



TEXAS A&M UNIVERSITY
GALVESTON CAMPUS.

INTRODUCTION TO THE MARITIME INDUSTRY

1. The Components of the Maritime Industry



MARA 205

Professor: Dr. Jean-Paul Rodrigue

Are you ready for some nautical nonsense?



A Brief Definition

- Maritime Industry
 - All the activities enabling and supporting maritime shipping.
- Components
 - Shipping industry:
 - Carriers and shipowners.
 - Port industry:
 - Port authorities and terminal operators.
 - Management and oversight of cargo:
 - Regulators, customs and cargo owners.
 - Ancillary activities:
 - Finance, insurance, and bunkering.

Introduction to the Maritime Industry: Course Outline

1. The Components of the Maritime Industry

2. History and Geography of Maritime Transportation

3. Types of Vessels and Cargo Markets

4. Shipbuilding and Scrapping

5. Carriers and Shipowners

6. The Cruise Industry

7. Maritime Laws and Regulations

8. Port Authorities and Terminal Operators

9. Cargo Handling and Warehousing

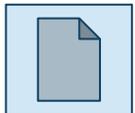
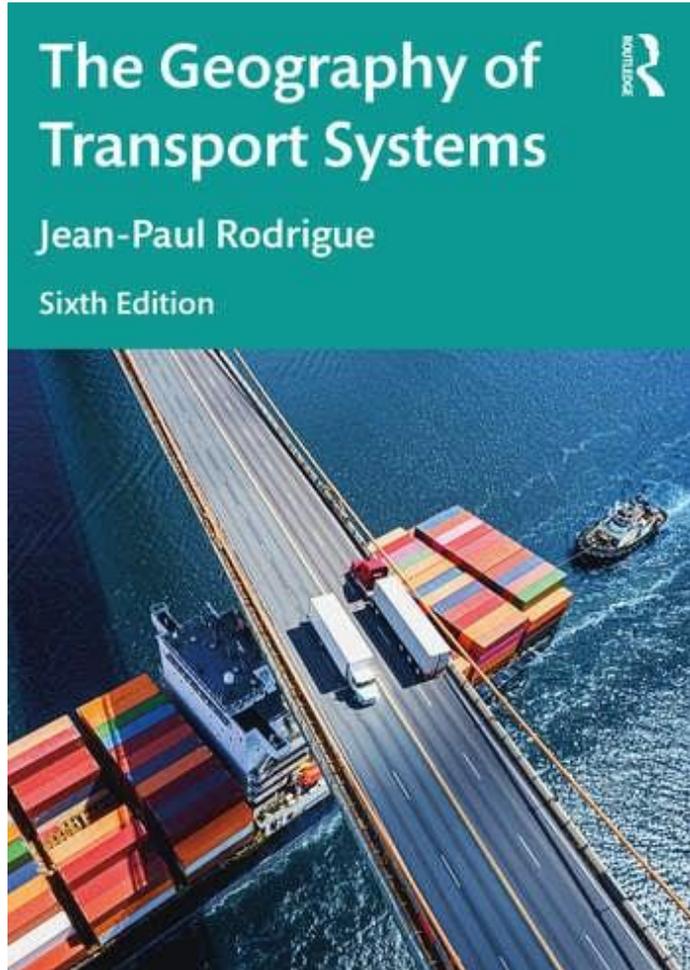
10. Chartering and Brokerage

