GLOSSARY

Allocative efficiency	Whether, for any level of production, inputs are used in the proportion which minimises the cost of production, given input prices.
Benchmarking	The process of comparing the performance of an individual organisation against a benchmark, or ideal, level of performance. Benchmarks can be set on the basis of performance over time or across a sample of similar organisations, or against some externally set standard.
Best practice	The set of management and work practices which results in the highest potential, or optimal, quantity and combination of outputs for a given quantity and combination of inputs (*productivity*) for a group of similar organisations. Best practice can be identified at a number of levels, including organisational, national and international.
Congestion	A situation in which an organisation has unwanted or surplus inputs and would incur a net cost to reduce those inputs.
Cost efficiency	Where an organisation is *technically efficient* and *allocatively efficient* and, hence, produces a given quantity, quality and mix of outputs at minimum possible cost given existing knowledge of technologies and people's preferences.

Data Envelopment Analysis (DEA)	A *linear programming* technique which identifies *best practice* within a sample and measures *efficiency* based on differences between observed and BEST PRACTICE units. DEA is typically used to measure *technical efficiency*.
Decision Making Units	The organisations or units being examined in a DEA study. In public sector studies, these units may not be commercial or profit-making entities.
Dynamic efficiency	Success with which producers alter technology and products following changes in consumer preferences and productive opportunities.
Efficiency	Degree to which the observed use of resources to produce outputs of a given quality matches the optimal use of resources to produce outputs of a given quality. This can be assessed in terms of *technical efficiency* and *allocative efficiency*.
External operating environment	Factors which affect the providers of outputs that are not in the direct control of managers — for example, weather, client wealth and in some cases input prices.
Linear program	A set of linear mathematical equations for which a solution can be obtained subject to an upper bound (maximisation) or a lower bound (minimisation).

Non-scale technical efficiency	Proportion of *technical efficiency* which cannot be attributed to divergences from optimal scale (*scale efficiency*); sometimes known as managerial efficiency or pure technical efficiency.
Outputs	Goods and services provided to entities or persons outside the production unit.
Partial productivity indicator	Ratio of the quantity of an output (or the combined quantities of a subset of total outputs) to the quantity of an input (or the combined quantities of a subset of total inputs) where some inputs or outputs are not included.
Peers	In DEA studies, the group of best practice organisations with which a relatively inefficient organisation is compared.
Production frontier	The curve plotting the minimum amount of an input (or combination of inputs) required to produce a given quantity of output (or combination of outputs).
Production technology	Relationships incorporated in production processes which determine the manner in which inputs can be converted to outputs.
Productivity	Measure of the physical output produced from the use of a given quantity of inputs. This may include all inputs and all outputs (*total factor productivity*) or a subset of inputs and outputs (*partial productivity*). Productivity varies as a result of differences

	in *production technology*, differences in the *technical efficiency* of the organisation, and the *external operating environment* in which production occurs.
Returns to scale	Relationship between output and inputs. Returns can be constant, increasing or decreasing depending on whether output increases in proportion to, more than or less than inputs, respectively. In the case of multiple inputs and outputs, this means how outputs change when there is an equi-proportionate change in all inputs.
Scale efficiency	The extent to which an organisation can take advantage of returns to scale by altering its size towards optimal scale (which is defined as the region in which there are constant *returns to scale* in the relationship between outputs and inputs).
Slacks	The extra amount by which an input (output) can be reduced (increased) to attain *technical efficiency* after all inputs (outputs) have been reduced (increased) in equal proportions to reach the *production frontier*. This is a feature of the piece-wise linear production frontier derived when using DEA.
Technical efficiency	Conversion of physical inputs such as labour services and raw materials or semi-finished goods into *outputs*. Technical efficiency is determined by the

	difference between the observed ratio of combined quantities of an entity's output to input and the ratio achieved by *best practice*. It can be expressed as the potential to increase quantities of outputs from given quantities of inputs, or the potential to reduce the quantities of inputs used in producing given quantities of outputs. Technical efficiency is affected by the size of operations (*scale efficiency*) and by managerial practices (*non-scale technical efficiency*). It is defined independent of prices and costs.
Total factor productivity (TFP)	Ratio of the quantity of all outputs to the quantity of all inputs. TFP can be measured by an index of the ratio of all outputs (weighted by revenue shares) to all inputs (weighted by cost shares).
Yardstick competition	Competition over performance levels where no market exists for the goods or services concerned. This competition relies on performance indicators.

Port and Shipping Terms

Berth	A place in which a vessel is moored or secured; place alongside a quay where a ship loads or discharges cargo.
Bill of lading	A document that establishes the terms of contract between a shipper and a transportation company. It serves as a

	document of title, a contract of carriage and a receipt for goods.
Break-bulk	Loose, non-containerised cargo stowed directly into a ship's hold.
Bulk vessel	All vessels designed to carry bulk cargo such as grain, fertilisers, ore, oil, etc.
Capesize	A vessel too large to pass through the Suez Canal.
Congestion	Accumulation of vessels at a port to the extent that vessels arriving to load or discharge are obliged to wait for a vacant berth.
Container Freight Station (CFS)	A shipping dock where cargo is loaded ("stuffed") into or unloaded ("stripped") from containers.
Containership	Ship equipped with cells into which containers can be stacked; containerships may be full or partial, depending on whether all or only some of its compartments are fitted with container cells.
Container Terminal	An area designated for stowage of cargo in containers, usually accessible by truck, rail, road and marine transportation, where containers are picked up, dropped off, maintained and housed.
Container Yard	A materials handling/storage facility used for completely unitised loads in containers and/or empty containers.
Deadweight (dwt)	A common measure of ship carrying capacity. The number of tons (2240 lbs.) of

