54.2% less. The reason is that a single five-platform, double-stack container wagon has 80 per cent fewer couplers and 40 per cent fewer wheels and brakes than the equivalent five conventional flat railway wagons. The line-haul portion of a double-stack operation can cost a railroad as little as US$0.50 to US$0.55 per mile, and with terminal and drayage costs added they can transport a container for less than US$0.80 a mile. In contrast, trucks operate at US$0.85 to US$0.90 a mile. In the last five years, for instance, use of the double-stack container wagons has increased from 3% of U.S. intermodal traffic delivered by railroads to almost 50% in 1988.

The cost-effectiveness of double-stack trains has had an enormous impact on ports. At the turn of the century many ports had rail lines to their docks, but in intervening years they were removed. Such removal reflects a shift from...
rail to road transport, as well as the flexibility, low cost and efficiency of the latter mode. Today, however, many ports are installing rail lines on or near their docks to facilitate the movement of containers directly between vessels and waiting rail wagons, thereby avoiding or reducing movements by trucks to rail terminals. For example, the ports of Los Angeles and Long Beach (U.S.) have joined with Southern Pacific Transport Company to construct a major off-dock intermodal container transfer facility (ICTF) 4.4 miles from each port. Certain other North American ports are constructing on-dock and off-dock ICTFs to enhance their competitive positions as load centers and in response to the differing needs of containerized imports and exports, and of domestic cargo movements.

The employment of this technology has not been limited to the U.S. For example, the national railroad of Mexico (FN de M) has entered into joint agreements with two U.S. railroads for the establishment of double-stack train services. First, in March 1990, FN de M and Southern Pacific Transportation Company initiated a twice-weekly, common-user service between the Los Angeles/Long Beach off-dock ICTF and Mexico City. Second, the shipping company “K” Line, together with its U.S. subsidiaries Rail-Bridge Corporation and terminal operator International Transportation Services, have joined with FN de M and Santa Fe, and began offering a weekly double-stack train service between its own on-dock ICTF at the port of Long Beach and Mexico City during April 1990. Another U.S. railroad, Union Pacific/Missouri Pacific, is planning to commence a double-stack train service with FN de M between Chicago (U.S.) and Mexico City, while the liner operator NYK is considering a similar service between Los Angeles and Mexico City. Finally, FN de M is planning to operate similar trains for domestic cargo movements. It will begin by serving the same Mexican rail terminals as do the international double-stack trains, but is to include a number of other terminals such as Chihuahua (Mexico).

In this new competitive environment, road carriers are experiencing lower earnings, eliminating services in double-stack routes, reducing fleet expansion plans and changing to medium- and short-haul operations where rail competition is less intense. However, some road carriers compete with double-stack trains by offering non-stop, team-driven services which provide faster delivery times. Ports have responded to the desire of road carriers to employ their equipment more intensively by constructing a greater number of entrance gates and by utilizing computers to provide drivers with needed documentation at gates. This eliminates the need for an intermediate parking area so that drivers could leave their trucks and enter an office to receive needed documentation, and reduces the overall time trucks must wait for containers. One road carrier has purchased an intermodal freight broker so that it can offer shippers the transport mode that offers the best service.
F. COMPUTERS AND COMMUNICATIONS SYSTEMS

With the advent of the telegraph in the early nineteenth century, European nations acquired the means to communicate almost instantly with their remotest outposts. For the first time in history, all those involved in trade and transport had a means to coordinate their activities and this brought about a profound transformation of trade routes, trading economics and even geopolitical relations. While the telegraph facilitates the periodic transmission of information, which then has to be transferred onto business documents, computers and communications systems utilize standardized electronic documents and enormously simplify their completion and revision, as well as error-free transmission. In addition, computers and communications systems create a basis for greater efficiencies and cost reductions through the integration of the activities of raw material suppliers, manufacturers, assembly plants, markets, carriers and ports, all of which might be located in different countries.

The differences between the telegraph coordinating activities and computers integrating them is clearly visible in ports. A multitude of persons and institutions carry out their individual activities in ports, but each has its own pursuits in mind and little or no incentive to enhance overall port productivity. The real value of an increase in productivity or a reduction in cost of any one port activity depends on whether it has a positive impact on the entire system or simply creates impediments for carrying out other endeavors. For example, a high-capacity port crane requires faster ship-to-storage cargo-handling equipment, simplified Customs procedures and cost-effective inland transport services, or it will create difficulties throughout the port. With the advent of computers and communications systems, however, ports administrations are presented with an opportunity to join with producers, traders and carriers in the modernization and integration of port activities so that new efficiencies in any one of them might be allowed to flourish by all others.

Computers and communications systems have made the rapid acquisition, processing and transmission of information as important to trade as labor, machinery and raw materials are to manufacturing. For ports, computers are as indispensable as cranes and fork-lift trucks, because they contribute to the movement of goods by adapting physical activities and integrating institutional requirements so that they might function in a complementary manner. Indeed, the success or failure of ports will come to depend on the speed of receiving, processing and delivering both cargo and information. Computers and communications systems provide ports with a number of benefits, such as accelerated gate movements, greater terminal security, cheaper and more accurate data entry and information to assist with the management of container operations. Such benefits cannot be questioned when a vessel loading plan for 450 TEU can be prepared in 60 seconds.
compared with eight hours by a manual system, or when trucking companies can be informed electronically regarding the availability of goods for transport instead of waiting hours at ports.

Computer-to-computer communications between vessel operators, ports, shipping agencies, Customs authorities, Customs brokers, freight forwarders, inland transport companies, shippers and consignees which utilize electronic versions of common business documents is referred to as electronic data interchange (EDI). In effect, EDI is paperless trading, or the carrying out of commercial activities on the basis of standardized electronic documents. Many cite the need for a signature on certain documents as a major legal obstacle to paperless trading, but with the increasing use of personal authentication codes for funds transfers, in a very short period of time they will be accepted internationally as the equivalent of a signature. Numerous banks plan to offer the alternative of making payments electronically, without a signature, and the Hamburg Rules already permit mechanical and electronic signatures if not inconsistent with the law where the document was issued.

While technically similar, direct computer-to-computer EDI should not be confused with third-party EDI networks. The former requires compatible electronic document formats which can be transmitted, received and understood by different computers, while the latter networks facilitate communications of otherwise incompatible formats through another computer provided by a third-party which receives, translates and delivers information. Third-party EDI networks allow ports to communicate with their customers with only a minimal investment. As was brought out in part III, the port of New York-New Jersey (U.S.) developed its EDI Automated Cargo Expediting System (ACES) which utilizes third-party services for only US$250,000. Most major EDI users require both direct and third-party network systems, but find that only 10% to 20% of their messages are handled by direct systems. Thus, due to the diversity of information systems utilized by all those receiving and providing services at ports, EDI systems should be designed to operate flexibly.

The enormous benefits of EDI encompass cost reductions which result from the substitution of electronic for paper documents and a greater capacity to match the demand and supply of goods and services through the integration of activities. The EDI manager for Phillips Electric reported that changing from paper files to EDI would reduce processing costs from US$3.00 per document to one-tenth of that amount. A U.S. EDI market research company recently indicated that it costs US$49.00 to process a paper commercial invoice and only US$4.70 for an electronic version of the same document. An analysis of such benefits over a broad spectrum of industries concluded that large firms could expect to see US$10.00 in savings for every US$1.00 invested in EDI, while medium sized firms might see a 7 to 1 ratio in savings to investment and small firms can anticipate a 5 to 1 return. A
European specialist estimated that by 1995 the savings resulting from the use of EDI could reach US$350 billion worldwide.