11. Insurance and Finance

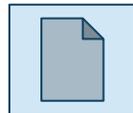
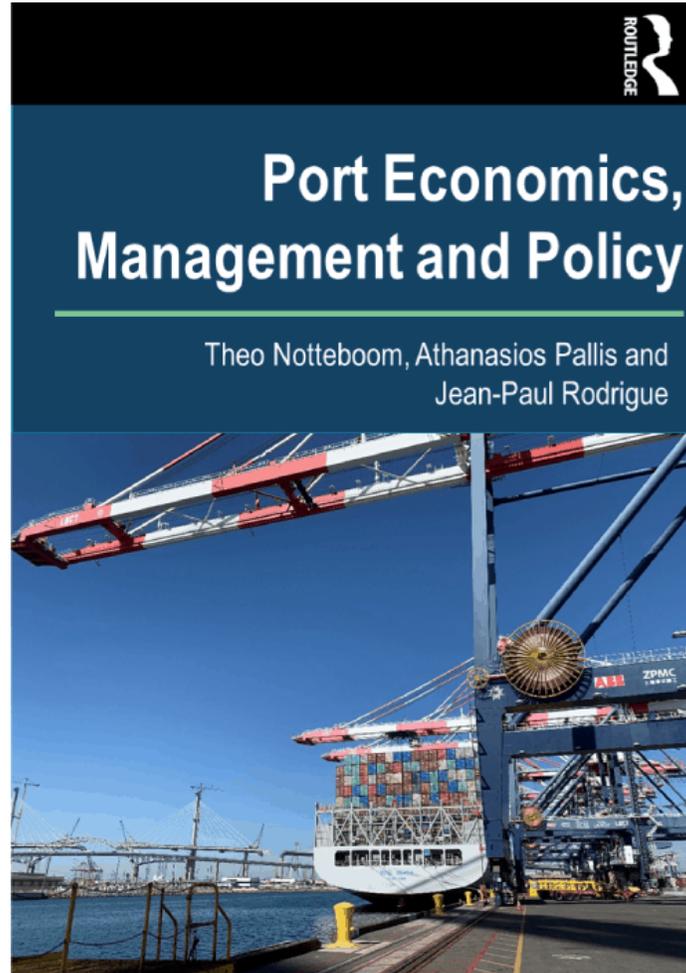
Grading Policy

- First Exam (25)
- Second Exam (25)
- Third Exam (25)
- Final Exam (15)
- Attendance (10)

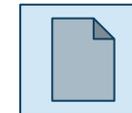
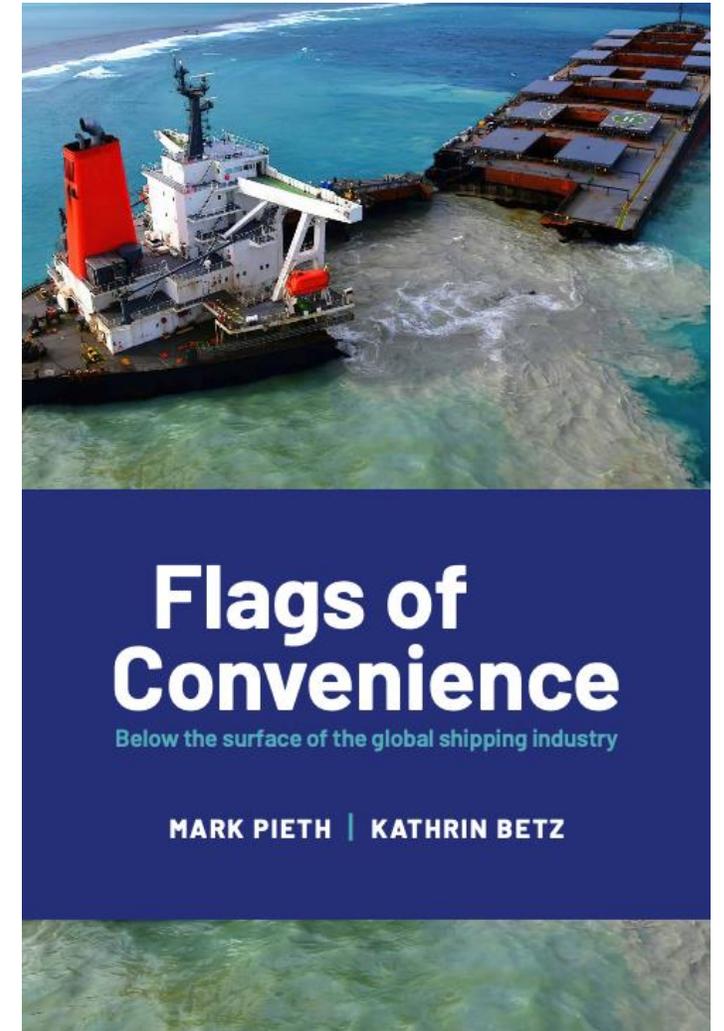
Reading Material



