



INTEGRATION AND COMPETITION BETWEEN TRANSPORT AND LOGISTICS BUSINESSES

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INTRODUCTION

The Round Table, chaired by Russell Pittman of the US Department of Justice, reviewed trends in horizontal and vertical integration in logistics businesses, maritime shipping, ports and rail freight transport and examined the circumstances in which integration might reduce the efficiency of the transport system. There are likely to be net benefits to society from such integration in competitive markets but if integration eliminates competition, market power might result in excessive prices, suboptimal investment and lower than optimal levels of service for the users of transport services. Options for sector specific regulators and competition authorities to manage the risks of market abuse were discussed and the adequacy of antitrust law and competition authorities to take remedial action should businesses exploit market power were assessed.

Five introductory papers and presentations were commissioned to provide the foundation for the discussions:

- Frémont (2009) and Van de Voorde *et al.* (2009) review empirical evidence for vertical integration of maritime shipping, port and logistics activities and consider whether economies of scope have been realised and the degree to which integration has created market power <http://www.internationaltransportforum.org/jtrc/DiscussionPapers/DP200901.pdf>, <http://www.internationaltransportforum.org/jtrc/DiscussionPapers/DP200902.pdf>;
- Marc Ivaldi made a presentation on the benefits of vertical integration in railways;
- Thompson (2009) examines economies and diseconomies arising from the integration of rail freight transport with port operations in Turkey and South Africa <http://www.internationaltransportforum.org/jtrc/DiscussionPapers/DP200905.pdf>;
- Pilsbury *et al.* (2009) set out the framework for competition assessments and examine competition issues and intervention options in the case of horizontal, vertical and conglomerate mergers in European railways <http://www.internationaltransportforum.org/jtrc/DiscussionPapers/DP200904.pdf>.

The competitive effects of integration depend on the structure of the market, as the discussion summarised here underlines. This has important implications for regulatory intervention, implying that a case-by-case approach needs to be taken for assessing mergers and acquisitions.

1. INTEGRATION IN MARITIME SHIPPING, PORT OPERATIONS AND LOGISTICS

- Is it a definitive trend and is it likely to result in welfare losses?

There is a substantial economic literature identifying ways in which economic efficiency can be increased through vertical integration in a wide range of industries, by eliminating externalities and aligning interests. Menard (1997) also cites eliminating double-marginalisation¹ and reducing transaction costs as a source of economic gains. Horizontal integration can increase efficiency by yielding economies of scale and scope. Integration takes a range of forms, from contractual arrangements to mergers and acquisitions. There is an extensive recent literature recording mergers and acquisitions in maritime shipping, port terminal and related port and logistics businesses (Van de Voorde 2009, Meersman 2009, Notteboom 2008). This is generally portrayed as the dominant characteristic of structural change in maritime shipping over recent decades; a trend that is expected to continue, intensifying concentration in the sector².

Integration in the sector can involve a wide range of businesses. Horizontal mergers can be between shipping lines, terminal operators, logistics providers, rail companies or between other inland carriers. In rail markets, mergers of companies providing parallel, competing routes have different implications for efficiency than “end-to-end” mergers that link companies along a route. This is discussed in the rail section below. A parallel situation exists with shipping lines, where a distinction can be made between what might be termed “route concentration” and “route extension” mergers. Shipping lines and logistics companies have responded to large shippers seeking more global services with horizontal mergers, acquisitions and alliances of both the route extension and route sharing kind. Vertical integration can involve any combination of the businesses listed but the impacts of shipping lines acquiring terminals may be very different from an inland carrier acquiring a logistics business, a point examined in Frémont (2009).

Empirical research at INRETS in France, (Frémont 2007 and 2009) suggests that vertical investments by maritime shipping groups have been limited mainly to ports and to some hinterland transport services. Though most have logistics units, these are generally run at arm’s length as separate business units. Shipping lines concentrate spatially, with large volumes on a few sites, to achieve scale economies. Shipping companies tend not to get involved in hinterland container transport services but usually take on a limited co-ordinating role rather than providing transport services directly. Vertical integration generally involves acquisition by shipping lines of port terminal operators to obtain dedicated container handling facilities that can be managed to minimise waiting times for ship berthing and loading. This is driven by economies of scale and scope in the logistics of the container as opposed to the logistics of supply chains.

Frémont notes that some attempts to integrate resulted not in efficiencies but in unwieldy management problems resulting from the size of the business units that emerged and difficulties in establishing common management systems. The costs were sometimes found to outweigh the advantages and de-mergers followed. The take-over of P&O-Nedlloyd by Maersk-Sealand to form Maersk Line in 2005 is a case in point. P&O merged with Nedlloyd in 1997. Its share price rose six-fold in two years. Maersk’s acquisition took the combined market share of the group to 18% of world container traffic. However, customers were subsequently lost, forcing restructuring in 2008 and the shedding of a large number of jobs. Scale economies may not be sufficient to make large mergers

profitable, especially when many duplicate services are involved. This may tend to limit concentration in maritime shipping. Ongoing research at the University of Antwerp³ has also found negative economies with concentration in maritime container transport in specific cases. Strategic power was proposed as the reason that mergers nevertheless continue to occur.

Another potential explanation, in the case of vertical integration, is that competition in maritime container shipping has reduced profit margins to the minimum, and shipping lines seek higher margins through service differentiation in other parts of the supply chain. A 1999 study by Mercer Management found the growth in market capitalization for logistics companies was running at 30% while that for shipping companies was estimated at 2%. Investing in logistics may improve the overall financial capacity of shipping lines given a higher return on investment from “care and nurturing” services for higher margin customers. Shareholder pressure may also push companies towards involvement in high price-to-earnings ratio businesses. However, some shipping lines have found logistics services a difficult business to make profits in.

The competitive effects of vertical integration depend on the structure of upstream and downstream markets. Vertical integration that fails to increase market power by eliminating competitors or raising entry barriers is unlikely to have adverse consequences for consumers (Riordan, 2005). In this context, antitrust policy traditionally focussed on exclusionary practices and the potential for businesses to foreclose on competitors by denying supply of inputs or services on which they depend, leveraging monopoly from one market to another. In contrast, many economists and lawyers, particularly those identified with the Chicago school of economics, see little in microeconomic theory to provide a rationale for such behaviour and highlight the importance of efficiencies arising from vertical integration, arguing that there is no economic basis for concern with exclusion in many cases as there is generally more profit to be made by trading with rivals (Posner, 2001). Posner suggests this may be overstating the case and “Post Chicago Economics” contests the conclusion (Riordan, 2008), using game theory to suggest a rationale for raising rivals’ costs as a way to force them out of the market (Salop *et al.*, 1995). No evidence of exclusionary practices was presented at the Round Table, but the team at the University of Antwerp intend to apply this analysis to the ports sector, in an extension to the discussion in Van de Voorde (2009). Even if vertical integration is usually not a problem as such, it clearly can raise competition issues when combined with exclusive access to key infrastructure, for example, where an airport makes an exclusive contract with an airline for the development of a terminal in the absence of a second, common carrier terminal at the airport (OECD, 2009). This point is addressed in the section below on essential facilities. The potential for vertical integration to undermine economic efficiency clearly needs to be assessed case by case.

Ports in OECD countries generally face competition from neighbouring ports. Indeed, as a previous Round Table on *Port Competition and Hinterland Connections* (OECD, 2009a) concludes, ports have seen their market power decline substantially with investment in hinterland transport infrastructure, that results in distant ports competing for business in overlapping hinterlands. Market definition is critical to understanding the nature of the competition, and geographic markets have become much larger. Overlapping hinterlands mean that both port and shipping competition concerns, above all, route competition. For instance, the Port of Prince Rupert in Canada (on the west coast) and the US Port of Norfolk (on the east coast), compete for the Chicago inbound traffic from South Asia (see Table 1). Competition authorities need to draw relevant market boundaries increasingly widely.

Concentration of the ownership of port terminal operations can give rise to market power, with the potential to raise serious issues for the public interest if, for example, most terminals in a port are owned by a single company and that company acquires assets in neighbouring ports. The land-leasing policies of port authorities matter in this respect. In OECD countries, relevant markets are wide

enough that concentration of port terminal assets is not currently a concern. Outside the OECD, this is not always the case.

While investing in port facilities in a cluster of ports may give a shipping line competitive advantages, it does not necessarily imply monopoly power *vis a vis* shippers if other routes are available and economical. For example, the acquisition of Cast North America by Canadian Pacific was contested on the grounds that the group's intermodal container shipping companies (Cast and Canada Maritime) would suppress competition on services between Montreal and Northern European ports. Although CP controlled 80% of the route on acquisition, the Competition Bureau suspended proceedings in 1997 in response to the planned entry of a competing service operated by Maersk-Sealand Service and P&O Nedlloyd Container Line. It eventually dropped the case on the grounds that: (1) Cast was clearly a failing company and so this factor needed to be considered; but (2) a survey of shippers for the case revealed that Canadian shippers had several alternative options, including services via New York and Halifax. While neither of these routes was as good as the Montreal option for buyers, they were sufficiently acceptable that the merged company would not be able to sustain a price rise. Route competition was the decisive factor although, as the case illustrates, the potential for entry to the market is also a key consideration in deciding if integration compromises competition.

Table 1. **Transit times between selected ports in South and East Asia and North America**

Transit Time (days: hours)	From	Mumbai (India)	Port Kelang (Malaysia)	Singapore	Laem Chabang (Thailand)	Hong Kong (China)
East coast ports						
	Halifax	14:13	17:21	18:06	19:20	21:00
	NY/NJ	15:01	18:20	19:05	20:18	21:23
	Norfolk	15:18	19:00	19:12	21:01	22:06
	Norfolk (via Panama Canal)			24:13	23:12	20:21
West coast ports						
	Vancouver	18:01	13:19	13:01		
	Los Angeles	19:03	14:22	14:13		

Note: Times are based on 22 nautical miles per hour.

Source: World Ports Distances Calculator (<http://www.distances.com>.) This table was previously published in Brooks, Mary R. (2007), *Addressing Gaps in the Transportation Network: Seizing Canada's Continental Gateway Advantage*, Toronto: Conference Board of Canada, October. ISBN: 978-0-88763-802-2.

The Maersk-P&O Nedlloyd merger did result in what the EC regarded as an excessive concentration of services on some routes – 80% of container shipping between the EU and South Africa. The EC therefore required divestment of the South African services and withdrawal of P&O Nedlloyd from the Grand Alliance before approving the merger.

The impact of horizontal integration on prices for container shipping is not easy to assess as data is not readily available and many factors affect pricing besides consolidation. Hummels (2008) has

tracked prices by commodity in container shipping on a number of routes looking for price discrimination, reflecting, among other factors, price elasticities of demand for the commodities. He interprets the presence of such pricing patterns to be an indication of the exercise of market power and finds discriminatory pricing on some thinly trafficked shipping routes serving African ports. Hummels suggests trade volumes are around 6% lower than they would otherwise be as a result and appears to interpret this as evidence for the abuse of market power. A more benign interpretation is that traffic is insufficient to support more than one service and that this is a form of Ramsey pricing, required to cover the fixed costs of serving these routes when the alternative is no service at all. As barriers to entry do not appear to be particularly high in these thin markets, this seems the more likely explanation. *Some* market power is a feature of most markets rather than an exceptional situation and where barriers to entry are not large, opportunities for abuse are limited.

The longstanding freedom of liner shipping conferences to co-ordinate schedules and prices was curtailed by EU law on 18 October 2008. It is difficult to assess the impact. Tariffs changed little through 2008, too short a period to assess the impact of the change, and since then any response has been swamped by the impact of the economic crisis. It remains to be seen how the EU will rule on consortia (Consortia Block Exemption Regulation 2000/823). On major trade routes, liner carriers need to own significant numbers of vessels (8-9, for example, to serve the Asia-Europe string) and many shippers will only buy from the three or four carriers that can provide global coverage. If the only way to get business is to own eight or nine vessels for Europe-Asia, six or seven vessels for transpacific and three or four vessels for transatlantic traffic and still have some presence in North-South trades, companies have to be very large to be considered for the business. Consortia formed by several firms to create a larger entity to achieve this minimum efficient scale may therefore be procompetitive rather than anticompetitive. Without authorisation of consortia there may therefore be less competition, not more; consortia members do compete within the consortia, acting not as “good friends” but merely “allies of convenience” in response to the market power of the largest buyers. Categorical evidence to support or refute this point is unlikely to be forthcoming, given the nature of the transactions.

The bargaining power of shippers lies in choice and large shippers have some control over this through their ability to allocate business among competitors on specific routes. Globally, large shippers have reduced the number of companies they buy from but many do act to preserve choice route by route. On the main trade routes, shippers have not had to sacrifice competition among their suppliers in return for more global services.

The global reach of logistic and transport conglomerates adds an increasingly international dimension to the regulation of competition. Some participants in the round table speculated that there might therefore be a need for new international regulatory authorities. However, the “effects doctrine”, adopted by most antitrust authorities, makes it possible to address potential problems arising from mergers, and other forms of integration through contractual arrangements, in any part of global supply chains. According to the doctrine, domestic competition laws are applicable to foreign firms, and also to the behaviour of domestic firms outside a state’s territory, whenever their behaviour or transactions produce a relevant “effect” in the domestic market. The potential to impose penalties in their own markets gives the largest antitrust agencies, in the EU, USA and Japan, sufficient reach to regulate mergers anywhere in global supply chains. For example, in 1998 the Competition Directorate General of the EC succeeded in imposing conditions on the merger of two U.S. aircraft manufacturers, Boeing and McDonnell Douglas – a merger that had been investigated and not challenged by the US Federal Trade Commission⁴. These remedies are probably sufficient to regulate behaviour in international transport and logistics markets.

2. COMPLETE PORT AND RAIL INTEGRATION

The bulk of freight rail and port assets are integrated in a single national company in some countries. In theory, this should contribute to technological and network efficiencies. However, it also provides increased scope for market power and the inefficiency that sometimes accompanies market power. Thompson (2009) reviews the experience of this extreme form of integration in Turkey and South Africa, finding that much of the potential efficiencies are lost. Revenues from profitable activities are used to subsidize other parts of the system, robbing the profitable businesses of funds for investment. As a result prices for shippers are inflated and services poor.

The ports in Turkey are currently being privatised, which will end cross-subsidy of the heavily loss-making, largely passenger rail system. Port profits have been insufficient to make up rail losses for many years. In South Africa, port profits have also subsidized the railways. While the country's separate iron ore and coal export lines are reasonably efficient, the remaining general freight network is not. Port revenues are used to cover rail losses at the price of much higher port charges than apply in similar ports around the world. Moreover, uniform charges are applied across all of the country's ports when conditions in the ports are far from uniform. The cross-subsidies inherent in the current arrangement mean that trade is effectively taxed to support the railways. The support to the railways has not been directed at investment in efficiency as the general network is in poor condition. Much of the money appears to be used, as in many other state-owned railways around the world, to maintain an inflated workforce.

Discussion in the Round Table concluded that in this extreme form of concentration, vertical separation of ports and railways is the starting point for improvement in performance. This increases the transparency of financial flows and provides for support to the railways to be subject to tests of value for money. Horizontal separation of the ports would bring benefits of competition and freedom to price services according to local conditions that are likely to outweigh any advantages of port integration. The railways could also benefit from horizontal separation, especially in South Africa where the iron ore and coal lines are viable without public support and very different businesses from the general freight network. Whether there might be scope for competition in these rail markets, or benefits from retaining vertical integration with dedicated port terminal facilities in Saldanah and Richards Bay goes beyond the scope of the discussions at the Round Table.

3. HORIZONTAL RAIL MERGERS

Ivaldi and McCullough (2005) examined the welfare effects of mergers and acquisitions in the US rail freight transport market following the 1980 Staggers Act. They found gains in efficiency from integration, mainly horizontal, that gave rise to an increase in consumer surplus of some 25% between 1986 and 2001, the benefits of integration outweighing any impact on competition. It is not easy to separate the effects of consolidation from the de-regulation that opened the way for mergers, and particularly the ending of prescriptive rail tariff regulation. Competition from a newly liberalised road haulage industry was also important in driving efficiency on the railways (Boyer 1987).

The most important threat to competition from horizontal integration is that by reducing the number of competitors in the market the merger may give the merged company market power. When the merger is between firms not currently operating in the same geographical market there remains the issue of eliminating a potential new entrant from competing in the market. The US rail mergers earlier in the time period of the study avoided the first of these effects as they mainly involved linking lines in different parts of the continent – segment to segment mergers – rather than integrating railways competing on the same territory. However, the 1990s saw major merger projects that resulted in the western and eastern parts of the US each reduced to two main competing railways: the mergers of the Burlington Northern and Santa Fe (1995) and the Union Pacific and Southern Pacific (1996) in the west, and the carving up of Conrail by CSX and Norfolk Southern (1998) in the east (Pittman 2008). Ivaldi and McCullough’s assessment covered a period (1986-2001) in which the number of Class-1 railways was reduced from 36 to 9, and it is notable that in the last round of more “parallel” mergers the data suggest weakening of the gains to consumers. At that point the Surface Transportation Board introduced a temporary moratorium on mergers while it examined the likely impact of further consolidation on competition. It subsequently lifted the moratorium but increased the burden placed on merger applicants to demonstrate public benefits from large mergers (Surface Transportation Board 2001; Kwoka and White, 2004). Since then there have been no further mergers.

Shippers in the US frequently complain of abuses of market power resulting in poor service or high tariffs. The Government Accountability Office has on a number of occasions identified potential concerns with market power in the rail industry (GAO 2006). In response, the Surface Transportation Board recently commissioned a study (Christensen 2008) to analyse current conditions for competition and potential measures that might be taken to enhance competition in the industry. This study failed to find evidence of market power abuse. Specifically the study noted that the indicators generally employed to measure market power (mainly the ratio of revenues to variable costs) are inadequate for the task. Despite this shortcoming, the study concluded that “the exercise of market power appears to have increased in the freight railroad industry over the last twenty years,” but this increase was no more than that necessary for the railroads to achieve “revenue adequacy” – i.e. to earn a reasonable return on capital. It therefore cautioned against any attempts to introduce network-wide pricing or trackage right rules, preferring instead specific local measures, such as arrangements for sharing congested terminals, to address local service quality and capacity issues.

Trackage rights (providing access to a competitor’s railway) were introduced on specific parts of the US network as conditions for the approval of mergers by the Surface Transportation Board where

parallel routes were merged. Trackage rights have also been negotiated voluntarily to provide access to US ports and other markets served by a single railway.

4. VERTICAL INTEGRATION AND ESSENTIAL FACILITIES

Pilsbury (2009) examines the economic framework for making competition assessments and reviews the assessment of the potential for market power abuse in European case law on horizontal, vertical and conglomerate mergers concerning railways. The review confirms the theoretical considerations discussed above that generally, vertical integration presents no threat to competition when neither of the merging parties have horizontal monopoly power in any part of the supply chain. However, there have been specific instances in the sector where vertical relations have been found problematic. The UK Competition Commission blocked the proposed merger of EWS (the largest British freight train operator) with Marcroft, a wagon maintenance firm, because it believed EWS, due to its dominance in train service, would be in a position to impose lower quality of service for wagon maintenance on its competitors and would be prepared to lose market share in the maintenance market in doing so, as the losses here would be outweighed by gains in its main freight haulage business.

Across the supply chain, the links most vulnerable to market power are often rail terminals and private sidings and the track linking them to the main rail networks, particularly in ports. These control access to loading and unloading facilities for competing train operators but are frequently owned or operated by a single railway company, usually the historically incumbent railway. As such they may be designated essential facilities by competition authorities or rail regulators and be subject to regulations that impose non-discriminatory access on the basis of published tariffs – although quality of service including the timing of the slots made available is also an important aspect of discrimination and not simple to monitor. Such facilities are subject to strong tests by competition authorities to establish if they really are essential. European case law follows a definition under which facilities are only classified as essential if without access to the facility there is no feasible way to compete and moreover there is no possibility of replicating the facility and covering its costs from the entrant's activities (Castaldo et al 2007). The difficulty of passing these tests explains why only three cases involving essential rail facilities have been taken to DGCOMP. Judges and regulators everywhere are reluctant to impose access rights as this acts as a great disincentive to private investment in new facilities.

The investment incentives for a private owner of an essential facility that decides autonomously on access will tend also towards underinvestment (OECD 2009). It might well be the case that reducing the owners control over access or regulating access charges outperforms unrestricted private ownership. The emergence of the voluntary agreements discussed below suggests this is so. A key question for future research is under what circumstances do the voluntary agreements not emerge?

Because of the aversion of regulators to imposing access rights, and because competition from trucking provides a viable alternative for most traffic, voluntary arrangements for sharing essential facilities are more frequent than regulated access. In the US, voluntary trackage or interchange arrangements for access to ports are the norm and railroads often form jointly owned systems, such as at the Houston Port Terminal, to provide for non-discriminatory port access. It was noted that the US Class 2 Iowa Interstate Railway's biggest intermodal business is selling terminal access to Union

Pacific railway. In Europe, the Port Authority of Antwerp brokered a large reduction in SNCB's prices for locomotives hauling trains within the port in 2008; SNCB, the incumbent national train operator, was the only company with locomotives authorised to run on the intra-port network. In Rotterdam a neutral company, Rail Feeder, was created at the instigation of the port authority in 2008 to run 80% of intra port rail operations with published tariffs following several years of complaints that the incumbent national infrastructure manager was unable to offer slots to new entrants.

Canada is an exception to the trend for voluntary arrangements to govern access to essential facilities. Canadian National and Canadian Pacific saw their exclusive access to private sidings compromised when the government required each to serve the other's customers at prescribed rates over an area extended to 30 km in 1987. The Canadian regulator calculates annually the charges to be applied across the country. Recently the calculation switched from being based on variable costs to covering also part of fixed costs at the urging of the rail companies so that neither risks being out of pocket. Canadian railways seldom make recourse to this regulation, however, as they are averse to provoking retaliatory action elsewhere on the network. And as in the US, the railways have entered voluntarily into a number of track sharing agreements, such as in the Fraser Canyon where each company has a line on either side of the river, now shared as a double track system.

5. CAPACITY CONSTRAINTS AND BOTTLENECKS

The efficiency gains from consolidation of US railways were passed on to shippers in part because of parallel liberalisation of the trucking market that brought the prices of road haulage down considerably, putting pressure also on rail prices. For much of the period since deregulation of the railways industry returns have been well below the average for listed companies⁵. That changed in recent years with capacity constraints and strong demand allowing railways to achieve normal market rates of return on investment. This in turn has spurred investment in rail capacity.

There is a distinction to be made between this interaction among capacity, revenues and investment and the potential for infrastructure bottlenecks to be used to generate elevated revenues without investment. Regulatory oversight of infrastructure charges is indicated in such circumstances, although requiring investment to expand capacity when congestion charges are levied would not necessarily yield optimal investment levels or optimal levels of congestion. There are likely to be cases where investment is not warranted but varying charges according to demand would improve the efficiency of use of the bottleneck, for example through responses in the way train operators configure services.

European Union legislation (Directive 2001/14/EC) accounts for this in the way it regulates infrastructure charges, which are required to be based on direct costs, plus a mark-up where necessary to meet financial constraints. Scarcity charges are permitted where an infrastructure manager would not otherwise be able to satisfy demand. In such cases, a capacity enhancement study must be undertaken but there is no requirement to invest. A cost benefit assessment of alternative approaches to enhancing capacity/satisfying demand is required but the legislation states that there is no obligation to undertake investments that are not economically or financially viable. With the integrated private railways in the US, competition normally makes such proactive regulation unnecessary although the

rail regulator has the power to control charges ex post (e.g. by imposing trackage rights) if it deems necessary.

Economics is based on the idea that there is always a "shortage", that is there is less than we would like, of anything good, whether it is rail track capacity, fine wine or clean air. If there is a bottleneck but no appropriate pricing mechanism, then the market will clear inefficiently. If the bottleneck is between countries or if an internal bottleneck is mostly a problem because it reduces international traffic flows the root cause may have mostly to do with international markets, including strategic behaviour by each country (they need the increased capacity more than I do -- let them pay for it) or the lack of a good international funding mechanism. It could also reflect incentives for "exporting taxes" through higher tolls and tariffs on routes predominantly used by transit traffic.

More broadly, a shadow price approach can be applied to assess whether a bottleneck merits regulation. This shadow price is the amount that "society" would pay to have the constraint relaxed or removed, which in turn reflects the degree to which there are substitutes, more or less adequate, for the bottleneck capacity. This is similar to the market definition exercise commonly applied in competition law. The shadow price cannot be defined precisely enough to substitute for a market price, however, and only prices formed in a reasonably competitive market provide a reasonable indication of the opportunity cost of scarce bottleneck capacity. Instead, answering some questions regarding choices available to customers can provide an indication of the degree to which capacity is constrained at this location, i.e. the degree to which it should in fact be considered a bottleneck, although this process will not provide much guidance on appropriate investment levels.

Evaluating the social cost of a "bottleneck" (i.e. a facility of which physical capacity falls short of demand) would require study of a) what shippers are doing in response to the constrained rail capacity, and b) what they would do in response to increased capacity. For example, what are the commodities being shipped on this corridor? Can these commodities travel by truck (bottleneck has lower shadow price), or do they travel only by rail (bottleneck has higher shadow price)? Do they simply flow in different directions to different customers in response to the bottleneck (bottleneck has lower shadow price), or is production constrained and employment lower because of the reduced transport options (bottleneck has higher shadow price)? Can the potential customers get very good substitutes from other sources (bottleneck has lower shadow price), or do they suffer without or pay much higher prices for much inferior substitutes (bottleneck has higher shadow price)? And so on.

These are not necessarily easy questions to answer, and data will not always be easily available, but they are more relevant questions than assessing if quality is below design standard, or what percentage of the time a routing is capacity-constrained.

6. VERTICAL SEPARATION AND TRANSACTION COSTS

Ivaldi (2009) underlines the importance of the wheel-rail interface in the costs of running railways⁶ and provides estimates for the increased capital, operating, maintenance and transaction costs that would be incurred if the US vertically-integrated freight railways were fully vertically separated. The estimates are problematic as they extrapolate differences in costs recorded between different companies well beyond the range of data available, since all US freight railways are integrated and none separated. Moreover the costs identified may lie at the extreme end of what is likely in practice as contracts can be designed to include incentives to minimise transaction costs, for example in the planning of track maintenance possessions. Regulations can also be designed to provide incentive frameworks to optimise the wheel-rail interface – such as ensuring track friendly rolling stock is used. It was noted that even though transaction costs are higher in Britain, with a fully vertically separated, railway, than in Germany where track and train operations remain together under a holding company, the additional costs arising from separation still only account for at worst 1.25% of total rail costs (Merket *et al.*, 2008). Thus, the competition that has been created does not appear to have come at the price of excessive additional transaction costs.

There has been a very large increase in rail infrastructure capital, operating and maintenance costs in Great Britain, particularly since the Hatfield accident in October 2000. However, factors other than transaction costs between train operators and the infrastructure manager account for this escalation. Outsourcing of infrastructure maintenance with inadequate monitoring and control by the infrastructure manager appears to have been the root cause (Smith *et al.* 2009), compounded by extreme aversion to risk on the part of both the new infrastructure manager and the regulator in the aftermath of the accident. Other countries that have vertically separated infrastructure from train operations, such as Sweden, have not experienced such an inflation of costs.

Transaction costs are only one aspect of the experience with vertical separation in formerly integrated railways. Some analysis of the overall impact of vertical separation on productivity is available, although somewhat inconclusive. Driessen *et al.* (2006) observe some modest increases in efficiency. Friebel *et al.* (2005) and Wetzel (2008) find that vertical separation does not seem to be necessary to achieve an increase in productive efficiency. Cantos *et al.* (2009) suggest that the processes of vertical separation had modest, positive effects on productivity in European railways over the period 1985-2005 (16 railways not including the UK). Gains in productivity and efficiency were found to be much higher when vertical separation was accompanied with reforms at the horizontal level, especially when new freight train operators enter the market. Growitsch and Wetzel (2009) also find horizontal market opening to have the strongest influence on efficiency and find in Europe that vertical integration is associated with diseconomies of scale except where measures to open the market to new train operators have advanced furthest. The research suggests that any negative impacts on productivity from the vertical unbundling necessary to permit the introduction of competition in Europe are minor compared to the gains in productivity achieved where competition has developed.

7. SETTING THE FRAMEWORK FOR COMPETITION – POLICY AND REGULATORY RESPONSIBILITIES

Deregulation in the US and restructuring in the EU had some common and some different objectives. In the US, the need was to remove regulation of prices and service levels that had stifled commercial flexibility and innovation and resulted in chronic and growing losses. The US railways mainly carry freight and were largely privately owned at deregulation. In the EU, the chronic financial losses and under-funding of investment on the mainly passenger networks was the primary problem Community legislation was designed to address, together with overcoming the national boundaries of the mainly state owned rail networks in order to promote the development of international services. For the European freight market in particular, fragmentation along national boundaries was and to a large extent still is a major handicap to efficiency. Vertical separation was probably the only practical way to create competition in the freight market given that passenger trains are the prime user of the networks.