EDI is not just a convenient method of moving data, but an entirely new management system. As illustrations of this point, the computers of Burlington Northern, a U.S. railroad, automatically transmit data (without human intervention) concerning the containers, their contents and destinations on its trains to other computers at the port of Seattle (U.S.) before the cargo has departed Chicago (U.S.) for that port. The ports of Bremen-Bremerhaven utilize EDI between themselves, car manufacturers and their suppliers in Brazil and Mexico to more closely match the demand and supply of goods and services. EDI allows computers not just to communicate, but actually to issue bills of lading, reserve space on vessels, provide arrival notices, and prepare dock receipts and manifests. An electronic arrival notice permits consignees to prepare for delivery more efficiently, identify the warehouse space into which the goods will be placed or program their delivery directly to manufacturing facilities. EDI could reduce the demand for warehouse storage, container restowes on vessels and unnecessary container movements in storage areas. It is estimated that EDI should raise port efficiency by 20-25% and most of that will be translated into increased capacity.

A major obstacle to greater worldwide usage of EDI is the lack of internationally accepted standard messages. In the 1970s, the U.S. Transportation Data Coordinating Committee and the Trade Data Interchange of the U.K. developed their own EDI standards. Due to the incompatibility of such standards and the need for those of an international nature, the United Nations Rules for Electronic Data Interchange for Administration, Commerce and Transport (UN/EDIFACT) was established in October 1987 under the administration of the UNECE and UNCTAD. The change to international standards avoids the need to print out data so that it might be reentered in another system. The reentering of data is not only time consuming but also creates risks of transcription errors.

There are a number of national and regional organizations involved in the establishment of EDI standards, but only UN/EDIFACT has a global mandate. The approval process of UN/EDIFACT takes several years with messages starting out as working papers, which is called Status 0. When a working paper becomes a draft proposal, it reaches Status P. The last stage or Status One is when UN/EDIFACT recommends an electronic message for approval. Thus far, UN/EDIFACT has approved a commercial invoice and a purchase order as United Nations Standard Messages (UNSM), but it is foreseen that about five more could be added to the list during 1990. By March 1990, there were 27 Status 0 messages under study and 37 others being considered by other regional and national organizations within the UN/EDIFACT framework. The activities of UN/EDIFACT are carried out at twice-a-year meetings with teams of rapporteurs representing Western
Europe, Eastern Europe and North America, who are supported by the recently-created EDIFACT Technical Assessment Group (ETAG). Due to the importance of these efforts on future trade and transport relations between countries, Australia and New Zealand recently nominated a rapporteur and those of the Far East are to do the same during 1990.

UN/EDIFACT message standards were recently adopted as the Western Europe standard by the European Committee for Standardization (CEN). Such adoption by CEN means that UN/EDIFACT standard will be compulsory for all public sector trade documents sent by computer and that conflicting national standards must be withdrawn or modified. The Customs Cooperation Council, whose membership encompasses 133 nations, also endorsed their usage. The U.S. Customs Service and U.S. Postal Service decided to begin migrating or adapting their systems to those standards, and the U.S. Office of Management and Budget issued a memorandum accepting them for international use. The Accredited Standards Committee, X-12, of the American National Standards Institute (ANSI) and UN/EDIFACT are jointly working on an International Forwarding and Transport Message (IFTM), which can be employed for both air and ocean transport. The IFTM, which entered into trial use in September 1989, has six functions: provisional booking, firm booking, booking confirmation, way-bill, bill-of-lading and arrival notice. Other messages which should have a substantial impact on port operations were considered for trial status at the September 1989 meeting and include a Customs declaration and a Customs response.

Port-to-port EDI has made it possible to achieve more precise planning of cargo handling from the moment a vessel leaves its last port of call. Shippers and consignees have found port-to-port electronic information transfers of great utility in reducing the enormous number of individual messages which have to be sent to multiple persons at both origin and destination. In 1988, the port of Singapore established direct EDI links with the two main container terminals in Hong Kong and the port of Bremen (Federal Republic of Germany), and plans to extend the system to the ports of Rotterdam (the Netherlands), Yokohama (Japan), New York-New Jersey (U.S.), Kelang (Malaysia) and Bangkok (Thailand). The port of Singapore estimates that these links should increase its productivity by 10-15%, eliminate the need for four new gantry cranes and increase container storage capacity because information on empty vessel slots will be instantly available and allow them to be filled immediately.

In 1972, member countries of the International Maritime Organization (IMO) adopted the International Convention on the Facilitation of Maritime Traffic which provides for the use of model forms for vessels entering and departing ports. These forms include the general declaration, ship's stores declaration, crew's effects declaration, crew list and passenger list. The IMO has undertaken the adaptation of these forms for electronic preparation and transmission through its Electronic Data Interchange-Maritime (EDIMAR).
Those forms are currently at the UN/EDIFACT Status 0 stage. In June 1990, an operational test of EDIMAR was conducted when the Soviet ferry “Ilich” was cleared to enter the port of Stockholm (Sweden) in less than two minutes. With the growing use of satellite communications and EDI, the transmission of these forms to ports and governmental authorities should become a common occurrence within a short period of time.

Computers and communications systems permit the tracking of cargo movements, but they rely on human intervention to enter needed information at specific locations in the distribution chain. Automatic equipment identification (AEI) eliminates the need for human intervention through the use of an electronic device (Tag) installed on containers and electronic sensing equipment located apart from units. Tags are placed on containers, chassis and other transport equipment, and store a limited amount of data regarding its size, capacity, age and owner. Tags can be read by sensing equipment placed at strategic locations such as port gates and gantry cranes. The sensing equipment directs a beam of radio waves at the passing Tag and it reflects back a beam with data which is then transmitted to a central computer. This permits ports to speed up the movement of containers into and out of port terminals, as well as reduce port and waterfront traffic congestion, thereby forming part of the inventory control and “just-in-time” delivery systems of cargo owners. The information received can be utilized not only by ports and cargo owners but also by national Customs administrations, freight forwarders, Customs brokers and carriers.

In recognition of the important role of AEI in intermodal transport systems, ISO began studying the matter as early as 1974. At that time, the reliability of existing systems was questionable and the matter was not considered again until the mid-1980s. By December 1987, TC 104, Working Group 3, Freight Containers Marking and Coding, was presented with a recommendation for an AEI standard which was based on a project sponsored by the U.S. Maritime Administration. After numerous modifications, it was approved at the June 1989 plenary session of ISO TC 104 and became Draft International Standard (DIS) 10374. The approval of DIS 10374 permits the designated AEI system to be subject to industry testing by all those wishing to use it. For example, in November 1988, APL began a two-year test which involved the installation of 20 690 Tags on 10 500 containers, 9 700 chassis, 250 trucks and 240 double-stack railway wagons. This does not mean that DIS 10374 will necessarily become an ISO standard, as other AEI concepts have been proposed and must be given serious consideration.
Chapter 6

THE LEGAL ENVIRONMENT

The formulation of international legal regimes is a slow, time-consuming and essentially an evolutionary process. For example, the United Nations Convention on a Code of Conduct for Liner Conferences required 16 years from the original negotiations until it finally entered into force, and the Southern Cone countries of South America utilized 10 years to elaborate and adopt a Customs transit regime. Historically, this slow process permitted ports to exercise considerable influence over legislative initiatives which might have an impact on their activities, but the situation has changed. Today, ports face the intermodal dispersion of their activities, discretionary cargoes and competing distribution channels, and their capacity to influence the content of such initiatives has been weakened. Thus, ports must strengthen their efforts to provide needed council to international and national fora and negotiators in an increasing number of areas so that the fundamental role they play at the confluence of political and economic events might be better understood and taken into account.