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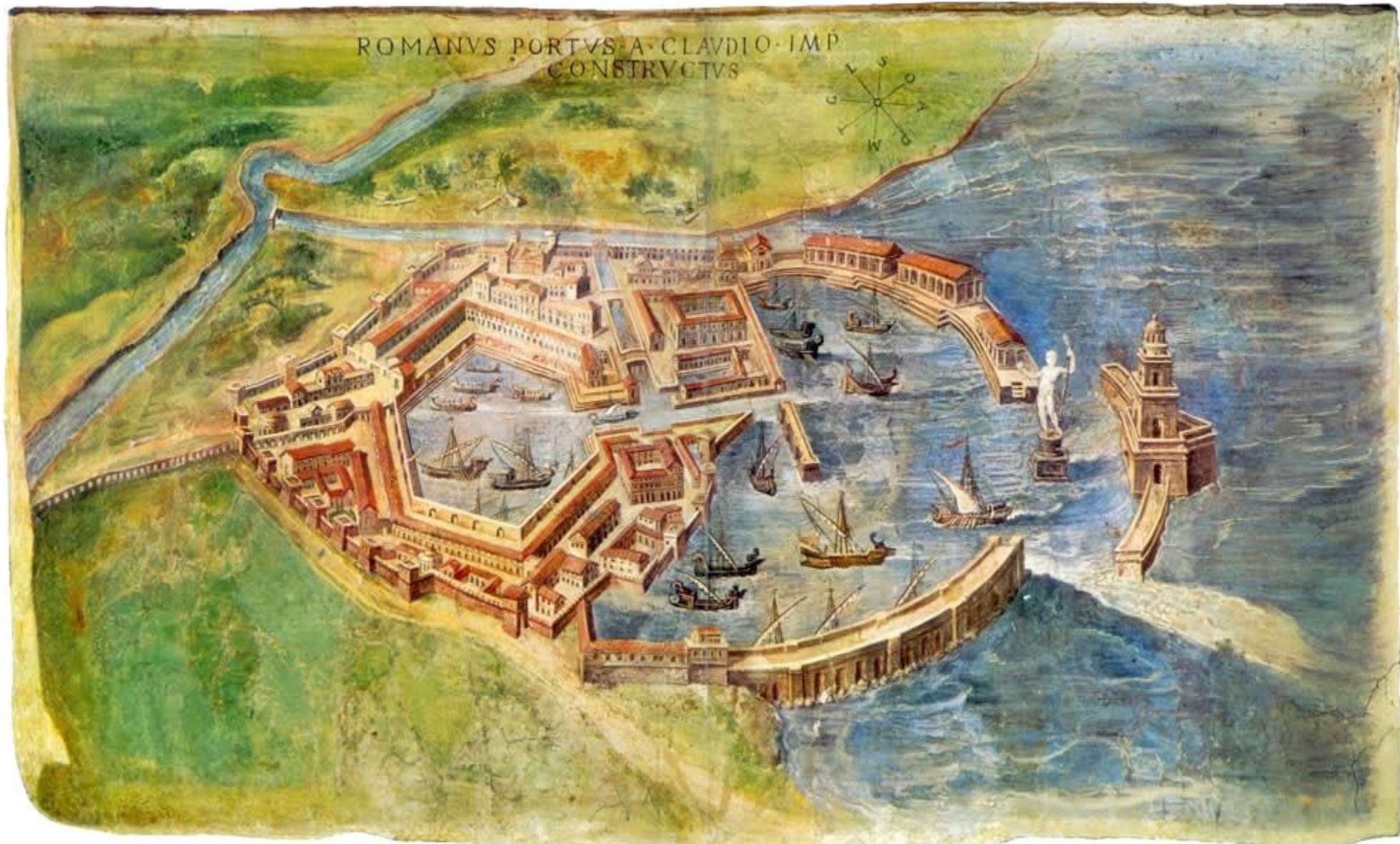
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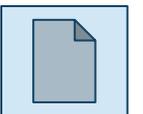


A. Setting the Context

The Port of Portus, Ancient Rome



Clipper Ship, Mid 19th Century

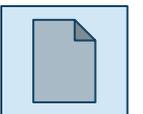


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One of the Last Liners, SS France (1969)



About 1,000 passengers



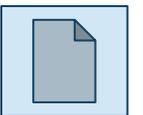
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Royal Caribbean Icon of the Seas (2024)



Cost: About 2 billion dollars; About 7,000 passengers

Loading Break-bulk Cargo, Port of New Orleans, early 20th Century



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The World in a Box: Containers on the Move



First Containership, Ideal-X, 1956



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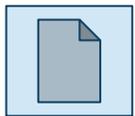
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Automated Stacking Crane (ASC), Busan Container Terminal (BCT)



Pallets waiting to be loaded in a container, Shenzhen, China



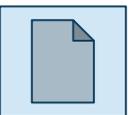
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Ikea Rolled Foam Mattress: Product Design and Distribution Efficiency