	cargo, stores and bunkers that a vessel can transport. It is the difference between the number of tons of water a vessel displaces "light" and the number of tons it displaces "when submerged to the 'deep load line'." A vessel's cargo capacity is less than its total deadweight tonnage. The difference in weight between a vessel when it is fully loaded and when it is empty (in general transportation terms, the net) measured by the water it displaces. This is the most common, and useful, measurement for shipping as it measures cargo capacity.
Demurrage	The delay of a vessel or detention of a shipment beyond the stipulated time allowed for loading or unloading; the resulting payment to the owner for such delay or detention.
Draft	The depth of a loaded vessel in the water, taken from the waterline, to the lowest point of the hull of the vessel; depth of water, or distance between the bottom of the ship and the water line. Also referred to as draught.
Dredging	Removal of sediment to deepen access channels, provide turning basins for ships and adequate water depth along waterside facilities.
Dry bulk	Low density cargo, such as agri-food products, fertilisers and ores, that are transported in bulk carriers.

Feeder Service	Transport service whereby loaded or empty containers in a regional area are transferred to a "mother ship" for a long-haul ocean voyage.
Feeder Vessel	A short-sea vessel which transfers cargo between a central "hub port and smaller "spoke" ports.
Free Trade Zone	A port designated by the government of a country for duty-free entry of any non-prohibited goods, Merchandise may be stored, displayed, used for manufacturing, etc., within the zone and re-exported without duties.
Gantry Crane	A crane or hoisting machine moored on a frame or structure spanning an intervening space, and designed to hoist containers into or out of a ship.
Gateway	A point at which freight moving from one territory to another is interchanged between transportation lines.
Gross Tonnage	Applies to vessels, not to cargo,$(0.2+0.02 \log_{10}V)$ where V is the volume in cubic meters of all enclosed spaces on the vessel.
Intermodal/Multimodal	Used to denote movements of cargo containers interchangeably between transport modes, i.e., road, water, rail and air carriers, and where the equipment is compatible within the multiple systems.

Jetty	Structure projecting out to sea, designed to protect a port from the force of the waves but also used to berth ships.
Knot	Measure of speed of a ship, equal to one nautical mile (6076 feet or 1,852 meters) per hour. In the days of sail, speed was measured by tossing overboard a log which was secured by a line. Knots were tied into the line at intervals of approximately six feet. The number of knots measured was then compared against time required to travel the distance of 1000 knots in the line.
Landlord Port	An institutional structure whereby the port authority or other relevant public agency retains ownership of the land, as well as responsibility for maintaining approach channels and navigation aids; under this model, the port does not engage in any operational activities.
Liner	A vessel sailing between specified ports on a regular basis.
Lloyds' Registry	An organisation maintained for the surveying and classing of ships so that insurance underwriters and others may know the quality and condition of the vessels involved.
Malaccamax	Maximum size ships (containerships and bulkers) which can cross the Malacca Straits. The Malaccamax reference is

	believed to be today the absolute maximum possible size for container vessels.
Mixed cargo	Two or more products carried on board one ship.
Mobile crane	General purpose crane capable of being moved from one part of a port to another.
Moor	To attach a ship to the shore by ropes.
Net tonnage (NT)	$(0.2+0.02 \log_{10}V_c)\ V_c(4d/3D)^2$, where V_c is the volume of cargo hold, D is the distance between ship's bottom and uppermost deck and d is the draught. "Ton" is figured as an 100 cubic foot ton.
Pallet	A flat tray, generally made of wood but occasionally steel or other materials, on which goods can be stacked. There are two principal sizes: the ISO pallet, which measures 1 x 1.2 meters and the europallet at 0.8 x 1.2 meters.
Panamax	Medium-size bulk carriers whose dimensions enable the ship to transit Panama Canal when the lock width is the limiting factor.
Pier	The structure perpendicular to the shoreline to which a vessel is secured for the purpose of loading and unloading cargo.
Pilotage	The act of assisting the master of a ship in navigation when entering or leaving a port or in confined water.

Port dues	Charges levied against a ship owner or ship operator by a port authority for the use of a port.
Quay	A structure attached to land to which a vessel is moored.
Reefer	Refrigerated container.
Ro/Ro	A shortening of the term "Roll on/Roll off". A method of ocean cargo service using a vessel with ramps that allow wheeled vehicles to be loaded and discharged without cranes.
Shipper	The person or company who is usually the supplier or owner of commodities shipped. Also called consignor.
Stripping	Removing cargo from a container
Stuffing	Putting cargo into a container.
Supply chain	A logistics management system that integrates the sequence of activities from delivery of raw materials to the manufacturer through to delivery of the finished product to the customer into measurable components. "Just in Time" is a typical value-added example of supply chain management.
Terminal	An assigned area in which containers are prepared for loading into a vessel, train, truck or airplane, or are stacked immediately after discharge from the vessel, train, truck or airplane.

Terminal charge	A charge made for a service performed in a carrier's terminal area.
Throughput charge	The charge of moving a container through a container yard or onto a ship.
Transshipment	A distribution method whereby containers are moved between large mother ships and small feeder vessels, or between equally large ships plying north-south (Europe-Africa) and east-west (Asia-Europe) routes.
Transshipment port	A port where cargo is transferred from one carriage to another or from one vessel of a carrier to another vessel of the same carrier without the cargo leaving the port.
Turnaround time	The time it takes between the arrival of a vessel and its departure from port; frequently used as a measure of port efficiency.
Unitisation	The consolidation of a quantity of individual items into one large shipping unit for easier handling.
Wharf	Structure built alongside the water or perpendicular to the shore where ships berth for loading or discharging goods.

Source: *Peter Brodie (1997), Dictionary of Shipping Terms, 3rd edition.*