A. INTERNATIONAL AGREEMENTS

1. Multisovereign trading blocks

There have always been important economic centers, whether cities or nations, but what makes them different today is that they group politically sovereign nations. There are numerous multi-sovereign trading blocks, but probably the best known are the Canada-U.S. Free Trade Agreement and the EEC. With reference to the latter, a precursor to the EEC was the European Coal and Steel Community. It was established between France and the Federal Republic of Germany in 1952 and provided a basis for economic cooperation which culminated in 1958 with the entry into force of the Treaties Establishing the European Communities (Treaty of Rome). A Customs union was established in 1968 and tariff barriers were eliminated.

The growing importance of the EEC can be seen from the expansion in the number of member States from the original six: Belgium, Federal
Republic of Germany, France, Italy, Luxembourg and the Netherlands to include Denmark, Ireland and the United Kingdom in 1973, Greece in 1980, and Portugal and Spain in 1986. While numerous measures have been taken to eliminate obstacles to commercial activities between EEC member States, many still remain. A 1983 study, for instance, estimated that the delays to truck transportation at internal borders cost the EEC US$14 billion annually. To eliminate all physical, technical and fiscal barriers to trade in goods and services between member States, the Single European Act was adopted at the end of 1985. Elimination of these barriers will create an economic environment which permits the free movement of goods, freedom to provide services and the right of establishment. It has been estimated that trucks carrying goods from Amsterdam (the Netherlands) to Milan (Italy) average only 20kph, mainly due to Customs delays at borders. However, with an open border policy at the end of 1992, it is anticipated that this journey should be completed at an average of 60kph.

The Single European Act requires the progressive elimination of all physical, technical and fiscal barriers to trade in goods and services between member States by 31 December 1992. Upon taking effect in mid-1987, it replaced the EEC's voting requirement of unanimity with a qualified majority on issues relating to the internal market, and retained certain exceptions such as taxation. When fully implemented the single EEC market will embrace 12 countries (2.3 million square kilometers) of approximately 322 million persons who have an estimated purchasing power of US$4 trillion. The single EEC market creates the prospect of greater economies of scale and expanded market opportunities far beyond those that any individual nation can offer. It effectively redefines the competitive relations between the EEC and other trading areas, and has led to cross-European mergers as well as the establishment of a European presence by enterprises from other countries. This dynamic process means that EEC companies should increase their world competitiveness through greater regional strength.

Many predict that the EEC single market will initiate a period of high economic growth in Europe and generate an increased demand for industrial and consumer goods. The establishment of the single market has led Canadian Pacific Ltd., a railroad, to initiate efforts to acquire the Delaware & Hudson Railway Company of the U.S. Canadian Pacific believes that trade between the EEC and North America will expand and that, as Montreal does not have sufficient water depth for the latest generation of container vessels, most of it will flow through ports on the U.S. east coast. Some expect that the EEC might utilize quotas as well as rules governing content, origin, reciprocity and technical standards to protect European producers. Others believe that the EEC will require a genuine community affiliation with 51% ownership by a member State to be considered a European company, and a third group suggests that access will be determined through bilateral negotiations for each industry group.
At the political level, a representative of the EEC association of manufacturers has declared that reciprocity will be utilized as a basis to ensure their access to non-EEC markets. This appears equitable until one begins to consider the bargaining strength of EEC enterprises. For reciprocity to be of equally beneficial to EEC and Latin American and Caribbean enterprises, they must have equivalent capacities to take advantage of it. Due to the overwhelming competitive advantages possessed by many EEC enterprises, such equality could be either ephemeral or non-existent. For many Latin American and Caribbean enterprises, this means that they would have to enter into joint ventures with their domestic competitors or EEC counterparts in order to have sufficient strength to establish a commercial presence in the EEC. For example, SLS of the U.S. has established a wholly owned EEC company as well as entered into a joint venture with an existing EEC enterprise for the intra-European movement of its own and third-party containers, and NYK of Japan is investing US$200 million in three major European distribution centers and established a new business coordinating company, NYK Europe Ltd.

Within the Latin American and Caribbean region, there have been many expressions of concern regarding the implications of the single EEC market. As an illustration of this point, in 1988, the EEC member States imported 137 million, 40 pound boxes of bananas under the zero-tariff provisions of the Lomé III Convention. The EEC provides an annual banana market estimated at US$1.5 billion, but 60% of that market is subject to preferential access arrangements. France and the U.K., for instance, impose a 20% tariff on bananas from non-preferential sources. Due to the importance of this market, the countries of Colombia, Costa Rica, the Dominican Republic, Ecuador, Guatemala, Honduras, Mexico, Nicaragua and Panama issued a joint statement requesting the EEC to ensure continuing access for their products after 31 December 1992. For an important trading nation such as Brazil, whose exports to EEC member States reached US$9.3 billion in 1988, the means by which access to that multi-sovereign trading block can be assured after 1992 is the subject of a study being carried out by its ministry of foreign relations.

Many EEC manufacturers, banks and ocean carriers are trying to establish a presence not only throughout Europe but also in countries which supply raw materials, assemble components and purchase finished goods. For example, enterprises of the Federal Republic of Germany, the U.K., the Netherlands and France are all making large investments in the U.S. to establish a commercial presence in that country in an effort to preclude any protective reaction to the single market and their products. EEC ports have responded to the coming single market by forming joint ventures to improve inland transport services, creating EDI links between themselves and ports of other regions, and offering transshipment as well as repacking, processing and distribution services. For example, the ports of Marseilles (France),
Genoa (Italy) and Barcelona (Spain) recently signed the Trident Agreement which establishes a basis for cooperation even though they are in competition for many of the same cargoes. With the coming of the Single European Market in 1992, these ports see themselves working together to recover cargoes which now flow through North Atlantic European ports, as well as to present joint positions to the EEC.

The port of Hamburg considers that it must increase the size of its terminal operators to strengthen their capabilities in order to respond to the growth in competition after the single EEC market is established at the end of 1992. In 1987, the port of Hamburg had about 20 terminal operators competing for cargo at the port, but Hamburg's Hamburger Hafen and Laugerhaus AG (HHLA) is buying Hapag-Lloyd's 74.9% share in Unikai Hafenbetrieb GmbH to concentrate container traffic and increase economies of scale. The competitive advantages of larger, economically stronger marine terminal operators have been recognized by a number of other ports. For example, European Container Terminal, Muller-Thomsen and Quick Dispatch of the port of Rotterdam (the Netherlands) joined forces as Europe Combined Terminals (ECT), the five terminal operators at the port of Rouen (France) combined to become Rouen Maritime Terminal and the port of Antwerp's (Belgium) largest terminal operator, Hessenatie, was purchased by the ocean carrier CMB and is being merged with Gylsen. Such consolidations should not lead to an abuse of their dominant positions, as these ports are highly competitive with each other.

In the short term, the single EEC market represents an increase in competition between European ports. For example, the manufacturing base of Italy is located in the northern half of that country. With the elimination of all barriers to the free movement of goods among EEC member States, greater volumes of Italian exports bound for North America could utilize either Italian ports or those in the Hamburg-Le Havre range. In the longer term, the free movement of labor, which is guaranteed under Article 48 of the Treaty of Rome, could result in the reciprocal recognition of port labor regimes so that the same benefits are provided dock workers who move between ports with labor surpluses and deficits. To ensure the commonality of worker benefits, this might lead to a Europe-wide port-labor agreement. As an indication of the very real possibility of such an agreement, the EEC recently proposed a European Social Charter which many in the U.K. port industry consider to be even more restrictive than the recently abolished Registered Dock Labour Scheme.