Some of the best performing railways in Europe are in Switzerland, which has two railways operating parallel competing routes for freight traffic. These two routes, using two alternative rail tunnels crossing the Swiss Alps, form the basis for two competing alliances of freight train operators on the key European trade route between the industrial north of Italy and Germany and the North Sea ports. Swiss railways, SBB, owner of one of the tunnels, began the process of merging its freight operation with the Italian freight incumbent FS. DB took a stake in the second Swiss tunnel operating company, BLS Cargo AG, and acquired the Dutch freight incumbent. Although Swiss and Italian railways subsequently de-merged, SBB Cargo cooperates with a number of independent freight railways in Italy and Germany.

The vision, created for European freight railways by Directive 91/440/EEC and subsequent policy packages, was for competition between the old national freight railways and new entrant railways, both running trains across borders. The focus has therefore been on interoperability and rights of access to infrastructure. A number of new train operators have emerged, particularly in Germany where several shippers that began by using specialised wagons to carry their own goods have become significant common carriers. New entrants also serve North Sea ports and the large Italian freight terminals in Verona and Milan. In the UK, two main freight companies compete to carry coal and containers. IBM (2007) provides a description of the development of competition in Europe, and Pittman, et al. (2007) provide further detail for Central Europe and Russia.

The emergence of a former national railway acquiring freight operators across Europe was not part of the vision, but Germany's DB has expanded rapidly, taking over the main freight rail operators in the Netherlands, Denmark, Spain and Great Britain, buying Poland's largest private rail carrier and seeking to buy freight operators in a number of other countries. At the same time Russian railways has made clear its interest in taking a large holding in DB. DB is also vertically integrated with logistics business and road hauliers through DB Schenker. It owns holdings in German port terminals at Hamburg and on the Rhine, and the rail freight business is integrated with rail passenger operations and rail infrastructure management through the holding company, DB AG.

DB's mergers have been cleared by national competition regulators and the European Commission, subject to some minor conditions. While the EC does have powers to review sequential mergers *ex post* to determine if competition has been reduced by the accumulation of assets, this is unlikely to impede the expansion of DB if its acquisitions continue to integrate by segment rather than taking over a competitor in its home market. There have been so few cross border rail operations historically that the mergers are unlikely to reduce international competition, simply because there was very little of it. DB's acquisition of EWS (freight) in Britain was subject to the condition that it implement planned investments by EWS in France to compete with SNCF (DB's strategic partner for passenger transport). Potential foreclosure of new competition will be relevant to future merger decisions as a result of this ruling but competition regulators generally make decisions on the basis of whether existing competition is curtailed and do not seek to develop new competition on a hypothetical basis. In both Europe and the US, the blocking of mergers by the competition authorities on grounds of loss of "potential competition" is rare.

If a model of two or more trans-European railways competing for freight were to be seen as desirable it would fall to the European Commission's sectoral regulator, DGTREN and the Council of Transport Ministers, to promote its development, rather than to the competition regulator, DGCompetition. Such a model would depend on Swiss or Austrian railways to be the hub of a group of railways providing competition on north-south routes, and French railways to provide competition on routes between the Atlantic and central European markets. In broad terms, DGTREN's role is to provide the structural and legal framework to create access to rail markets and make competition possible. DGCOMP's role is to protect competition from erosion by mergers and acquisitions under an approach common to all sectors of the economy.

8. INFRASTRUCTURE OWNERSHIP AND PRICING IN A VERTICALLY SEPARATED RAIL SYSTEM

DBs vertically integrated activities are likely to bring benefits without raising competition concerns (so long as horizontal acquisitions avoid raising concerns of unwarranted market power) with one major exception, the integration of the rail infrastructure business with train operations. With only accounting separation between these businesses it is difficult to guarantee absence of discrimination between DB train operations and competitors in the allocation and pricing of track access and ancillary services. The German competition regulator has in the past required changes in DB's infrastructure charging systems to avoid discrimination but full separation would be a better guarantee of neutrality and of ensuring that public funding of infrastructure cannot leak into indirect support for other activities (e.g. making debt available from banks on more favourable terms than it otherwise would be). That said, non-incumbent block train and incumbent short line freight rail operators account for more of the market in Germany (16% in 2006) than in most other European countries, suggesting barriers to new entrance are higher in some countries that have fully separated infrastructure from operations (IBM, 2007). It may also reflect profit opportunities in the German market rather than favourable conditions on entry.

The most problematic aspect of vertically separated railways is the distance created between the monopolistic infrastructure manager and the market for rail services. The regulator faces a difficult task in creating appropriate incentives. Where the infrastructure manager is required to cover a

substantial part of its fixed costs and needs to use Ramsey type price discrimination to lift cost recovery above marginal levels, it is not in a position to differentiate between shippers and commodities because it does not deal directly with shippers. Vertically integrated railways can make much better use of Ramsey pricing to cover infrastructure costs.

9. THE RISKS OF REGULATORY INTERVENTION TO PROMOTE COMPETITION

Regulators responsible for setting infrastructure access prices are frequently accused of allowing too high a rate of return on capital cost. The risks of setting rates too low are, however, higher than setting them too high as investments simply would not be made undermining quality of service and deterring expansion. This illustrates the risks associated with much regulatory intervention to promote competition. It is also a factor in explaining the advantages of structural remedies over behavioural remedies to prevent potential market power abuse. To take a recent example, the UK Department for Transport referred prices on the passenger rail rolling stock market to the Office of Rail Regulation as it believed high prices were reducing consumer welfare. In a report in 2008, the Competition Commission confirmed prices were excessive but found that the root cause was weaknesses in the process for bidding for passenger train operating concessions (franchises) that eliminate incentives for negotiating rolling stock prices. It recommended that the DfT address the issue through changes to the franchising process rather than regulating prices as the competition authorities (the Competition Commission and ORR) were not best placed to deal with the real problem.

Competition authorities have to strike a difficult balance as there are very few absolutes in the business environment. They will not always get decisions right. Appeals mechanisms are important but the length of time it takes to deal with complaints to competition authorities, in some cases up to 4 years, plus the possibility of decisions going to appeal deters companies from taking up competition cases. The costs of bringing a case are high and involve disclosure of internal intelligence to those outside the firm (including their opponents). The data requirements are onerous and the outcome is highly uncertain. There can also be risks of retribution from the company against which proceedings are initiated.

Boards of Directors will avoid bringing a competition case unless they see no other option and believe that the future of the company is so threatened that they have no other choice. From a corporate strategy perspective, they believe the competition case will be time-consuming relative to other approaches. A much shorter term and more accurate tool is a well-designed advocacy campaign. The court of public opinion can be harnessed by a well-targeted marketing campaign and the opposition can be forced to concede better terms much more quickly and without opening either firm to government scrutiny. This again gives structural remedies the advantage in terms of cost effectiveness and perhaps suggests competition authorities should have a proactive duty to keep markets under review. At the same time the costs of keeping markets under review are also high and, again, data demands imposed on companies for monitoring can be very large.

Where competition is created through structural change, wherever possible, competition in the market is to be preferred to competition for the market. This is because competition for the market requires costly monitoring of performance and because of the potential for strategic behaviour in negotiating concessions for the market. Part of the success of the US and Canadian rail reforms rests

on reliance on competition in the market rather than for the market. There is a parallel with antitrust intervention. When competition authorities find it necessary to impose conditions on mergers to preserve competition, structural remedies such as requiring divestment of businesses are to be preferred whenever possible over behavioural remedies, such as controlling tariffs, because of the costs of monitoring implementation.

10. CONCLUSIONS

A key goal of antitrust policy is to promote economic efficiency (Posner 2001)⁷. The efficiencies achieved by businesses that integrate can be offset by wider inefficiencies if integration eliminates competition. The competitive effects of integration depend on the structure of the market. This implies a case by case approach needs to be taken to assessing mergers and acquisitions. Few cases of transport markets vulnerable to elimination of competition from such integration were identified at the round table.

The competitive effects of vertical integration depend on the structure of upstream and downstream markets. In general, vertical integration is only likely to raise competition issues when there is excessive concentration in one of the horizontal layers of the market.

Railways present a potential for monopoly power through horizontal integration although most mergers in the sector have concerned complementary sections of the market rather than competing services on both sides of the Atlantic. Consolidation in US railways may have reached the point where further mergers between Class-1 railroads would eliminate competition in broad markets and these railroads are now required to demonstrate public benefits to obtain approval for mergers from the Surface Transportation Board (STB). In Europe, mergers between freight train operators have so far involved route extension through international acquisitions. They have not therefore threatened competition in existing (domestic) markets.

Port terminal operations could be vulnerable to accumulation of market power if significant shares of assets in neighbouring ports are taken over by the same company. Nevertheless, most markets can be served by multiple routes and the boundary around the relevant market for testing competition becomes increasingly large as the hinterland reach of ports increases with land side transport investments.

Maritime shipping involves increasingly large fixed costs because the ability to offer global services carries a premium and requires large fleets of vessels. This implies significant barriers to entry. Concentration might therefore be able to eliminate competition. However, large shippers have countervailing power through their ability to allocate business among competitors on specific routes. Globally, large shippers have reduced the number of companies they buy from but have acted to preserve choice route by route. On the main trade routes, shippers have not had to sacrifice competition among their suppliers in return for more global services.

Some shippers are more vulnerable to market power than others as a result of their location or the specific characteristics of the goods they produce. More generally, certain links in transport systems can be seen as essential facilities, requiring particular attention to prevent potential market power

abuse. This concerns in particular rail infrastructure within ports, when these facilities are owned by a single company and competing rail companies seek access to terminals in the port. In many cases, cooperative arrangements have resolved access problems to such essential facilities. US railways have generally reached voluntary trackage right agreements. Voluntary arrangements have resolved charging, capacity and slot allocation problems in the ports of Antwerp and Rotterdam. It is difficult to establish that facilities really are essential in competition law as it requires proof that alternative services do not exist or cannot be replicated. In rail markets, competition from road haulage is also sometimes a viable substitute under competition rules. Competition authorities are also generally reluctant to impose rights of access because of the risk of deterring investment in such facilities. These hurdles explain the preponderance of voluntary arrangements for resolving issues of access rather than imposed rights of access at published tariffs. They suggest also that governments should proactively seek to broker such voluntary arrangements at critical points of access to transport networks.

All regulatory intervention bears risks. Competition authorities and regulators do not always get decisions right. This reinforces the need for a case by case approach to competition issues rather than systemic regulation of markets susceptible to market power. Regulation can also be the source of welfare losses and de-regulation, to create competition, can be the most significant of reforms. The 1980 Staggers Act, which removed controls on rail tariffs and access rights in the US, is a clear example. Among other things, this transformed a persistent seasonal shortage of grain wagons at harvest time into seasonal pricing of wagons and a futures market in grain wagons, eliminating shortages. De-regulation might similarly improve railway performance elsewhere, in Russia for example.

Antitrust law deals with competition issues arising from changes in the structure of markets as a result of mergers and acquisitions. The existing structure of transport markets can, however, be a source of inherent inefficiency and this is not amenable to improvement by antitrust authorities. Where governments seek to improve efficiency by introducing competition through structural change this is the responsibility of transport or industry ministries, with implementation assigned to sectoral regulators rather than competition authorities. Where competition is created through structural change, wherever possible, competition in the market is to be preferred to competition for the market. This is because competition for the market requires costly monitoring of performance and because of the potential for strategic behaviour in negotiating concessions for the market. Similarly, when antitrust authorities find it necessary to impose conditions on mergers to preserve competition, structural remedies such as requiring divestment of businesses are to be preferred whenever possible over behavioural remedies, such as controlling tariffs, because of the costs of monitoring implementation.

The global reach of logistic and transport conglomerates adds an increasingly international dimension to the regulation of competition. The “effects doctrine”, adopted by most antitrust authorities, makes it possible to address potential problems arising from integration in any part of global supply chains. According to the doctrine, domestic competition laws are applicable to foreign firms, and also to the behaviour of domestic firms outside a state’s territory, whenever their behaviour or transactions produce a relevant “effect” in the domestic market. The potential to impose penalties in their own markets gives the largest antitrust agencies, in the EU, USA and Japan, sufficient reach to regulate mergers anywhere in global supply chains. These remedies are probably sufficient to regulate behaviour in international transport and logistics markets.

Price discrimination is present in global maritime shipping and logistics markets and there is evidence of higher tariffs in some thin markets. However, this appears much more likely to reflect a need to recover costs through Ramsey type price discrimination rather than abuse of market power, as the barriers to entry in these parts of the market are not excessively high.

To sum up, the key competition issue for global logistic businesses and transport services is access to essential facilities. This concerns rail terminals in particular, especially in ports. Voluntary access arrangements are generally indicated for these facilities but public authorities can have a key role in brokering agreements. Integration between businesses at different vertical levels in the supply chain risk undermining economic efficiency only when one of the parties holds monopoly power in one of the levels. The large and expanding size of freight gateway hinterlands means that in general they overlap, providing alternative, competing routes to serve shippers and horizontal monopolies are unusual in OECD countries. Class-1 freight railways in the US may have reached the limits of consolidation in this respect. In some other countries, structural change and deregulation of tariffs could bring improvements in efficiency, in the ports and railways of South Africa and Russia for example, and in Turkey, where the process has already begun.

NOTES

1. Multiple profit margins added by successive companies involved in a chain of activities to produce a good or service.
2. This experience is not unique to maritime shipping. As noted by Ivaldi and McCullough 2005, “mergers have been a dominant aspect of US railroading for almost the entire 175 year history of the industry”.
3. Under the supervision of Eddy van de Voorde.
4. See Fox, 1998.
5. Although the appropriate benchmark is the performance of companies facing similar risks to rail businesses and this may be below the average for listed companies.
6. This makes the regulation of vertically separated railways more complicated than the regulation of airports and airlines. See also Pittman, 2005.
7. Posner argues it is the only legitimate goal, suggesting transfers of income can be ignored. Others argue that transfers can be large and regressive and are therefore also a legitimate concern for antitrust policy (Pittman 2007).

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**EMPIRICAL EVIDENCE FOR INTEGRATION AND DISINTEGRATION OF
MARITIME SHIPPING, PORT AND LOGISTICS ACTIVITIES**

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SUMMARY

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Arcueil, December, 2008

1. INTRODUCTION

In 50 years, containerisation has become the backbone of globalisation. That it has done so can be attributed to the beneficial interaction of three broad types of factor: technical, economic and organisational. In the beginning, containerisation was nothing more than a simple technical innovation. However, as an intermodal tool, the container paved the way for new and long-term organisational models in the transport sector. These organisational factors challenged transport actors, who had to redefine the demarcation lines between their respective businesses in order to bring reliable door-to-door transport chains with a global reach into operation. The opportunities that containerisation offered would have remained a dead letter had they not coincided with the deep upheavals in economic factors since the 1970s. The very strong growth in international trade in manufactured products, systematically higher than growth in international trade overall – itself higher than GDP growth – marks a deeper division in international labour, which was made possible only through the support of a strong transport system.

Since its advent in the mid-1960s, containerisation has been bringing about the integration of the transport chain (Brooks, 2000). At the same time, shippers' logistics needs have been increasing steadily as they take advantage of the opportunities offered by globalisation to develop their production and/or distribution activities on an international scale and this necessitates synchronisation of their activities in space and time through the introduction of logistics chains. The management of these chains is a source of control as well as providing a source of profit for all – forwarders, maritime or inland transport operators, forwarding agents or logistics specialists – who are involved in the these chains (Heaver *et al.*, 2001).

All international transport companies now claim to be logistics operators capable of providing a customised response to the needs of their shipping clients. Meanwhile, logistics theorists, particularly academics, demonstrate the organisational and economic advantages of putting in place logistics chains integrated as closely possible with the creation of the value chain, from the pre-production of goods through to the final distribution stage. What counts is no longer transport so much as the organisation of logistics services for shippers. If they are to meet this demand, carriers would therefore have to integrate a whole series of logistics functions, which would mean extending the scope of their activities far beyond their original core business. However, one does need to question the term “logistics” and whether there actually is integration as is assumed to be the case today. Is an ordinary port-to-port maritime transport service still essential? Does the shift to door-to-door transport services mean real vertical integration of the different modes of transport by a single operator? Does this integration lead to marginalisation of a firm's original core business? Apart from actual transport, is the management of logistics chains for a shipper right from pre-production through to end distribution really as common as all that?

In order to answer these questions, we will concentrate on the biggest shipping lines. Today, they are key actors in transport chains by virtue of the global networks they have deployed (Slack *et al.*, 2002), the transport capacity they control – in 2007, over 80% of containerised traffic was concentrated in the world's top 20 shipping lines – and the opportunities that containerisation is giving them to establish themselves as logistics providers (Evangelista, 2005), chiefly because they control the

containers, which can be regarded as part of a vessel's cargo hold. Containerisation has reportedly transformed maritime operators into fully-fledged logistics firms capable of providing a basic door-to-door service but also of more extensive involvement in the management of entire logistics chains, including tracking and direct operations on the cargo itself. Our question is: is the apparent integration of logistics and port functions by shipping lines actually a reality? How does their core business as maritime lines fare with the introduction of integration, which would tend to relegate maritime transport services to second place and appears to be determined by the very nature of containerisation?

On an essentially qualitative basis, in the absence of complete quantitative data, our aim is to demonstrate that the involvement of scheduled shipping lines as logistics providers in a logistics chain is still very debatable. We will demonstrate that containerisation effectively paves the way for the processes of horizontal and vertical integration. However, the less doubt there is about horizontal integration, the more we should be questioning vertical integration. An analysis of the activity of maritime groups is convincing in this respect. With this in mind, we propose to make a clear distinction between "container logistics" and "freight logistics". The first of these is an integral part of the maritime business and is totally the responsibility of the shipping line. The second involves the direct handling of goods over and above straightforward transport provision. This distinction prompts some very strong reservations as to the actual vertical integration in the transport chain.

2. CONTAINERISATION AND HORIZONTAL AND/OR VERTICAL INTEGRATION PROCESSES

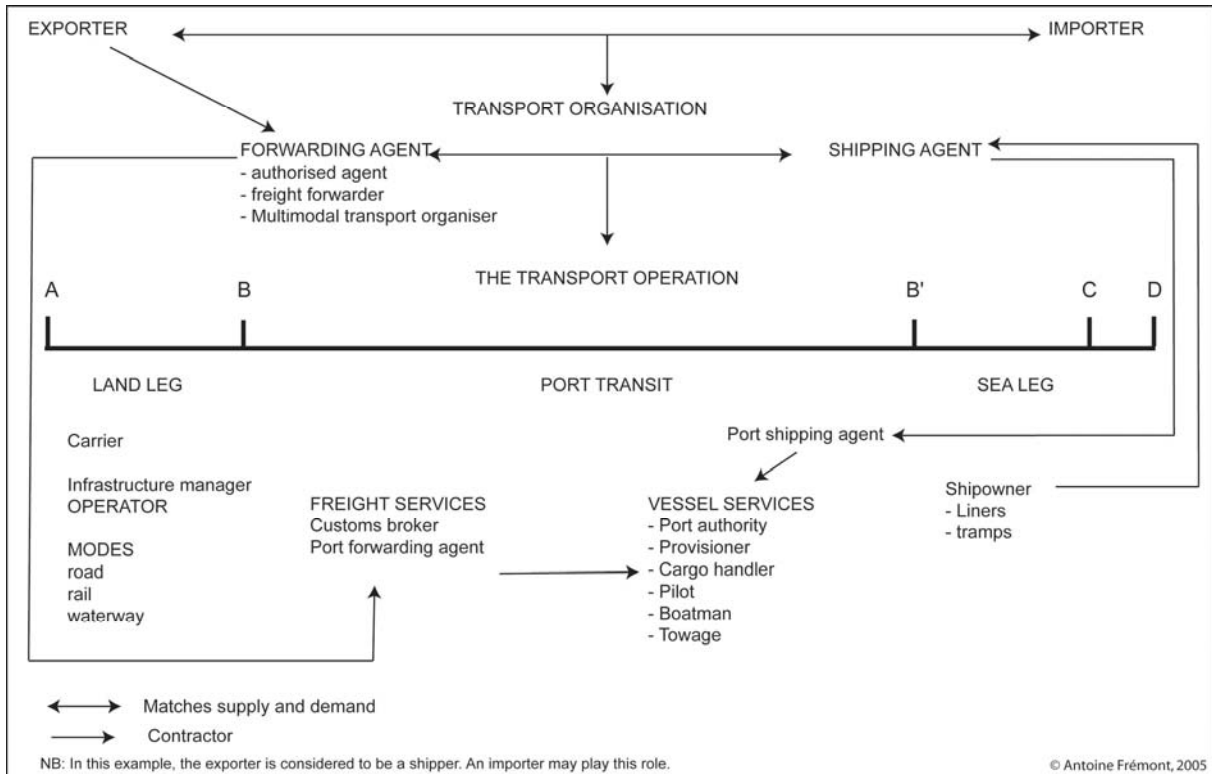
2.1. Historical segmentation of the businesses involved

Historically, international freight transport by sea required the involvement of many actors specialised in a specific task who would work to provide a service on behalf of the shipper.

The first, and fundamental, difference between the transport modes is that sea transport is confined to a port-to-port leg only. This is the business of the shipping line, be it the owner or simply the operator of the vessel. On land, road, rail and inland waterway modes compete with one another based on their respective advantages and disadvantages. Other differences between them are their principles of organisation, innovation and intramodal competition. Historically, there has been no co-ordination among the various inland modes of transport either.

From this modal perspective, organising the transport of freight by sea is a highly complex task given the number of intermediaries involved. The agent, if acting as freight forwarder, arranges transport for his shipper client, matching demand with available sea transport supply provided by a shipping agent who works in port B on behalf of the shipping line if the latter does not have a presence there itself. The shipping agent effectively gives the shipping line a presence in the port.

Figure 1. Parties involved in the sea transport chain in shipping freight from point A to point D via ports B and C



If negotiations are successful, a transport contract is drawn up to allow the actual shipping operation to proceed. The latter involves actors in the port who see that the contract is followed, particularly when cargo is being loaded and offloaded from the vessel, the very moment when the freight change hands and responsibility for them passes from the freight forwarder to the shipping line or vice-versa, with the port forwarding agent designated by the freight forwarder acting as representatives for the shipper and the freight while the ship's agent, designated by the shipping agent, acts on behalf of the shipping line. In addition, for the shipping line, numerous vessel services are indispensable for a successful port call. These are dependent on trades that each has their own history and organisation, which vary a great deal from one port to another.

Transporting freight by sea involves greater risk than using only inland transport precisely because it requires the consecutive use of several modes of transport, each with a different operating perspective. Martin and Thomas (2001) describe the port community involved in handling various goods before the advent of containerisation as a system split up among different actors. This system reflects the rigid division of the different functions and tasks designed to limit the responsibility of each for the goods in the event of damage. Despite that, responsibility can still be a grey area, chiefly when the goods are being moved from ship to shore or vice-versa with different usages and customs in different ports.

In this system, which could be called "Fordist", the international transport service is segmented into different well-structured markets: maritime transport, pre- and post-shipment carriage and the

organisation of transport. In these markets people with demand meet suppliers and enter into transactions with them. These are transactional markets.

2.2. The logistics opportunities that containerisation offers

While the intent, here, is not to give a detailed account of the numerous advantages of containerisation, there are four major advantages that have opened up new opportunities for redesigning transport chains through horizontal and/or vertical integration by the various players in the transport chain.

The first two such advantages concern mainly the sea leg of transport: port handling efficiency and reduced transport costs per unit carried, made possible by the steady increase in size of container ships. Higher volume maritime transport has facilitated consistent economies of scale over time, culminating in the reduction in the cost of port-to-port transport by scheduled shipping lines.

The third advantage is that containers are intermodal tools that facilitate door-to-door services. In the intermodal transport chain, while no individual mode loses its identity or its importance, the role of each is henceforward determined by the objectives of the system overall (Hayuth, 1992). Intermodal transport allows scheduled shipping lines to develop *hub and spoke* networks that span the globe and high-volume inland transport networks that interface with maritime networks. The reduction in transport costs no longer applies solely to the port-to-port leg; it is extending to door-to-door services as well.

The fourth advantage is the development of logistics services. Yet, how can we define these? Among the many definitions of logistics proposed is the following: all of the methods and resources deployed to manage the physical flows necessary for the seamless operation of an activity, a firm etc. Conventionally it applies to physical flows (transport and inventory management) but its methods can also apply to financial and information flows. At the level of a firm, it is a function that organises the transport and storage of goods from pre-production (raw materials procurement) to end point (product marketing) (Dufetelle, 1995). Associated with logistics is Supply Chain Management. The definition of the latter may encompass logistics itself. The entire logistics chain extends from the supplier to the end client. Production is therefore order led. It must enable the overall management of resources in order to provide the best service for actual and forecast customer demand (ASLOG, 2002). Overall management is complex since it involves the management not only of physical transport flows but also of associated information flows as well as management of the interfaces between the different actors in the chain from the producer to the end consumer, including the wholesaler and distributor and, of course, the transporter(s). In order to achieve its primary objective, which is to reduce inventory as much as possible with the aim of just-in-time provision in order to have “the right product in the right place at the right time”, to quote the well-known slogan. Supply chain management relies on information on everything from demand right up to the data necessary for distribution including actual design and production (Damien, 2001). It needs to rely on an information system.

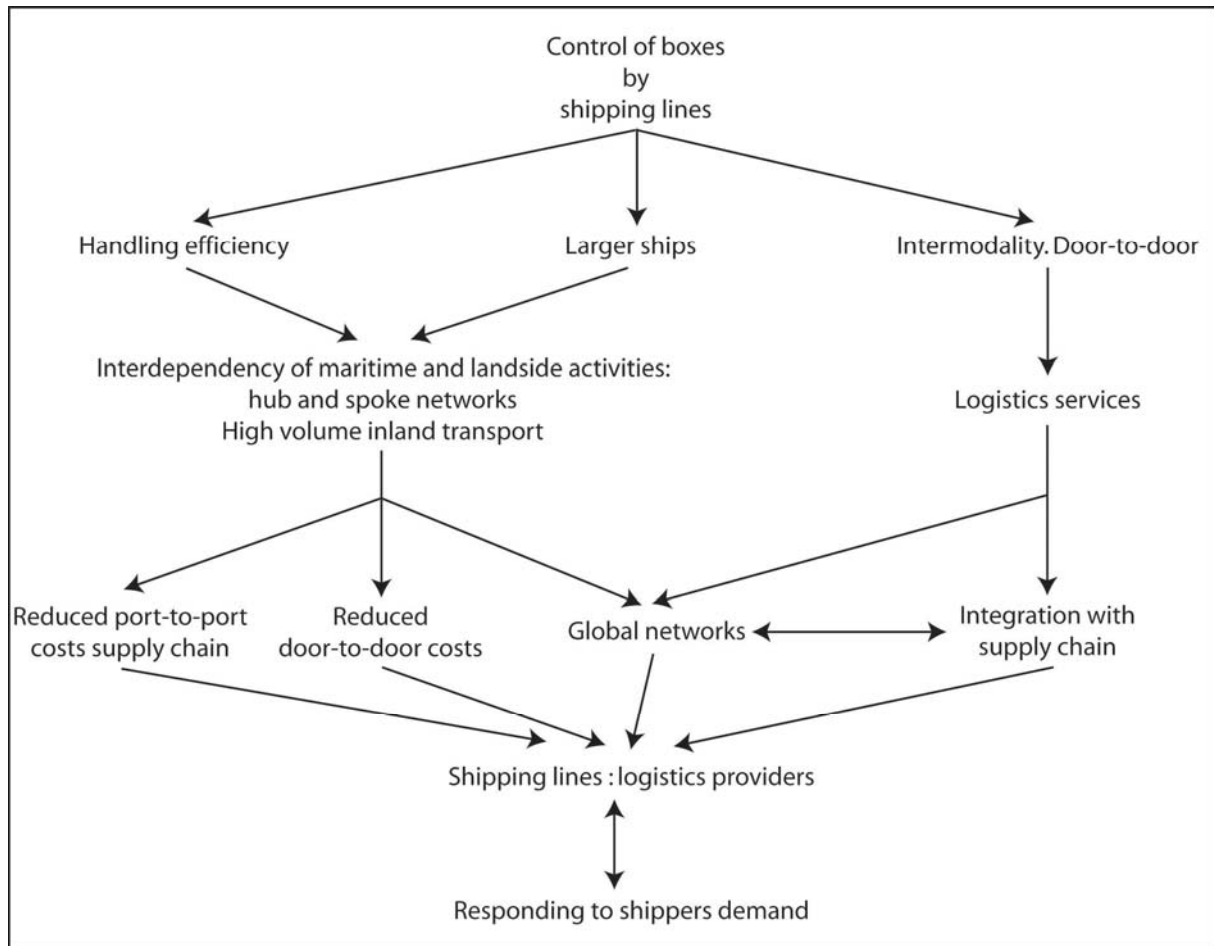
A container operator that provides a door-to-door service or even just a quay-to-quay maritime service is in the logistics business. His service as “just” a carrier aims to optimise physical flows of goods using an intermodal transport unit. Better handling, large ships, intermodal transport, higher volume transport and the hub technique are complementary tools that serve optimisation. Yet they concern only the actual transport segment.