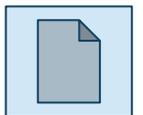
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Container and Tanker Ships Crossing the Miraflores Locks at the Panama Canal (The Panamax Standard)



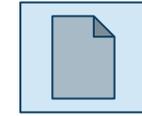
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Containership Crossing the New Agua Clara Locks at the Panama Canal (New Panamax Standard)



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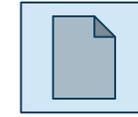
Suez Canal Blockage, March 2021



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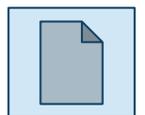
Containership Dali, March 2024



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Economies of Scale: Ultra Large Crude Carrier (ULCC), Persian Gulf



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Petrochemical Port Complex, Houston





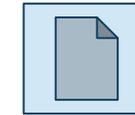
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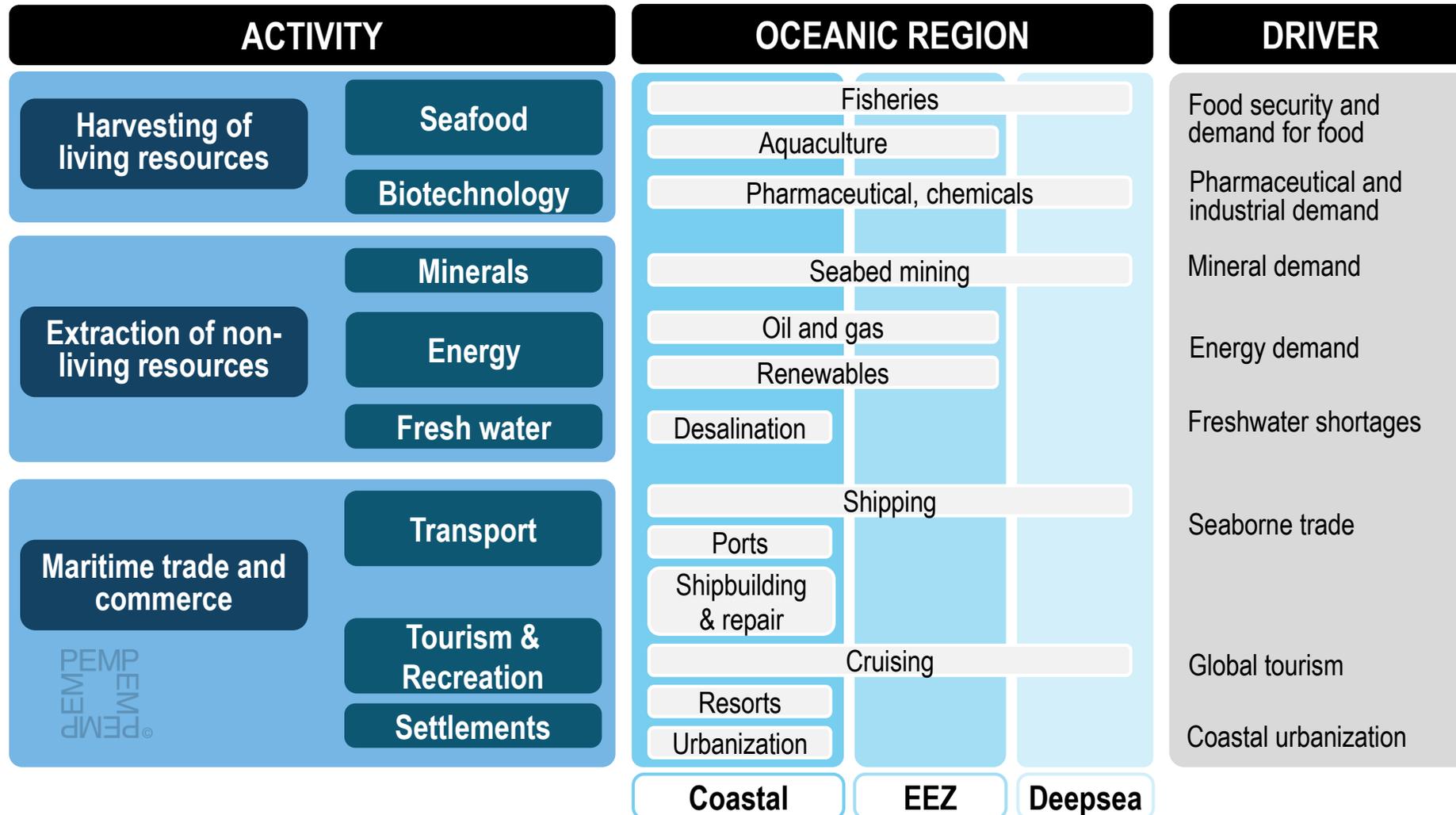


B. What is the Maritime Industry?

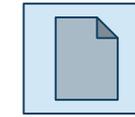
The Blue Economy



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Fundamental Characteristics of the Maritime Industry



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TERTIARY INDUSTRY

- Mostly tertiary (service) sector.
- Some primary (fishing & energy).
- Some secondary (shipbuilding, construction).