For the future, the single EEC market could lead to the establishment of joint ventures between EEC marine terminal operators and those in Latin America and the Caribbean. With the globalization of trade, foreign companies are constructing factories in developing countries which offer low-cost inputs such as raw materials, labor and component manufacture, and/or market access advantages. This has increased the need for efficient
ports in those countries. Governments must undertake massive investments in their ports or lose such economic growth initiatives. To avoid such losses, many countries lacking the capacity to borrow funds could permit direct foreign investments in their ports. These ventures would contribute to a convergence of waterborne trade at major ports and lead to an improvement in land transport systems. The resulting installations could be owned jointly between foreign and national investors, but would probably be operated in accordance with the terms negotiated between the host country and foreign investors.

2. Civil liability of marine terminal operators

The United Nations Commission on International Trade Law (UNCITRAL) convened an international conference in Vienna (Austria) from 16 May to 2 June 1989 to consider a draft Convention on Liability of Operators of Transport Terminals (OTT). The scope of this draft Convention and its liability regime encompass the activities of ports and marine terminal operators. Specifically, article 5 (1) provides that the OTT is liable for loss, damage or delay to the goods in his care unless he proves that he, his servants or agents took all measures that could reasonably be required to avoid the occurrence which caused the loss, damage or delay and its consequences.

To place such a liability regime on ports and marine terminal operators overlooks those situations in which they cannot verify the condition of the goods received for care. Containerized goods can be received from ship operators, factories, freight forwarders, NVOCCs and others, and are handled with such speed that inspections are seldom, if ever, carried out. For example, a recent decision of the Supreme Court of New South Wales (Australia) absolved an ocean carrier of any responsibility for the loss of goods, where the container into which they were loaded was sealed and locked at the shipper’s warehouse, and held that the container, not its contents, is the subject of the statutory and contractual provisions which preclude shipowners from denying receipt of cargo acknowledged in a bill of lading. This decision mirrors the operational reality of liner shipping and would appear equally applicable to ports and marine terminal operators. Even though the Convention seeks to protect cargo owners from overpowered OTTs by prohibiting, at article 13, any derogation from its liability regime, it seems that one would be necessary where inspections cannot be made.

3. Maritime liens and mortgages

A Joint Intergovernmental Group of Experts on Maritime Liens and Mortgages and Related Subjects was established by UNCTAD and IMO, pursuant to the recommendation contained in resolution 6(XI) of the
Working Group on International Shipping Legislation of UNCTAD, to review international legal regimes on maritime liens and mortgages with a view to bringing them up-to-date. In the light of this review, the Joint Group prepared a draft convention on maritime liens and mortgages, and recommended to UNCTAD and IMO that a diplomatic conference be convened to consider it.

Article 4 of the draft convention provides ports with a maritime lien against vessels for dues and charges, but ranks it fourth in priority after crew wages, claims for loss of life or personal injury and salvage claims. The following article, 5, confers on all of the aforementioned liens priority status over registered mortgages and other charges. However, maritime liens for salvage claims have priority over all other liens, including port dues and charges, which arose before the salvage operation. The draft convention contains no provision which establishes lien status for the removal of wrecks or for the repair of damage to port installations caused by vessels. These and other liens are recognized as valid at article 6, if they form part of a country's national law, but rank in priority after all article 4 liens and registered ship mortgages. Thus, ports must ensure that their national legislation grants them priority lien status for the payment of any expenses incurred in wreck removal or for the repair of damage to installations caused by vessels.

4. Environmental protection

There are numerous international convention which have been adopted to protect the marine environment and others are being elaborated. With the very real possibility that these new regimes will place limits on port activities, as well as establish new responsibilities, ports should participate in their formulation.

The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78), has five annexes which deal with different types of contaminating products which might be discharged from vessels. Annex 1 covers oil pollution and has entered into force. Annex 2 is in force and deals with bulk chemicals. Annex 3 is to come into force on 1 January 1991 and covers pollution from packaged chemicals. Annex 4 deals with sewage and has not entered into force. Finally, Annex 5 covers garbage and entered into force in 1989. The major impact of MARPOL on ports is the need to create reception facilities for oily wastes, bulk chemicals and ships' garbage.

It is estimated that ports receiving 500 to 2 000 deep-sea vessels each year may expect quantities of oily waste for disposal amounting to 5 000 to 10 000 tons annually. After such pollutants have been received they must be treated or processed to be rendered harmless. The Government of the Soviet Union recently indicated that it is to build a new oil bunkering and tank cleaning facility between the ports of Vostochny and Nakhodka in the Far East. This

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installation will have a capacity for 100,000 cubic meters of fuel oil and ships of all nations will be allowed to use it. For garbage, many ports simply compile lists of waste disposal companies and give them to ships.

After a number of major oil pollution incidents from vessels in U.S. waters, the Government of that country submitted a draft international convention on oil pollution preparedness to IMO for consideration at the March 1990 meeting of the marine environmental protection committee. Of the measures proposed in the draft convention, one which could have the greatest impact on ports concerns the requirement that all signatory parties must establish contingency plans, including response centers with trained personnel and oil spill clean-up equipment. The personnel and equipment will most likely be located at ports and should create additional demands for the utilization of scarce and extremely valuable port property.

The possible modification of annexes I and II to the International Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (London Dumping Convention), to include a prohibition list of wastes (those substances that cannot be dumped) and an action list of wastes (those which can be dumped if their concentrations or quantities are within acceptable limits), has led ports to stress the need to permit the ocean dumping of uncontaminated dredged materials. All too often, however, the materials that ports wish to dredge contain high concentrations of elements which cannot be disposed of at other ocean sites. A possible solution might be to consider that the removal of any and all materials which improve or maintain water depths of ports and access channels would strengthen their commercial role for the hinterland they serve. A part of that hinterland’s property taxes, for instance, might be utilized to share the costs for disposal of dredged materials. If those materials are contaminated, a port would be enhancing its social role by rendering them innocuous so that they might be deposited in a safe place, and the same reasoning for use of a part of the hinterland’s property taxes would apply with even greater force.

**B. NATIONAL LEGISLATION**

1. **The partial deregulation of transport**

With the emergence of a global economy, in which countries exporting manufactured goods must trade in demanding international markets, the existence of national regulatory regimes for transport was found to generate unnecessary costs for exporters and importers that reduce the competitiveness of their products. The original purpose of these regimes was to avoid the creation of monopolies, provide a basic remuneration to carriers and ensure services to small communities. These goals were met, but their costs were high. For example, if a trucking company had a U.S. Interstate Commerce Commission permit to operate, it was not necessary for the
company to own trucks to make a profit. It would merely rent the permit to a second company for actual operations. In the regulated environment of the mid-1970s, truck companies were enjoying up to 28% return on equity. So inflexible and costly was the regulatory system for land transport in the U.S. that manufacturers were able to justify private fleets even though they were operating 30-40% of the time empty.

This situation changed dramatically in 1980 when the U.S. greatly reduced the regulation of land transport by adopting the Staggers Rail Act and the Motor Carrier Act. In March 1981, the scope of the Staggers Act was extended to rail and truck transportation provided by rail carriers in connection with highway trailer on railway flatcar (TOFC) and container on railway flatcar (COFC) services, including such services when performed with cargo having a prior or subsequent movement by ocean carrier. These measures, together with the Shipping Act of 1984, eliminated regulatory constraints on competition between modes of transportation and increased productivity through service and technological innovations. These deregulatory efforts have permitted carriers to compete with each other on price, enter into joint transport arrangements, quote intermodal rates, extend the scope of their operations, and make cross-modal purchases. The most prominent such competitive venture was the purchase of liner operator Sea-Land Corporation by CSX Corporation, a large company with interests in rail and barge transport, for US$800 million.