Apart from transport service provision, however good its performance, a container operator can expand its logistics services for its client, the shipper. From operation and management of transport

supply, which requires container tracking via information systems, the operator can, in theory, graduate to goods tracking, or to performing direct operations (labelling, repackaging, bringing to standard, etc.) on goods when they pass through the warehouse stage, becoming even more extensively involved in the logistics chain. The container operator then becomes a logistics provider in the fullest sense of the term: it can turn its hand to all stages of production and consumption and tends to bring them all together into one integrated process: procurement, manufacturing, distribution, consumption, waste recovery and recycling. Its aim, in this case is not so much to minimise transport costs alone as to minimise total logistics costs while at the same time optimising logistics to meet the performance requirements stipulated by its client (Savy, 1995).

In fact, containers are particularly suited to just-in-time management, which needs to meet set schedules and maintain reliable delivery. Depending on the quantities to be transported, which may change in time and space, all that is needed is to adapt the number of containers. Containerisation also allows the regular transport of small deliveries by consolidating goods from different origins in the same container (LCL-Less than Container Load as opposed to FCL-Full Container Load).

T.D. Heaver (2002a) lists the potential advantages of this type of integration of logistics operations for a container operator, in this case a shipping line. Demand from any given client for one activity may support another. Just as airlines build hotels in order to fill their planes, a container operator may supply a logistics service in order to fill up its containers and secure the loyalty of its customers. Economists mainly point out the opportunities to reduce transaction costs between the different components of the logistics chain by internalising them and controlling the entire chain, which makes for greater transparency. Another important source of synergies comes from shared use of an information system, which can again be expanded from the management of container flows to goods management. Lastly, integration of the logistics function enables greater business diversification thus providing better protection against business and price fluctuations in one segment of the chain or another.

Figure 2. **Scheduled shipping lines: from control of boxes to logistics services**

2.3. Vertical and/or horizontal integration scenarios

In theory, containerisation prepares the ground for full vertical and horizontal integration of the transport chain.

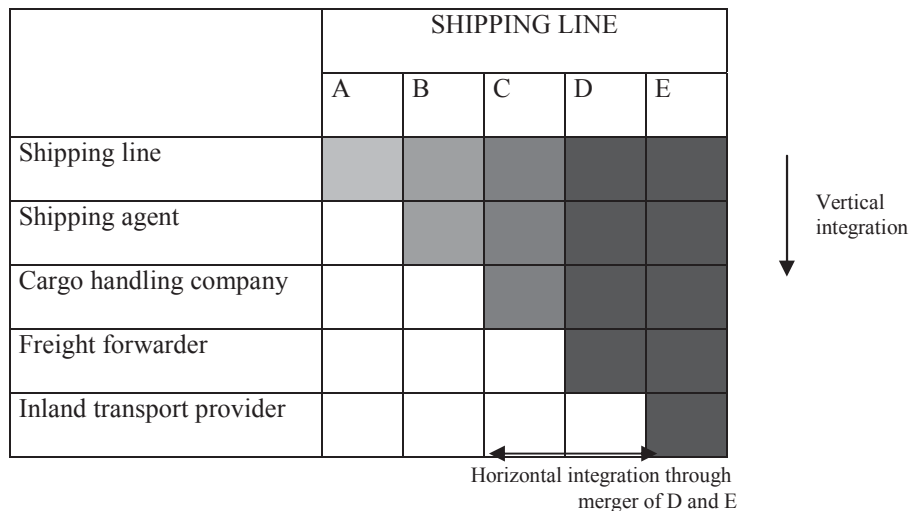
Integration may be horizontal. Containerisation encourages the emergence of very large shipping lines. This is because the economies of scale to be gained from the use of large ships and hubs are only possible for lines that control sufficiently large volumes. For a maritime carrier there are three alternatives: alliances with other shipping lines, formerly competitors but now inescapable partners; acquisition of a competitor; or, lastly, internal growth of the company. The objective of these three forms of horizontal integration, other than a general desire to increase the volumes carried, may be to increase market share on a given maritime route or, conversely, to extend the geographical coverage offered by the line's maritime networks. This latter solution does not provide any major economies of scale at the beginning since becoming established in a new market is risky and means small market shares at first unless a major operator with a presence in the same geographical sector can be bought out wholesale. The hub technique is a less risky way of doing the same thing and of reaping all of the benefits if volumes increase over time.

The choices available to shipping lines are more or less the same for cargo handlers and freight forwarders, through, for instance, the establishment of networks of terminal or agencies. That said, there is one major difference between forwarders and shipping lines or cargo handlers. The business of the former requires primarily human resources to strengthen a network of agencies that facilitate contact with client shippers while the latter must first make heavy capital investments to be able to ensure maritime and landside links or large-scale handling operations.

Containerisation also facilitates vertical integration with a view to reaping all of the benefits of intermodal transport, this time, rather than economies of scale. A multimodal transport operator (MTO) replaces a piecemeal system in which the shipper used to sign separate contracts with each single-mode carrier by a single contract with a single multimodal operator, which will then be responsible for all transport over the entire journey (P&O Nedlloyd, 2003). Theoretically, it could replace all of the actors who ensure part of the transport operation, each from their own individual business-specific perspective, and organise the most streamlined door-to-door transport possible from a single business perspective, even if that would not prevent it sub-contracting one part of the transport operation or another to a specialist. Being able to respond to the needs of its clients with the widest possible range of logistics services is not the only benefit for such an MTO, it should also benefit in terms of its own internal organisation, which can be a source of savings.

Figure 3 presents different theoretical scenarios for transport chain integration in which the shipping line is the key player in the integration process.

Figure 3. **Transport chain integration based on shipping line examples**



When a shipping line integrates the functions of a shipping agent into its business, it can have its own representation in ports and is no longer dependent on an external agent, who – although he of course works for the shipping line – can also offer his services to a competitor. Primarily, this is a commercial investment to reinforce direct contact with the customers of freight forwarding agents or shippers. Besides offices in ports, it requires human capital to be in touch with the local situation in a given market.

When a shipping line integrates the functions of a cargo handler into its business, it can secure its port operations, particularly in hubs, which implies perfect co-ordination of calls by its various mother

and feeder ships. By taking over handling operations the shipping line is no longer dependent on a handling company that it does not control and can schedule its ships through a terminal that is wholly dedicated to its own operations. This requires substantial investment, which could only be justified by a high enough volume of port calls; otherwise, the dedicated terminal would be underutilised and lose money (Musso *et al.*, 1999; Haralambides *et al.*, 2002; Cariou, 2003).

As well as the functions of shipping agent and cargo handler, a shipping line may further integrate the transport chain by becoming an inland carrier, freight forwarder and/or logistics provider. It then leaves the purely maritime and port segment to engage in the inland transport segment. The shipping line moves away from its core business to encounter new sets of problems. It may become a rail or road operator, which would probably give it better control over its container fleet traffic, but it might lose the potential advantages it gains from competition between the various inland modes. Likewise, in becoming a forwarding agent or logistics provider, it broadens its commercial range by directly addressing shippers. It captures some goods that will ensure that its ships are filled but at the same time enters into potential competition with its own traditional clients, freight forwarders, and runs the risk of losing the goods.

Containerisation facilitates the transition from transactional markets to relational markets where transport supply is no longer segmented but offers a door-to-door solution to shippers, which may itself be integrated into a wider solution for the management of the shipper's supply chain. Containerisation paves the way for relational markets since it has standardized the conditions of door-to-door transport through intermodality.

2.4. Limits of integration

Integration of the transport chain is anything but straightforward. It calls into question long-established relationships between clients and suppliers who go from being partners bound by commercial contracts to potential competitors. In any given port, a cargo handler which yesterday worked for shipping line A loses that line's traffic as soon as it begins to handle its own cargo. To offset the loss, the cargo handler must turn to other shipping lines and becomes a *de facto* competitor of the handling company set up by shipping line A. Likewise, will a forwarding agent who has traditionally handled traffic for the line continue to do so if shipping line A develops its own freight forwarding or customs brokerage service and is immediately faced with the temptation of poaching customers from its former forwarding agent?

For the shipper client, a horizontally and vertically integrated transport chain raises the problem of competition in a situation that could turn into a monopoly. True, integration allows the shipper to benefit from a door-to-door service and to outsource logistics so that it can concentrate on its core business. This is the "one-stop shop" idea: a single container operator, carrier and/or logistics provider offers its shipper clients a whole range of services to meet their logistics needs through its worldwide agency network (Panayides, 2002). However, total outsourcing can also make shippers heavily reliant on the service provider. Faced with a potential monopoly situation as a result of significant vertical integration or with logistics services that could make them dependent compared with conducting their own activity, it is in shippers' best interest to promote competition between the various actors in the transport chain.

Lastly, integration of the transport chain comes up against the financial, technical and human-resource capacity of the different actors involved. By definition, these capacities are limited and uneven across firms and this inevitably entails trade-offs between strategies which would promote the extension of geographical coverage or increase the volume of operations (horizontal integration) and

strategies which would lean towards broadening the company's range of business and services (vertical integration). It all depends on market share, income and expected return on investment (Heaver, 2002a). In other words, it is impossible for one group – one forwarding agent, cargo handler, or shipping line, however powerful it may be – to do everything, everywhere, all at the same time. It has to choose.

Hence, differentiated transport chains, integrated or otherwise, are being established and are starting to compete with each other. While economists stress the greater potential efficiency of integrated chains compared with chains involving several contractors (Frankel, 2002; Robinson, 2002), which remains to be demonstrated in practice, let us simply bear in mind the variety of possible situations.

3. A STRONG HORIZONTAL INTEGRATION DYNAMIC, LIMITED VERTICAL INTEGRATION

3.1. Horizontal integration in practice

Horizontal integration is not in doubt, whether in the case of shipping lines, cargo handlers or forwarding agents/logistics providers. In 1980, the top 20 shipping lines accounted for 45% of world container traffic capacity. In 2000, their share had risen to 52% and to 82% in 2007. In the same years, the share of the top five operators rose from 17% to 24% and then to 43%. Since the year 2000, this concentration dynamic has been accelerating sharply. The system of global alliances that are bringing together essentially Asian shipping lines also warrants mention. Through mergers/acquisitions or alliances, the goal of shipping lines has been to set up global maritime networks capable of providing high-frequency, high-capacity services to the world's three main economic centres, East Asia, North America and Europe.

Table 1. Share of the world's top 20 shipping lines, 1979-2007:
in % of world fleet (million TEU)

	1979	1989	2000	2004	2007
20 LEADING SHIPPING LINES	44.1	32.8	52	62.3	82.3
of which: European lines	21.5	8.6	21.2	28.2	45.5
North American lines	12.7	4.5	0	2.1	0
Asian lines	9.9	15.7	27.6	30.2	34.7
World Fleet (million TEU)	951	2 995	6 490	9 088	11 629

Source: *Containerisation International*, various issues.

Table 2. **The top twenty shipping lines in November 2008, in % of world fleet capacity in TEU***

Rank	Operator	Nationality	%
1	Maersk	Denmark	15.7
2	Mediterranean Shg Co	Italian/Swiss	11.1
3	CMA-CGM	France	7.6
4	Evergreen Line	Taiwan	4.8
5	Hapag-Lloyd	Germany	3.8
6	COSCO Container L.	China	3.8
7	APL	Singapore	3.8
8	CSCL	China	3.4
9	NYK	Japan	3.2
10	Hanjin / Senator	South Korea	2.9
Share of Top 10			60.2
11	MOL	Japan	2.9
12	OOCL	Hong Kong	2.8
13	K Line	Japan	2.5
14	Yang Ming Line	Taiwan	2.4
15	Hamburg Süd Group	Germany	2.3
16	CSAV Group	Chile	2.2
17	Zim	Israel	2.2
18	Hyundai M.M.	South Korea	1.9
19	PIL (Pacific Int. Line)	Singapore	1.4
20	UASC	United Arab Emirates	1.2
Share of top 20			82.0
World total			100.0
of which			
European shipping lines			40.6
Asian shipping lines			35.8

* The capacity of the world fleet is estimated at 12.9 million TEU.

Source: Alphaliner.

Table 3. **The three major alliances in April 2008, capacity in million TEU**

	TEU million	Members
CKYH	1.4	Coscon
		K Line
		Yang Ming
Grand Alliance	1.3	Hapag-Lloyd
		NYK Line
		MISC
		OOCL
The New World Alliance	1.0	APL
		Hyundai
		Mitsui OSK Lines

Source: K Line Annual Report, 2008.

Similarly, since the end of the 1990s, a few terminal operators have dominated the market. They have developed worldwide terminal networks always targeting the three main centres of the world's economy. They may be exclusively terminal operators, subsidiaries of shipping lines or may even still be an integral part of a shipping line's business without actually being a separate subsidiary. The share of world cargo handlers in port handling operations was only 18 per cent in 1996. Ten years later, it had increased to 70 per cent and investment programmes now in progress should further reinforce the trend.

**Table 4. World's top 10 cargo handlers in 2006,
in % of TEU throughput of world ports***

Rank	Operator	Nationality	Core business TO/S**	%
1	HPH	Hong Kong	TO	13.8
2	APM Terminals***	Denmark	TO	11.8
3	PSA	Singapore	TO	10.7
4	DPW	Dubai	TO	9.4
5	Cosco	China	S	5
6	Eurogate	Germany	TO	2.7
7	Evergreen	Taiwan	S	2.1
8	MSC	Italian/Swiss	S	2
9	SSA Marine	United States	TO	1.7
10	HHLA	Germany	TO	1.5
Share of top 10				60.7
Share of world operators				70.7

* 443 million TEU handled worldwide in 2006.

** TO = Terminal Operator / S = Shipping line

*** APM Terminals is the stevedoring subsidiary of the AP Möller group, which also owns Maersk, the world's top shipping line. APM Terminals has a close working relationship with Maersk, but does not work exclusively for it.

Source: Drewry, 2007.

Lastly, a few major freight forwarders/logistics providers are making their presence felt on a worldwide scale (see Table 8). They offer their clients worldwide logistics services using their vast network of agencies. These have more often than not been set up through buyouts of local firms, triggering a vast concentration dynamic in the sector. Their activities can range from express courier delivery to total management of a shipper's supply chain. Originally, their business centred on freight forwarding. Unlike shipping lines and cargo handlers, their activities are not capital intensive.

3.2. Limited vertical integration

3.2.1 *Advantages long recognised*

As evident as it is that horizontal integration is now a reality, it remains to be demonstrated that this is the case for vertical integration. Having said that, theoretically, the advantages of moving towards vertical integration are obvious. Let us take the example of shipping lines. Vertical integration today would offer them a way of gaining comparative advantages over their competitors, particularly through the development of logistics services, for two fundamental reasons. It is becoming more difficult, if not impossible in the long term, for shipping lines to generate sustainably competitive margins by reducing maritime costs, with the cost reductions obtained from using larger vessels being so systematically wiped out by dropping freight rates when new capacity is brought into operation... except when there are unusual conditions such as very strong growth in world exports, powered mainly by China (Panayides and Cullinane, 2002; Lim, 1998). The current economic and financial crisis has brought an abrupt end to a very long cycle of growth. Secondly, for door-to-door services, the maritime cost is secondary; an estimated 23 per cent of total transport costs (Stopford, 2002). Furthermore, the increase in vessel size automatically tends to accentuate the transfer of costs from maritime to landside transport (Notteboom, 2002, 2004a). Shipping lines stand to gain doubly from vertical integration: it would enable them to control non-maritime costs, but also to consolidate their position as logistics operators in their own right so that they could gain a comparative advantage, hence sustainably competitive margins, on land when it seems impossible for them to do so at sea. Rather than merely an advantage, vertical integration appears to be a necessity.

Transport chain integration by shipping lines is not a new idea. As far back as 1966, the then president of the Swedish Shipowners' Association said that the time had come when the business of ship-owners could no longer stop short at maritime transport, but should also encompass inland transport. If ship-owners wished to confine themselves to maritime transport, they would slowly realise that they had become mere cogs in a giant transport machine. They should begin to see themselves as transport companies, not as purely maritime carriers and should forge close relationships with the other links in the transport chain¹.

However, outside of this long-term vision, vertical integration processes only really began to establish themselves from the 1980s when transport chain integration could be considered, even then, to be the great idea of the decade. This period saw mergers and acquisitions between groups involved in different stages of the transport chain. The American Sea-Land line was bought out in 1986 by the US rail company CSX after the collapse of McLean's Reynolds group. CSX along with APC, then owner of the APL shipping line, were among the biggest rail operators in the United States. The P&O group had a land arm, POETS, which provided pre- and post-shipment container haulage and routes over the English Channel as well as warehousing and distribution. The Dutch shipping line, Nedlloyd, developed the "Nedlloyd Flowmasters" concept at this time in order to show that it handled freight and information flows equally well². Conversely, forwarding agents and road hauliers became shipowners. The most well known of these at the time was the Swedish company, Bilspedition, which acquired control of Cool Carriers, the world's largest reefer shipping line, in 1988; it acquired the leading Swedish line company, Transatlantic, the same year and, in 1989, went on to buy out Gorthon Lines, the main exporter of Swedish forestry products by sea; finally, it took over Atlantic Container Line, one of the main consortia in the North Atlantic, by acquiring the stakes of CGM, Wallenius and Cunard.

Did these mergers finally deliver cohesive groups? At the end of the 1980s, it would be more accurate to say that there was diversification of the major maritime groups, with the underlying objective of potential integration of the transport chain (Gugenheim, 1990). What was the position

15 years on? Some of the examples misfired. Bilspedition's venture into maritime transport ended in 1994, only five years after its acquisition of ACL. The US rail group, CSX, parted with Sea-Land in 1999, when it tired of the very poor financial results of its maritime subsidiary. In 2004, Hapag-Lloyd totally withdrew from all logistics activities to focus solely on maritime containerised transport. It seems that integration does not always bring success.

3.2.2 In 2007, vertical integration still just as limited

In 2007, shipping lines, or the maritime groups they are part of, that have developed real logistics subsidiaries – i.e. subsidiaries that claim to be capable of providing freight forwarding, land haulage, or logistics services – are few. Of the top 12 shipping lines in 2007, all, with the exception of Hapag-Lloyd proclaim loudly and clearly that they are logistics providers. However, an analysis of their annual reports shows that only three of them have a logistics subsidiary of any size, taking turnover as a measure of size: AP Möller, NYK Line and APL/NOL. The turnover of Maersk Logistics has increased substantially following the acquisition of the maritime activities of P&O Nedlloyd in the summer of 2005. Based on the information available from their annual reports, compared with the overall turnover of the groups to which they belong or even with the turnover generated by shipping line activities, the turnover of these logistics subsidiaries clearly accounts for a really significant share in only two companies: the Japanese group, NYK and, to a lesser extent, the AP Möller Group. Otherwise, logistics is a secondary activity.

In contrast, in 2007 just as in the 1980s, the vertical integration strategies followed by shipping lines have been confined mainly to handling operations (Slack *et al.*, 2005) and, in North America, to the operation of rail bridges made possible by the US Shipping Act of 1984.

Table 5. **Subsidiaries involved in port handling, intermodal transport and logistics activities of shipping lines in 2007**

Group	Shipping line	Port handling	Intermodal	Logistics
AP Möller Group	Maersk	APM Terminals	ERS	Maersk Logistics
CMA-CGM Group	CMA-CGM		RSC Progeco LTI France CMA Rail	CMA-CGM Logistics TCX Multimodal Logistics
China Shipping Container Lines	CSCL	China Shipping Terminal		China Shipping Logistics
Neptune Orient Lines	APL	APL Terminals		APL Logistics
NYK Group	NYK	Terminal & Harbour services		NYK Logistics
Mitsui OSK Lines	MOL			Logistics
Hanjin	Hanjin shipping			Hanjin Logistics
Orient Overseas International	OOCL	Terminal operations		OOCL Logistics

Source: Annual Reports of shipping lines.

Table 6. Logistics activities of the top 12 shipping lines in 2007

Shipping line	Parent company	Logistics subsidiary	Share of maritime line and logistics in total activity % *	Share of logistics in total activity % *	Share of logistics in container activity % *
Maersk-Sealand	AP Möller	Yes	52.0	5.8	11.2
MSC		No	100.0	?	?
CMA-CGM		Yes	100.0	2.7	2.7
Evergreen		No	98.5	0?	0?
Hapag Lloyd		No	100.0	0	0
Cosco		Yes	?	?	?
APL	NOL	Yes	100.0	15.1	15.1
China Shipping		Yes	?	?	?
NYK Line		Yes	48.2	21.0	40.8
Hanjin		Yes	81.5	?	?
MOL		Yes	39.6	3.2	8.0
OOCL		Yes	98.2	?	?

*: in % of turnover.

?: no data.

Source: Annual Reports, 2007.

3.2.3 Comparison of the logistics business of shipping lines and freight forwarders/logistics providers

Two main types of organisation can be identified. In the first of these, the shipping line is a subsidiary of a larger consortium-type group which, in addition to its shipping line subsidiary, may or may not have a logistics subsidiary, but also has a handling subsidiary. In this case, the link between the maritime subsidiary, the handling subsidiary and the logistics subsidiary is not necessarily direct. The three subsidiaries may conduct their business independently of each other and work for different clients. They operate as profit centres. The AP Möller and NOL groups are typical examples of this type of organisation and, to a lesser extent, so is CMA-CGM with its intermodal and logistics subsidiaries. The turnover of these subsidiaries can be identified clearly from company annual reports. Conversely, in the second type of organisation, it is impossible to identify the activities of logistics subsidiaries from the annual reports, which suggests a low level of activity and/or close or virtually exclusive relationship(s) with the maritime parent company. Handling is not set up as a subsidiary: it is therefore considered not as a profit centre but as a cost item in the integrated management of maritime lines.

A comparison of the turnover for the logistics activities of maritime groups and the world's largest freight forwarders/logistics operators also shows the limits of vertical integration. The logistics subsidiaries of maritime groups are dwarfed by the world's largest logistics operators (Tables 7 and 8). Their overall turnover is very substantially lower than the overall turnover of logistics operators. If we take into account only the maritime business of the latter, where that information is provided, they remain substantially dominant. Only NYK Logistics and probably Maersk Logistics attain a level of

business comparable to that of groups like Shenker or Panalpina. The predominance of freight forwarders /logistics operators can be seen, too, in terms of agency presence worldwide: the networks of freight forwarding/logistics companies are much thicker on the ground than networks of the logistics subsidiaries of shipping lines.

Lastly, the scope of activity covered by the logistics subsidiaries of maritime groups is not clear. The annual reports of freight forwarding/logistics companies draw a distinction between straightforward transport operations, differentiating between maritime and air, and inland transport (intermodal) and logistics, i.e. supply chain management on behalf of a shipper. This is a distinction that is not made by the maritime groups. One therefore has to ask what the term “logistics” means to maritime groups.

Table 7. Turnover by main segment of activity (in USD billion), number of agencies and number of TEU carried (in millions) by shipping lines in 2007

Group	Total	Maritime shipping lines	Terminals	Logistics	Agencies	TEU Million
AP Möller	51.2	21.1	2.5	3	200	13.6
NYK	20.7	5.2	1.1	4.3	291	?
CMA-CGM	11.8	11.5	?	0.3	650	7.7
NOL/APL	8.6	6.7	0.6	1.3	95	4.7
MOL	8.5	?	?	?	120	?
Hanjine	6.5	?	?	?	200	3.6
OOCL	5.6	?	?	?	100	4.6

Source: Annual Reports, 2007.

Table 8. Turnover by main segment of activity (in USD billion), number of agencies and number of TEU controlled by the largest freight forwarders in 2007

	Total	Freight forwarding		Inter-modal	Logistics	Agencies	TEU Million
		Air	Maritime				
DHL Logistics*	38.3	8.4	5.4	5.3	19.2	> 2000	2.8
Kuehne&Nagel	19.1	4.5	7.6	2.8	4.1	> 750	2.6
Shenker**	20.5		9.8	8.4	2.3	> 1500	1.4
Panalpina	7.6	3.7	2.8	0.0	1.2	> 500	1.2

*: DHL Logistics is a subsidiary of the Deutsche Post Group.

** : Schenker is a subsidiary of the Deutsche Bahn Group.

Source: Annual Reports, 2007.

4. THREE TYPES OF LOGISTICS

4.1. The findings of a survey

Between 2001 and 2004, we conducted a series of interviews with shipping lines in Europe and East Asia, asking them systematically to provide a definition of their activity and a description of the changes in their relations with forwarding agents. These surveys are not exhaustive, but they do provide some clear indications. The table below shows systematically the content of the answers for each shipping line with which we met. It shows the extent to which – despite the widespread but unsupported idea that containerisation is driving an ongoing revolution that is giving birth to a single, all-encompassing entity known as “logistics” – each actor’s respective activities remain very clearly identified and separate, and that their content is only changing slowly.

Table 9. **Inland carriage, relations with clients and definition of logistics: some viewpoints of shipping lines**

	Your management of pre- and post-shipment carriage	Your relations with shipper and/or forwarder clients	What is logistics?
MSC Antwerp 2004	Take advantage of competition between road carriers. Dedicated block trains in a contract with BCargo.	Forwarding agents are the main clients. Direct contact with large shippers.	Provision of door-to-door service on the basis of client demand.
Hanjin Le Havre 2001	Development of inland transport by the shipping line. Limitation of inland transport by forwarding agents. Special relations with ten local road carriers.	Partnership with forwarding agents. No transit unit and no customs operations except at the explicit request of clients.	Optimum management of container fleet.
MOL Le Havre 2001	60% of land transport controlled by shipping line, compared with an average of 40% for the port of Le Havre. Try to develop transport under the control of the shipping line, including when the client is a forwarding agent.	60% of clients are forwarding agents and 40% are direct clients, most often large shippers (Danone, Carrefour). Need to have some clients who are large forwarding agents (Shenker), who provide regular volumes. Do not encroach on the territory of forwarding agents.	Optimised management of container fleet through the European Logistic Centre of Rotterdam. Which implies, if possible, control of inland transport through carrier haulage.

P&O Nedlloyd Le Havre 2001	Subcontracting with large road haulage companies that have a network of agencies throughout France.	90% of containers handled are FCLs, mainly with forwarding agents. LCL activity is marginal. This is handled by P&O Nedlloyd GLD (Global Logistic Distribution)	Optimum management of container fleet. Manage imbalances in shipping flows.
Maersk Le Havre and Marseilles 2001	Has subsidiary Macadam for road transport but outsourcing predominates.	Maersk Logistic is a separate entity from Maersk Sealand. Consolidation (LCL) is carried out by forwarding agents, who are very large clients of Maersk.	Optimum management of container fleet.
CMA-CGM Marseilles 2001	Outsourcing for road haulage. “It is not the same business”.	Shippers do not want to have to deal with shipping lines that have a monopoly position because they would also be freight forwarders.	Before integrating logistics, a need to control port terminals. To integrate logistics, the simplest method is to purchase a freight forwarder.
Hanjin and Hyundai Seoul 2002	Weakness of door-to-door service in South Korea. 10% at most.	In South Korea, the need to use a customs declarant for customs operations.	The maritime line’s key activity is port-to-port service.
P&O Nedlloyd Singapore 2001	Outsourcing of feeding since competition is strong. Maximise relations between feeders and mother vessels. Importance of PSA for the success of this process.	Strong position of forwarding agents on the European market.	On trans-Pacific, need to develop logistics to meet shippers’ demand. P&O’s investment in logistics is recent and still generates little income.
Evergreen Singapore 2001	Same as for P&O.	Direct relations with both forwarding agents and shippers.	Evergreen confines itself to the role of maritime carrier. Logistics is not our business.
NOL Singapore 2001	Same as for P&O. When NOL took over APL, this did not include the US rail subsidiary Stacktrain.	Forwarding agents are more efficient for LCL than shipping lines.	APL Logistics is based in Oakland and organises logistics for large shippers.
MOL Singapore 2001	Same as for P&O.	As a maritime line, MOL cannot compete with the biggest forwarding agents. Ability of forwarding agents to provide volumes to fill vessels.	MOL has invested in logistics for 17 years but this activity remains limited and adapts to client demand. In Singapore, logistics provided for two clients in the field of chemicals. “The key is to remain focused on the core business, which is that of carrier”.
CMA-CGM Hong Kong 2001	Dedicated barge service on the Yangtze.	Chinese market: capture freight more rapidly than competitors by opening commercial agencies in continental China.	Chinese market: priority is to capture freight, and then to optimise flows for clients and inside the company.

Source: Surveys.

4.2. “Container logistics” and “vessel logistics”

For shipping lines, the logistics that count are “container logistics”. This consists of optimising the management of the container fleet. This fleet represents, along with vessels, a substantial amount of fixed capital. For a container vessel to operate effectively requires two to three times more containers than the vessel’s capacity, with one set of containers on the vessel at any given time and two others on shore. The cost of this large investment can be kept proportionately lower through better management of turnaround times and the time that containers are immobilised on land.

