

THE IMPACT OF STRUCTURAL CHANGES IN LINER SHIPPING ON CARIBBEAN PORTS

This edition of the FAL Bulletin deals with maritime transport in the Caribbean and focuses on structural changes in liner shipping and its impact on ports and transshipment in the Caribbean.

The article has been written by Dr. Gustaaf de Monie of Policy Research Corporation N.V., Antwerp, Belgium, and is based on the study "Caribbean Ports Scan", which is about to be published by Policy Research Corporation (Fax 32-3-2869496). The opinions expressed in this article are of the author and may not necessarily coincide with the views of ECLAC.

The main purpose of this edition is to encourage a constructive and fruitful discussion. Comments are thus invited to Policy Research Corporation N.V. (Gustaaf De Monie), Policyresearch@imnet.be, and ECLAC (Jan Hoffmann), jhoffmann@eclac.cl.

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NEW LOGISTICS CONCEPTS

New logistic concepts such as outsourcing, just-in-time delivery (JIT) and globalisation have created the need for the establishment of complex international distribution chains. The ultimate goal of these is to allow shippers to place the right product on the manufacturing or retail floor anywhere in the world at the right time and at the right price.

If it is true that globalisation and global logistics would not be sustainable without a frequent and efficient transport network, it is equally true that both the concept and its enabling tools have had a tremendous impact on maritime transport. The relationship between economic growth, trade, and maritime transport has been analysed in a previous FAL Bulletin, issue 136, September 1997,

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With hindsight, it is for maritime transport operators easy to explain and convince the international trade community, how effectively liner carriers have responded to the new demands placed on them by industrialists and distributors, depending on globalised sourcing and supply. If it is true that, from 1960 onwards, liner companies had been actively exploring ways and means to improve the utilisation of their ships, it was only with the advent of containerisation that revolutionary changes in service patterns and shipping structures occurred. Undeniably, containerisation has largely contributed to the demise of the traditional liner conference system, because it made end-to-end services a redundant concept. Besides,

containerisation fundamentally changed the economics of liner shipping and completely upset traditional ship service patterns and methods of operation. None of these 'revolutions' have as yet been completed. Their consequences have been radical and often unexpected and more revolutionary change is coming.

SCALE INCREASES

Scale increases in shipping are the inevitable, but logical, result of the main tendencies observed in the liner business. These include:

- trade expansion and growing traffic levels;
- strong concentration both on the demand and the supply side;
- specialisation of shipping services offered;
- technological innovation;
- integrated door-to-door transport.

Spectacular and most visible are the scale increases in container vessel size. It is now obvious that in the past thirty years, the point of diseconomy of scale has continuously been pushed further up the TEU-capacity axis (TEU stands for Twenty Foot Equivalent Unit and refers to a container of 20 feet x 8 feet x 8 feet). Thus, the prospect that 8 000 TEU vessels will be ordered before the end of this century is no longer considered as utopian (in fact the Sovereign Maersk depending on the ratio between full and empty containers and the average utilisation of box weight capacity, effectively offers up to 8 700 TEU slots with a 6-high deck stow). The Germanischer Lloyd recently announced that 12 000 to 14 000 TEU container ships will be the next logical step if their commercial viability can be proven (See: 'GL views 12 000 TEU - 14 000 TEU vessels as the next logical step', 'Containerisation International', August 1997).

The economies of scale that are driving the race towards jumbo container ships are real. But, as repeatedly demonstrated, they are also subjected to the law of diminishing returns. This leads some industry observers to convincingly proclaim the end of further increases in the size of cellular container ships. Such observers tend, however, to overlook two important facts. First, to support their case they refer to current cost and productivity data. Caution is required here, as fundamental cost and productivity modifications cannot be ruled out. Secondly, even accepting the fact that the law of diminishing returns will fully apply and that additional costs will increase faster than conceivable scale economies, it would be incorrect to assume that such declining returns would not be worth to pursue.

Obviously, the decision to increase ship size can not be taken in isolation. A wider perspective is required. Thus, enabling factors underpinning the need for scale increases must be present. In the past these have included such factors as strong and sustained growth of containerised trade flows, the rapid and suitable adaptation of port facilities to handle the much larger vessels, improvements in container terminal handling performance in terms of reliable high daily output and last but not least the concentration of the shipping sector's supply side.