Transport deregulation in one country allows all shippers and consignees, both domestic and foreign, to take advantage of its benefits. Upon receiving such benefits, foreign shippers and consignees request their governments to grant them the same conditions for the transport services they utilize, or the opportunity to use those of other nations. Due to the geographical spread of such benefits, many other countries are also involved in the deregulation of transport. As illustration of this point, Japan deregulated its shipping industry in 1985, New Zealand deregulated transport in 1984, Canada and Hungary have taken major steps in that direction, and Korea and Pakistan are considering doing the same. In Europe, competition and intermodal cooperation should be enhanced and a wider range of transport services will probably be available after 1992, when the Single European Act is to come into full effect. Finally, prior to the reformulation of the dock labor regime at Chilean ports in 1981, presented in part III of this document, both road and ocean-liner transport were deregulated.

For ports, perhaps the most significant effect of transport deregulation has been the pressure placed on them to lower costs, increase efficiency and to maximize the utilization of their assets. The reason for this is that deregulated transport services allow relatively easy diversions of cargoes between ports and have increased inter-port competition. For example, the director of the port of New York-New Jersey (U.S.) considers that cargoes are port-blind; that is, they can pass through almost any port, and are
influenced only by the factors of overall transit time, cost and value-added services. In a deregulated environment, carriers have enormous bargaining power and can negotiate favorable arrangements with ports, as they are no longer geographically constrained to utilize a specific port. The deregulation of carriers has changed ports, both operationally and economically, and forced them to be more responsive to customers' needs and to provide new services in order to remain competitive.

2. Port regulation

Most Latin American and Caribbean ports do not have a body of port regulations as such, but rather an incongruent group of rules which arise from the controls placed on each of the organizations and enterprises that carry out their activities in ports. As was brought out in part III of this document, a myriad of institutions control port activities and their individual legal regimes, which were adopted at different times and seek to achieve distinct and, at times, conflicting objectives. The national port administration, which is usually under the control of the ministry of transport, has little or no influence over the activities of Customs, health and sanitation, the central bank or dock workers. In fact, each of the aforementioned groups exerts such an enormous amount of control over the national port administration that they determine working hours, which cargoes are dangerous, which investments might be made, where cargoes might be stored and many important aspects that would appear to be the prerogative of management.

The number of dock workers, their compensation, times for vacation and many other aspects related to the work environment would appear to be proper matters for negotiations between labor and management, but for many ports of the ECLAC region they are topics of national legislation or the resulting agreement between them must receive government approval. For example, a proposed modification to the national legislation which controls dock worker activities in Uruguay includes details such as who is to clean the cargo holds of vessels and the manner in which dock workers are to be selected. Many commercial codes of Latin American and Caribbean countries explicitly limit the involvement of port administrations to daily activities, and reserve to the president of the country or an agency designated by him the authority to determine which port infrastructure projects are to be undertaken, the realization of studies and even the manner in which vessels must carry out their maneuvers. Such detailed legislation has created a lethargy in the port community that almost precludes problem solving, unless a solution can be found in the regimes governing port activities.

The presence of governments in port commercial matters would be acceptable if the regulations of each of the organizations involved formed part of a harmonious, cohesive whole and if they were sufficiently flexible to incorporate changes in cargo units and volumes, as well as handling
techniques, “just-in-time” delivery systems and trade policies. The need to update such regimes can be seen when dock workers retain their compensation formulae based on tonnages handled, even though containers are the predominant cargo unit, and to harmonize such regimes when port (public sector) employees and dock workers (from union hiring hall) with the same working hours cannot coordinate their activities. So strong are the jurisdictional boundaries between the various legal regimes that maintenance workers at the port of Montevideo (Uruguay) went on strike to prevent the entry of a hospital ambulance, even though that of the port was not functional, on the grounds that it would amount to a privatization of their activities. As a result, the commission for coordination of activities at that port has directed its efforts towards non-political, non-jurisdictional, non-productivity and non-cost problems such as those related to broken pavement and lighting for cargo-handling operations.

3. Illicit drug traffic

The movement of illicit drugs through certain Latin American and Caribbean ports is a growing problem. Customs authorities in most Latin American and Caribbean countries readily admit that their ports and transport systems are utilized for the movement of illicit drugs between producing and consuming nations. Recently, for instance, 250kg of cocaine were found aboard the Peruvian vessel “Mar Pacifico” at the Argentine port of Quequen. Illicit drug traffic involves producers, shippers, consignees and consumers, as does any legitimate trade activity, but ports and ocean carriers are often utilized as unknowing, non-culpable agents. For their part, ports and carriers face exacting legal regimes which require them to maintain security over cargoes, transport equipment and persons.

Numerous initiatives have been undertaken at the international, regional and national levels to deter such traffic. At the XXXXIV General Assembly of the United Nations, held at New York from 19 September to 29 December 1989, Algeria, Bolivia, Brazil, Colombia, Ethiopia, India, Jamaica, Malaysia, Mexico, Nepal, Peru, Senegal and Yugoslavia requested that a Special Session be convened to deal with the growing problem of narcotic drugs. In General Assembly Resolution 44/16, it was suggested that this Session should:

“consider the question of international cooperation against illicit production, supply, demand, trafficking and distribution of narcotic drugs, with a view to expanding the scope and increasing the effectiveness of such cooperation ...”

The Special Session on narcotic drugs was held at United Nations headquarters New York, 20-29 February 1990. The report of the Ad Hoc Committee of the Special Session made a number of important recommendations. For example, it suggested that States should proceed rapidly as possible to ratify or accede to the United Nations Convention
against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, consider the adoption of bilateral, regional and multilateral agreements to suppress illicit trafficking in such substances and strengthen their cooperation for controlling their movement in vessels, aircraft and vehicles.

In December 1988, the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances was adopted at a conference held in Vienna (Austria). A total of 67 countries signed the Convention, which contains a wide range of legal standards which seek to reduce drug production, trafficking and demand, but only one nation has ratified it and 20 are necessary for it to enter into force. Article 15 of the Convention enumerates security measures that a contracting party may require of ports and carriers which are strikingly similar to many of those in U.S. Customs Service regulations and in Carrier Initiative Agreements. Also, a proposal has been made to amend the annex of the International Maritime Facilitation Convention to recommend various practices that might be utilized to reduce the utilization of vessels as a means of illegal drug trafficking.

At the regional level, experts from 26 European nations met in Paris (France), 18 September 1989, to coordinate their individual drug policies. The experts are charged with formulating a detailed plan of action by mid-1990 which would permit the harmonization of criminal codes and establishment of a network of information on large capital flows. At the national level numerous governments have adopted measures to control illegal drug traffic. For its part, the U.S. Government has adopted the Anti-Drug Abuse Act of 1986 and the Omnibus Drug Initiative Act of 1988 to control the illicit movement of drugs to the U.S. The former gives the U.S. Customs Service the authority to seize any ship or aircraft on which drugs are found, unless the carrier can demonstrate that neither the owner, operator, master, pilot nor any other employee responsible for maintaining and ensuring the accuracy of the cargo manifest knew, or by the exercise of the highest degree of care and diligence could have known, that such substances were on board. Unfortunately, the Act does not define the term, “highest degree of care and diligence.”