To optimise the repositioning of containers on trade routes that are by nature unbalanced, shipping lines must not lose control of container flows, including on inland segments, which explains the development of the practice of inland haulage of containers by shipping lines (carrier haulage). This allows shipping lines to triangulate³ and consolidate pre- and post-shipment carriage, using more advantageous transport modes while adapting commercial objectives to logistic constraints (Gouveral, 2002). We observe in our survey that when the pre- and post-shipment carriage is carried out mainly by sea via feeder vessels, as in Singapore, the approach of shipping lines remains identical, i.e. optimising co-ordination between mother and feeder vessels to ensure the turnaround of containers and more fully loaded vessels. These techniques of triangulation and co-ordination are easier to implement when they are based on major maritime networks and large volumes that multiply the possibilities of repositioning (Gouveral, 1998).

On the other hand, inland haulage of containers by freight forwarders (merchant haulage) does not allow the shipping line to have full control of information on its containers, which considerably hampers the turnaround of containers. At the same time, however, it is not willing to impose financial penalties on a client that keeps its containers too long, out of fear of losing its business.

The development of intermodality and door-to-door transport under the responsibility of shipping lines is taking place to the detriment of the activity of forwarding agents, who are in fact losing some of their organisational power over the entire transport process. However, what interests shipping lines is not so much to challenge forwarding agents as to optimise their container flows before and after sea carriage on their vessels. What is more, the situations differ from one market to another, most often for historical reasons. Carrier haulage, for which it is very difficult to obtain figures, predominates in North America because of the importance of dedicated rail freight services, and in the United Kingdom, where the shift in port activity from the west to the east coast has led to the disappearance of the network of UK forwarding agents. Elsewhere, in Europe and in Asia, where forwarding agents and shippers continue to play the dominant role in organising surface transport (Heaver, 2002), the share of inland transport directly controlled by shipping lines can reasonably be estimated at approximately 30% (Notteboom, 2004b). But this average conceals deep-seated differences between shipping lines. In Le Havre, the representative of MOL stated that his company had a rate of 60% and wondered how some competitors, such as CMA-CGM, managed to survive with low rates. This depends on the differing extent of involvement of companies in a given market and, with regard to CMA-CGM, on some very recent successes, which are still limited mainly to the strictly maritime component.

The involvement of shipping lines in the inland component of transport in no way means that they are buying up inland transport companies. It is limited more simply to more or less long-term outsourcing contracts with companies specialised in road, rail or waterway modes or feeder companies, for shipping lines take full advantage of the competition existing between many operators. When shipping lines announce that a dedicated rail or waterway service has been opened, it is most often for commercial reasons, but their actual involvement in terms of capital in these services is

marginal. E. Gouvernal (2003) shows that this is true with CMA-CGM's rail subsidiary, Rail Link: "Like many other rail services, RL's service provision stems from co-operation between the various existing actors. There is no new competitor in these services, nor any specific investment by a leader, but a strategy for integrating the service", by strengthening co-operation between the actors involved in different activities and who continue to focus on their core business. The Metrans and Polzug rail services (Dubreuil, 2002) from Hamburg and the services of the European Rail Shuttle (ERS), established jointly since 1994 by Maersk-Sealand and P&O Nedlloyd, mainly from Rotterdam, have this same organisational rationale even though in the case of ERS, Maersk has now entered into a phase of investment in traction.

Similarly, the extensive integration of the activities of shipping agents by shipping lines and the less widespread integration of stevedoring activities can also be interpreted as the desire of these shipping lines to gain better control of container logistics. By controlling the activities of shipping agents, shipping lines have more information on the origin and destination of containers, which enables them to have better control of seamless transport services and to set up an information system covering their entire network and thereby, once again, to optimise container flows. In the case of a dedicated terminal, the rationale is identical. No aspect of freight logistics takes precedence over the terminal, except at the margin, for dockside space is too limited and scarce to develop consolidation/deconsolidation operations there. On the other hand, the objective of a terminal, whether it is multi-client and run by a stevedoring specialist or is dedicated and run directly by a shipping line, is to minimise the negative effects of breaking bulk, which is to be "streamlined" as much as possible so that container flows to or from the vessel and the various inland transport modes will take place virtually seamlessly. The key priority is to ensure that nothing disrupts the turnaround of container vessels, which have very high operating costs, or that of large-volume inland carriers (trains and barges), although this is less important (Heaver, 2005). The process again involves this same optimising of container turnaround, which we call "container logistics".

Container logistics is very closely linked to the efficient operation of vessels, which also corresponds to a specific and widely studied type of logistics, i.e. vessel logistics. This consists of optimising the cash flow generated by a vessel while minimising the costs of operating it. Shipping lines remain shipping lines. They fit out and operate vessels. Container logistics is quite closely related to vessel logistics. Once a container ship reaches port, it becomes a puzzle that is broken up into as many boxes as it contains. The efficient operation of a container vessel, i.e. which enables it to sail with a high load factor and at least cover its fixed costs, begins on shore by bringing together as quickly as possible the pieces needed to put together again this never-ending puzzle. Container logistics, even if it broadens the activity of shipping lines to include inland components, is primarily based on a rationale of supporting maritime shipping.

4.3. Are shipping lines interested in freight logistics?

4.3.1 *The logistics of freight forwarders*

There is, consequently, beyond "container logistics", "freight logistics", which consists of controlling flows of freight and even transforming them in a process guided by various needs, ranging from those of producers to those of intermediate and final consumers. If we base our assessment on the Internet sites of shipping lines and forwarding agents and advertising in the maritime press, this activity would now appear to be widespread, to have reached maturity and to be made available to shipper clients by all carriers and logisticians. Here again, we must take this with a certain degree of caution, both with regard to shipping lines and freight forwarders.

Let us begin with freight forwarders, since this is normally their business. Those with whom we met (SDV in Le Havre, Singapore and Hong Kong; Shenker in Singapore; Rhenus Alpina and Kuehne & Nagel in Antwerp) all focused on the minor extent of the changes that have taken place in the content of their business. The business of forwarding agents can be defined simply. Both now and in the past, they make their money mainly by carrying out consolidation/deconsolidation operations on freight. Forwarding agents make a profit by reconsolidating consignments in a single container for various shippers and consignees and by charging a commission on maritime freight. They are specialists in LCL containers (Less than Container Load). The other traditional strong point of forwarding agents resides in their ability to manage all customs operations. This “primary” activity of forwarding agents can be seen to be clearly identified in the annual reports of the groups in Table 3. For example, it accounts for over 50% of the turnover of Kühne & Nagel and nearly one-third of the activity of Panalpina. These groups perform the same type of activity for air freight.

Should we use the term “logistics” to describe a simple and longstanding activity, the content of which has ultimately not changed much over time? According to one of the people we spoke with, a number of planning engineers have formalised concepts of the 1970s-80s and “*given a number of technical sounding words such as packaging or re-packaging to ordinary operations. But we have been handling freight from here and elsewhere for a long time. For many years, we have been adding value to freight at certain points on its itinerary. What does labelling lipstick destined for the United States entail? A handling worker who is paid the minimum wage takes the lipsticks out of cartons, puts them on a conveyor belt, which goes through a machine that prints information on the lipsticks, and at the other end another worker puts the lipsticks back into the carton. That’s all there is to it^A.*”

According to everyone that we interviewed, the importance of supply chain logistics, in which forwarding agents are positioned before and after the production process and manage flows of goods on the basis of the parameters provided by their shipper clients, must not be overestimated in the activity of forwarding agents. In fact, logistics only accounts for a minor percentage of the turnover of groups that have historically focused on maritime forwarding. Should this also include these groups’ inland transport activities, which can be interpreted either as being part of seamless logistic services or more simply as a mere transport service provided? These inland transport operations generate significant turnover.

Table 10. **Share of the various activity sectors in the turnover of freight forwarders/logistics operators in 2007 (%)**

	Total	Freight forwarding		Intermodal	Logistics
		Air	Maritime		
DHL Logistics	100.0	21.9	14.1	13.8	50.1
Kuehne&Nagel	100.0	23.6	39.8	14.7	21.5
Shenker	100.0	47.8	0.0	41.0	11.2
Panalpina	100.0	48.7	36.8	0.0	15.8

Source: 2007 Annual Reports.

Today, as in the past, the services provided by forwarding agents are based on an in-depth knowledge of the market, through networks of agencies whose staff is their main resource. Capital investment is very low, being limited to a few warehouses for consolidation/deconsolidation

operations. The real change in the business is due to the emergence of a limited number of global operators, who are able to offer their clients worldwide services through a global network of agencies. Information and communication technologies have made it possible to achieve productivity gains and establish these global networks, but it is by no means certain that the content of the business of forwarding agents has radically changed.

4.3.2 *Logistics and shipping lines: a myth?*

Since freight forwarders admit that they do not do much logistics, what about shipping lines, for which this is not their core business? In the annual reports provided by shipping lines, the turnover generated by the logistics subsidiary is considered as a whole, without the possibility of distinguishing between consolidation/deconsolidation activity, inland transport services or logistics contracts. In fact, the situation seems fairly simple. Line shipping operators develop direct contacts with large shippers (of automobiles, consumer goods or agri-food) who provide them with regular and large volumes of FCL containers. This privileged relationship between a shipping line and one or more large shippers can account for up to half of the activity of a shipping agency in a given port. For shipping lines this has many advantages, i.e. the guaranteed and regular filling up of vessels over a long period, since the contracts are generally for one year; identical origins and destinations of containers over time, which make it possible to ensure the continuity of maritime service; the establishment of large volume inland transport for pre- and post-shipment carriage, such as block trains and barges; and lastly, full control of the container fleet. In Antwerp, for example, MSC works for the German car manufacturer, BMW, which generates sufficiently large flows to justify its own block train to Wackersdorf, Bavaria⁵. This has been the location since 1990 of a BMW logistics centre for the redistribution of parts both inside Germany and from and to foreign countries.

Does this mean that we should speak of logistics in this case? The shipping line does deal with the freight directly, which is entirely the responsibility of the shipper. The container remains sealed. The shipping line makes money by providing a maritime transport service that it controls and that it extends to the inland segment, essentially through outsourcing agreements with land-based partners. This service meets logistic needs dictated by the shipper, who requests, for example, that containers be delivered to its warehouses on a specific day because it has scheduled this flow as part of a production and/or distribution process. But the activity of shipping lines remains strictly confined to transport and does not extend to freight logistics. A large share of FCL containers transported by shipping lines, in fact, contribute to container logistics from which these lines derive major benefits because they remain essentially maritime-oriented.

Besides this direct relationship with shippers, the main clients of shipping lines continue to be forwarding agents, since shipping lines are not interested in LCL containers as this is not their business. They prefer to leave this task to forwarding agents, with whom they do not wish to compete directly for fear of losing business, which would immediately lead to lower load factors for their vessels. When they develop these activities, they do so through subsidiaries entirely dedicated to this segment of the transport chain. In the opinion of a representative of CMA-CGM, the simplest solution for developing logistics activity is to buy a company specialised in this field, which clearly illustrates the lack of direct relations between the business of shipping lines and that of forwarding agents. When they exist, these logistic subsidiaries do not necessarily maintain privileged relations with the maritime branch of the group. For commercial reasons, the Bolloré Group has clearly separated the entities SDV and Delmas, since SDV is developing its transit activities worldwide while Delmas is specialising in the regular North-South line to and from Africa. The fact that these two activities are independent was clearly shown by the sale of Delmas by the Bolloré Group to CMA-CGM in June 2005, which provides yet another example of vertical disintegration. Inside the AP Möller and APL/NOL groups, the logistics subsidiaries, Maersk Logistics and APL Logistics, choose as maritime carriers either the

group's maritime subsidiary or another carrier depending on the market and the client, even though there is in fact a natural tie between the maritime carrier and the freight forwarder of the same group. For example, for Maersk Logistics, its objective, according to its Website, is to provide integrated logistic solutions for its most important clients. But shippers should at no time feel that they only have a single partner, who controls the entire chain and is able to impose its transport and logistics solutions and, above all, its prices (Heaver, 2002b).

The maritime groups that really develop a logistics activity in addition to their liner shipping operations remain very limited in number, i.e. APL/NOL, NYK and Maersk. These shipping lines, which might be described as consolidators, nevertheless continue to be careful to maintain good relations with forwarding agents, for they cannot do without the volumes of business that they provide. For the other shipping lines, logistics remains an activity that is limited and at the very least uncertain. It has more to do with publicity slogans than with reality.

4.4. Striking a balance between the three types of logistics

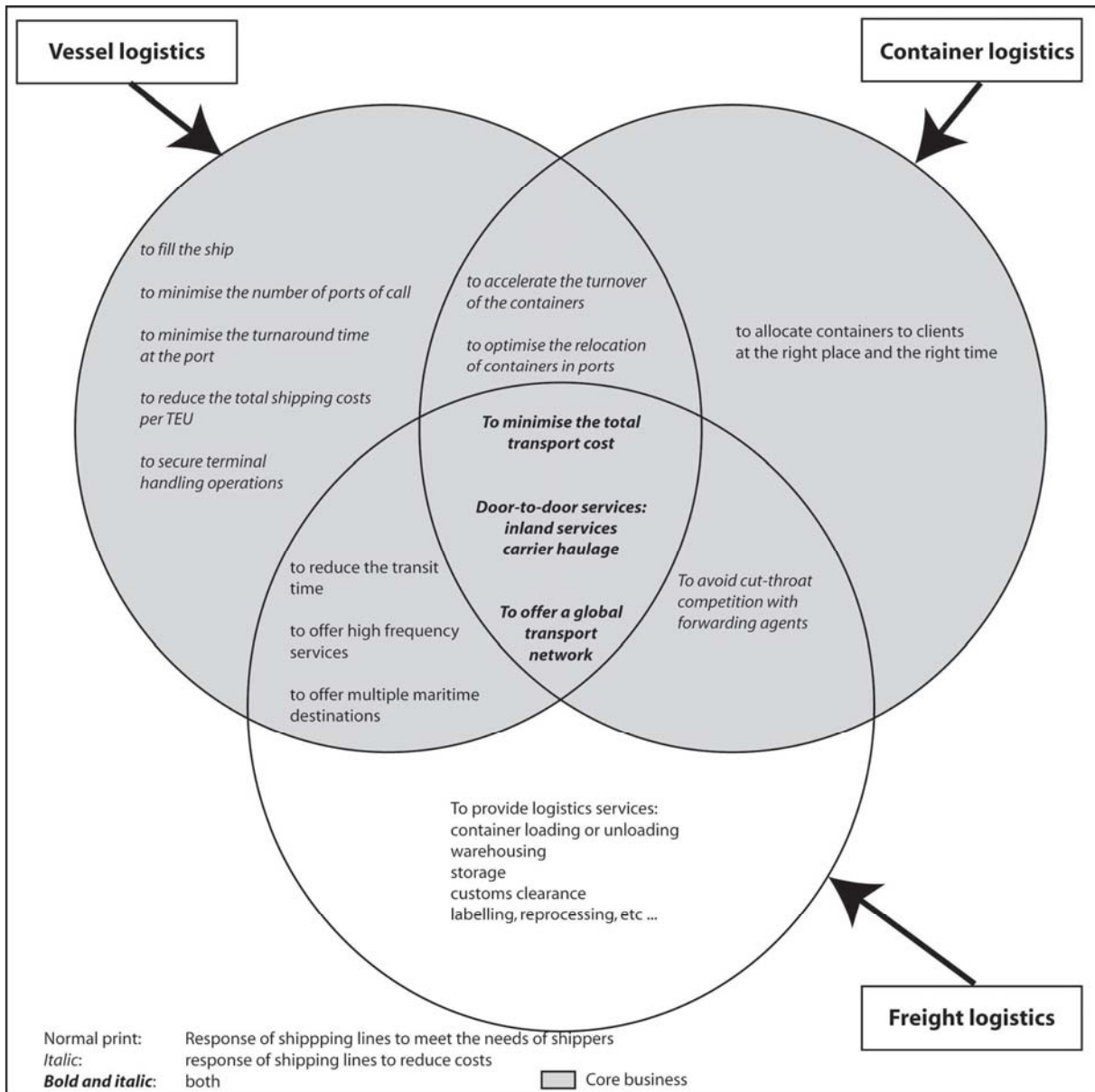
4.4.1 *Vessel logistics and container logistics predominate*

The ongoing integration of the transport chain is a fact that has profoundly altered the activities of the various transport actors. However, the magnitude of the upheavals should not conceal the fact that the process of integration of the chain is far from being complete, as is proved by the distinction made for liner shipping operators between “vessel logistics”, “container logistics” and “freight logistics”.

For liner shipping operators, the objective is to strike the right balance between these three types of logistics in order to generate maximum revenues while meeting the needs of their shipper and forwarder clients. In fact, as Figure 4 shows, the activity of shipping lines is marked by contradictions between the effort to respond to the needs of clients and the overriding need to remain abreast of competitors by reducing costs. Ultimately, shipping lines have very few means of action that enable them to go in both directions simultaneously (to reduce the total transport cost, to provide a global network and door-to-door services). Otherwise, they choose between expanding the range of services provided to their clients, which generates revenues but also additional costs, and optimising their activity, which often means responding less effectively to clients' expectations.

Between container logistics and freight logistics, liner shipping operators are initially focusing their efforts on the former, as it provides them with the greatest operational advantage for managing their maritime lines. “Container logistics” is prompting them to invest significantly in the inland segment of transport, which does not necessarily mean that they are really and deeply involved in “freight logistics”. Consequently, the real intensity of vertical integration needs to be strongly qualified. This conclusion highlights the continuing relevance of the core business of shipping lines, i.e. vessel logistics, even though the organisation of their networks of maritime lines can only be understood by taking into account their integration into larger transport chains that include inland segments.

Figure 4. The balance between three types of logistics



4.4.2 Control of inland transport chains to support the core business

It is clear that carrier haulage of FCL containers by liner shipping operators is perfectly consistent with this desire to control vessel and container logistics. It enables them to remain focused on their core business, which is maritime transport. The inland transport segments support the activity of maritime lines. In the case of carrier haulage of these FCL containers, shipping lines are able to provide a more efficient and less expensive door-to-door transport solution than what shipper clients could provide using their own resources or relying on freight forwarders. Why is this so? Because the management of inland pre- and post-shipment carriage in fact also contributes to vessel logistics, i.e. the efficient operation of maritime lines. It makes it possible to compress door-to-door transport costs, while providing an additional service to shipper clients. The same holds true for port

stevedoring, since it contributes to vessel logistics, which explains the ever-growing integration of this function by shipping lines, with the sole difference that it does not provide an additional service to shipper clients.

To manage these inland transport chains (road, combined rail/road or waterway/road transport), shipping lines cannot, to use the terms of the theory of transaction costs, simply rely on the market to provide inland transport services when needed or ensure outsourcing, for these chains are sustained over a long period of time and require relations of trust if they are to be reliable. Similarly, to internalise the chain completely (a top-down process) requires considerable financial resources and large volumes of freight to justify establishing inland transport companies. Only the group AP Möller has adopted this approach with, for example, its rail subsidiary European Rail Shuttle, even though it does not work exclusively for Maersk Line. This is why liner shipping operators prefer hybrid forms of organisation, in which they play the role of an orchestra conductor. They co-ordinate the contributions of the inland partners of the transport chain – road, rail and/or waterway carriers – particularly in setting up combined transport chains. In this way, liner shipping operators do not replace the other land transport actors, who also remain focused on their core business. However, the latter's activities are co-ordinated upstream by liner shipping operators, and this helps improve the performance of the entire transport chain. The example of CMA-CGM with its intermodal subsidiaries is a good illustration of this approach.

However, this co-ordination of the entire inland transport chain by shipping lines who set up these types of organisation is conducted with a very specific objective, i.e. to contribute to the efficient operation of shipping lines by extending their freight transport services to the hinterland, and by optimising the management of the container fleet, while at the same time providing an additional service to their largest shipper clients. Consequently, this integration of the transport chain by shipping lines is aimed at strengthening their core business, i.e. liner shipping.

5. CONCLUSION

Without questioning the reality of the upheavals in the organisation of transport chains caused by containerisation over the past fifty years, we argue that there is a discrepancy between the assertions of professionals and academics and the actual facts observed regarding the vertical integration of containerised transport by liner shipping operators, which have historically played a key role in all the innovations linked to containerisation. This is no doubt explained by an overworked use of the term “logistics”, without any real definition of what it means.

Despite the wide number of possibilities provided by containers, which can range from basic port-to-port service to externalised management of their freight flows by shipper clients, the core business of shipping lines remains the essential factor for understanding the greater or lesser extent of their involvement in the transport chain. The prime concern of shipping lines is to fill their vessels, which must, at the very least, generate sufficient revenues to cover their cost. Everything else is secondary or aimed at meeting this concern.

It is clear, from this perspective, that shipping lines emphasize two types of logistics, i.e. vessel and container logistics. The former leads them to become involved in ports by making major

investments in sea terminals. The latter explains why they are becoming involved in inland transport by setting up road, rail and waterway services. The latter services do meet a real demand on the part of clients, or else they would serve no purpose. However, the underlying rationale behind these services remains primarily related to liner shipping, for they are aimed at capturing freight in the hinterland, managing flows of containers and bringing them to ports at the lowest cost in order to fill vessels. Nevertheless, this involvement in inland transport most frequently remains confined to an organising role. It consists of co-ordinating the various links in the transport chain to achieve reliable and competitive door-to-door service, particularly when combined rail/road and waterway/road modes are involved. However, it is much less frequent for shipping lines to become directly involved as inland transport operators. For this, they rely on specialists that provide these services as their core business.

In terms of the core business of shipping lines, freight logistics has little to contribute, except for forcing shipping lines to become involved in a new activity that already has its own specialised operators. However, shipping lines do not have enough financial capacity to invest everywhere, which explains why they have chosen to focus on vessel and container logistics which support their core activity to enable them to remain in line with their competitors. For shipping lines, this balance can be expected to continue in coming years.

On the other hand, one could no doubt imagine vertical integration in the opposite direction, from land to the sea. Certain major logistics groups control very large volumes worldwide and have considerable financial capacity. In response to a shipping line market that is becoming increasingly concentrated, controlling the maritime segment might prove to be a judicious means of optimising services to shipper clients. However, this is a move that would have to be approved by shippers, who rarely like to depend on a single provider for their logistic services.

All this is to say, simply, that the assertions of professionals and academics are ahead of the reality observed on the ground, although, with regard to containerisation, these assertions, because of the compelling prospects that they open up, will gradually shape the reality to come.

NOTES

1. *Journal de la Marine marchande*, 30 June 1966, p. 1468.
2. “Nedlloyd: transport total”, *Journal de la Marine Marchande*, 5 October 1989, p. 2406.
3. Instead of taking an import container directly to the port, to try to reuse it directly for export from its import delivery point.
4. Transcription of an interview with a representative of SDV France in Paris in 2001.
5. *Containerisation internationale* (2004), “MSC blocktrain from Antwerp begins”, June, p. 31.

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**MARKET POWER AND VERTICAL AND HORIZONTAL INTEGRATION
IN THE MARITIME SHIPPING AND PORT INDUSTRY**

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1. INTRODUCTION

The maritime sector is undergoing constant change, as is particularly apparent in the shift in competition that has unfolded in recent years. Whereas in the past shipowners and ports used to compete with one another, the competitive struggle is now increasingly unfolding at the level of logistics chains. Today, market players are selected not so much for their stand-alone competitiveness, but on the basis of whether or not they belong to a successful maritime logistics chain. This explains why certain market players are continuously trying to gain greater control over these chains, including through vertical and horizontal alliances, mergers and acquisitions.

This contribution considers in greater detail these concerted efforts to increase market power through extensive integration. First, we deal with the competitive shifts that have occurred in the port and maritime arena. Subsequently, we look at the strategic behaviour exhibited by the main market players (shipowners, terminal operating companies, port authorities, logistics service providers, etc.) and analyse their objectives. Finally, we assess the consequences of the strategies pursued in the context of the anticipated future scenarios.

2. THE COMPLEXITY OF THE MARITIME LOGISTICS CHAIN

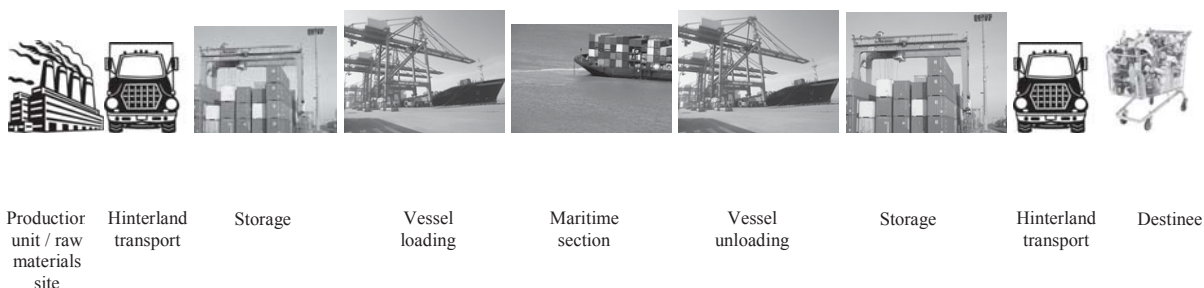
The nature of competition in the maritime and port industry has changed in recent years from a competitive struggle between individual shipping companies and ports to one involving maritime logistics chains (Suykens and Van de Voorde, 1998; Meersman, Van de Voorde and Vanelslander, 2008). In other words, competition is no longer unfolding at the level of individual ports or shipowners but rather at that of logistics chains connecting origin and destination.

Successful maritime logistics chains are like well-oiled machines in which every nut and bolt is perfectly attuned. Consider the case of seaports. Modern seaports are crucially important nodes in international logistics chains and their associated networks. The success of the logistics chain as a whole depends on the competitive strength of the seaports belonging to that chain and vice versa. A similar reasoning applies to the other maritime transport players, including shipowners, port undertakings and hinterland transport providers.

Clearly, then, the competitive strength of a port or any other maritime player does not depend exclusively on the own infrastructure and organisation; it is also affected by a variety of other market forces.¹

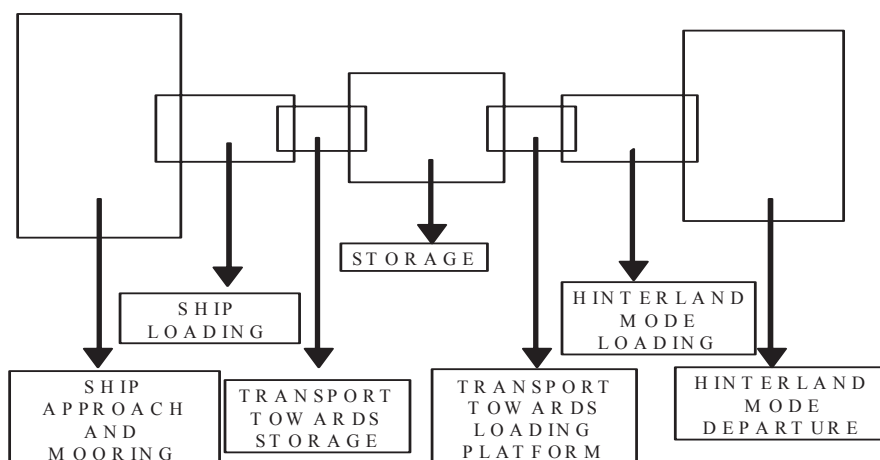
Roughly speaking, a maritime logistics chain consists of three large sections: the purely maritime activities, goods handling in the port and hinterland transport services. The formation of chains depends on three important elements: the maritime connections, the goods-handling operations (usually involving large volumes), and the distribution towards the hinterland. Figure 1 provides a schematic overview of such a logistics chain. Depending on the goods category concerned and the type of chain management applied, this structure may become more complex and possibly involve different ports of call.

