Cascade Effects in Container Shipping

Implication for Regional and Feeder Ports

Portek International Limited

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What we do

Portek is both a

*provider* of equipment, services
and solutions to ports worldwide,
& an

*operator* of medium sized ports.
What we do

• **As provider to ports:**
  – Modernize Port Equipment – upgrading equipment from PX to PPX, turnkey
  – Quick deployment of cranes to meet surge in traffic; sale or lease
  – Crane accidents recovery & repairs
  – Port IT & Automation modules
  – Traffic studies, marketing program to attract traffic, simulations
What we do

• As *port operator*:
  – T009 & T300 (Jakarta, Indonesia)
  – Bejaia Mediterranean Terminal (Algeria)
  – Valetta Gateway Terminal (Malta)
  – Port of Libreville & Port Gentil (Gabon)
Background
The Trend

• By end of 2007, there were 188 Vessels of greater than 10,000 TEUs on order

• By 2011, Post Panamax Vessels will contribute 50% of all container slots
Definitions

- Mid Panamax MPX ~ 2000 – 3500 TEUs
- Large Panamax LPX ~ 3500+ – 4500 TEUs
- Post Panamax PPX ~ 4500+ – 6000 TEUs
- Large Post Panamax LPPX ~ 6000+ – 8000 TEUs
- Super Post Panamax SPPX (Mega Ships) ~ 8000+ – 12500 TEUs
Cascade Effects

• **Cascade effect**: big ships displacing small ships across all ship sizes
World Container Fleet Supply

- Order book of 6.9 million TEU with an average ship size of 4,500 TEU.
- Existing world fleet is only 11.8 TEU, with an average ship size of less than 3,000 TEU.
Displacing

LPPX/ SPPX
7,000 – 12,500 TEUs

Displacing

LPX/ SPX
4,000 – 6,000 TEUs

Displacing

Small Vessels
2,000 – 4,000 TEUs

Displacing

Smaller Vessels
1,000 – 2,000 TEUs
Cascade Patterns (1)

Deployment of Megaships
Cascade Patterns (2)

Routes for LPX/PPX
Cascade Patterns (2)

New (Shuttle) Services for LPX/PPX
Cascade Patterns (3)

Routes for MPX
Shipping Economics
And Implications for regional and feeder shipping
Shipping Economics

- **Shipping Economics**: driven by need to fill the vessel to achieve low unit slot cost
What are the implications?

- More consolidation, M&A in the regional and feeder trades?
- Slot sharing, gradual exit of smaller ships?
- Increase in fuel cost will further accentuate the cost difference
- Ship call frequency decrease due to larger ships and bigger loads
- Reduced port calls, as port with low load factor will be dropped out
Impact on Ports

Implications for regional and feeder ports
Regional Ports & Feeder Ports

- **Regional ports** are ports serving Intra-continent of Intra-regional trades such as Intra-Asia trades, SE Asia Trades

- **Feeder ports** are mainly those that feed or receive cargo to and from a regional port or a major hub port
Challenges for Regional and Feeder Ports

• Questions confronting regional and feeder ports:
  – Are the (displaced) big ships coming to your port?
  – Are you pushed further into the feeder trades?
  – Which ports can be winners and which may be bypassed?
The Future of Regional Ports

2,500 TEU ships → 5,000 TEU ships

Some regional ports may emerge as the regional hubs, and attract more transshipment traffic
The Future of Feeder Ports

Feeder ports who cannot service larger ships will be marginalized, they may dropped as a port of call, will see reduced frequency, and connectivity.
Advantage = US$ 8 / TEU / day savings in slot cost
= US$ 48 for a voyage of 6 days
Winners and Losers

• For South East Asia:
  – Tg Priok (Jakarta)?
  – Manila, Laem Chabang?
  – Port Klang?
  – Cai Mep Port? With throughput in Vietnam growing at 25% a year, will Cai Mep be a winner?
River Ports VS. Sea Ports