To fill that void, the U.S. Customs Service recently published a Sea Carrier Security Manual. The Manual outlines a wide range of measures such as fences, guards, background checks of employees, drug detection equipment, sealing of empty containers and the movement of containers directly between ships and storage areas without any intermediate staging. It also requires verification of information contained in trade and transport documentation which accompany shipments, as well as a thorough review of the external details of the shipments themselves for any possible evidence of tampering. These measures enhance the physical security of cargo storage areas at both domestic and foreign ports so that if illicit drugs are found any potential fines might be mitigated.
In 1984, the U.S. Customs Service started the Carrier Initiative Agreements in which carriers, both U.S. and foreign, agree to enhance security at foreign ports, aboard vessels and at facilities in the U.S. in order to deter the utilization of their vessels for illicit drug traffic. Currently, over 450 ocean carriers and associations have signed such agreements. To further strengthen these efforts, in 1989 it established the Super Carrier Initiative Agreement for carriers offering services in high risk trade routes. It requires signatory carriers to impose strict security standards at foreign and domestic ports and on their vessels, while the U.S. Customs Service is obligated to provide enhanced security and training in search techniques to key carrier personnel, conduct foreign and domestic site surveys and to carry out a post-seizure analysis so that weaknesses in the carriers security systems might be identified. In return, carriers will be held harmless in the first instance in which drugs are discovered aboard one of their ships or in cargoes under their control. A second offense would be subject to reduced penalties and only a third would result in large fines.

On their own initiative, ocean carriers in U.S. trades have established the Maritime Security Council (MSC). The MSC is divided into ocean carrier and clean trade committees in order to provide the industry with an opportunity to exchange ideas on security procedures and training, and to have a common voice vis-à-vis U.S. Government agencies. The clean trade committee recently promulgated a detailed code of conduct which encompasses stringent compliance with the law, use of the most advanced technologies to prevent drugs being hidden in containers, keeping accurate records of their regular customers and cooperation with the U.S. and other governments to carry out background investigations of employees. At a recent meeting of the American Association of Port Authorities, the chairman of the MSC indicated the drug problem is so pressing for Caribbean countries that it could lead to a restriction of trade flows in and out of the subregion. Also aware of this problem, the Caribbean Shipping Association is preparing a code for port managers that will provide them with guidelines to identify inconsistencies in measurements and movements of containers, as well as those which have been subject to unusual delays, so as to identify those units that might contain illicit narcotics.

The implementation of the U.S. Acts and Carrier Initiative Agreements has been onerous. The liner operator Navieras de Puerto Rico estimated that it spent US$1.2 million during 1989, which includes US$400,000 for overtime pay to crew members conducting vessel searches at sea. An increasing number of carriers such as Evergreen Line, Gran Golfo Express, Kirk Line and SLS all been heavily fined for transporting illicit drugs to the U.S., even though it was done without their knowledge or any culpable negligence. The U.S. Customs Service decision in the Evergreen case is similar to those of the other carriers. Evergreen was fined over US$65 million for two separate incidents in late 1986 when containers discharged from its vessels at the port.
of New Orleans (U.S.) were found to contain substantial amounts of marijuana. These containers were carried from the Far East to the U.S., with transshipment at the port of Bustamante (Jamaica). The fines were mitigated to US$29.5 million a year later and recently the U.S. Customs Service cancelled them entirely.

Cargo security has become a major factor for carriers in the selection of ports. Following the Evergreen fines for transporting marijuana from Jamaica to the U.S., for instance, many ocean carriers that transshipped their containers in Jamaica are now utilizing the ports of South Florida (U.S.). In response, the Government of Jamaica is now applying a series of measures that should strengthen security. These include publication of an Export Security Service Manual by the Jamaica National Export Corporation, a registration scheme for exporters, government security guards at ports, the inspection of containers by four different agencies, the escort of containers between the port and place of filling, the use of fiber-optic seals and the reinspection of containers before loading aboard vessels.

These measures will cost the Jamaican economy around US$2 million annually, but should be compared with the annual loss of US$20 million from a 50% reduction in port container throughput following Evergreen’s decision to stop serving Jamaica. To recover some of these costs, on 1 November 1989 the U.S.-Jamaica Discussion Agreement commenced levying a US$75.00 security charge on all containers, both north and southbound, and numerous other conferences have done likewise. However, not all lines agree with such additional charges. The largest liner operator in the trade between Colombia and the U.S., Flota Mercante Grancolombiana, has established stringent anti-smuggling measures, but recently rejected the imposition of a security charge as it would unnecessarily increase the cost of trade between those countries.

In summary, the independent efforts of international, regional and national bodies to suppress illicit drug traffic have created an unnecessary plethora of security standards and requirements which place ports, carriers, shippers and consignees in the costly position of having to comply with all of them. It would appear important that Latin American and Caribbean ports request their governments to consider adopting the 1988 Vienna Convention and ratifying the proposed amendments to the International Maritime Facilitation Convention so that they might come into force as soon as possible and become the basis for uniform international security standards.
Chapter 7

CONCLUSIONS AND RECOMMENDATIONS

In every age, ports have had to adapt themselves to service larger vessels, offer more productive cargo-handling equipment, facilitate the use of longer distance inland transport services, adjust to changes in government regulations for trade and transport, and utilize modern communications systems. These trends are not new, but many Latin American and Caribbean ports function as though they were still in the first 50 years of this century and seem indifferent to the global economy in which they must compete, intermodal services they must offer, modern technologies they must utilize and a new legal environment they must embrace. The traditions and habits of those years have so conditioned the thinking of many of those providing services in ports that they have become a powerful deterrent to any reorientation of their activities.

Such thinking seems myopic and, at best, centers on what ought to be done to optimize resource application by taking into account only what goes on from shipside to port gate. Ports must explicitly take into account the effects of activities on their operations which occur from the time goods are produced until they are consumed. If a port does not incorporate this enlarged dimension into its activities, trade flows will bypass it for others that do. Dock workers, Customs, land transport companies and all others involved in providing services at ports must recognize that they are part of very competitive global distribution chains and adopt policies which permit an ongoing critical evaluation of the service, market, technological and legal factors which continually change the port environment so that appropriate responses might be formulated.

For the 1990s, the ports of Latin America and the Caribbean should have three objectives: increasing productivity, containing costs, and becoming part of international distribution chains. These objectives include all of the service, market, technological and legal changes presented earlier in this document. For example, a port cannot increase its productivity nor contain costs without reducing excess labor, and offering intermodal connections and modern technologies. Just as biology exacts a price for survival, so does the
commercial world. That price is change. In every age ports have had to face a
turning point, a new way of seeing a coherence among fragmented trade
requirements and responding to them. Such a point has arrived with
scale-economy vessels, long-distance inland transport, computers, satellite
communications systems and the emergence of a global economy. Ports must
extend the scope of their operations by becoming an integral and, therefore,
larger part of the commercial activities of the customers they seek to serve. If
governments, Customs authorities, carriers and labor support Latin American
and Caribbean ports in their efforts to respond to these challenges, the 1990s
should be a most rewarding decade for everyone.

A. PORTS IN A GLOBAL ECONOMY

For ports to function successfully in a global economy composed of an
increasing number of multi-sovereign trading blocks and demanding
international markets they must be freed from the constraints of an
overregulated, centralized and public sector dominated commercial
environment. This study has presented experiences of different ports and
their policies, not just to present broad principles of how they dealt with that
environment, but to give some of the details involved in putting those
principles to work. The enormously valuable experience of Chilean ports
since 1981, for instance, provides a fundamentally positive message: the
compensation of dock workers for changes to their institutional regimes,
when combined with the privatization of cargo-handling services and the
deregulation of the port commercial environment, benefited not only dock
workers and ports but also the entire national economy.