CONCENTRATION OF THE SUPPLY SIDE

The concentration of the supply side in liner shipping has been the root cause for, as well as the inescapable consequence of containerisation. Since the introduction of the first containerised services on major world routes the inevitability of this evolution was recognised and as early as the mid sixties joint services and major consortia were formed. These offered a solution to the basic paradox of introducing larger and more productive ships: how to maintain adequate service frequencies without creating massive

over-capacity? Schedules were therefore streamlined and selected resources pooled.

After a transitional period running from the mid eighties to 1990, these initially established joint working arrangements collapsed. New combinations of regular shipping lines, styled as alliances, were formed. These now mainly consist of very large container carriers, in quest of operational harmonisation, freight rate consolidation and cost control. For many industry analysts, alliances are merely an intermediate phase in the ineluctable march towards large mergers and the formation of new multinational transport monoliths.

The trends are not straightforward and definitely not linear. Next to the alliances and multinational transport monoliths, operating on a global basis, many niche operators exist. These either focus on specific route segments or target highly specialised cargoes.

The existence of both major and niche operators results in a high volume of inter and intra-regional exchanges, and offers a broad spectrum of modal and routing choices. This implies that – in spite of the described concentration on the supply side on a global level – the number of options offered to shippers has actually increased.

IMPACT ON THE CARIBBEAN

In the years ahead, shipping and port developments in the Caribbean will, much more than before, be determined by the dramatic changes occurring in the liner industry on a global level. For Caribbean shipping and port interests, it is of crucial importance to envision and anticipate as accurately as possible the probable evolution of the liner industry in general and of the container trades in particular.

It is reasonable to expect that the mix of ever stronger oligopolistic major carriers, massive trade volumes on the main east-west routes, growing trade flows on the north-south links and continued shippers' pressure for lower logistics costs will encourage further increases in the size of container ships deployed. More than ever before, the choice of appropriate vessel size and type will be one of continuing specialisation.

Table 1: Throughput forecasts (million TEU)

Million TEU	1995	1996	2005				2010			
			Optimistic		Moderate		Optimistic		Moderate	
	Number	Number	Number	Growth	Number	Growth	Number	Growth	Number	Growth
Caribbean	3.15	3.44	7.46	9.0%	7.00	8.3%	11.48	9.0%	10.09	8.1%
Central America Atlantic	2.03	2.16	5.03	9.5%	4.49	8.3%	8.07	9.6%	6.41	8.0%
Central America Pacific	0.21	0.24	0.98	15.1%	0.83	13.2%	1.89	14.8%	1.36	12.3%
TOTAL	5.39	5.84	13.47	9.6%	12.32	8.6%	21.44	9.6%	17.86	8.3%

Source: Policy Research Corporation N.V. on the basis of Ocean Shipping Consultants forecasts

Although extrapolating into the future is a risky business and long-term predictions are notoriously inaccurate there is merit in developing alternative scenarios. One of these could be a simple status quo situation. Another extraordinary, but not necessarily less likely scenario, is one in which the east-west loops would be dominated by the majors with ships that have capacities far in excess of the 8 000 TEU-

level. In such a scenario, the probability would be high that the axial east-west hauls are served by fast ships of possibly up to 15 000 TEU carrying capacity, calling at just four or five ports. One of these ports is likely to be in or near the Caribbean Basin.

THE CHANGING MARITIME GEOGRAPHY

The future maritime geography of container lines will have to accommodate fluctuating and often contradictory demands. For example, a principal requirement container carriers must satisfy is the shortening of the transit times of the cargoes carried in containers. This is most easily achieved by offering direct services and maximising the number of direct port calls. At the same time the container carriers need to minimise total ship-turn-round time per voyage. Apart from boosting port productivity, the latter can most effectively be achieved by reducing the number of direct port calls and covering the various sub-regions through a dense network of feeder services.

As a result of these fluctuating and contradictory needs, the years ahead will see continuously changing shipping line policies and strategies with regard to selected ports of call, the role ports are expected to play within a line's network and the service patterns that are established.