Figure 1. A typology of the maritime logistics chain



If we home in on the port-related activities in the above overview, we notice that one of the most important roles of ports lies in the transfer of goods from ship to shore and from ship to ship. Jansson and Shneerson (1982) distinguish the following aspects:

Figure 2. The main activities of a seaport according to Jansson and Shneerson



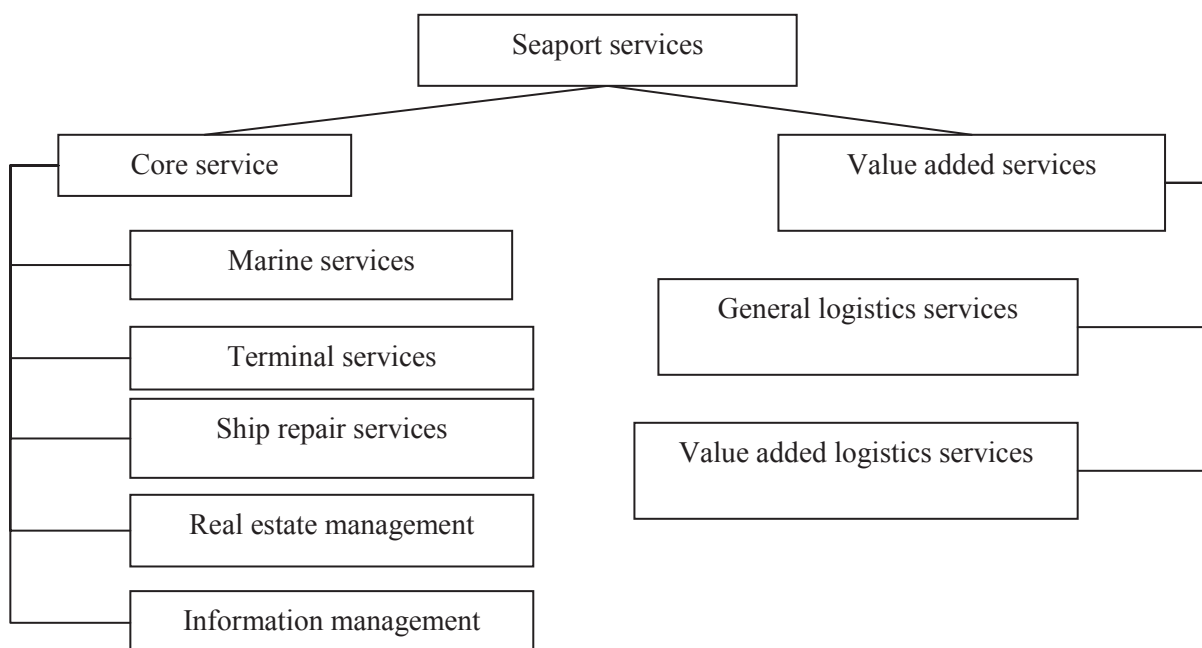
Source: Own diagram, on the basis of Jansson and Shneerson (1982).

Strikingly, the distribution function is prominent in seaports, as they usually serve an extensive hinterland.²

In the course of the 1950s, many seaports acquired a further function, in addition to trade and throughput. Because of certain agglomeration effects – consisting mainly in economies of scale, location effects and urbanisation benefits – ports were found to be excellent locations for certain types of industrial activity. Consequently, in addition to their role in trade and transport chains, they also became significant links in the industrial chain.

In more recent research, one distinguishes even more clearly between the various subactivities in seaports. Increasingly, these are so-called value-added activities, as shown in Figure 3 below. This evolution is indicative of the increasingly complex nature of seaports.

Figure 3. **Principal seaport activities according to the World Bank**



Source: Own diagram, on the basis of World Bank (2001).

The implication is that the competitive strength of seaports has become dependent on a great many variables. Vanelslander (2005) identifies 89 such variables, which may be classified as policy-related, scope-related, chain-related and terminal-specific. Some have an undeniable impact on the costs to the user and hence to the competitive position of the port. We summarise in Table 1 below.

Table 1. **Seaports' main distinguishing factors**

Factor	Possible states
Activity scope	Complete – limited
Lay-out	Tidal - non-tidal; basins - no basins
Location	Coastal – river; large - small population hinterland
Organization	Land lord – limited operating – operating
Security	High – moderate – low
Traffic	High – moderate – small; mixed – containers only – bulk only

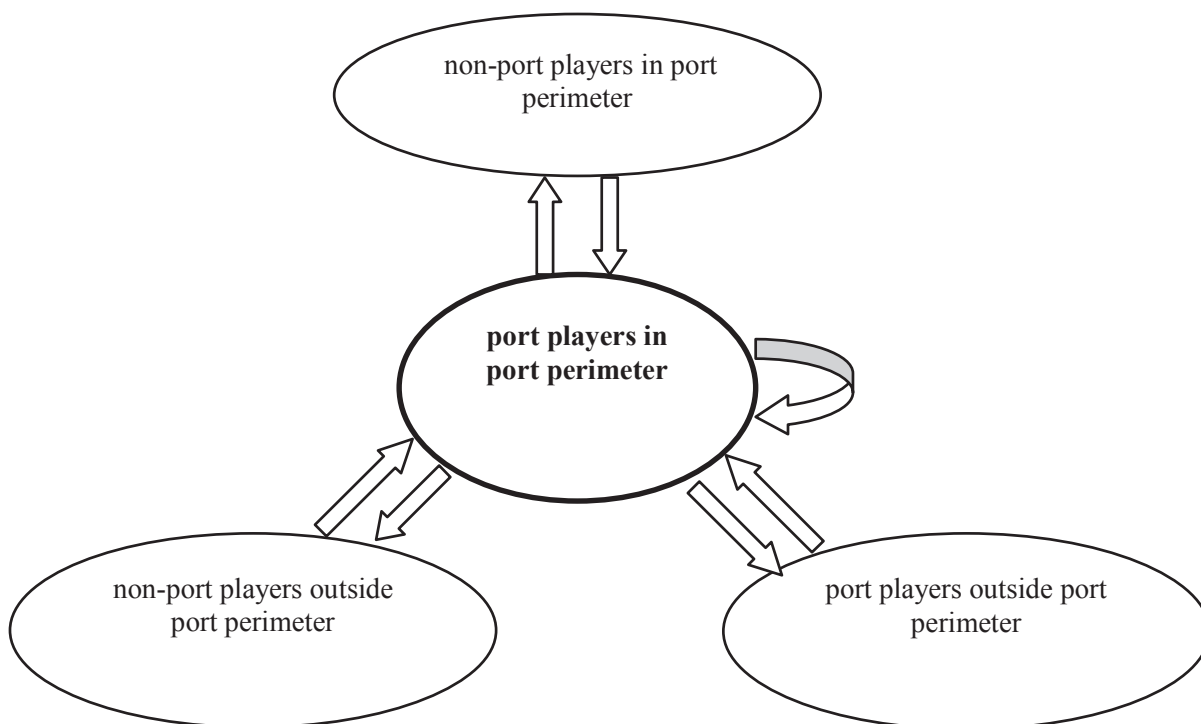
Most combinations of variables values are possible, although some combinations occur more frequently than others. Each combination is, in principle, tied to a different cost structure.

However, that is not the end of it. Seaports are, after all, made up of a variety of links. Often these are controlled or managed by different players, but some activities are also integrated across links. Each aggregated decision will therefore give rise to a chain reaction. This may in turn result in bottlenecks that are not immediately apparent.

A port encompasses more than the port authority as the governing body, the shipping companies as its principal customer and terminal operating companies (TOCs) as the main suppliers of throughput services. There are numerous other, often smaller players to take into account. Yet, hitherto, there has been a lack of insight into the relative importance, the negotiating strength and the market power of each of these players. What is required is a genuine understanding of the mutual relationships, the financial participations, and, as the case may be, forms of managerial control.

A study by Coppens *et al* (2007) considers these issues in greater depth. It takes a bottom-up approach, and consists in a sector analysis based on a regional input-output table linked to microeconomic data. In this manner, the principal clients and suppliers of all port players are identified (cf. Figure 4).

Figure 4. Relationships between port players

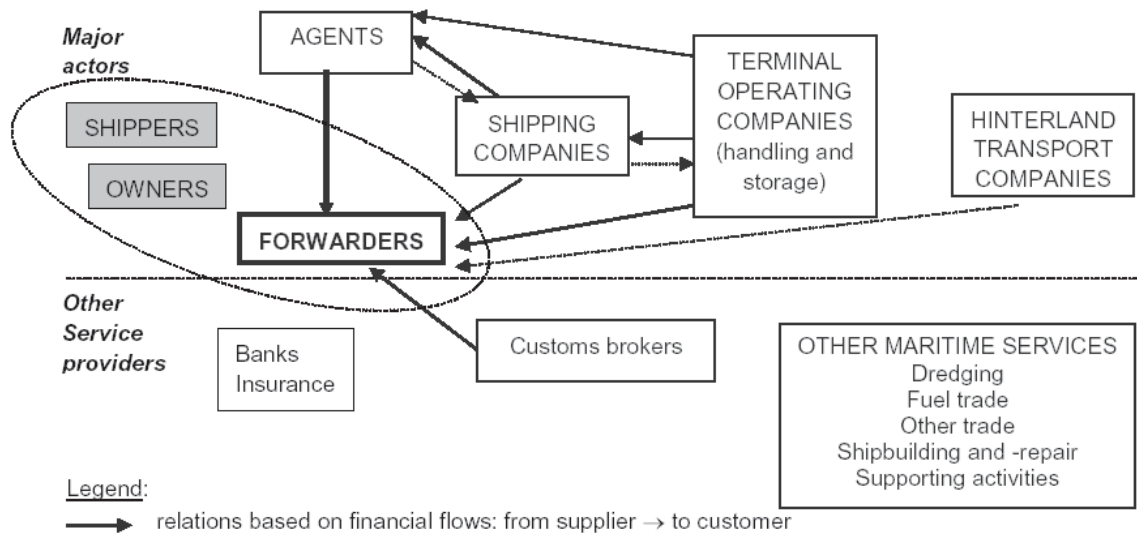


Source: Coppens *et al.*, 2007

The empirical research by Coppens *et al.* (2007) focuses on the port of Antwerp. By way of illustration, Figure 5 provides an overview of the financial flows between the various players. In the case of Antwerp, the significance and, even more so, the sensitivity of the forwarders are very apparent: many of the financial flows are generated through mediation of this activity. Substantial cargo flows reach Antwerp through consolidation. Shipping companies base their decisions regarding shipping routes and schedules on the volume of cargo. Obviously, the role of a number of other port players should not be underestimated either.³

Typical examples of such players are fuel trading and dredging. The former plays a big role in ship operations, whereas the latter has its role in the construction of shipping and port facilities. The availability of efficient fuel provision can convince a shipping company to call at a port which is at the margin, or to make it a longer stay, in both cases resulting in more cargo loading and unloading capacity. Dredging activities are an important element of capacity creation and maintenance.

Figure 5. Interactions between port-related players and their size



Source: Coppens *et al.*, 2007.

Taking a look at value added generated by smaller players, fuel trading, forwarding and hinterland transport take the biggest share, next to terminal operating activities, which has the largest share. The same ranking applies to employment, where fuel trading is replaced by supporting activities.

This kind of disaggregated analysis can help explain how the largest players (i.e. shipping companies, terminal operating companies...) will, in the longer term, try to increase their control over logistics chains, e.g. through acquisitions of smaller but strategically important players. There have already been examples of agents who became takeover targets, and terminal operators, too, may be expected to undergo or actively seek further integration with, for example, shipping companies. However, this integration will be more flexible than it has been in the past: horizontal integration, i.e.

integration between companies belonging to the same industry, shall be achieved through alliances rather than through mergers, while vertical integration, i.e. forms of closer cooperation between parties across the logistics chain, shall tend to consist in joint ventures and dedicated handling.

The potential involvement of non-port groups or even non-transport groups should not be overlooked either: they may wish to acquire control over certain activities within seaports with a view to short-term financial gain rather than the sustainability of the activities as such. It is for this purpose that activities are selected for inclusion in the portfolios of financial groups on the basis of risk and potential return, as well as the extent to which they generate value added that may be turned into profit.

3. FORMS OF INTEGRATION IN THE MARITIME LOGISTICS CHAIN

Let us now consider the consequences of cooperation between the various maritime and port players in the context of the competitive environment in which they operate. We shall take as our starting-point the following synthesis (based on, among others, Meersman, Van de Voorde and Vanelslander, 2008).

- The global economy obviously continues to be the motor of the maritime sector (Meersman and Van de Voorde, 2001; Meersman and Van de Voorde, 2006). However, that economy is also undergoing rapid change: recent years have seen enormous growth in international trade and consequently also in sea-bound trade, a process characterised by an international redistribution of labour and capital and an integration and globalisation of the markets. In the second half of 2008, however, recession set in.
- Shipping companies are strategically important clients of ports. On the one hand they attract traffic and industrial activity to the port, while on the other they are attracted by such industrial activity. Freight passes through the ports, after which drayage may be taken care of either by the ocean carrier (i.e. ‘carrier haulage’) or the shipper (i.e. ‘merchant haulage’). We have also witnessed substantial scale increases on the part of shipping companies in recent times. This has been achieved first and foremost through horizontal cooperation and/or mergers and takeovers. Additionally, shipping companies have set their sights on terminal operators and inland transport services, as operations are increasingly approached from the perspective of complex logistics chains, whereby each link must contribute to the constant optimisation of the chain as a whole. This has altered the competitive balance in the market, as shipping companies have gained in power through their overall control of logistics chains.
- We have also witnessed important structural evolutions within ports. Traditional stevedoring firms have evolved towards more complex *terminal operating companies* (TOCs), more often than not because a shortage of working capital necessitated mergers, takeovers and externally financed expansion projects. In some cases, the external capital was provided by shipping companies, many of which have established their own terminal operating branch. These may operate as *dedicated* terminals for the shipping company itself (e.g. Cosco Pacific), or they

may pursue a more independent course (e.g. APM Terminals), possibly as a multi-user terminal in order to improve the utilisation rate. Port and public authorities, for their part, initially stood by rather passively.

Clearly, then, the port and maritime industry has undergone a dynamic evolution in recent years. In this context, we refer explicitly to Heaver *et al* (2001), where the various forms of cooperation and concentration in the industry are discussed in greater detail. The proposed configuration continues to apply today, even though some players seek partnerships more actively than others do. Table 2 provides an updated overview of the great variety that exists in types of cooperation in the port and maritime industry. We restrict ourselves to shipping companies, TOCs, port authorities and hinterland operators.

As Table 2 shows, there is indeed great variety in forms of cooperation within and between the different categories of players. In the next sections, we analyse a number of specific situations in detail: horizontal co-operation between TOCs, horizontal co-operation between shipping companies, vertical co-operation between shipping companies and TOCs.

Table 2. Strategic cooperation in the maritime sector (with examples)

Players	Shipping companies	Terminal operating companies	Port authorities	Hinterland operators
	<p>* Vessel sharing agreements (e.g. CMA-CGM FAL4 and China Shipping AEX 3 on North Europe - Far East from August 2008)</p> <p>* Joint-ventures (e.g. Swire Shipping, Ahrenkiel and MOL on Tasman Orient Line between Far East and Darwin from May 2008)</p> <p>* Consortia (e.g. Hamburg Süd and Hapag Lloyd on Europe - Caribbean/WCSA)</p> <p>* Alliances (e.g. Grand Alliance: Hapag Lloyd, MISC, NYK and OOCL)</p> <p>* Mergers/acquisitions (e.g. CSAV bought remaining 25% in Companhia Libra de Navegação in July 2008)</p> <p>* Conferences (e.g. ESPMC-WITASS Conference: Container Cargo Lines, CMA CGM, CSAV, Hapag-Lloyd, Hamburg Süd and "K" Line, to be liquidated October 2008).</p>			
Stevedores	<p>* Joint-ventures (e.g. CHKY Alliance carriers (Coscon, Hanjin, "K" Line, Yang Ming) and ECT (Hutchison) at Rotterdam Euromax from September 2008)</p> <p>* Dedicated terminals (e.g. MSC at Antwerp Delwaidedok, operated by joint venture MSC and PSA-HNN)</p> <p>* Share (e.g. Tangier Med Gate: 50% Eurogate Tanger (itself 20% CoMaNav, 40% Contship Italia, 40% Eurogate) and 20%</p>	<p>* Mergers/acquisitions (e.g. MSC 51% from NYK Ceres Terminals in New Orleans Terminals)</p> <p>* Joint-venture (e.g. National Container Company (NCC, 80%) and Eurogate (20%) at Baltic Container Terminal, open 2009)</p>		

<p>Port authorities</p>	<p>CMA CGM, 10% CMA CGM subsidiary CoMaNav, as well as 20% MSC from May 2008) * Consortia (e.g. Pacific International Lines (PIL) and Container and Terminal Services (CTS) at Chittagong Container Terminal (CCT) from July 2008)</p>	<p>* Concessions (vb. Antwerp Deurganckdock by PSA and DP World since 2004) ** Joint-ventures (e.g. Ningbo Port Authority and HPH in Ningbo Beilun Port Phase II since 2001)</p>	<p>* Alliances (e.g. Port of Rotterdam and Humber Trade Zone since 2004)</p>	<p>* Alliance [e.g. Railion (DB's freight section) signed a cooperation agreement with EW&S for traffic from the Benelux countries, Germany, and Eastern Europe.]</p>
<p>Hinterland operators</p>	<p>* Block trains and capacity sharing (e.g. NYK between Rotterdam and Duisburg) * Acquisitions (e.g. Maersk acquired Roadways in UK)</p>	<p>* Joint-ventures (ECT) in Duisburg Inland Port, with own rail and inland navigation shuttles between Rotterdam and Duisburg</p>		

Source: Own processing of data from various shipping companies, stevedoring firms and port authorities; based on Heaver *et al.* (2001).

4. IN-DEPTH ANALYSIS OF HORIZONTAL AND VERTICAL CO-OPERATION AMONG SHIPPING COMPANIES AND TOCS

This section tries to identify recent trends in the kind of horizontal and vertical agreements among shipping companies and TOCs.

To begin with, mergers and acquisitions among TOCs are assessed. As Figure 6 shows, the concentration drive, which was particularly strong during the late 1990s, has lost momentum. The most recent transaction of consequence was the takeover of P&O Ports by Dubai Ports Authority, after which the company was renamed DP World. At this very moment, Spanish operator Dragados, which was previously part of a construction group, is involved in takeover talks with various operators, including HPH and DP World. It would appear, then, that preference is now given to new start-ups, be it under a joint venture or as a solo investment.

Among shipping companies, too, the takeover drive seems to have come to a relative halt too. As shown in Figure 7, the only new moves to have been registered since 2000 are the takeover of Delmas by CMA-CGM in 2005, the acquisition of P&O Nedlloyd by AP Moeller in 2006, the purchase of CP Ships by Hapag Lloyd in 2007. Alliances and vessel-sharing agreements are presently the preferred option, most probably because of the inherent flexibility offered by this type of deal.

It would appear that vertical co-operation is now applied a lot more commonly by shipping companies as a means of gaining control over port capacity. An example that comes to mind is that of dedicated operating contracts. Table 3 provides an overview of the dedicated terminal agreements involving the top-5 container shipping companies. Each of these firms is involved in a number of such agreements, most of which were reached only recently. Dedicated terminals are in many cases also linked to financial stakes being taken by the shipping line under consideration.

It is furthermore striking that eight of the top-15 TOCs are subsidiaries of shipping companies, with a varying degree of independence in decision-making. This again illustrates the importance that shipping companies attach to being involved in the terminal operating business, not so much for the sake of diversification, but rather to ensure that sufficient port capacity is available. However, the relationship between such terminal subsidiaries and their parent companies is often not equivocal or problem free, APM Terminals being a case in point. Originally a dedicated terminal subsidiary of the AP Moeller Group, under the then name of Maersk Terminals, the business unit acquired relative independence in 2002. To underline this autonomy, the headquarters were moved from Copenhagen to The Hague (Scheepvaartnieuws, 2007). At the present moment, APM Terminals still has a preferred supplier relationship with its parent company, even though it is free to – and indeed does – negotiate (dedicated) terminal handling capacity, mainly on the condition that sufficient port capacity is reserved for the parent company. The multi-user decision also depends on the strength of any other shipping companies, their shares in total port throughput and the stakes they might take in any joint ventures. It should be added that AP Moeller's interest in the overall chain is not restricted to port terminals. Maersk is also active in road and rail and was till 2005 active in the air transport business.

Figure 6. Mergers and takeovers between terminal operating companies

	1996		2001		2003		2006		2008
1	PSA		HPH		HPH		HPH		HPH
2	HPH		PSA		PSA		PSA		PSA
3	P&O Ports		APM Terminals		APM Terminals		APM Terminals		APM Terminals
4	Maersk		P&O Ports		P&O Ports		DP World		DP World
5	Sea-Land		Eurogate		Eurogate		Cosco Pacific		Cosco Pacific
6	Eurokai		DPA		Cosco		Eurogate		Eurogate
7	DPA		Evergreen		Evergreen		SSA Marine		SSA Marine
8	ICTSI		Cosco		DPA		APL/NOL		APL/NOL
9	SSA		Hanjin		SSA		HHLA		HHLA
10	Hamburger Hafen und Lagerhaus Aktiengesellschaft (HHLA)		SSA		APL/NOL		Hanjin ?		Hanjin
11	Pacific Ports Co.		HHLA		HHLA		MSC		MSC
12	Ceres Terminals Inc.		APL/NOL		Hanjin		NYK		NYK
13	Europe Combined		NYK		MSC		OOCL		OOCL
14	Bremer Lagerhaus Gesellschaft		Hyundai		NYK		CSXWT		CSXWT
15	NYK		CSXWT		OOCL		Mitsui OSK Lines		Mitsui OSK Lines
16	APL/NOL		Mitsui OSK Lines		CSXWT		Dragados		K Line
17	OOCL		OOCL		Mitsui OSK Lines		K Line		TCB
18	Hanjin		K Line		Dragados		TCB		ICTSI
19	Mitsui		Dragados		K Line		ICTSI		
20	Evergreen		TCB		TCB				
21	K Line		MSC		ICTSI				
22	Cosco		ICTSI		P&O Nedlloyd				
23	CSXWT		Yang Ming Line						
24	Terminal Contenedores de Barcelona (TCB)								
25	Yang Ming Line								
...	Hyundai								
...	Hessenatie		Hessenatie						
...	Noord Natie		Noord Natie						
...	Contship Italia sa								
...	Sinport Sinergie Portuali								
...	Egis Ports		Egis Ports						

Source: Company annual reports.

Figure 7. Mergers and takeovers between shipping companies

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
1	Maersk Line	Maersk Line	Maersk Sealand	Maersk Sealand	Maersk Sealand	Maersk Line	Maersk Line	Maersk Line	Maersk Line	Maersk Line
2	Evergreen	Evergreen	Evergreen Line/Uniglo	P&O Nedlloyd	P&O Nedlloyd	MSC	MSC	MSC	MSC	MSC
3	P&O Nedlloyd	P&O Nedlloyd	P&O Nedlloyd	Evergreen	Evergreen	P&O Nedlloyd	Evergreen	Evergreen	P&O Nedlloyd	CMA-CGM
4	Sea-Land	MSC	Hanjin/DSR-Senator	Hanjin/DSR-Senator	Hanjin/DSR-Senator	Evergreen	P&O Nedlloyd	P&O Nedlloyd	Evergreen	Hapag Lloyd
5	COSCO	Hanjin	MSC	MSC	MSC	Hanjin/DSR-Senator	CMA-CGM	CMA-CGM	CMA-CGM	COSCO
6	Hanjin	Sea-Land	COSCO	NOL/APL	NOL/APL	COSCO	Hanjin/DSR-Senator	NOL/APL	NOL/APL	CSCL
7	MSC	COSCO	NOL/APL	COSCO	COSCO	NOL/APL	COSCO	COSCO	COSCO	Evergreen
8	MOL	NOL/APL	NYK	NYK	CMA-CGM	CMA-CGM	NOL/APL	NYK	COSCO	NOL/APL
9	NYK	NYK	CMA/CGM/ANL	CP Ships	NYK	MOL	NYK	COSCO	Hanjin/DSR-Senator	Hanjin
10	HMM	MOL	CP Ships	CMA-CGM	CP Ships	CP Ships	MOL	CSCL	NYK	NYK
11	Zim	HMM	Zim	MOL	K Line	NYK	CP Ships	OOCL	OOCL	MOL
12	Yangming	Zim	MOL	K Line	OOCL	K Line	K Line	MOL	CSAV	OOCL
13	CMA-CGM	CP Ships	K Line	Zim	MOL	Zim	OOCL	Zim	MOL	K Line
14	OOCL	CMA/CGM	HMM	OOCL	HMM	OOCL	Zim	CP Ships	K Line	Yang Ming
15	NOL	Hapag-Lloyd	OOCL	Hapag-Lloyd	Yang Ming	CSCL	Hapag Lloyd	K Line	Hapag Lloyd	Zim
16	CP Ships	OOCL	Yangming	Yang Ming	Yang Ming	Hapag Lloyd	Yang Ming	CSAV	Zim	Hamburg Süd
17	K Line	K Line	Hapag-Lloyd	CSCL	Zim	HMM	CSCL	Hapag Lloyd	Hamburg-Süd	HMM
18	APL	Yangming	UASC	HMM	Hapag Lloyd	Yang Ming	Hyundai	Yang Ming	Yang Ming	PIL
19	Hapag-Lloyd	UASC	CSAV	CSAV	CSAV	PIL	CSAV	HMM	CP Ships	CSAV
20	Cho Yang	Saifmarine	Cho Yang	Hamburg-Süd	Hamburg-Süd	CSAV	PIL	Hamburg Süd	HMM	Wan Hai
		Uniglo						Delmas		
		Lloyd Triesting								
		DSR Senator								

Source: Company annual reports.

Table 3. **Dedicated terminals top-5 container shipping companies**

Shipping company	Terminal	Date of announcement	Terminal operator
Maersk	Rotterdam	1998	APM Terminals
	Bremerhaven	1999	APM Terminals - Eurogate
	Algeciras	2005	APM Terminals
	Lazaro Cardenas	2007	HPH
	Felixstowe	2008	HPH
	Tanger	2008	Maersk - APM Terminals - Akwa Group
MSC	La Spezia	1971	Eurogate - MSC
	Napels	2002	MSC - Cosco
	Bremerhaven	2004	Eurogate
	Antwerp	2005	PSA - MSC
	Valencia	2006	MSC
	Las Palmas	2007	MSC - Dragados
	Le Havre	2007	MSC
	Kumport		Limar Port and Ship Operators SA
CMA-CGM	Le Havre	2006	CMA-CGM - GMP
	Busan	2007	Macquarie - Bouygues - Hyundai - KMCT - BPA - KUKJE - KCTC
Hapag-Lloyd	Hamburg CTA	2001	HHLA - Hapag-Lloyd
Cosco	Singapore	2003	PSA

Source: Company annual reports.

5. REASONS FOR INTEGRATION

As each form of cooperation is intended to enhance the players' own competitive position, we have thus far considered them as a whole. Ultimately, though, the industrial economic purpose of respectively horizontal cooperation (e.g. between shipping companies) and vertical cooperation (e.g. between a shipping company and a TOC) is often quite different.

In the case of horizontal cooperation, the companies' optimal shape depends on the benefits of scale and scope. These are present for as long as large-scale production and service provision results in economies. Such scale and scope effects are instrumental to companies' merger and diversification strategies. They also affect pricing, entry and exit behaviour, and whether or not a long-term sustainability of the competitive advantage is feasible.

The source of economies of scale and scope are diverse (Besanko, 2007, p. 78): indivisibilities and the spreading of fixed costs; increased productivity of variable inputs, especially in consequence of specialisation; a reduction of joint stocks; engineering principles associated with the so-called 'cube-square rule'.⁴ Other sources relate to joint purchases, marketing, and R&D.

The question arises whether recent horizontal mergers in the maritime and port industry have confirmed the existence of economies of scale and scope. In the past decade, we have witnessed two evolutions: on the one hand, shipping companies have become ever larger through mergers, takeovers and organic growth, which has led to greater concentration; on the other, we have seen evidence of closer cooperation through strategic alliances. In both cases, the purpose is clearly to benefit optimally

from economies of scale and scope within the boundaries set by antitrust legislation. By way of illustration, we refer to one of the major merger operations in shipping history. One of the explicit goals of the merger between Nedlloyd and P&O in 1996 was to achieve scale benefits and thus to reduce costs (Hansen, 1997). However, the operation was not particularly successful, and the proclaimed objective was not attained. This led in turn to the takeover of P&O Nedlloyd by Danish group AP Moeller in 2005. Again, the stated objective was to realise scale benefits and to acquire even greater market power. As far as the latter goal is concerned, the merger has been successful to some extent. It has however been far less successful in achieving the envisaged scale benefits. P&O Nedlloyd gave preference to the Danish group over a number of Asian candidates (including NOL and China Shipping) because of its substantial cash stocks and in view of so-called ‘cultural similarities’ (Neleman, 2005). The extent of the latter was clearly overestimated, as the integration consumed a lot more money and effort than originally anticipated, which impacted substantially on the group’s results (USD 568 million loss in 2006, USD 202 million loss in 2007). Moreover, the expectations in terms of market share were not achieved either. In fact, on routes to and from the US, the group lost market share (Leach, 2006).

Table 4 shows that in the terminal operating business, merging groups have been more successful in increasing market share and obtaining good financial results. The top company in 2007, HPH, obtained a market share of 14% with a worldwide throughput of more than 66 million TEU, on a total throughput by all operators of 485 million TEU. The top 8 companies together represent 52% of the worldwide market. However, the picture is mixed depending on the company considered. It is striking that HPH has obtained a turnover which is relatively a lot higher than that of PSA, whereas its throughput is not that different. The difference in EBITDA is even smaller. A similar difference between turnover and EBITDA balance can be found between DP World and APM Terminals.