The changes in Chilean ports occurred because the Government of that
country determined that dock workers should be accorded no greater
benefits than those of other industries and that its role was not to operate
ports, but to provide physical infrastructures and an institutional framework
so that they might better contribute to its export-oriented trade policy. The
social costs to bring about such changes were more apparent than real, and
the compensation paid to dock workers minimized the impact of
commercially oriented institutional changes. The institutional changes at
Chilean ports do not make them a special case, as they were afflicted with the
same ailments found throughout the region: formal and informal employment
systems, high costs, low productivity and monopoly pricing, as well as strong
socio-political policies to provide work opportunities for the unemployed in
surrounding cities.

The results of conflicting policies in the areas of port operations, labor
and investments demonstrate clearly not only the direct link between ports,
trade and national economic growth but also the enormously positive impact
ports can have on the competitiveness of a nation's exports if they are allowed
to operate on a commercial basis. Ports are a manifestation of national
sovereignty, but it must be expressed in a manner which ensures that commercial objectives can be achieved. All too often, however, port policies are negotiated responses to political, social and economic problems which preclude their solution and reduce a nation's commercial opportunities. For governments to deal effectively with the macroeconomic issues of aggregate demand, consumption and savings, they must go beyond the surface phenomena of monetary and fiscal policies and focus upon the structural pillars that support them. As a consequence, a major task facing Latin American and Caribbean governments in the emerging global economy is to transform their ports in order to provide progressively greater support, in terms of productivity and cost-effectiveness, for export-oriented macroeconomic policies.

In a fiercely competitive global economy there is no way that the fragile links between producers and consumers can tolerate ports which are costly, inefficient and unproductive. Both industrialized and developing countries function in the same global economic environment and must export to earn foreign exchange, and their ports face a similar need to solve institutional problems and to invest in infrastructures. What is different for many Latin American and Caribbean ports is that they have sought to avoid making needed changes which would lead to the offer of new services, a redimensioning of the workforce, the utilization of new technologies and an updating of legal regimes. Without these changes, ports of this region have become costly, inefficient and unproductive, and have resulted in a loss of trade opportunities. The central message of this document is that such losses are unnecessary and that the transformations which must be made to Latin American and Caribbean ports can benefit dock workers, ports, cargo owners, governments and national economies.

B. PORT INSTITUTIONS

The majority of the institutional problems facing Latin American and Caribbean ports are a consequence of the conflicting framework of economic goals, labor agreements and legislation under which they are required to operate. That framework frequently requires ports to act as if they were non-profit institutions, instead of enterprises which must provide services which are cost-effective and productive. This creates two incompatible worlds for ports, which must provide commercially viable services and, at the same time, satisfy numerous socio-political objectives. In today's world of deregulated, intermodal and electronically joined distribution functions, ports must have an institutional framework which permits the attainment of commercial objectives, facilitates private sector investments, allows users to have a voice and vote in port matters, provides for managerial autonomy, improves the authority of directors to make commercial decisions, assigns performance accountability, rationalizes labor requirements, ensures that
realistic investment decisions are being made, and establishes inter- and intra-port competition.

Latin American and Caribbean governments are faced with the task of redefining the roles of their ports in the light of service, market, technological and legal changes. They can no longer permit fossilized port institutions to reduce a nation’s export trade opportunities and must ensure that such institutions are as flexible and dynamic as trade. Efforts in this area might commence with port administrations. Port management must establish credibility through the reorganization of its own bureaucratic structure. Once the benefits of the managerial reorganization are known and understood by all, it should be easier to extend the process to all those providing and receiving services at its facilities. The guiding principle behind an institutional reorganization is not only to improve the productivity and cost-effectiveness of the port but also to provide trade partners of other regions with absolute assurance that goods will arrive on time and in the agreed condition.

Ports are not a mere collection of docks, cargo-handling equipment and warehouses, but a common meeting place for almost all those involved in international trade. The numerous interfaces between carriers, ports, shippers, consignees, freight forwarders, Customs brokers, ship’s agents, banks, Customs and many others reflect an abundant source of problems. If a port ignores these interfaces and the problems among all those who interact in the port area, it is inviting inefficiencies and greater costs. Productivity increases and cost reductions in ports are nothing more than solutions to a continuum of customers’ problems. Ports, therefore, must not hesitate to become involved in these interfaces through the establishment of strategic alliances among people, enterprises and institutions which can lead to the creation of more efficient cargo-handling and distribution systems and a greater demand for their services.

The primary objective of such alliances is to bring about greater collaboration between, for instance, dock workers, terminal operators and Customs to enhance the profitability of exporters, importers and carriers which utilize its facilities. To achieve this objective ports must recognize that their position at the confluence of commercial, political and social events of a country requires their involvement in, not isolation from, the international competition faced by exporters, importers and carriers. This is to ensure that services are personalized, that those who want a particular service are ready in all respects to receive it, and that those providing services are cost-effective, efficient and productive in their operations. Port management must be concerned with those receiving and providing port services, and acquire specialized knowledge of their activities so that communications might be continuous and strategies altered to take advantage of changing conditions.
C. PORT INFRASTRUCTURE

Latin American and Caribbean countries must have modern port facilities and technologically appropriate cargo-handling equipment. However, the major problem facing Latin American and Caribbean countries is not the financing of evermore sophisticated, capital intensive cargo-handling systems, but their slow adoption and inefficient utilization rates which arise from inadequate management authority and monopolistic control of ports by unions. Before facilities are constructed and equipment purchased, governments, ports, lending institutions and carriers must begin by increasing the productivity and cost-effectiveness of existing terminals. There are three major obstacles to such increases: first, the institutional structure of regulatory constraints, ineffectual management and burdensome labor regimes under which ports operate; second, the belief that productivity increases can be obtained only through additional infrastructural investments; and third, the exclusion of the private sector from port operations.

The pursuit of ever-greater productivity, through new technologies in all facets of the distribution chain, will cause ports to transform themselves into unobstructed intersections for cargoes, transport modes, information and related services which promote international trade. With each change in port infrastructures, supporting institutional arrangements have been modified to ensure that vested interests are preserved and not to reflect the characteristics of new cargo-handling equipment. Such interests have always been precise in the measures they need to avoid competition, but they have never drafted a strategic plan to meet it. The accumulation of special-interest modifications through the years has created an enormous network of unnecessary tasks and costs which exporters and importers must pay, and lost trade opportunities the national economy must bear. No longer can governments prejudice international trade by permitting the isolation of port management and labor from the economic well being of the hinterland they serve.

With ocean carriers making fewer ports-of-call and utilizing long-distance inland transport services, many ports have begun to share a common hinterland and should consider engaging in different but complementary activities. This would permit a degree of specialization between geographically separate ports and allow each to attain new scale economies. The benefits of such combinations should not be overlooked. The trading power of a combined port can extend their common hinterland, create additional sources of financing for new facilities and capture the cargoes of smaller ports. Whether closely situated ports of this region, such as Buenos Aires (Argentina) and Montevideo (Uruguay), Valparaiso and San Antonio (Chile), Cartagena, Santa Marta and Barranquilla (Colombia) or Santo Tomas de Castilla (Guatemala) and Puerto Cortes (Honduras) could achieve the such benefits through cooperation would seem to merit investigation.
With the need for ever-increasing cargo volumes to reach economies of scale in port operations, shared and even multinational ports will become as commonplace as slot-chartering is today in liner shipping.