• Cascade effect will tilt the balance in favour of sea ports:
  – Ho Chi Minh VS. Cai Mep
  – Bangkok VS. Laem Chabang
  – Ports along Yangtze VS. coastal ports (Yangshan, Ningbo, etc.)
Winners and Losers

• For Indian subcontinent/ Arabian Sea:
  – Will Nhava Sheva emerge as a major port of calls for Post Panamax vessels?
  – Karachi, Bandar Abbas
Challenges

What can regional and feeder ports do?
Challenges

- Insufficient cargo volume for new size of ships
- Physical infrastructural constraints
- Equipment constraints
- IT & communication system constraints
- Administrative issues – bureaucratic red tape, labour management issues, custom inspection, adopt best practices
Cargo Volume Constraints

• There must be sufficient cargo or load factor for the ship to justify making a call.

• Regional Ports must:
  – Expand its hinterland; seize initiatives to be a gateway port for the country, and neighboring countries.
  – Attracting transshipment traffic
  – Stimulate a more balanced trade
Round TRIP Simulation System

Ports of call:
- Rotterdam
- Felixstowe
- Hamburg
- Le Havre
- Gothenborg
- Aarhus

Comparison of Costs

- Vessel and Voyage Costs
- Handling Costs
- Hinterland and Transshipment Costs
Physical Infrastructural Constraints

• Draft:
  – Regional ports: 13 – 15 m
  – Feeder ports: 10 – 12 m

• Sufficient turning radius

• Berth Length:
  – Regional ports: 300 – 330 m
  – Feeder ports: 200 – 250 m
Physical Infrastructural Constraints

• Yard space:
  – The more usual constraint
  – A lot of yard space needed for an exchange of 2,000 to 3,000 boxes
Equipment Constraints

- **Panamax Quay Crane**
  - Lift Height (26 m → 30 – 32 m)
  - Outreach (12 – 13 rows → 14 – 15 rows)
  - Crane speeds – possible to increase incrementally
Equipment Constraints

• Panamax Quay Crane
  – Drive change – improve reliability, parts obsolescence
  – General refurbishment – better cabin ergonomics, greater safety as in braking systems, etc.
  – Twin lift 2 X 20’ can be incorporated without major change in operating procedures
Quay crane modification & drive change in Penang, Malaysia
Boom extension in Tuticorin, India
QC Drive change in PSA, Singapore
RTG speed increase in Penang, Malaysia
Equipment Constraints

• **Yard Equipment**
  – RTG height of 1 over 4 (or 1 over 3) to 1 over 5 or 1 over 6
  – *Yard space is at a premium*
  – Straddle carriers of 1 over 2 configuration are being phased out in favour of 1 over 3
IT & Communication Systems

• The port IT system must be able to cope with an exchange of 3,000 to 4,000 moves per ship within a 24 hour period
Upgrading of CTMS
Review of Operational procedures
Radio Data Terminals for accurate real time information
GPS Satellites

Fixed GPS (reference)

Send Error Correction Data

Mobile GPS

Position Determination Systems
Administrative Issues

- Streamlining customs procedure and documentation flow – many ports in developing countries have time consuming custom inspection, and complicated documentation, resulting in a dwell time of containers
Administrative Issues

• Dealing with Bureaucracy - state owned ports slow to respond to customer needs, cumbersome procurement process, not able to gear up quickly to handle increased traffic

• Labour issues - Some unionized labour force continuing with outdated work practices, resist changes and new technology
Conclusions
Conclusion: Mega Hub and Regional Port

- Big ships reinforce the hub and spoke pattern of shipping, favoring mega hub ports

- Some regional ports will be winners and emerge as regional hubs. Many will be bypassed
Conclusion: Feeder Ports and Feeder Shipping

- Feeder ports face pressure as feeder vessels scale up. Failure to cope means: high freight costs, low connectivity and becoming less relevant.
- Further shake-out in regional and feeder shipping through mergers and acquisitions. Smaller ships of less than 1000 TEU size will retreat to marginal or niche routes or to domestic, inter-island routes.
Thank You

Questions?
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