Table 4. **Top 8 global terminal operators – financial results and market share**

	Turnover	EBITDA	Throughput	Throughput
	Million USD	Million USD	Million TEU	share
HPH	4 864	1 649	66.3	14
PSA	3 009	1 462	58.9	12
DP World	2 731	1 100	43.3	9
APM Terminals*	2 519	404	31.4	6
HHLA	1 857	597	7.2	1
ICTSI	361	118	3	1
APL Terminals	609	113	4.5	1
Cosco Pacific	51	29	39.8	8
<i>World total</i>			<i>485</i>	

* TEU-figures based on capital share

Source: *Containerisation International*.

In the case of *vertical cooperation*, the central question is how the vertical chain can be organised most efficiently. Companies are commonly confronted with a choice between producing and purchasing, in what is known as the ‘make-or-buy’ decision. The reasons for buying may include scale and scope effects (i.e. restriction of one’s activity to the core business) and bureaucratic considerations (i.e. the avoidance of agency and lobbying costs). The choice for ‘making’ may be inspired by the

avoidance of transaction costs, or the prevention of leaks of sensitive corporate information. In reality, the two options are extremes on a continuum of possibilities insofar as degree of vertical integration is concerned. As Table 2 clearly demonstrates, the maritime and port industry is characterised by a variety of forms of vertical cooperation and integration, ranging from controlled market transactions to full vertical integration.

The impact of vertical integration on competition has been the subject of much industrial economic research, and it presents a constant challenge to the regulating authorities. Riordan (2008, p. 145) asserts in this context that “antitrust policy in the United States recognises that a vertical merger can create incentives for anticompetitive foreclosure or facilitate collusion, while remaining mindful that vertical integration can achieve efficiencies”.

As far as the maritime and port industry is concerned, insights into the objectives and outcomes of horizontal and vertical cooperation are still rather limited. There is a need for further empirical research into, among other things, the existence of economies of scale and scope. And, if they do exist, it is equally important to determine how far they reach, where their boundaries lie. If they do indeed exist and are found to be substantial enough, then we will undoubtedly see additional mergers and takeovers in years to come. It is also important that we should conduct empirical research into factors affecting scale and scope effects (e.g. coordination costs, the risk of leakage of sensitive corporate information, transaction costs...) and weigh them against each other, under various market conditions. This could help explain differences in vertical integration, including in relation to the speed at which it unfolds.

Insight is also required into the relationship between developments in the maritime and port industry on the one hand and competitive relationships and market power on the other. After all, antitrust concerns revolve around the definition of markets, the measurement of market power and the identification of that market power.⁵ In relation to horizontal mergers or takeovers involving direct competitors (e.g. shipping companies), Werden and Froeb (2008, p. 43) assert that they give rise to unilateral anticompetitive effects if they cause the merged firm to charge a higher price, produce a lower output, or otherwise act less intensively competitive than the merging firms, while non-merging rivals do not alter their strategies. Unilateral effects contrast with coordinated effects arising if a merger induces rivals to alter their strategies, resulting in some form of coordination or reinforcement of ongoing coordination.^{6 7} More specifically, there would appear to be a need for two types of research. The first type is disaggregate research into the industrial and economic behaviour of shipping companies, TOCs and other players in the maritime and port chain. One possible approach is through case studies.⁸ Additionally, there is a need for model-based and empirical research, including into the extent that pricing and production volume decisions by a single shipping company or terminal operating company may impact on the price-setting and output of other shipping companies.^{9 10}

6. CASH OR GAMBLE? A LOOK AT SOME POSSIBLE FUTURE SCENARIOS

The question arises how the industry will evolve in the future. How will port and maritime players respond to the economic downturn? How will declining economic growth translate to the maritime sector? To what extent is the slowdown tangible in industrial output rather than in services? Will the above outlined evolution towards scale increases based on horizontal and vertical mergers continue to manifest itself? And what are the likely consequences in terms of vessel size, especially in the container business? What timeframe are shipping companies looking at in their quest for further cooperation? What strategies will market players other than the shipping companies pursue¹¹? How will the maritime industry evolve in the near future? What position should port authorities assume? Will players currently operating within the port perimeter, such as terminal operators, be able to survive independently?

These are crucially important questions to the sector and its players, yet all are shrouded in uncertainty. Moreover, the market is not static, but extremely dynamic. One may therefore reasonably assume that each market player will try to anticipate on likely strategic moves by other players.

6.1. Shipping companies: further reorganisation, mergers and scale increases?

Thus far, there has been a strong integration movement mainly in the container business. Yet, precisely in this dynamic subsector, we make a peculiar observation: despite the fact that shipping companies have been complaining for some time about relatively low freight rates due to overcapacity, they continue to invest steadily in additional capacity. Table 5 provides an overview for May 2008 of the operational fleets of and vessel orders placed by the leading shipping companies.

The underlying strategy of these shipping companies is clear to see: in response to already low freight rates, they are attempting to deploy additional capacity at a lower operational cost per slot. Moreover, they consider a mixed fleet as a means of spreading risks. Additional cost control can be achieved through mergers and takeovers, and the entailed capacity reduction. Strategic and financial considerations by the holdings that control the shipping companies will keep capacity further in check, through strategic alliances, new partnerships, the rerouting of vessels. These evolutions may / will result in shifts in terms of direct port calls, which will in turn affect the volume of freight to be carried to and from the hinterland. On the other hand, it is perfectly conceivable that a port may compensate largely or even wholly for a drop in direct port calls through additional (maritime) feeder services.

Table 5. Overview of fleet sizes and vessels ordered, 2008

Owner		Operational fleet				Orders			
		Ships		TEU		Ships		TEU	
No.	Shipping Company	30/5	28/11	30/5	28/11	30/5	28/11	30/5	28/11
1	Maersk Line	550	544	2,006	2,041	71	85	325	421
2	MSC	396	432	1,289	1,437	54	56	578	668
3	CMA CGM	392	387	936	986	76	75	631	615
4	Evergreen	179	175	628	626	10	0	109	0
5	Hapag-Lloyd	139	132	505	496	14	14	123	123
6	Coscon	146	154	454	494	73	67	528	486
7	APL	127	135	428	491	33	25	234	183
8	China Shipping	133	142	421	442	34	31	234	239
9	NYK	121	113	410	417	38	32	213	182
10	Hanjin	87	89	365	373	40	34	315	288

Source: DynaLiners.

This evolution will have important consequences for the rest of the maritime logistics chain, including ports and their hinterland services. In the short to medium term, the pressure of such reorganisations will result in a profound reshuffle of services offered. New alliances will be formed, leading to further mergers and takeovers. On the side of the shipping companies, the market will stabilize, though there will of course be fewer players following the inevitable rationalisation and concentration drive¹².

In the very short run, the overcapacity which is observed in the sector, mainly due to falling demand as a consequence of the current economic and financial crisis, leads to the cancellation or slowdown of orders for new constructions where contractually possible, and to modified sailing schemes. Examples of the latter are slow steaming and temporary lay-up of vessels. In the cases where none of these are possible, for whatever contractual reason, shipping companies keep on operating their regular sailing schemes at a loss. Only companies with so-called ‘deep pockets’ can do this for a rather substantial duration of time. But for none of the companies, such situation is sustainable in the longer run. It can however be expected that the situation may return to ‘normal’ sooner or later, once the counter-reaction hitting the economy and therefore also the maritime business has been undone.

The further increases in vessel sizes may also have a profound impact in the longer-run evolution.¹³ The present state of science suggests that increasing vessel size will lead to a different cost function, among other things because of the necessity of a second engine. Moreover, shipping companies have had some unpleasant experiences with scale increases in tanker shipping, including the imposition of higher port dues. The expectation is therefore that they will not allow themselves to be manoeuvred into a situation where they have no alternative seaport, i.e. where port authorities are all too aware that ship-owners price elasticity is extremely low. Finally, benefits of scale achieved at sea may be lost through higher terminal and hinterland transportation costs due to the greater freight volumes involved.¹⁴

6.2. Additional capacity and scale increases at landside

The economic benefits shipping companies seek through far-reaching scale increases and the corresponding cost reduction must not be wasted through time and cost bottlenecks on the quay, in the terminal or during connecting in-land transport. Port authorities and TOCs are aware of this, so that they try to maintain sufficient available capacity.

Many Northern European ports intend to further expand in the short to medium term, albeit almost entirely in terms of container throughput capacity. Table 6 provides an overview of these expansion plans. The result is again quite predictable: any substantial growth in capacity will further aggravate overcapacity in the global market and at certain European terminals, where operational quays are already lying idle.¹⁵

Besides these plans for additional capacity, there is also the issue of the organisation of freight handling at terminals. Here, too, we notice a concentration movement, inspired in part by the growing need for investment capital, which the original owners are often no longer able to supply themselves. This concentration movement has also created a buffer against any attempt at vertical integration on the initiative of the shipping companies.

Obviously, the prospect of even further concentration among terminal operators poses an economic threat to shipping companies, as reduced competition may lead to lower productivity growth, longer vessel-handling times and, perhaps most importantly of all, higher handling rates. The latter evolution is primarily a consequence of the fact that shipping companies no longer have a choice between any number of rival terminal operators, but are increasingly dependent upon large players who operate in different locations and are therefore able to negotiate longer-term package deals for services in those different ports. This way, the focus of port competition is gradually shifting from the level of individual port authorities to that of terminal operators, i.e. large groups that are able to offer regional networks of services.

We may assume with a high degree of certainty that shipping companies will not be prepared to (continue to) undergo this evolution. As their relative market power is at stake, it seems logical that they should put greater effort into acquiring so-called dedicated terminals, be it under joint ventures with locally active terminal operators or otherwise. This needs not be detrimental to the port authorities' cause, as it will at least make shipping companies less footloose, in the sense that a long-term relationship is forged that makes them less likely to relocate (Heaver *et al.*, 2001). In the short term, such dedicated terminals may however lead to lower utilisation rates of available capacity.

Table 6. **Recent and planned expansion of container capacity in the Hamburg–Le Havre range**

Haven	Terminal	Unused capacity / Planned increases
Amsterdam	no structurally idle capacity, no concrete plans	
Antwerp	Deurganckdok terminals Saeftinghedok terminals?	2008: 4,000,000 TEU idle 2014? 7,000,000 TEU additional
Bremen	CT 4	2008: 1,900,000 TEU idle
Hamburg	Eurogate Container Terminal Hamburg CTH	2010: 1,900,000 TEU additional
	HHLA Container Terminal Burchardkai CTB	2010: 2,400,000 TEU additional
	HHLA Container Terminal Altenwerder CTA	2010: 600,000 TEU additional
	HHLA Container Terminal Tollerort GmbH CTT	2010: 1,050,000 TEU additional
Le Havre	Port 2000	Phase 2: 2 quay walls in a tidal terminal (2008-2009), 500,000 TEU increase Phase 3: 6 quay walls in a tidal terminal (?), 500,000 TEU increase
Rotterdam	EUROMAX terminal Maasvlakte 2	2009: 2,300,000 TEU 2013: 17,000,000 TEU
Vlissingen	Westerschelde Container Terminal	2,000,000 TEU, no specified date
Wilhelmshaven	Jadeweserport	2009: 2,900,000 TEU additional
Zeebrugge	no structurally idle capacity, no concrete plans	

Source: own table based on data from various port authorities.

6.3. A relative decline in market power for the port authorities?

The involvement of port authorities in commercial activities within the logistics chain is declining. Consequently, the market power of those port authorities and, as the case may be, the public authorities that control them is also decreasing¹⁶. In other words, managerial control over the maritime logistics chain now lies only partly with the ports and the undertakings located in those ports

In the current negotiation game between shipping companies and terminal operators, those same port authorities do however hold a strong trump card: they have the power to grant concessions and to determine their duration. Once a long-term concession has been awarded, they lose much of their market power, though. It has, for example, hitherto proven very hard to penalise concession holders who fail to achieve the objectives of their business plan. Consequently, there is an economic incentive for port authorities to award long-term concessions (e.g. 30 years), but in conjunction with mandatory interim objectives agreed upon beforehand with the concession holder¹⁷.

7. CONCLUSIONS

However, the previously outlined trends point at certain elements that can help us reduce this uncertainty to some extent. Let us briefly summarise.

We may reasonably assume that the economy and international trade will continue to grow substantially in the future, despite the current economic and financial slowdown. This trend will also manifest itself in maritime trade. There are no indications of increasing profit margins in maritime transport. This is in itself rather surprising, as ocean carriage involves a risk for which investors may reasonably expect a premium. Moreover, demand for vessel capacity is expected to rise further. Consequently, at the level of individual shipping companies, shareholders will exert constant pressure on management to improve business results. Management will in turn continue to pressurise other links in the logistics chain, including the port, the terminal operating companies and the hinterland modes, which will give rise to further verticalisation.

Some shipping companies have, in recent years, taken a number of important long-term decisions, including in relation to fleet expansion. At aggregate level, this holds a real danger of overcapacity, which would inevitably lead to further rationalisation and cost reduction through partnerships, takeovers and mergers. Such movements may, or will, result in changes in terms of shipping companies' ports of call, loops and frequency of service.

In the short to medium term, overcapacity will result in lower freight rates and lower ROI, putting additional pressure on market players elsewhere along the logistics chain. Over a slightly longer time horizon, a lack of working capital may give rise to cooperation agreements that go beyond the level of dedicated terminals.

Shipping companies will no doubt retain a degree of dominance. In the case where a shipping company, through vertical integration, has gained control of the container terminal where its vessels are loaded and unloaded, that company will of course find it relatively easy to determine in which links of the chain the greatest cost savings may be achieved by distributing resources differently so that the productivity level of the different links is modified. What is then required is for the various links to be geared to one another in such a way that productivity gains are maximised in links where the greatest cost reduction is achieved. This way, the shipping company is able to increase the productivity of the chain as a whole. In the case where a shipping company has not achieved vertical control, the impact of each action depends on the prevailing relationship between shipping lines and terminal operators. Shipping companies will, in any case, try to keep the tightest possible control over the generalised cost of a given port call. And if this should prove difficult, they will no doubt look out for the most appropriate solutions, i.e. an alternative port that is able to contribute to the lowest generalised cost.

The most likely scenarios, which therefore deserve to be studied in depth, are more or less known. However, the speed at which the various market players within the maritime logistics chain will take specific initiatives shall depend on a battery of exogenous and endogenous variables. As is the case with pricing in the maritime sector, and with successfully covering oneself against price fluctuations and other risks, timing is what ultimately determines who will emerge a winner.

All parties belonging to a given maritime logistics chain have one interest in common: to ensure that their chain is the most attractive, i.e. that it is the most efficient and the cheapest. The user, who depending on the contract is the forwarder or the destinee of the cargo, will after all consider the total cost of the chain. In order to gain insight into this aspect, additional model-based and empirical research is absolutely indispensable.

NOTES

1. Take the example of seaports. As ports are an integral part of a logistics chain, it does not necessarily make sense to consider the productivity of a terminal or port as an isolated entity. Resolving a bottleneck in one link may, after all, simply transfer the problem to another link, so that this in turn will not function optimally. In other words, an increase in productivity in one link may impose higher costs on another (Valleri and Van de Voorde, 1996, p. 127). An increase in the capacity of ships, for example, will spread the fixed cost of sailing over more containers, but it also requires a greater handling capacity, or else the bottleneck on the maritime route may be transferred to the port or hinterland services.
2. Consider the example of the Port of Hamburg. Its hinterland extends from Lisbon in the southwest to Glasgow in the northwest, St. Petersburg in the northeast and Istanbul in the southeast. There are direct departures to thirty-nine destinations outside Germany (Port of Hamburg, 2008).
3. This holds even more so for other ports, as Antwerp is typically a forwarder-driven port. Coppens *et al.* (2007) compares the situation in Antwerp with that in a number of other ports, resulting in a typology which distinguishes between forwarder-driven, agent-driven and transshipment-driven ports.
4. According to Besanko (2007, p. 85), this rule states that “as we increase the volume of the vessel by a given proportion, the surface area increases by less than this proportion”.
5. Baker and Bresnahan (2008, p. 15) define market power as the ability of firms to raise prices above the competitive level for a sustained period. Market power may be identified in different ways, including on the basis of rotation in demand, variation in observable cost components, a comparison with the conduct of competitive firms, and unusual movements in price (Baker and Bresnahan, 2008, p. 19).
6. The term ‘unilateral’ is used because the merged firm and its rivals both pursue their unilateral self-interest (Werden and Froeb, 2008, p. 43).
7. Container shipping companies continue to complain about relatively low profit margins. For example, on 2 October 2008, the going rate for a 20-foot container on the Asia-Europe route was USD 350, compared to USD 1 400 just a year before (RZD partner). This may be indicative of a very competitive market. Moreover, the EU is no longer tolerating the conference system which has existed since 1875. From this perspective, the current wave of mergers and alliances may be seen as an attempt to achieve lower average cost through scale increases, which will yield a higher return if prices remain stable.

8. An option that comes to mind is a detailed analysis of whether or not port players have, in the past, applied so-called entry-detering strategies (e.g. limit pricing, predatory pricing, capacity expansion).
9. A joint doctoral research programme is underway at the Universities of Ghent and Antwerp into the strategies of container shipping companies. One of the aspects studied is the relationship between market concentration and profitability (Sys, 2007 and 2008).
10. In this context we may also refer to the fact that, at the present moment, the antitrust authorities are focusing mostly on the coordinated effect of mergers: they have to be interpreted as the impact of a merger on the incentives to collude (explicitly or explicitly) (Kühn, 2008, p. 105).
11. In recent years, most port and higher public authorities have concentrated mainly on the container business. The question arises whether this is or has been a wise strategy. After all, not all cargo can be containerised. Moreover, the added value and profits realised in, say, project cargo are usually significantly higher than in containerised cargo.
Consider the following two (related) examples:
 - a) The petrochemical industry is extremely important to the ports of Rotterdam and Antwerp: it provides significant employment and represents substantial added value. It is, moreover, a non-footloose industry that also fulfils an important supply function to other companies and sectors. At the same time, however, it is sensitive to changes in environmental legislation and industrial policy.
 - b) The revenue realised by the major ports usually consists in a cyclical and a non-cyclical component. Revenue from concessions (to both industrial concerns and TOCs) are relatively stable in the short to medium term, i.e. they are less sensitive to cyclical fluctuations.
12. As far as the forming of alliances is concerned, there is a certain parallel to be drawn with the air transport industry. The main difference lies in the fact that, in the airline business, all major carriers belong to alliances and only the smaller companies have stayed on the sidelines, while in the maritime sector, some of the large companies have not joined an alliance (see for example MSC and CMA-CGM).
13. Will we see a further evolution towards 10 000 to 12 000 TEU, or even up to Malaccamax-sized vessels of 18 000 TEU? The answer no doubt depends on the context, but certainly there is no denying that the new generation of Maersk vessels, with a capacity of over 13 500 TEU, represent another step in that direction.
14. The question arises how far one can / should go in order to achieve economies of scale and scope. For example, in the deployment of 8 000-plus TEU vessels, the number of calls is restricted to ports handling large volumes (in the order of 1 000 to 2 000 movements). However, the system still relies on ‘hubs’, implying additional handling costs. One may reasonably assume that it will then become interesting for non-mainports to attract smaller ships (e.g. in the order of 1 500 to 2 000 TEU) offering direct origin-to-destination services, without hubbing and associated additional handling and storage costs.
15. Typical examples are Amsterdam, Cagliari, Zeebrugge and Sines.
16. The question of where market power actually resides cannot be answered unequivocally, as the situation varies from port to port. In the case of such mainports as Rotterdam and Antwerp, it is already the case that terminals are given in concession, albeit mostly under a joint venture

between a shipping company and a terminal operator. From this, we draw the following conclusions:

- a) The shipping companies and terminal operators involved appear to adhere to the saying ‘If you can’t beat them, join them’. Rather than engaging in an all-consuming competitive struggle, they prefer to collaborate. The immediate effect is, however, a new decline in the relative power of port and public authorities;
 - b) Revenues from a dedicated terminal may be higher, but now they need to be divided. In the case of a 50/50 terminal, the operator must, unlike in the past, give up 50% of profits to the shipping company. On the other hand, terminal operators thus acquire greater certainty that freight flows will be retained or may even increase in the future.
17. The proposed strategy is in any case purer than that previously applied by some port authorities in an effort to enhance their competitive position. A case in point was the move by the port authority of Rotterdam in 1999 to acquire a 35% stake in terminal operator ECT. Such action, be it temporary or on a more permanent basis, raises the spectre of conflict of interest, not in the least because the port authority continues to hold power of decision when it comes to the granting of concessions.

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**RAILWAY AND PORTS ORGANISATION IN
THE REPUBLIC OF SOUTH AFRICA AND TURKEY:
THE INTEGRATOR'S PARADISE?**

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1. INTRODUCTION

There seems to be an inevitable tendency among transport experts to focus on “their” part of the production system without looking at transport from the point of view of the customer – the shipper/receiver. The result is often either a fascination with pieces of technology or a focus on a single mode. From this point of view, concerns for “efficiency” and economies of scale tend to dominate, while the functioning of the entire door-to-door network, and especially the issues of competition within the network, often receive short shrift. One purpose of this Round Table is to correct this.

Having said this, this paper is written from the point of view of a land transport practitioner, specifically a railways expert. The author’s view of the system, its linkages and competitive forces, is shaped by this perspective. In the course of his career at the World Bank, the author has visited many ports and discussed issues of interaction with land-side modes, but will readily defer to ports experts for the details of port operation.

This paper looks in detail at the cases of two countries – the Republic of South Africa (RSA) and Turkey – that exhibit extreme cases of transport organisation. In both countries, the railway and most of the ports are under unitary control, with essentially no regulation and only limited information available to assess behaviour. If economies of scale are important, if the “integration” achieved by organisational unification is truly beneficial, and if competition is not needed to limit the behaviour of the unified organisations, then these countries should be at the cutting edge of system performance, with high efficiency, low costs and excellent service. If the reverse is true, then they furnish at least a few data points for the analysis of the importance of diversity of organisation and competition within the system.

The author is a former employee of the World Bank and has worked with Bank teams in both the RSA and Turkey. In order to avoid confidentiality issues, he has used only publicly available data or public sources of information. In all cases, opinions given in this report about the RSA or Turkey are the author’s and should not be attributed to the World Bank or any of its members or directors.

It is hard to understand or appreciate the RSA or Turkey cases without a broader discussion and framework of how the pieces of the logistics chain fit together and how competition exists within the system. This paper will begin with a brief discussion of the pieces of the system and how they fit together. It will attempt to highlight how “integration” and “competition” happen within the system in order to show, in a conceptual sense, how the RSA and Turkey differ from other countries.

2. STRUCTURAL DEFINITION AND DISCUSSION OF “LOGISTICS”

The terms “integration” and “competition” are easy to use, but are much harder to pin down in practice. In fact, they are highly complex in their nature and in the combinations or permutations that exist in the system. Integration is actually a *spectrum* of possible relationships that distinguish it from true independence, which might be defined as separate activities (or entities) that interact only at arms’ length. Degrees of integration can begin with information sharing (advance notice of arriving traffic), various kinds of co-operation (common billing), joint ventures to own facilities used in common (rail tracks or truck warehousing in a port), and extending to common ownership either in a single company or within a broader conglomerate or holding company¹.

Within the integration spectrum, there is no necessary argument that ownership should be either public or private – there are plenty of examples of both, and of mixes depending on the specific case. In practice, some pieces of the system tend to be privately owned (deep sea shipping and landside trucking), while other pieces (port real estate, aids to water navigation and roads) are almost always publicly owned. Despite differences of ownership, quite close co-operation and even joint venture ownership are possible.

Perhaps more important, the simple usage of “competition”, to imply the set of actions taken by one party to maximize its objectives in conflict with others, is at best only a partial description of the way the system actually works. Competitors may very well have multiple, unclear or even unpredictable objectives that will produce unexpected outcomes. Possible objectives could include maximizing the efficiency of the transport system; but they can also include generating the highest returns (economic and/or financial) for a distinct link or for the entire chain. Other important objectives clearly include explicit social issues such as employment generation, as well as local, regional or national development, sometimes in conflict with other localities, regions or countries. Quite frequently, since the attack on the World Trade Center, “security” concerns (more or less well defined) have become paramount. Finally, political objectives, such as various kinds of “equalisation” or cross-support from one part of the network to another, can govern the behaviour of parts (or all) of the system. Ports (sea or air) and their inland linkages are the critical foundations for commercial interaction among nations: as such, they are unlikely to be allowed to focus solely on their own interests.

Finally, in a number of cases, the underlying incentives that drive significant parts of the behaviour of the system are not sufficiently acknowledged. A good example is labour employment and wages. Because ports have an effective “monopoly” on a nation’s access to world trade, there are economic rents to be extracted from port activities if any of the port actors are so inclined. When all the ports in a country are commonly owned and/or when all of the ports have the same labour union, the rents are potentially multiplied. The same is true for customs officials who can, in some countries, extract bribes for easing cargo flow². In both cases, it can be in the interest of the parties to limit competition and inhibit linkages.

Overall, the point to be emphasized is that the interaction between structure (“linkages” or mergers) and competition or integration is not always obvious or straightforward.

Logistics has been defined as the management of the total cost of transport and distribution from producer gate to receiver gate. In simpler terms, transport is what a mode produces; effective and efficient logistical management is what the customer actually needs. Logistics necessarily involves cost, speed and reliability of transport, but also includes loss and damage, time value of inventory, handling costs at interchanges and nodes, packaging, size of shipment, etc.

In reading the papers for this Round Table, “logistics” seems to be used mostly to characterize containerised flows of relatively high-value products, and the remainder of this paper adopts this usage. It deserves emphasis, however, that bulk shippers of iron ore, grain or coal represent a significant share of international trade, and they want service to be integrated across modes from origin to destination, although the relative trade-offs between transport costs and speed and reliability of service may differ from containers.

Another important qualification is that the analysis of logistics in this Round Table seems to focus on *sea* ports. While this may be true for sheer tonnage moved, it leaves out airports that are increasingly important in cargo *value*. As an example, the largest port in the US, measured by cargo value rather than tonnage, is JFK airport in New York City. Three of the largest ten ports in the US, measured by value of cargo, are airports. It would be interesting to compare the value of the cargo received at Schipol and Frankfurt airports with the values of cargos at Rotterdam or Hamburg.

In very broad terms, Figures 1 and 2 outline the workings of the logistics network as it relates to this Round Table³. Figure 1 starts with one port serving essentially one set of internal receivers or shippers (its “hinterland”). Figure 2 expands the picture to cover two ports and two hinterlands.

Figure 1 shows a set of deep-sea carriers serving a port that may have one or more waterside facilities (quays and cranes). The port may have one or more land-side facilities for moving and storing containers and loading them onto the land-side modes. An incoming container (or other commodity) then could be loaded onto a truck, a railway or an inland barge, and each of these modes can have competing carriers. Once a container is loaded into a surface carrier, it may then go through an inland handling or consolidation facility before reaching the ultimate receiver. There can even be added links, such as rail shipment from the port to a subsequent handling facility, where shipments are then directed by trucks to final receivers.

At this level, horizontal competition could be manifested at a number of points: competing ocean carriers (Carrier 1 *versus* Carrier 2 or Carrier 3), competing water-side unloading opportunities (A *vs.* B or C), competing land-side loading and cargo management (X *vs.* Y or Z), intra-modal competition (Truck company 1 *vs.* Truck company 2, Railway *vs.* Railway), etc. There can also be intermodal competition when railways compete with trucking and inland water modes (e.g. Railway 1 *vs.* Trucker 1). Finally, there can be horizontal competition between chains: that is, the green path involving Liner 1, Port facility A, Port facility X and Trucker 1 could compete with the blue path involving Liner 2, Port facility B, Port facility Y and Railway 2.

One type of potential integration is obvious. If all of the shipping lines integrate (merge), then the port might benefit from use of larger ships, but would lose the competition among liner companies. The same could occur among port facilities, trucking companies, rail companies or inland water operators. It is harder to argue in favour of multiple port ownership and control, although ostensible concerns for managing port specialization (or national security) have caused countries to do so. These types of merger have been called “horizontal” integration, and they have been generally considered questionable because of their impact on intra-modal competition, especially when the owner is a private entity⁴. In many cases, government agencies or enterprises are allowed more market power because of the (arguable) assumption that they will necessarily act in the broader public interest.

The other type of integration, by linkage, is also clear. It is argued that the quality and cost of logistics services is affected by the connection between services: the quality of the entire linkage chain suffers if the transfer from one link to another is defective. As a result, it can be argued that allowing a liner company to own port facilities, or allowing a railway to own part of a port (or, in some cases, allowing a railway to own a trucking company) could guarantee effective and low-cost linkages and thus increase efficiency. By extension, an entire chain could be owned by one entity⁵. In theory, an increase in this type of link integration ought to increase competition at the link *versus* link level.