Ports have always been required to provide an abundance of information to almost everyone in the distribution chain. Carriers and cargo owners have often indicated that they could make better decisions with more timely information, but even with such information those providing services at ports cannot instantly respond to their needs due to the disintegrated nature of their activities. Ports, even small ones, that succeed in understanding the data interchange and activity integration dimensions of electronic information systems will be able to quickly assemble and disassemble critical masses of skills, equipment and funds so that they might take advantage of market opportunities or reduce the impact of market reversals. The boundaries of EDI in a global economy are neither political nor geographic, but, rather, those of cost and efficiency.

It is true that a global market, intermodal services, computers and communications system have irreversibly altered the role of ports, but such changes present them with an opportunity to become a major EDI access point for the entire trade community. Creating such a point of access would vastly simplify communications requirements by eliminating the need for exporters and importers to send practically the same message to multiple persons in the distribution chain. It would provide a central point for the rationalization of port services and, finally, their integration. However, EDI represents a threat to ports because many of their trade activities, except the actual loading and discharge of ships, can be carried out by Customs, interior cargo terminals, cargo owners, carriers and freight forwarders. Ports should seek to become control centers for trade through their adoption of EDI systems, or they could be subsumed into other systems and lose many revenue generating activities. Thus, the challenge for ports is to offer EDI services in three areas: (i) terminal operations, (ii) communications with government agencies and (iii) information transfers with carriers and cargo owners.

The use of closed, enterprise-oriented electronic information systems in a global economy are increasingly difficult to justify. Just as ports need standard container and pallet dimensions to protect their investments as well as to offer intermodal services, they need EDI international message standards for the same reasons. To ensure that the specific needs of Latin American and Caribbean countries are considered when such standards are being negotiated and adopted, they might wish to consider nominating their own rapporteur who would participate in the meetings on UN/EDIFACT.
D. PORT LABOR

In the 1950s, ports began investing in specialized terminals and extremely efficient cargo-handling equipment. These investments transformed ports into an industry that requires highly-skilled persons to operate equipment for the loading and discharge vessels, and to carry out cargo-handling activities in an intermodal, "just-in-time" commercial environment. What has often been lacking, however, are parallel alterations in port labor regimes. Latin American and Caribbean governments, together with port managers, dock labor, carriers, exporters and importers, must reformulate port labor regimes in order to create a new consciousness on the part of both management and labor so as to change their perception that "no matter how bad the situation, somehow everything will go on". The usual efforts to correct this situation have been the "ritual creation" of committees and commissions which later fail to receive the support they need.

For this new consciousness to become a reality, it must be understood by governments, port managers and all those providing services at ports that benefits come from the utilization of docks, warehouses and cargo-handling equipment, and not from their mere existence. Port installations are important to the extent that they support labor. Customs, port administrations, carriers, freight forwarders, Customs brokers and banks to carry out their individual tasks. For example, port labor must be willing to work 24 hours-a-day, seven days-a-week and in any weather. Customs must comply with its legislative requirements in a manner that facilitates commercial transactions, and port management must be given the authority to integrate all activities so as to optimize the resulting system. The benefits of such a system will be maximized when services are rendered in accordance with market requirements, and cargoes are delivered on-time and free from damage.

Latin American and Caribbean governments can support the creation of this new consciousness through the adoption of labor legislation that clearly distinguishes between personnel practices for state-owned enterprises such as ports, which must satisfy commercial objectives, and their national civil services. This constitutes a middle ground between private sector commercial management and public sector administration of port services, and might be referred to as the commercial administration of port activities. The port administration might be a government organization which commercially manages ports, with the private sector being allowed to invest in and operate terminals. Legislation to support this orientation should be prepared with inputs from port users, such as importers, exporters, carriers, ships agents and freight forwarders, to ensure that its structure provides needed incentives, performance standards and direction as a competitive, profit-making enterprise.
To support the commercial administration of port activities, the above mentioned legislation must give port managers the means to deal with labor in areas such as their number and composition, remuneration, interchangeability of tasks and productivity. Such legislation might be implemented immediately or in stages over a period of time. The rapid implementation of legislative changes, with compensation being awarded the persons affected, has the advantage of ensuring the policy's creditability and, above all, of preventing "policy drift" by interest groups who can successively alter the process. When compensation cannot be awarded, such changes might require labor representatives, port management and terminal operators to elaborate a plan to restructure port labor which would be executed over a period of, for instance, five years.

Variations in the demand for dock workers is a labor-management problem that has defied all efforts to achieve a solution. Even though the demand for port labor is foreseeable, it varies widely due to changes in vessel schedules and trade fluctuations. Due to such variations, port labor representatives cannot demand the employment security that reflects the conditions of other industries. There are, nonetheless, a number of things that can be done. For example, dock workers and their representatives must recognize that the only way a port employer can afford permanent employees is if they are continuously working. To achieve this objective, the carefully guarded jurisdictions or boundaries between many skills should be eliminated and training programs undertaken to create a multi-skilled workforce. This would facilitate shifting dock workers from one task to another in accordance with changing requirements and create a basis for permanent employment.

In combination with the above measures, joint studies should be undertaken by port managers and labor representatives to determine which positions should be occupied even if no ship is in port and which positions would be filled only when there are cargoes to be handled. In the first situation, positions such as operators of highly-technical equipment, and repair and maintenance crews should be filled on a permanent basis. These position should not belong to particular dock workers, even though filled on a permanent basis. In the second situation, there may be a sufficiently stable demand for port labor that a certain number of these positions may also be filled on a permanent basis. However, ports should be allowed to utilize casual employees for those activities in which workers cannot be dedicated to remunerative tasks more than an agreed minimum period of the time.

Finally, Latin American and Caribbean governments should establish a normative structure which limits and balances the bargaining strength of both labor and management. Port management and labor must be actively engaged in finding ways to improve the productivity of existing equipment and installations, as an alternative to spending huge sums of money to avoid solving difficult institutional problems. Port labor representatives will have to expand their activities from those concerning wages, working conditions, and
retirement and medical benefits, to include the capacity to bring about a concerted effort among union members to raise productivity and lower costs through the adoption of new cargo-handling technologies and work rules. Today, and even more in the future, ports can no longer support, at the same time, the costs of introducing modern technologies and of paying for an underutilized labor force.
BIBLIOGRAPHY

ALAMAR, Informativo (Uruguay), No. 477, April 1985 through No. 584, January 1990.


BIMCO Bulletin (Denmark), January/February 1990.


Cámara Marítima de Chile, Memoria Anual, No. 45, 1988, and No. 46, 1989, Santiago, Chile.

Carga Internacional (Colombia), March 1985 through May 1990.


Container Management (U.K.), May 1989.


Economic Commission for Latin America and the Caribbean (ECLAC), Changing production patterns with social equity. The prime task of Latin American and
United Nations, General Assembly Resolution 44/16, 1 November 1989.


United States, Department of Agriculture, Office of Transportation, Moving agricultural products by double stack trains: An update, Washington, D.C.


United States, United States Code.


Via Port of NY-NJ (U.S.), April 1986 through January 1990.


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*CEPAL Review* first appeared in 1976 as part of the Publications Programme of the Economic Commission for Latin America and the Caribbean, its aim being to make a contribution to the study of the economic and social development problems of the region. The views expressed in signed articles, including those by Secretariat staff members, are those of the authors and therefore do not necessarily reflect the point of view of the Organization.

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</table>

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