DERIVED DEMAND

- Outcome of other activities.
- Industrial and manufacturing.
- Trade and retailing.
- Tourism.



CAPITAL INTENSIVE

- Infrastructure-heavy.
- High cost of entry.
- Long-term investments.
- Propensity toward oligopolies.



FIXED & MOBILE ASSETS

- Asset interdependency.
- Ships.
- Ports and channels.
- Equipment.



ECONOMIES OF SCALE

- Most suitable sector.
- Increase capital-intensiveness.
- Massification and atomization.

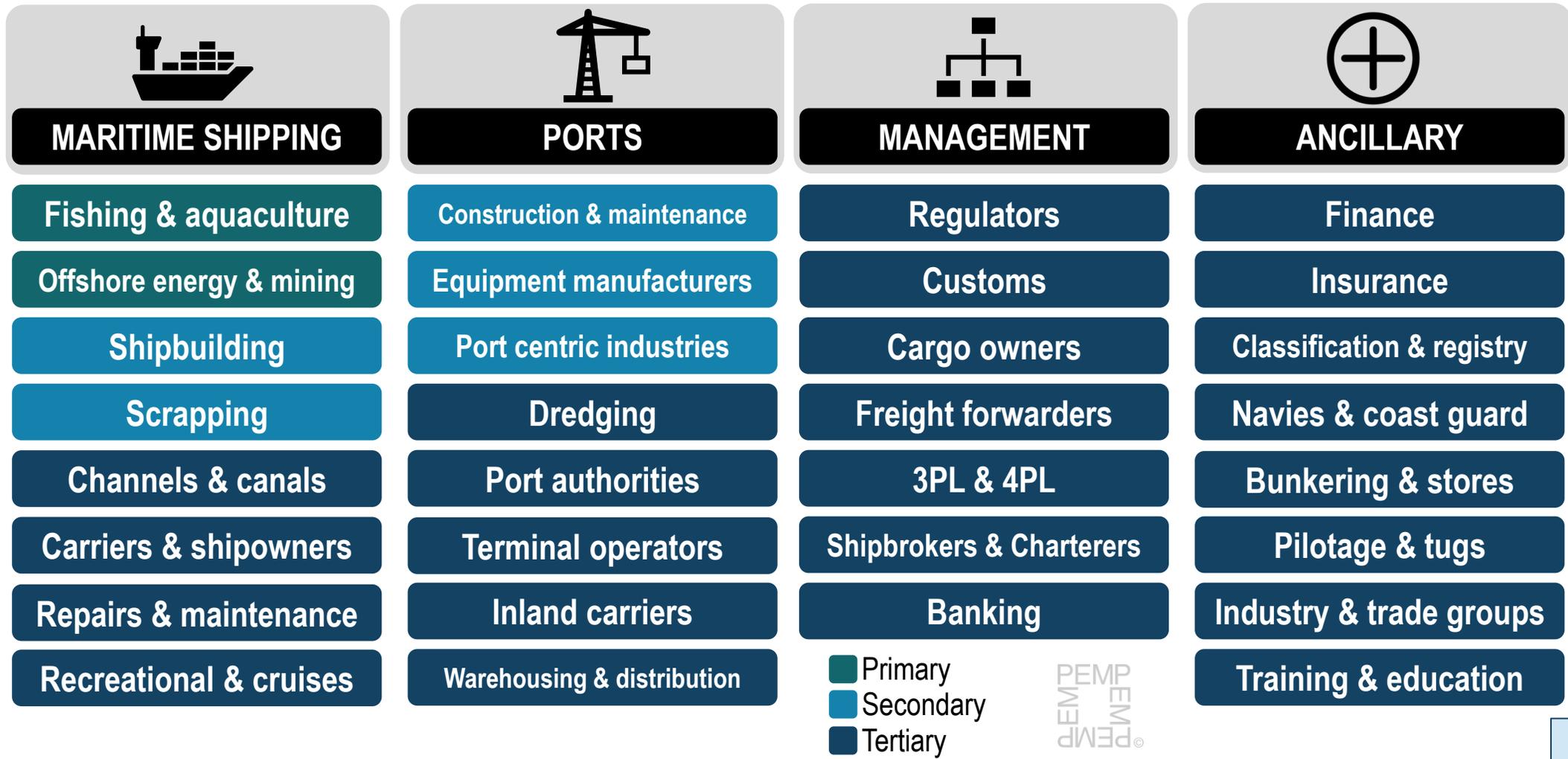


TRANSACTION INTENSIVE

- Multiple actors, markets and regulations.
- Large quantities of cargoes.
- High values of assets and cargoes.

PEMP
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PEMP
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Elements of the Maritime Industry



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INTRODUCTION TO THE MARITIME INDUSTRY



C. Main Components

Fishing and Aquaculture

- Fishing
 - Ancient history.
 - 10% of the global protein input.
 - Commercial fishing fleets.
 - Jurisdiction issues.
- Aquaculture
 - 50% of the fishing output.



Offshore Energy and Mining

- Offshore oil and natural gas
 - Extraction of energy resources on continental shelves.
 - Gulf of Mexico, Alaska and the North Sea.
 - Source of additional resources but also conflicts.
- Windfarms
 - An emerging energy generation paradigm.
 - Ports as construction, assembly, and maintenance platforms,
- Seabed mining



Shipbuilding and Scrapping

- Shipbuilding
 - Making and assembling ship components.
 - Heavy industrial activity associated with steelmaking.
 - Largest shipyards in China, South Korea and Japan.
- Ship scrapping
 - Disassembling and cutting ships into parts.
 - Beaching in India, Pakistan and Bangladesh.



Channels and Canals

- Capital-intensive shortcuts
 - Built to improve navigation and connectivity.