Depending on the structure of the system, however, linkage integration also offers opportunities to *suppress* competition. Suppose, for example, a railway owns a port (or is part of a common holding company). It is easy to see how the common entity might control trucking, competing railway or inland water entry to the port in order to favour the owning railway. There are a number of similar ways in which completing a particular link could reduce access by potentially competing participants to a crucial facility. Linkage integration is not always good: in fact, it is always a balance between potentially improved service to one shipper *vs.* denial of access to all other shippers and competitors.

Figure 2 raises the issues at a higher level, where there are competing ports, competing hinterlands and more potential carrier combinations. In this case, there are two ports competing with each other for service to hinterlands that partially overlap (see red and black paths). The efficiency of a particular port can increase the size of the overlapping area for which it can offer service.

From this perspective, more possibilities for “integration” emerge, at least some of which clearly can reduce the competition for logistics services from the point of view of the receiver/shipper. For example, if the two ports are under common control, the owner could limit competition or establish tariffs that would force traffic to travel along a desired line, which might benefit the owner but not be optimum for the shipper. Or, if there is only one railway serving both ports, the railway might well establish its tariffs in order to steer traffic through a favoured port.

As suggested above, the objectives of the owners would then become critical. If all parties are motivated by economic efficiency alone, then the flows through the system would presumably be optimum for all. If, on the other hand, any of the parties has market power and is motivated by financial maximization, then flows might well be distorted in the interest of the owner. If any of the actors is a public authority, pursuing social or political goals, then the ultimate effect on flows through the system would be unpredictable (at least on efficiency grounds): this would be especially difficult to predict if the ports, land operating companies or hinterlands are in different countries and subject to different social, political or national priorities.

The above discussion necessarily underlines the issue of regulation where market power exists. In principle, it should be possible for a potential regulator to analyse the operation of a port to determine whether the operator is abusing a market position, either by excessive tariffs or by discriminatory tariffs that favour one shipping line or one access mode over another. It should be possible to determine whether the port is acceptably efficient, and it should also be possible to regulate the tariffs and services of trucks, railways and inland waterway operators where it can be shown that they have market power.

In practice, even at the individual public operator level, it is difficult or even impossible to do so. This is partly because of the challenge of asking one public authority to regulate another (when both are subject to the same political control and neither may be seeking fully definable objectives), and partly because few public or private operators are willing (or are required) to produce and publish the information needed to analyse and control their behaviour.

This is even more difficult at the linkage or chain level, even though it is at this level that the logistics system is most affected. Even in the case of a single country, a regulator would need authority and expertise in all of the links – shipping lines, ports, trucks, railways and inland water, along with the related warehousing, interchanges, etc. It is even more difficult at the multi-country level because of conflicts of national interests and the non-existence of regulators with real multi-national authority.

With this as background, how can we use the examples of RSA and Turkey to analyse what happens when the various kinds of potential “integration” are carried to their logical extreme?

3. THE REPUBLIC OF SOUTH AFRICA (RSA) CASE

The Republic of South Africa (RSA) is one of the largest countries, and is by far the most developed economy, in Africa. Partly as a result of its wealth, and partly because of its long-standing inclusion of western capital and management skills, RSA has had a relatively well-developed transport network. Figure 3 provides a general picture of South Africa and its transport network, which includes approximately 362 000 kilometres of highways (of which about 74 000 km are paved), 21 000 km of railways, 3 900 km of pipelines and seven major sea ports.

The organisation of the rail, ports and pipelines is shown in Figure 4. The national agency controlling these three sectors is a state-owned holding company, Transnet. Transnet holds an effective monopoly in all of these sectors. Rail is further divided between the Freight Rail activity (previously known as Spoornet) and Rail Engineering (doing business as Transwerk). Ports is divided between the National Ports Authority (NPA), which owns and performs the landlord function of almost all of RSA’s ports, and Port Terminals (South African Port Operations, or SAPO) which owns and manages the operations function of almost all of RSA’s ports. Pipeline (called Petronet) owns and operates all significant petroleum pipelines in RSA. Transnet is owned and is under the nominal tutelage of the Department of Public Enterprises. To complete the picture, the highway system is under the control of the Department of Transport and its highway agency (SANRAL), which is also tasked with overall transport policy and some aspects of highway regulation.

Transnet is the successor company to South African Transport Services (SATS). SATS was formed during the days of apartheid and the non-recognition by the international community of the apartheid regime. The highly centralised and inwardly focused organisation of SATS was a response to the need to marshal all of the State’s resources and limit access to outside information as the regime struggled for survival. Transnet inherited the SATS roles and authorities and has retained them, with two significant exceptions: 1) South African Airlines was spun off, primarily because Transnet wanted to transfer the losses to the government; and 2) the rail passenger functions of the old Spoornet were spun off to the South African Commuter Corporation (SARCC) and to a new intercity passenger rail company (Shosoloz Meyl), again in order to remove the passenger financial burden from Transnet.

Transnet is a major corporation on a world scale, with total assets valued in the range of USD 10 billion and annual revenues in the range of USD 3 billion. Table 1 gives some of the details of the performance of Transnet and its divisions for the past three years. The profits of NPA and Petronet are very high, as is the return on net investment of NPA, Petronet and SAPO⁶. Spoornet’s profits are

relatively low, and because Spoornet has about 40% of Transnet's assets with only about 20% of its income, its return on net assets is much lower than the rest of the organisation.

3.1. Spoornet in perspective

Table 2 provides basic size and operational data for most of the world's railways. Spoornet is highlighted in this table (as is TCDD, to be discussed below). Overall, Spoornet appears to be a relatively large and efficiently operated railway. It accounts for about 2% of the world's track-km and carries nearly 2% of the freight tonnage (1.29% of the world's tonne-km). Spoornet's freight traffic (tonne-km) is greater than that of any EU railway. Its labour productivity [output per staff measured in Traffic Units (tonne-km + passenger-km)/Employee] exceeds all EU railways, and its traffic density (TU/km of line) exceeds all European railways except for the Baltics and Switzerland. According to South African MOT estimates, Spoornet carries about 20% of all freight tonnage and about 36% of all freight tonne-km⁷.

The appearance is somewhat deceptive, however. In fact, Spoornet contains two high-density bulk operations that are effectively distinct from the remainder of the system. One of the high-density operations – the Sishen to Saldanha iron ore line (see Figure 1) – carries about 30 million tonnes on only 880 km of line. The other high-density line – the Coal Export line from the Ermelo region to the Port of Richards Bay (see Figure 1) – carries about 70 million tonnes of coal on only 574 km of line. The entire remainder of the railway, known as the General Freight Business (GFB), carries around 80 million tonnes of mixed traffic, *including all of the containerized traffic*, on the remaining 20 000 km of line. Put another way, the two major bulk lines account for only 6.7% of the line-km, but generate 56% of the tonnage and about 60% of the tonne-km carried by the railway.

Thus, the GFB, which provides the rail part of RSA's critical container logistics linkages to the world, actually performs at density levels below those of EU countries, and almost certainly would show lower productivity levels if data were available to support the calculation⁸. Although international tariff comparisons are notoriously difficult, rough calculations indicate that the tariffs on the iron ore traffic (in PPP USD/tonne-km terms) are slightly below the levels charged by US Class I railways for iron ore. Tariffs on the coal export traffic are two to three times US Class I levels for coal, and the GFB tariffs are 4 to 7 times higher than US Class I practice for other cargos.

The physical condition of the railway mirrors its three businesses. The iron ore line is technically up-to-date: the 30 million tonne-km/km traffic density is high, the 30-tonne axle load is fully up to world best practice (typical EU practice is 22 tonnes, typical US Class I practice is 30 tonnes), and the 50 KV, 50 Hz electric traction system is highly efficient⁹. The 70 million tonne-km/km traffic density on the coal export line is quite high, and the 25 KV, 50 Hz electric traction system is standard world practice, but the 25-tonne axle load is somewhat low by heavy tonnage railway practice. Aside from these nearly world-class systems, though, the remainder of the system is in relatively poor condition, with locomotives of an average age of 25 years and increasing derailments.

3.2. NPA and SAPO in perspective

The RSA has seven significant commercial ports (Figure 1). Of these, Durban, Cape Town and Port Elizabeth handle mostly containers and higher value cargos. Saldanha Bay handles the iron ore exports from the Sishen to Saldanha line, while Richards Bay handles the coal exports from the Ermelo to Richards Bay line. The Port of Mossel Bay handles mostly bulk liquids while the Port of East London handles a mix of containers and bulk cargo. Transnet is now developing a new port at

Ngqura that will handle a mix of containers and bulk cargo and which is targeted to be a transshipment hub for Southern Africa. Table 3 gives a general picture of the scale and nature of operations at the various ports. It deserves emphasis that, while NPA has a monopoly over the landlord function at all ports, the SAPO monopoly primarily extends to containers and higher valued commodities. Private operators under leases handle a majority of the *bulk* commodities; but, as with Spoornet, Transnet's port management remains fully in control of all of the commodities, especially containers, which are significant in the logistics system.

It is somewhat harder to analyse the efficiency of ports than that of railways. The general picture of the Transnet ports is one of efficiency for the bulk ports at Richards Bay and Saldanha Bay as compared with relative inefficiency at the remainder. Port productivity is described as "...very low by international benchmarks. The Durban container terminal lifts on average 17 containers (TEUs) per hour, whereas the international norm is at least 35 TEUs per hour. From a service point of view, the problem is even more severe due to a huge amount of congestion. The equipment used at most of the container terminals is old and generally in poor condition. Although some newer cranes are in operation at Durban container terminal, the average age of the cranes is about 30 years compared to the international norm of around 20 years¹⁰." Other observers have similarly concluded that the South African ports have productivity levels for containers and higher value cargo of about 50 to 70% of comparable ports elsewhere, while the bulk ports are relatively efficient. Moreover, productivity at non-bulk ports appears to have been declining over time in some of the more important ports. In addition, water-side congestion is generally rated as serious.

For reasons that have never clearly been articulated in current policy, tariffs in RSA public ports are equalized. That is, all public ports have the same charges. At least partly because of the low productivity and higher costs, and at least partly because of the extremely high profitability of Transnet's maritime activities, port charges in RSA are generally cited as high, though the percentage disparity from other countries is not available.

3.3. Pipelines

"The pipeline industry in South Africa is characterised by the monopolistic position of Petronet, a subsidiary of Transnet. Petronet owns and operates almost the entire network with the exception of one crude oil line from Saldanha to Milnerton¹¹." The 3 300 km pipeline network operated by Petronet (an additional 600 km are operated privately) carries about 16 billion litres of oil products (refined and crude) and about 334 million cubic metres of gas. There are no data on comparable prices, but the high profit margins and the solid return on net assets suggest that the prices are not low.

3.4. Regulation of Transnet

Transnet has been largely unregulated, both in economic areas and in safety. According to the NFLS, "*Transnet develops rail policy (by default, due to its dominance), conducts economic and safety regulation, provides and maintains infrastructure, and is also responsible for freight transport operation¹².*" As to ports, the NFLS also states that "[e]conomic and safety regulation at the ports is solely administered by the agencies, themselves, while seaside regulation is conducted by the South African Maritime Safety Authority (SAMSA) and the Department of Environmental Affairs and Tourism¹³." A recent tariff increase proposed by Petronet was limited by the National Energy Regulator of South Africa (NERSA), which is, interestingly, an energy and not a transport regulator.

3.5. Assessment of the system performance and structure

It would be difficult to provide a more cogent assessment than that provided by the NFLS, a product of the Ministry of Transport. A number of quotations are listed below:

“The National Freight Logistics strategy [NFLS] is a response to the freight system’s inability to fulfill the demand for cargo movement at prices, levels of service, quality of service, and at acceptable levels of reliability in a manner that supports the national developmental strategies. This failure stems from an inappropriate institutional and regulatory structure that does not punish inefficiency and reward efficiency. It is structurally incapable of appropriately allocating external costs and raising efficiency... This strategy signals a shift toward demand-delivery of freight logistics services, rather than a supply approach (p. ii).

“The freight system in South Africa is fraught with inefficiencies at system and firm levels. There are infrastructure shortfalls and mismatches: the institutional structure of the freight sector is inappropriate... and the regulatory frameworks are incapable of resolving problems in the industry (p. ii).

“...South African products that move in the hinterland face a difficult challenge in terms of the inefficiencies in our ports and rail environment (p. 3).

“The existence of operations entities within the same holding company as the infrastructure companies exacerbates perverse behaviour and pricing further, while transfer pricing entrenches the inability to introduce competition in the medium and long term without radical shifts in regulatory and industrial restructuring leadership from the state (p. 6).

“The operating environment is characterised by open competition on the one hand (as are the road and airfreight sectors), whilst on the other hand it is characterised by monopolies that reduce efficiency and the value proposition to customers (as in the ports and rail sectors). In addition, shortfalls in infrastructure provision and poor infrastructure maintenance contribute to a poor value proposition to customers and add to the logistics cost burden (p. 9).

“Our infrastructure is inappropriate for the development path of our country, and needs to be revamped... Furthermore, our regulatory regime has not been inadequate to constrain the pricing of monopoly infrastructure entities. The infrastructure monopolies have extracted huge margins from the movement of cargo, without ensuring sustainable levels of re-investment. These profits have tended to be used to subsidise inefficient operations and loss making components in other areas of the transport and logistics sector, rather than raising our capacity over time (p. 9).

“Monopolies that are sustained within the freight logistics sector contribute significantly to high levels of inefficiency. This leads to a situation in which there is little incentive to reduce costs. This is mainly a consequence of the excessive market power held by organisations within the Transnet group. Again, these are strongly evident in ports and rail... (p. 9).”

Even Transnet acknowledged, in its 2008 Annual Report “[t]he company was not sufficiently oriented towards its customers – in fact, Transnet’s inefficiencies were rubbing off on some of its major customers in the form of real losses of international opportunities” and “[l]ow efficiencies resulted in congestion at the ports and unstable service delivery in freight transport.”

3.6. Reform initiatives

The issues discussed above have been well known and much discussed in the RSA for decades, and have been the focus of a number of studies over that time. Minor changes have been suggested, and some legislation has been passed. For example, the National Ports Act provided for the corporatization of the NPA into a separate company wholly owned by Transnet for the purpose, apparently, of clarifying the performance of the landlord function and subjecting its activities to some level of regulation. Transnet opposed this law and has thus far persuaded the Government not to initiate the corporatization process. No other significant reform is in process.

It is hard for an outsider to explain why so little reform has taken place, despite the clear need for change and the repeated studies and relatively accurate diagnoses of the kind of reform that would work. To some extent, the Government clearly has higher priorities, and political conflicts over the past few years may well have made reform difficult. Perhaps equally important, the lack of progress simply reflects the ability of a well-funded and deeply entrenched state enterprise to resist reforms that threaten the power of the agency and its ability to deliver on a vast number of political and social tradeoffs which it has accepted over the years.

4. THE TURKEY CASE

The Turkish Republic, a nation of approximately 72 million, lies between Europe and Asia. It has borders with Azerbaijan, Armenia, Bulgaria, Georgia, Greece, Iran and Iraq. It has long coastlines on the Black Sea and the Mediterranean, and commands the Bosphorus and the Dardanelles (the only connection between the Mediterranean and the Black Sea). It is also the transit country for several major oil pipelines from the Middle East to the Black Sea and the Mediterranean. Turkey's transport system thus has major international significance.

Turkey enjoys a relatively extensive highway system of approximately 427 000 km and has a number of private trucking companies. Its 7 500 km of pipelines are focused on oil and gas, much of it transit traffic. The "Republic of Turkey General Directorate of State Railways Administration" (TCDD), operates both the national railways system (8 697 km of line) and seven of the country's major sea ports. TCDD thus has held a monopoly on all rail services and controls a majority¹⁴ of the port activity in the country. Figure 5 shows the layout of the rail network and the seven TCDD ports as well as the Port of Ambarli.

Many of the railway lines in Turkey were originally built by private companies. Upon the formation of the Turkish Republic in 1923, all private railway lines were nationalised and combined into the "General Administration of Railways and Ports", formed in 1924. In 1953, TCDD took its current form as a state-owned enterprise (State Economic Enterprise, or SEE, established to provide a monopoly railway service) under the supervision of the Ministry of Transport. TCDD is thus a unitary enterprise, not a holding company, operating the seven ports as a division of the enterprise. In addition, similar to Transwerk in RSA, TCDD has subsidiaries that are the monopoly suppliers to TCDD of manufacture of locomotives under licence (Tulomsas), manufacture of passenger coaches (Tuvasas) and manufacture of freight wagons (Tudemsas).

Figure 6 below shows the current organisation diagram of the enterprise. Table 4 gives an overall picture of the financial performance of TCDD over the past five years.

4.1. TCDD's rail network

Table 2 compares TCDD to the world's railways. TCDD is smaller than Spoornet and carries significantly less freight traffic, but more passenger traffic. TCDD's labour productivity and traffic density are significantly less than Spoornet's (though Spoornet's GFB network would be much more comparable to TCDD). TCDD's labour productivity and traffic density are somewhat below EU averages, but not markedly so in many cases. Since 1990, TCDD's traffic has been essentially stagnant; with freight growth of 1.3% compounded annually, intercity passenger traffic growth of 0.9% annually, and suburban passenger traffic shrinking by about 4% annually. TCDD now carries about 2% of Turkey's passenger-km (98% by road) and about 5% of Turkey's tonne-km (92% by road and 3% by pipeline)¹⁵. In both cases, the railway role has been gradually shrinking for the past twenty-five years.

Table 4 highlights another aspect of railway performance – TCDD loses money in *all* its areas of rail activity. The ratios of revenue to expenses in 2007 are: suburban passenger, 79.3%; intercity passenger, 16.7%; and freight, 31.9%. These ratios are unusual in two aspects: 1) freight is highly unprofitable; and 2) suburban passenger traffic is less unprofitable than either freight or intercity traffic. The losses on passenger service are largely generated by tariffs that average about one-third of those in the EU (one-fourth the US levels) and somewhat lower productivity than the EU. Losses on the freight traffic have essentially the same causes, though the tariff disparity is not as great. Interestingly, a part of the freight losses is caused by the fact that TCDD has reduced its freight tariffs significantly over the past twenty years, while neither traffic nor productivity grew significantly. Moreover, as Table 2 shows, TCDD has a much higher percentage of passenger traffic than Spoornet and the US system, though TCDD is roughly comparable with many EU railways in its passenger-to-freight traffic proportions.

In technical terms, TCDD's maximum axle load of 20 tonnes puts it at the low side of EU practice for freight traffic, and makes it difficult for TCDD's freight operator to compete with trucks. In addition, about 80% of TCDD's traffic is concentrated on half the network, meaning that the remainder of the system is even less financially justified (for freight or passenger services).

TCDD is also a problem from a national perspective, as Table 4 shows. TCDD's railway losses have risen to the range of USD 1 billion annually, making it the largest deficitary public enterprise, accounting for about 0.3% of GDP. Subsidies paid by government are now in the range of USD 500 million.

4.2. TCDD's ports

Table 5 profiles the seven ports operated by TCDD (as shown in the TCDD Annual Statistics). All of the seven ports handle general cargo and break bulk. At around 800 000 TEU, Izmir is the major container port, though Haydarpaşa and Mersin handle lesser amounts of containers¹⁶.

It is difficult to assess the efficiency of the TCDD ports. A World Bank analysis stated that a proposed project in Turkey "... will reduce the logistical costs associated with the current inefficiencies and high costs of both the railway and port sub-sectors, allowing importers and exporters to develop existing trade-related businesses¹⁷." As Table 4 shows, if the high port profits,

now used to support rail losses, were reduced to normal levels, port tariffs could probably be reduced by as much as 30 to 50%, with a direct impact on Turkey's trade competitiveness.

4.3. Regulation

TCDD's tariffs and safety have been essentially unregulated, leaving TCDD free to set its tariffs. In practice, TCDD has been constrained by the normal degree of political interference in the affairs of state enterprises. More importantly, there has probably been a relationship between the size of TCDD's subsidies and its tariff policy. This could partly explain the unusually high suburban tariffs: but there is no apparent explanation for TCDD's low freight tariffs.

4.4. Assessment of system performance

It is common in World Bank loans for a government to issue a "Letter of Development Policy" to the Bank, which provides the underlying government evaluation of the performance of the economic sector involved in the loan, and states the policies to be followed by government in deploying loan funding. The Minister of Transport's letter stated "[i]n common with many rail companies throughout Europe, TCDD's performance has declined in recent years. Passenger numbers have declined by around 50% during the 10-year period, to a market share of round 2%. Over the same period, freight traffic has declined by around 10% to a market share of around 4%. At the same time, TCDD's financial position is precarious. TCDD made a loss of USD 292 million in 2003 and expected loss for the year 2004 is USD 513 million. Treasury has transferred 331 million US \$ to TCDD in 2003¹⁸." The Minister also stated three objectives: "(i) to significantly reduce the current fiscal burden of TCDD on public finance; (ii) to increase the competitiveness of the Turkish economy by reducing the logistic costs associated with the inefficiencies of the railway and port sub-sectors; and (iii) contribute to Turkey's accession to the European Union¹⁹." There is little doubt that Turkey pays a high price for the railway's inefficiencies and the high costs of TCDD's ports.

4.5. Reform initiatives

After a number of years of discussion, and TCDD resistance to change, the Government has decided to restructure TCDD. The approach consists of two elements: restructuring of the railway, and separation and concessioning of the ports.

4.5.1 Railway reform

The railway reform programme is broadly based on the EU model, with a separated infrastructure manager (no decision on accounting versus institutional separation), open access for freight operators that might want to compete with TCDD's freight operator, infrastructure access charges (to be developed). TCDD railway operators will be structured as autonomous public corporations under government ownership, suburban passenger operations will be transferred to local governments with services provided by TCDD under contract or by private operators, and the three manufacturing subsidiaries will be divested. In addition, the reform programme includes a component for labour force adjustment and a significant component for asset modernisation. In parallel, a regulatory body for infrastructure charges, licensing and safety certification will be developed, along with development and publication of an MIS to produce all required reporting information.

4.5.2 *Port reform*

After years of discussion (and encouragement from the EU and the World Bank), the Turkish Government gave the Privatization Agency the task of concessioning the ports. As of today, the status of concessioning is:

- Mersin was contracted for 36 years in 2007 and is now in private operation;
- Iskenderun is now in the tender process;
- Izmir has completed the tender process and the 49-year contract is pending approval of the State Council;
- Derince has completed the tender process and the 36-year contract is pending State Council approval;
- Samsun has completed the tender process and has Privatization Agency approval. It will now go to the State Council;
- Bandirma has completed the tender process and has Privatization Agency approval. It will now go to the State Council;
- Haydarpasa was closed.

The process for each port is fully complete only after State Council approval of the contract. Before approval, port revenues and costs remain on the TCDD books. After approval, excess staff will remain on TCDD books until the staff adjustment programme is implemented.

5. THE RSA AND TURKEY CASES COMPARED

There are a number of similarities and differences between the two cases:

- Transnet is a holding company, whereas TCDD operated the railways as an integral division.
- Transnet control covered rail, most ports and pipelines whereas TCDD had no control over pipelines.
- Transnet overall is profitable and, at least according to its Annual Report, each of its Divisions is profitable as well (though Spoornet is only marginally so, and appears to have been marginally unprofitable in the past). The TCDD rail network is strongly unprofitable, and port profits have been insufficient to cover railway losses.
- After the transfer of the intercity and suburban passenger functions, Spoornet is totally focused on freight, with passenger losses now the responsibility of government. TCDD has a major passenger component in both intercity and suburban areas, similar to Spoornet 15 years ago. Port profits in Turkey have thus not only been supporting rail freight activities, but have also leaked out into the passenger sector.

- Both TCDD and Transnet are essentially unregulated and both have had a strongly dominant position in port traffic, though Transnet faced some competition in bulk traffic through the ports of Saldanha Bay and Richards Bay, and TCDD faced container competition from the Port of Ambarli. Trucking competition was the only significant constraint on their pricing and service behaviour.
- By virtue of their public ownership and at least partial monopoly position, both were subject to political intervention in policy decisions.
- Because of their employment level and economic power, both were able to resist reform for many years (and Transnet is still successful in doing so).
- Interestingly, TCDD publishes Annual Reports that provide a reasonable amount of information with which to assess its operations (better, in fact, than most EU railways) whereas Transnet has, in the name of “integration”, ceased publication of such data.
- Most important, despite having access to all of the economies of scale of large organisations with significant market power, and despite the opportunities for “co-ordination” that unification of rail and ports (and pipelines) arguably offers, neither entity is efficient, neither offers adequate service to the country, and neither was able to maintain its assets properly. Both charged high prices in the ports sector, harming the international logistics and trade position of the country.

6. IMPRESSIONS FOR DISCUSSION BASED ON THE RSA AND TURKEY

The word “impressions” is used rather than “conclusions” because two cases do not characterise the full range of relationships in the logistics area, nor do they constitute a dataset adequate to support strong conclusions. With this acknowledged at the outset, the RSA and Turkey cases do suggest a number of points for debate.

Ownership and control of ports with a common hinterland poses the risk of manipulated tariffs for a number of reasons. There is the temptation to “equalise” tariffs, either in order to promote access to remote regions or to favour one or another part of the hinterlands for partisan political reasons. Perhaps more importantly, without competition, the ports offer an irresistible opportunity to generate monopoly rents that are then transferred to employees or the owning agency, or others, usually with highly opaque accounting. Consolidated accounting erases the ability to measure the results of any individual port.

Link-type integration can also be bad if it denies others’ access to one of the links. In RSA and in Turkey, the port operator has (or had) a clear incentive to favour rail access over trucks (though the RSA Government’s lack of control of overweight trucks has a countervailing impact), partly because of the internal corporate relationship and partly because the rail link offers another opportunity to generate or distribute a monopoly rent from the port. Moreover, when rail and port are commonly owned, the resulting consolidation of information makes it very difficult to isolate the performance of the parts.

Having a single rail operator for multiple ports is also probably questionable, especially when the rail operator is not efficient. This could put the rail operator in the position of generating rents that competition between the ports might otherwise generate. It could also permit the rail operator to favour one of the hinterlands over another. This effect could be alleviated by highly effective truck and/or water competition, but the full effect will depend on the size and shape of the hinterland affected. Both of these effects would be more serious in RSA if the ownership of the ports is devolved to local authorities, and they will be more serious in Turkey when (assuming the process is completed) the ports are privately operated by separated companies.

Using port profits to support rail losses and rail investment hurts *both* port and rail. It results in higher port tariffs than are necessary, reducing the productivity of the entire economy. It also drains the port of investment needed for rehabilitation, replacement and expansion, and harms the freight system of the country if, as is the case in Turkey and was the case in RSA, the port surpluses are used to support rail *passenger* deficits and investment²⁰. The only significant case to be made for non-transparent transfer of funds, generated from one place in an “integrated” system to another part of the system, is political convenience.

Lack of transparency and information, especially under consolidated reporting, makes oversight and regulation at any point difficult, if not impossible. The increasing consolidation of Transnet in RSA has removed even the vestiges of independent accounting for Spoornet, and has made port-by-port results in NPA or SAPO difficult. In response, the RSA is beginning to create regulators for some port functions, but it seems clear that the new regulators will be hobbled by lack of information and attempts to implement regulations that will inevitably conflict with policies and political objectives (port equalisation is a good example).

The injection of explicit (or hidden) political objectives makes behaviour unpredictable because the objectives often conflict with explicit efficiency objectives and with market forces. The result is usually unfavourable to a proper functioning of the networks. Governments, such as the RSA, have justified their controls of the entire network on the basis of competition with other nations, apparently believing that it is somehow nations that are competing to form logistics chains. In fact, a complete logistics chain is a complex set of interacting pieces, only a very few of which are open for public intervention. Attempts by governments to influence the logistics chains are almost certain to fail. This obviously raises the question of what should be the role (if any) of governments in the logistics chain?

Figures 1 and 2, along with the RSA and Turkey cases raise a critical question for the EU. It is clear that the Commission, beginning with Directive 91-440 and continuing through its subsequent directives and packages, intended to ensure that, on the rail side, there would be effective competition at all ports, no matter who the port owner or rail infrastructure manager might be. In Figure 1 and Figure 2 terms, this would have meant that every (independent) port in the EU should at least in theory have competitive rail entry from all national freight operators. Moreover, as the Commission’s policy has evolved, it should be possible for each EU port to enjoy access by multiple private operators as well. In practice, the programmes of several railways, notably DB Holdings and Railion, pose a paradox. DB’s action to acquire many other freight operators in Europe, without fully breaking the connection with infrastructure (in Germany), poses the threat of various kinds of reduction of competition, by merger and by linkage, that would reduce freight rail competition in the EU, not only in port access, but across much of Europe as well. In addition, ownership of, for example, both the old DB cargo and the old NS Cargo, could expose the ports of Rotterdam and Hamburg (for example) to a single rail carrier with clearly mixed and less than transparent motives. It is worthwhile asking again who is competing and for what in assessing the future structure of the EU rail freight sector, both through ownership and access charges.