The big picture that has been emerging in the past decade is based on a backbone formed by the main east-west and west-east loops on which multiple north-south links are grafted. Such critical link-ups occur basically in global or main hub ports. To complete the network, different layers of 'feeder' connect the global or main hubs with regional and or sub-regional hubs and the latter with a multitude of larger and smaller feeder ports. The number of layers may vary and depends on operational, economic and commercial opportunities. The conceptual construction of the new geographical structure of container liner shipping is illustrated in the following figure.



To better understand the illustration, it might help to consider a hypothetical situation at the South American East Coast, where "minor ports" could, for example, be found along the river system and in Patagonia, a "sub-regional main port" may be Buenos Aires, a "regional pivot" might be Santos or Sepetiba. At the South American West Coast, "minor ports" could be Puerto Montt and Antofagasta, a "sub-regional main port" might be Callao, and the "regional pivot" could develop in Panama. As for the "global pivots" in the Western Hemisphere, possible candidates might be Los Angeles/ Long Beach on the U. S. West Coast and Freeport, Bahamas, just off the U.S. East Coast. The above is not meant to be a forecast or suggestion but purely as an example to illustrate the concept of "multi-layered port calls" for the case of Latin America.

In the region where a global pivot is located, it is possible that this port will also assume the function of regional pivot. In particular, this might be the case in the Caribbean.

Some ports are natural global hubs or regional pivots. Others do not have this vocation or pretension. Political decision-makers and port managers will, however, inevitably push for global, main or regional hub status against better judgement. This is understandable in that for most ports 'throughput maximisation' is and remains a priority objective. The consequences of this, already observable at present, are new heavy investments in port infrastructures, superstructures and equipment, the inevitable creation of substantial over-capacity and a poor utilisation of limited financial and economic resources.

The development scenario in which 10 000 to 15 000 TEU ships are deployed on the main east-west axis and north-south linkages are maintained with feeder ships from 250 to 6 000 TEU's, perfectly fits with

the multi-layered service pattern presently being established by major operators and their newly formed alliances. What will be new is the function those very large container ships are expected to take on in the global network. It is anticipated that they will exclusively be used for maintaining the very fast east-west/west-east long haul maritime connections. Hence, *all* containers aboard will be transhipped in one of the four or five selected global hubs.

PRESENT AND FUTURE CONTAINER TERMINAL STATUS AND ROLE

Scale increases and concentration of the supply side in container liner shipping almost inevitably result in the development of high capacity, large throughput hub ports. This phenomenon has in the past two decades substantially modified the competitive position of ports and the size and configuration of container terminals. Many small ports have been abandoned by liner operators. Others are only intermittently served by feeder ships. Larger traditional ports have tried to consolidate their position, through massive capital investments and borrowing. New ports in greenfield areas have sprung up, expanding rapidly although lacking a local cargo base to support their growth.

Many of the political decisions to uphold ambitious port development plans have been made with considerable disregard for facts and figures. One inescapable truth remains: to function as a main, regional or sub-regional hub, ports must satisfy minimum conditions with regard to critical external or internal factors. The choice of hub will increasingly be made, by giving particular attention to factors such as connectivity, 24-hour operational capability and price.

Table 2:

Port productivity measured on New Caribbean Service (NCS) vessels in the Caribbean and on the Colombian/ Venezuelan Atlantic Coast (1995).

Port	Output per ship-hour at berth (in moves)
San Juan (Puerto Rico)	40
Willemstad (Curaçao)	32
Ponce (Puerto Rico)	30
Oranjestad (Aruba)	26
Kingston (Jamaica)	23
Port of Spain (Trinidad & Tobago)	19
Santa Marta (Colombia)	10
Puerto Cabello (Venezuela)	10
Cartagena (Colombia)	7

Source: New Caribbean Service.

In the past an important captive traffic base was often considered a major asset in the main-line's choice of hub. In recent years, with the building up of multi-layered feeder networks, this condition is seen as less critical.