 - Managed by an entity responsible for construction, maintenance and improvements.
 - Tolls collected (size, tonnage, class).
 - Channel (waterway): Follows a natural body of water and improved with dredging.
 - Canal: Artificial structure (often with locks).
- Maritime infrastructure
 - Pipelines and telecommunication cables.



Carriers and Shipowners

- Carriers
 - Transport cargo on behalf of its customers.
 - Common carrier: multiple customers on an open market.
 - Can own or lease ships.
- Shipowners
 - Purchasing and managing ships.
 - Make them available on the leasing market.



Recreational and Cruises

- Recreational uses
 - Pleasure boats.
 - Associated with increases in standard of living.
- Cruises
 - Cruise lines maintain a fleet of cruise ships.
 - Itineraries in regional cruise markets.
 - Caribbean and Mediterranean the most important markets.



Construction and Maintenance

- Construction
 - Construction and engineering firms.
 - Construction, repair and maintenance of port facilities.
 - Capital-intensive.
 - Mega projects.
 - Long time horizon.



Equipment Manufacturers

- Specialized equipment
 - Terminals require a range of specialized equipment.
 - Designed to do a single task by a specialized manufacturer.
 - Cranes and cargo handling equipment.
- Multipurpose equipment
 - Vehicles and forklifts.
 - Provided as is or with small modifications.



Port Centric Industries

- Manufacturing complexes
 - High material input industries.
 - Capacity to move and store heavy materials.
 - Connectivity to global markets.
 - Shipyards, fish processing, petrochemicals, steelmaking, automotive.



Dredging

- Land reclamation
 - Removal of materials to prepare for a new facility.
 - Mostly port terminals.
 - Can involve airports and urban land.
- Channel maintenance
 - Dig and maintain channels to defined draft.



Port Authorities

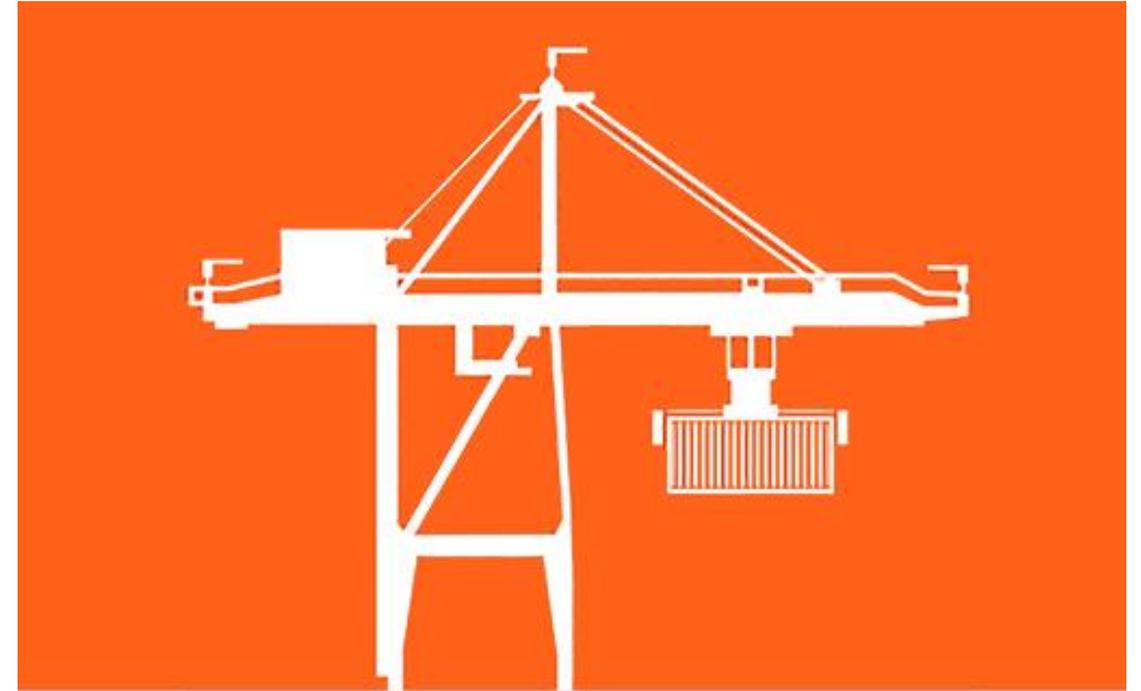
- Governance
 - Ports are generally publicly owned.
 - Usually state or municipal-owned.
 - Entity responsible for the development, operations, lease and marking of the port.
 - Functions can be subcontracted.
 - Terminal concessions with defined terms and conditions.



PORT HOUSTONSM

Terminal Operators

- Terminal operators
 - Responsible for the development, management, and operation of a port terminal.
 - Wide range of functions and terminal operations.
 - Own facilities or lease through concessions.
 - Sell services on open market or exclusive use.
 - Many part of a portfolio.



 Lifting Global Trade.
APM TERMINALS

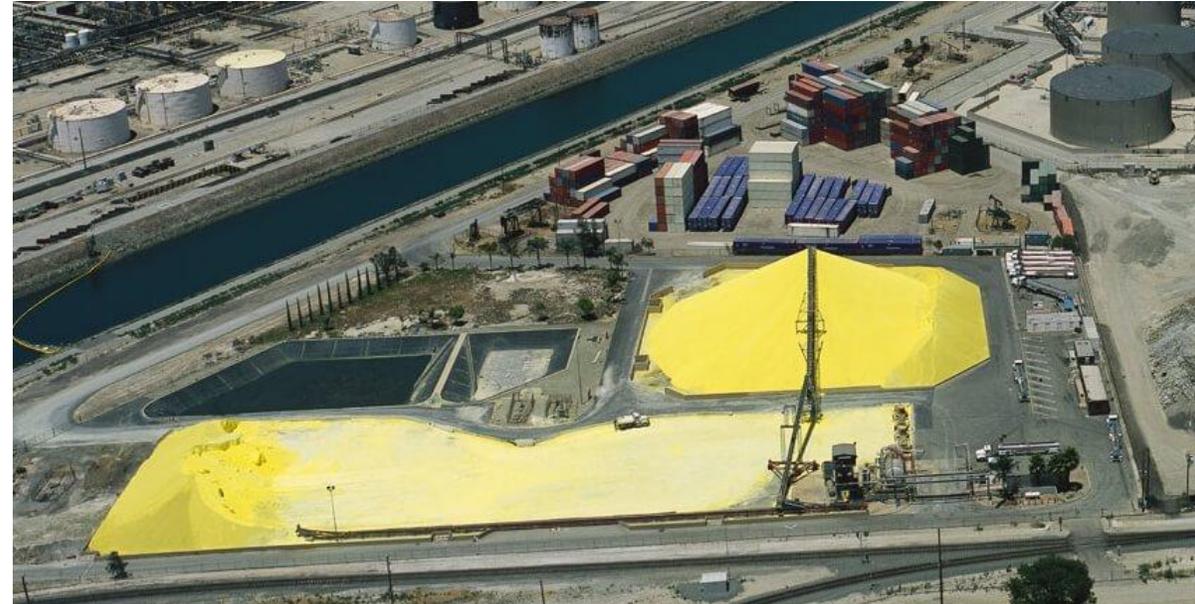
Inland Carriers

- Hinterland access
 - Carrying cargo to/from ports.
 - Rail, truck and barge companies.
 - Enter port facilities through gates (trucks) or dedicated facilities.