The final steps in the hub port developmental process may be the establishment of a 'necklace' of off-shore Mega hubs (to serve the + 10 000 TEU ships) and the linking up of such Mega hubs with main, regional and sub-regional pivot ports and feeder ports. The past trend is clear and the movement has started.

THE WIDER CARIBBEAN

The Caribbean and Central American regions, which up to recently played a relatively minor role in the world containerisation process, have suddenly become the focus of attention. Again, not the local captive trades have triggered this remarkable awakening, but the completion of main hub port projects in Freeport, Bahamas, and Manzanillo and Coco Solo, Panama, coinciding with the vast expansion of the container facilities in Kingston, Jamaica, and the announcement of a major expansion scheme for Balboa, Panama.

The net effects of these developments, although presently not yet accurately identifiable or quantifiable, are evident. The Caribbean and Central American hub trades, underdeveloped as they were for the past 30 years, are expected to grow very rapidly in the next decade. None of the throughput forecasts produced in recent years have given much consideration to the potential effects of the new hub facilities on the total Caribbean throughput.

Projections of Ocean Shipping Consultants (OSC) for the Caribbean and Central America for 2005 already anticipate annual growth rates of between 8.6% and 9.6%. For 2010 the respective forecast growth figures are 8.3% and 9.6%. In nominal values the Caribbean container throughput could grow from 3.15 million TEU in 1995 to 10.0 or 11.5 million TEU by 2010. These forecasts were developed well before the East Asian financial crisis erupted in 1997 and may therefore be optimistic. The forecast figures, on the other hand, do not fully acknowledge the potential impact of multi-layered feeder operations. Neither do they account for the expected 'boom' in transshipment activity in Freeport, the Panamanian ports or Kingston. Hence, total throughput volumes may well substantially surpass the already promising OSC estimates. How quickly and how much the transshipment flows can grow, depends to a large extent on three factors. These are the service quality, the price of the terminal handling and the availability of a suitable number of appropriate container berths.



A most likely scenario would predict spectacular growth in container exchanges at Freeport and the ports of Coco Solo, Manzanillo and Balboa, with strong growth also being recorded in Kingston. The region would then see the transshipment flows converging on three main hubs with re-distribution and collection of containers directly to and from origin or destination ports. The Panamanian ports (certainly on the Atlantic seaboard), can be considered as a single hub.

Table 3: Additional container handling capacity in Panamenian terminals by 2005

Manzanillo International Terminal (MIT), end phase II.	1 000 000 TEU/ year
Evergreen Coco Solo	400 000 TEU/ year
Hutchison Cristobal	500 000 TEU/ year
Hutchison Balboa	1 500 000 TEU/ year
TOTAL	3 400 000 TEU/ year

Source: Policy Research Corporation N.V.

The choice of main hub port has presently been made by most major carriers. Thus Evergreen will use Coco Solo, Maersk-Sealand has opted for Freeport as well as Manzanillo, the Global Alliance and Hanjin/Tricon for Manzanillo only, MSC for Freeport only, Zim and NCS for Kingston. But none of these choices (possibly with the exception of Evergreen which will operate its own terminal) are necessarily long term. The principal characteristic of the transshipment trades being their volatility, it can be expected that over time some carrier-port partnerships will change. Nevertheless, there is little doubt that the centres of gravity will be the ones mentioned and the ones that are continuing with their ambitious development plans. The ultimate achievement for any of these ports would be, once +10 000 TEU container vessels are deployed, the selection as MEGA hub for the Eastern seaboard of Central America and the Caribbean.

The choice of sub-regional hubs on the contrary, is still wide open. One reason for this is the still limited application of multi-layered feeder operations in the Caribbean. The generally poor performance of the container terminals on a second echelon is another reason. And the lack of dedicated container terminal facilities as well as the under-equipment of existing terminals a third one.

This state of affairs is quickly becoming history. Container volumes are growing, much port container handling capacity is being added, equipment upgraded and performance levels boosted. For those ports that aim to play a role in the sub-regional transshipment business, the appropriate time to prepare for it is now. The logic for this is simple. Some of the competitors, because they are not ready or fully convinced of the potential offered by multi-layered container transshipment and feeder operations, will delay their decisions. They will therefore irrevocably miss the opportunities offered.