Warehousing and Distribution

- Storage and distribution
 - Related to port traffic.
 - Support port-centric logistics.
 - Tanks (liquids; oil, LNG).
 - Silos (grains and chemicals),
 - Piles (minerals; coal, iron ore)
 - Open spaces (cars)
 - Covered facilities (distribution centers).
 - Buffer between production and consumption.



Regulators

- Regulatory oversight
 - At the international, national and state levels.
 - Safety, security, and standards.
 - International Maritime Organization (IMO).
- US Regulators
 - Federal Maritime Commission (FMC).
 - DOT-MARAD (infrastructure).
 - DOC (tariffs and quotas).



Customs

- Oversight of cross-border flows
 - Maritime industry highly globalized.
 - Large amounts of cross-border flows (some passengers).
 - Customs monitor flows to enforce tariffs, duties, quotas and sanctions.
 - Perform cargo inspection at ports of entry.



Cargo Owners

- Shippers
 - On the production side (manufacturers).
 - On the distribution sides (wholesalers and retailers).
 - Determine the origin and destination of the cargo.
 - Can directly organize transport (own account).
 - Contract a third party.



Freight Forwarders, 3PL/4PL

- Freight forwarders
 - Organizing transportation between the cargo owner and the carrier.
 - Consolidation, rate negotiation and filing documentation.
- 3PL
 - Own transportation and logistics assets.
 - More comprehensive range of services.
 - Transportation, inventory management, storage, and distribution.
- 4PL
 - Planning procurement and supply chains.



Shipbrokers and Charterers

- Shipbrokers
 - Intermediaries between shipowners and charterers.
 - Specialize in shipping sectors (tankers, bulk, containers).
- Charterers
 - Find ships and routes to deliver cargo.
 - For private customers or on open markets.
 - Also provide crews and stores.
- Large shipping lines have shipbroking and chartering services



Banking

- Transaction-intensive industry
 - Large quantities of cargoes.
 - High value cargo.
 - Settle transactions and remit payments.
 - Loans and lines of credit.
 - Letters of credits are a common tool in maritime shipping.



Finance and Insurance

- Finance
 - Capital-intensive industry.
 - Capital for the construction and lease of ships, infrastructure (terminals) and superstructures (equipment).
 - Long term horizons (retirement and sovereign wealth funds).
- Insurance
 - Identify known risks to ships and cargo.
 - Identification of liability (multiple stakeholders).



Ship Classification and Registry

- Ship classification
 - Rigorous technical and safety standards.
 - Issuing classification certificates.
 - Necessary to be registered and insured.
- Ship registry
 - Confirms ownership and nationality.
 - Who has regulatory control over the ship (safety and labor conditions).
 - Open registry countries (e.g. Panama and Liberia) account for 70% of world tonnage.



Navies and Coast Guard

- Navies
 - Protecting national interests.
 - Project national power over international waters.
- Coast guard
 - Maritime border control.
 - Inspecting ships for compliance.
 - Search and rescue.



Bunkering and Stores

- Bunkering
 - Supply of fuel to ships.
 - Mainly Bunker C (marine fuel oil).
 - At port or offshore.
 - Transition towards alternative fuels (LNG).
- Stores
 - Provision of supplies and equipment for ships.
 - Food, water, medical, spare parts.
 - Very important for cruises.



Pilotage and Tugs

- Pilotage
 - Ensure reliable and safe navigation along navigation channels.
 - Pilots have extensive knowledge of local navigation.
- Tugs
 - Assist ships maneuvering in harbors.
 - Push or pull barges for river and coastal navigation.



Industry and Trade Groups

- Representing maritime interests
 - International, national and regional organizations.
 - Regroup port authorities, terminal operators and carriers.
 - Each cargo segment has representative interest groups (bulk, petroleum, refrigerated).
 - Commercial opportunities (networking).
 - Research, advocacy and lobbying.



Training and Education

- Institutions
 - Transfer skills required in the maritime industry.
 - Maritime academies provide training and certification of ship personnel.
 - Academic and commercial research.
 - Consultants.