At least in the RSA and Turkey, integration and merger probably did reduce competition, and the economies have paid a significant price through underinvestment and inefficiency. A fair suggestion is that both mergers and the various levels of “integration” ought to be subject to a reasonable burden of proof. While it seems likely that many kinds of integration will be justifiable, this cannot be taken on faith.

As an example of what rail *versus* rail competition can do, for ports, railways and the logistics system, it is interesting to cast a brief glance at the US railways since the Staggers Act deregulated the system.

Prior to the deregulation, the Interstate Commerce Commission (ICC – now called the STB, or Surface Transportation Board) had tightly controlled almost all aspects of rail competition, including tariffs and mergers. In 1981, in the first year of deregulation, there were 37 private rail freight companies, and the average tariff charged was about USD 0.0429 per tonne-km (in 2006 constant USD). By 2006, the average freight tariff had fallen to USD 0.0194 per tonne-km, a 55% reduction in constant terms. This was not just an artifact of the increase in coal shipments based on cheaper western coal (coal rates fell by over 61%), but was felt in all commodities, including containers (reduction of about 46% in real terms), with percentage reductions ranging from 28% to 51% in real terms.

After deregulation, there were several major occurrences: first, the railways employed innovative technology in order to improve the efficiency of labour and capital; second, a number of operating methods were adopted (especially unit trains) that permitted much higher efficiency; third, tariff innovations, especially contract tariffs²¹ where railways could invest in support of guaranteed volumes, permitted a much more direct relationship between what the railway could sell and the customer wanted to buy. Finally, in apparent contradiction of the need for more competition, the number of Class I (large) railways was allowed to decrease through merger from 37 to 9, largely because the railways successfully argued that these would mostly have an end-to-end effect, increasing the length of haul and competitiveness with trucks, rather than being side-to-side mergers which would reduce rail competition. At least in this case, largely end-to-end mergers (linkage) did increase competition, with major benefits for the economy.

NOTES

1. It is worth noting that common ownership does not necessarily guarantee integration. In many cases conglomerates are notorious for having poorly co-ordinated or even competing subsidiaries.
2. Some countries generate up to 40% of their total government revenues from import duties.
3. These figures are considerably simplified purely for the purpose of highlighting the major possibilities of competition and integration or merger. In particular, Figure 2 could be expanded to show three ports or more, multiple hinterlands, etc. In addition, for simplicity, both figures look at inbound flow on a ship entering a port in the country of destination. It does not show the mirror image system in the country of origin. For simplicity, these figures look at a one-way flow: obviously all flows could be reversed. Finally, pipelines are excluded from the figures because they are significant only in bulk flows: in some ports and countries this is a significant share of tonnage and value sent through the overall logistics chain.
4. Not all possibilities for horizontal competition exist in all cases. Small ports may have only one liner and one set of handling facilities in any case. Few ports (the larger US ports might be the exception) have competing railways, but most ports have competition among trucking companies. Not all ports have inland water services.
5. In fact, there was a point at which one railway company, CSX in the US, did own deep ocean and inland water shipping, and did control certain port facilities.
6. Because Transwerk has only one customer (Spoornet) and Spoornet only one supplier of maintenance services, it is difficult to say what Transwerk's performance would be if it were an arm's length entity.
7. NFLS, p. 4.
8. The last year in which Transnet published a Divisional Report for Spoornet was in 2004. In 2004, the labour productivity for the Coal Export line was given as 13.86 million TU/employee, with the productivity of the Iron Ore line at 24.99 million TU/km, and the GFB shown as 1.49 million TU/km. It should be noted, however, that even the 1.49 million level shown for the GFB exceeds most EU railways, probably because the GFB did not involve passenger services, whereas most EU railways carry a high percentage of passenger traffic. See Spoornet 2004, p. 60.
9. 50 KV traction is actually unusually high, but is possible in this application because the space around the railway permits higher clearances.
10. NFLS, p. 24.
11. NFLS, p. 20.
12. NFLS, p. 8.

13. NFLS, p. 8.
14. The Port of Ambarli, the largest container facility in Turkey, has been private (Zeybek, 2008, Table 3).
15. TCDD Istatistik Yilligi, pp. 108 and 109.
16. TCDD 2007 lists the Izmir throughput at 898 000 TEU, whereas Zeybek, 2008, states that the capacity of Izmir is only 443 000 TEU. The source of this discrepancy is not clear. In addition, according to Zeybek, the capacity of Ambarli is 1.5 million TEU, making it the largest container port in Turkey.
17. World Bank, 2005, p. 3.
18. World Bank, 2005, p. 29.
19. World Bank, 2005, pp. 29 and 30.
20. It is interesting to note that Transnet's monopoly ownership of the pipelines in RSA actually produced even higher operating income ratios than in the ports – money that also did not yield adequate maintenance of the pipelines, let alone the ports or railways.
21. The ICC had ruled that contract tariffs were illegal, before the Staggers Act.

ANNEX:

TABLES AND FIGURES

Table 1. Transnet Revenue and EBITDA* table by division

(millions of Rand)

	2006				2007			2008		
	Revenue	EBITDA*	EBITDA %	Return on Net Assets (%)	Revenue	EBITDA	EBITDA %	Revenue	EBITDA	EBITDA %
Freight Rail (Spoornet)	14 055	2 910	20.7	8.8	14 574	3 522	24.2	16 598	5 151	31.0
Rail Engineering (Transwerk)	3 645	738	20.2	48.6	7 310	1 088	14.9	8 156	1 188	14.6
National Ports Authority (NPA)	5 438	4 242	78.0	24.9	6 107	4 628	75.8	6 843	5 198	76.0
South African Ports Organization (SAPO)	3 585	1 193	33.3	29.7	4 098	1 561	38.1	4 843	1 810	37.4
Pipelines (Petronet)	1 060	860	81.1	16.3	1 218	931	76.4	1 292	990	76.6
Total	26 034	10 301	39.6	16.7	26 889	11 149	41.5	30 091	13 185	43.8

* Earnings Before Interest, Depreciation and Amortization.

Notes: Most recent exchange rates have been: one Euro=13.251 Rand, and one USD =10.2415 Rand. PPP\$ multiplier is ~2.5.

Source: *Transnet Annual Reports 2006, 2007, 2008*. Return on net assets is not available after 2006.

Table 2
International Railway Comparisons

	Year	Total Route km	Total Locs	Freight Wagons	Passengers (000)	Passenger-kilometers (000 000)	Freight Tonnage (000 000)	Freight Tonne-km (000,000)	P-Km as % of TU	Staff	Average Load, Freight (km)	Freight tonne-km per Wagon (000)	Output per staff (000 TU)	Staff per km of Line	Traffic Density (000 of TU per km)
LATIN AMERICA:															
Argentina (all concessions)	20 05	18,504	461	23,500	2,533,318	7,845	234	12,262	39	5,300	524	522	3,794	0.29	1,087
Bolivia (all concessions)	20 04	2,743	54	1,907	705	264	1.3	969	21	785	734	508	1,571	0.29	45.0
Brazil (all concessions)	20 05	27,666	2,394	90,119	2,15,136	3,336	387.6	221,300	1	24,469	571	2,456	9,180	0.88	8,120
Chile (Fepasa Only)	20 04	2,379					8.6	1,795	-	590	210		3,042	0.25	75.5
Mexico (all concessions)	20 05	17,382	1,088	32,560			97.2	70,899	-	14,000	729	2,177	5,064	0.81	4,079
Peru (all concessions)	20 02	1,580			950	80	2.2	750	10	1,200	341		692	0.76	52.5
Uruguay	20 05	3,003	22	1,788	517	12	1.3	331	4	511	251	185	672	0.17	11.4
AFRICA (SUB SAHARAN):															
Cameroon	20 05	1,016	67	1,130	1,021	325	1.8	1,052	24	2,200	579	931	626	2.17	1,355
Congo-CFCO	20 05	795	29	1,070	500	135	0.6	231	37	600	385	216	610	0.75	46.0
Cote D'Ivoire (all of Sitarail)	20 04	1,261	20	807	100	10	0.6	501	2	3,126	880	621	163	2.48	40.5
Gabon	20 04	810	20	548	200	95	3.9	2,219	4	1,300	569	4,049	1,780	1.60	2,857
Ghana	20 04	977	61	750	2,340	85	1.9	242	26	3,777	129	323	87	3.87	33.5
Kenya	20 02	2,634	152	5,154	4,794	288	2.2	1,538	16	7,000	691	298	261	2.66	69.3
Malawi	20 04	710	24	478	395	26	0.2	38	41	487	158	79	131	0.69	9.0
Namibia	19 95	2,382	50	1,627	124	49	1.8	1,082	4	1,944	615	665	581	0.82	47.4
Nigeria	20 05	3,557	126	2,744	1,526	363	0.1	105	78	13,618	827	38	34	3.83	13.2
Senegal/Maif (Transrail)	20 05	1,546		602	500	275	1.5	541	34	1,500	350	899	544	0.97	52.8
Spornet	20 05	20,247	2,646	94,210	3,100	991	18.22	109,721	1	32,516	602	1,165	3,405	1.61	5,468
Sudan	20 05	5,478	115	4,651	100	40	1.3	766	5	11,800	565	68	215	1.47	14.7
Tanzania	20 06	2,722	86	1,828	694	433	1.7	1,970	18	9,000	1,152	1,078	267	3.31	88.3
TAZARA	20 00	1,860	75	2,235	1,641	518	0.6	780	40	4,175	1,231	349	311	2.24	69.8
Uganda	20 04	259	43	1,431			0.9	218	-	1,150	241	152	190	4.44	84.2
Zaire	20 05	3,641	136	3,876	400	140	1.2	444	24	13,600	370	115	43	3.74	16.0
Zambia	19 99	1,273	62	5,758	830	186	1.6	554	25	3,400	339	96	218	2.67	58.1
Zimbabwe	19 97	2,759	169	11,385	1,598	583	1.20	4,871	11	12,025	406	428	454	4.36	1,977
MIDDLE EAST & N. AFR:															
Algeria	20 05	3,572	221	10,026	27,300	929	8.3	1,471	39	10,500	177	147	229	2.94	67.2
Egypt	20 05	5,150	671	11,592	4,51,100	40,837	10.1	3,917	91	91,400	388	338	490	17.75	8,690
Iran	20 05	7,131	606	19,848	19,400	11,149	30.3	19,127	37	13,700	631	964	2,210	1.92	4,246
Jordan	20 05	293	19	346			2.9	1,024	-	600	353	2,960	1,707	2.05	3,495
Morocco	20 05	1,907	199	5,707	18,500	2,987	32.9	5,919	34	9,300	180	1,037	958	4.88	4,670
Saudi Arabia	20 05	1,020	56	2,060	1,100	393	2.6	1,192	25	1,600	458	579	991	1.57	1,554
Syria	20 02	2,450	183	5,313	1,417	364	5.9	1,812	17	11,500	306	341	189	4.69	888
Tunisia	20 05	1,909	174	3,930	36,804	1,319	10.8	2,067	39	5,226	192	530	648	2.74	1,774
EUROPE & C. ASIA:															
Albania	20 05	447	58	824	1,400	73	0.4	26	74	2,200	65	32	45	4.92	22.1
Turkey (T.CDD)	20 05	8,997	531	16,102	76,306	5,036	18.9	9,078	36	30,991	564	479	564	3.59	1,023
Macedonia	20 05	699	56	1,525	900	94	3.1	530	15	2,900	171	348	215	4.15	89.3
Yugoslavia	20 05	3,809	365	10,561	13,500	852	12.6	3,482	20	22,300	276	330	194	5.85	1,138
Croatia	20 05	2,726	278	7,330	39,800	1,266	14.3	2,835	31	14,200	198	387	289	5.21	1,504
Russia	20 05	85,245	12,213	540,529	1,338,723	172,217	128.13	1,858,100	8	1,161,900	1,450	3,438	1,747	13.63	23,817
Ukraine	20 05	22,001	4,370	150,254	518,400	52,655	46.24	223,980	19	368,200	484	1,491	751	16.74	12,574
Kazakhstan	20 05	14,204	1,702	88,541	15,900	12,129	21.55	171,855	7	94,300	797	1,941	1,951	6.64	12,953
Belarus	20 05	5,498	606	25,281	141,000	13,568	125.1	43,559	24	78,300	348	1,723	730	14.24	10,391
Georgia	20 05	1,515	322	11,732	3,600	720	1.90	6,127	11	15,800	322	522	433	10.43	4,519
Armenia	20 05	711	56	3,846	703	27	2.6	654	4	4,745	250	170	143	6.67	95.7
Uzbekistan	20 05	4,014	286	10,406	16,100	2,012	5.38	18,007	10	35,400	335	1,730	566	8.82	4,987
EAST ASIA:															
China	20 05	62,200	16,453	541,824	1,106,510	583,320	230.92	1,934,612	23	1,665,588	838	3,571	1,512	26.78	40,481
Republic of Korea	20 05	3,392	587	9,121	9,21,300	31,004	44.5	10,108	75	29,300	227	1,108	1,403	8.64	12,120
Malaysia	20 05	1,667	100	3,707	3,700	1,181	4.0	1,178	50	5,000	295	318	472	3.00	1,415
Mongolia	20 05	1,810	111	2,633	4,300	1,228	14.1	8,857	12	15,200	628	3,364	663	8.40	5,572
Thailand	20 04	4,044	278	6,900	50,873	9,332	13.8	4,085	70	19,000	296	592	706	4.70	3,318
Viet Nam	20 05	2,671	321	4,975	12,800	4,558	8.7	2,928	61	44,200	337	589	169	16.55	2,803
SOUTH ASIA:															
Bangladesh	20 05	2,855	286	10,236	42,254	4,164	3.2	817	84	35,172	255	80	142	12.32	1,745
India	20 05	63,465	7,910	222,379	5,378,000	575,702	60.21	407,398	59	1,422,200	677	1,832	691	22.41	15,490
Pakistan	20 05	7,791	592	21,812	78,200	24,237	6.4	5,013	83	86,807	782	230	337	11.14	3,754
Sri Lanka	20 05	1,200	141	2,458	11,400	4,358	1.5	135	97	16,360	90	55	275	13.63	3,744
DEVELOPED COUNTRIES:															
Austria	20 05	5,690	1,229	15,846	191,600	8,470	8.17	17,036	33	47,200	209	1,075	540	8.30	4,483
Belgium	20 05	3,542	759	12,756	186,600	9,150	6.10	8,130	53	37,200	133	637	465	10.50	4,879
Bulgaria	20 05	4,154	584	12,414	33,700	2,389	20.3	5,164	32	33,700	254	416	224	8.11	1,818
Czech Republic	20 05	9,513	2,167	34,610	178,200	6,631	75.8	14,385	32	65,200	190	416	322	6.85	2,209
Denmark	20 05	2,212	63		152,400	5,459			100	3,170			1,722	1.43	2,468
Estonia	20 05	959	113	3,279	5,200	248	44.8	10,311	2	3,300	230	3,145	3,200	3.44	11,010
Finland	20 05	5,732	545	11,162	63,500	3,478	40.7	9,706	26	10,300	238	870	1,280	1.80	2,300
France	20 05	29,286	4,588	35,456	962,700	76,159	129.97	41,898	65	167,200	323	1,182	706	5.71	4,031
Germany	20 05	34,218	4,787	156,751	1,785,400	72,554	27.46	88,022	45	224,800	321	562	715	6.56	4,693
Greece	20 05	2,576	154	3,204	10,000	1,854	3.0	613	75	8,100	204	191	305	3.14	95.8
Hungary	20 05	7,730	981	16,658	120,400	6,953	44.0	8,537	45	44,600	194	512	347	5.77	2,004
Ireland	20 05	1,919	94	926	37,700	1,781	1.5	303	85	5,500	202	327	379	2.87	1,086
Israel	20 05	899	74	640	26,800	1,618	7.5	1,149	58	1,600	153	1,795	1,729	1.78	3,078
Italy	20 05	16,225	3,297	44,242	516,800	46,144	68.7	20,131	70	99,100	293	455	669	6.11	4,065
Latvia	20 05	2,375	205	5,290	25,900	894	54.9	17,921	5	14,600	326	3,388	1,289	6.15	7,922
Lithuania	20 05	1,772	240	9,309	6,700	428	49.3	12,457	3	11,300	253	1,338	1,140	6.38	7,271
Netherlands	20 05														

Table 3. South African Ports

	Functions		Commodities	% of tonnage*
	Public	Private		
Richards Bay	Break Bulk, Bulk, Containers	Bulk	Coal, Steel, Iron Ore, Other	48
Durban	Containers, Bulk, Break Bulk	Break Bulk, Bulk	Steel, Granite, General Cargo	24
Saldanha	Break Bulk, Bulk	Bulk, Break Bulk	Iron ore, other ores	16
Cape Town	Containers, Bulk, Break Bulk	Break Bulk, Bulk	General Cargo, Fruit, Timber, Meat and Fish	6
Port Elizabeth	Break Bulk, Bulk, Containers	None	Ores, Fruit, Scrap	4
East London	Break Bulk, Bulk, Containers	None	Cars and parts, General Cargo	1
Mossel Bay	Bulk, Break Bulk	Liquid Bulk	Oil, General Cargo	1

* Export tonnage is about 122 million tonnes, Imports are about 39 million tonnes.

Source: National Freight Logistics Study.

Table 4. General Profitability Analysis of TCDD operations (millions of constant 2007 USD)

	2000	2001	2002	2003	2004	2005	2006	2007
Suburban Passengers								
Expenses	\$ 64.31	\$ 57.20	\$ 58.64	\$ 45.72	\$ 58.36	\$ 59.05	\$ 54.00	\$ 53.38
Revenues	\$ 43.62	\$ 38.51	\$ 36.14	\$ 33.00	\$ 34.42	\$ 40.98	\$ 42.88	\$ 42.32
Net Loss	\$ 20.69	\$ 18.69	\$ 22.50	\$ 12.71	\$ 23.94	\$ 18.07	\$ 11.12	\$ 11.06
Revenues/Expenses (%)	\$ 67.83	\$ 67.32	\$ 61.63	\$ 72.19	\$ 58.98	\$ 69.39	\$ 79.40	\$ 79.28
Mainline Passengers								
Expenses	\$ 462.25	\$ 479.68	\$ 467.50	\$ 439.85	\$ 478.70	\$ 478.84	\$ 485.35	\$ 504.22
Revenues	\$ 81.19	\$ 83.34	\$ 83.95	\$ 81.76	\$ 74.81	\$ 80.79	\$ 81.43	\$ 84.00
Net Loss	\$ 381.07	\$ 396.34	\$ 383.55	\$ 358.09	\$ 403.89	\$ 398.05	\$ 403.92	\$ 420.22
Revenues/Expenses (%)	\$ 17.56	\$ 17.37	\$ 17.96	\$ 18.59	\$ 15.63	\$ 16.87	\$ 16.78	\$ 16.66
Total Passengers								
Expenses	\$ 526.57	\$ 536.87	\$ 526.14	\$ 485.56	\$ 537.06	\$ 537.89	\$ 539.36	\$ 557.60
Revenues	\$ 124.81	\$ 121.84	\$ 120.09	\$ 114.76	\$ 109.23	\$ 121.77	\$ 124.31	\$ 126.32
Net Loss	\$ 401.76	\$ 415.03	\$ 406.05	\$ 370.80	\$ 427.83	\$ 416.12	\$ 415.05	\$ 431.28
Revenues/Expenses (%)	\$ 23.70	\$ 22.69	\$ 22.82	\$ 23.63	\$ 20.34	\$ 22.64	\$ 23.05	\$ 22.65

	2000	2001	2002	2003	2004	2005	2006	2007
Freight								
Expenses	\$ 909.31	\$ 744.91	\$ 812.64	\$ 765.36	\$ 818.92	\$ 880.45	\$ 887.75	\$ 880.44
Revenues	\$ 205.34	\$ 187.31	\$ 209.03	\$ 231.10	\$ 256.88	\$ 271.13	\$ 275.79	\$ 281.08
Net Loss	\$ 703.97	\$ 557.60	\$ 603.61	\$ 534.27	\$ 562.04	\$ 609.32	\$ 611.96	\$ 599.36
Revenues/Expenses (%)	\$ 22.58	\$ 25.14	\$ 25.72	\$ 30.19	\$ 31.37	\$ 30.79	\$ 31.07	\$ 31.92
Total Railway								
Expenses	\$1,435.88	\$1,281.78	\$1,338.78	\$1,250.93	\$1,355.98	\$1,418.34	\$1,427.11	\$1,438.04
Revenues	\$ 330.15	\$ 309.15	\$ 329.12	\$ 345.86	\$ 366.12	\$ 392.90	\$ 400.10	\$ 407.40
Net Loss	\$1,105.73	\$ 972.64	\$1,009.66	\$ 905.07	\$ 989.86	\$1,025.44	\$1,027.01	\$1,030.64
Revenues/Expenses (%)	\$ 22.99	\$ 24.12	\$ 24.58	\$ 27.65	\$ 27.00	\$ 27.70	\$ 28.04	\$ 28.33
Port Services								
Expenses	\$ 229.45	\$ 205.52	\$ 204.29	\$ 181.17	\$ 190.55	\$ 202.86	\$ 188.54	\$ 166.09
Revenues	\$ 369.91	\$ 378.76	\$ 418.57	\$ 359.88	\$ 342.17	\$ 333.61	\$ 360.98	\$ 257.38
Net	\$ (140.45)	\$ (173.24)	\$ (214.28)	\$ (178.71)	\$ (151.62)	\$ (130.75)	\$ (172.44)	\$ (91.29)
Revenues/Expenses (%)	\$ 161.21	\$ 184.29	\$ 204.89	\$ 198.64	\$ 179.57	\$ 164.45	\$ 191.46	\$ 154.96

	2000	2001	2002	2003	2004	2005	2006	2007
Grand Total TCDD								
Expenses	\$1,665.33	\$1,487.30	\$1,543.07	\$1,432.10	\$1,546.53	\$1,621.20	\$1,615.65	\$1,604.13
Revenues	\$ 700.06	\$ 687.91	\$ 747.69	\$ 705.74	\$ 708.29	\$ 726.51	\$ 761.09	\$ 664.77
Net Loss	\$ 965.28	\$ 799.40	\$ 795.38	\$ 726.36	\$ 838.24	\$ 894.69	\$ 854.56	\$ 939.35
Revenues/Expenses (%)	\$ 42.04	\$ 46.25	\$ 48.45	\$ 49.28	\$ 45.80	\$ 44.81	\$ 47.11	\$ 41.44
Total Subsidies paid by Government	\$ 257.75	\$ 381.10	\$ 368.18	\$ 360.96	\$ 407.63	\$ 430.42	\$ 462.34	\$ 446.89
	Output (000 000)							
Tonne-km	\$9,761.00	\$7,486.00	\$7,169.00	\$8,669.00	\$9,417.00	\$9,152.00	\$9,676.00	\$9,921.00
Passenger-km								
Suburban	\$1,592.00	\$1,355.00	\$1,265.00	\$1,295.00	\$1,328.00	\$1,375.00	\$1,399.00	\$1,473.00
Intercity	\$4,215.00	\$4,149.00	\$4,017.00	\$4,583.00	\$3,835.00	\$3,661.00	\$3,878.00	\$4,080.00
TOTAL	\$5,832.00	\$5,568.00	\$5,282.00	\$5,878.00	\$5,163.00	\$5,036.00	\$5,277.00	\$5,553.00
Revenue/Tonne-km (USD)	\$ 0.02	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03

	2000	2001	2002	2003	2004	2005	2006	2007
Revenue/Passenger-km (USD)								
Suburban	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03	\$ 0.03
Intercity	\$ 0.02	\$ 0.02	\$ 0.02	\$ 0.02	\$ 0.02	\$ 0.02	\$ 0.02	\$ 0.02
Traffic Index: 1990=100								
Freight	\$ 123.32	\$ 94.58	\$ 90.57	\$ 109.53	\$ 118.98	\$ 115.63	\$ 122.25	\$ 125.34
Suburban	\$ 54.32	\$ 46.23	\$ 43.16	\$ 44.18	\$ 45.31	\$ 46.91	\$ 47.73	\$ 50.26
Mainline	\$ 121.16	\$ 119.26	\$ 115.46	\$ 131.73	\$ 110.23	\$ 105.23	\$ 111.47	\$ 117.28
Conversion Factor	1.26 Million Lire/USD							

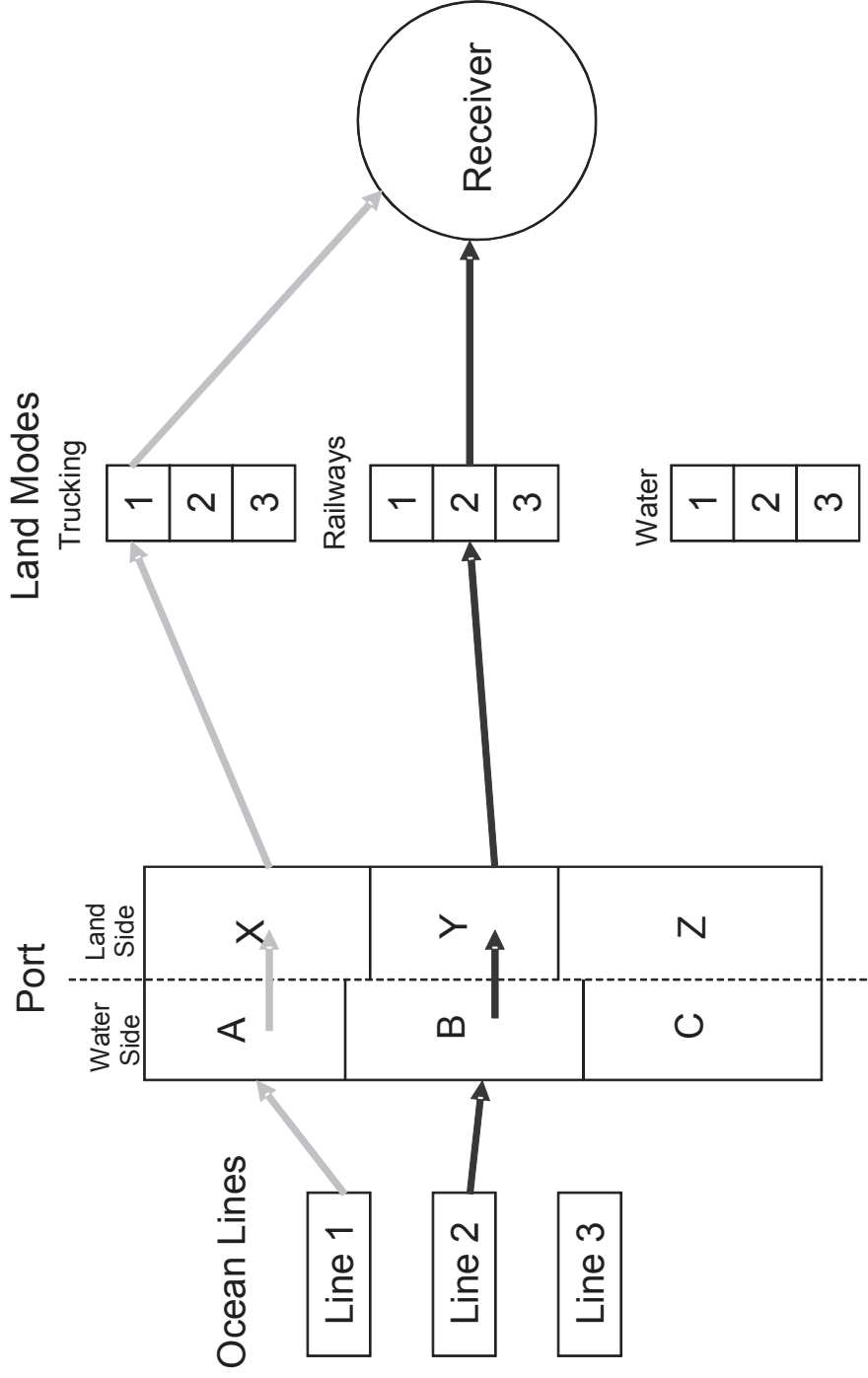
Source: TCDD, *Istatistik Yilligi*, various issues.

Table 5. TCDD Ports (2007)

	General cargo, break bulk (000 tonnes)	Containers (000 tonnes)	Containers (000 TEU)	Tonnes Handled (000)		Total	Per cent tonnes
				Outbound	Inbound		
Haydarpasa	651	3 277	397	1 376	2 552	3 928	10.7
Derince	3 027	4	1	845	2 186	3 031	8.3
Samsun	1 616	0	0	2 276	3 329	5 605	15.3
Mersin	3 177	2 428	232	367	1 480	1 847	5.1
Iskenderun	1 846	0	0	538	1 078	1 616	4.4
Bandarma	8 465	0	0	3 799	4 666	8 465	23.2
Izmir	3 210	8 858	898	7 740	4 328	12 068	33.0
Totals	21 992	14 567	1 528	16 941	19 619	36 560	100.0

Source: TCDD Annual Statistics, 2007, pp. 75-76.

Figure 1. Horizontal and link competition with one port



Note: Only two paths are shown, but many paths are possible.

Figure 2. Port and hinterland competition

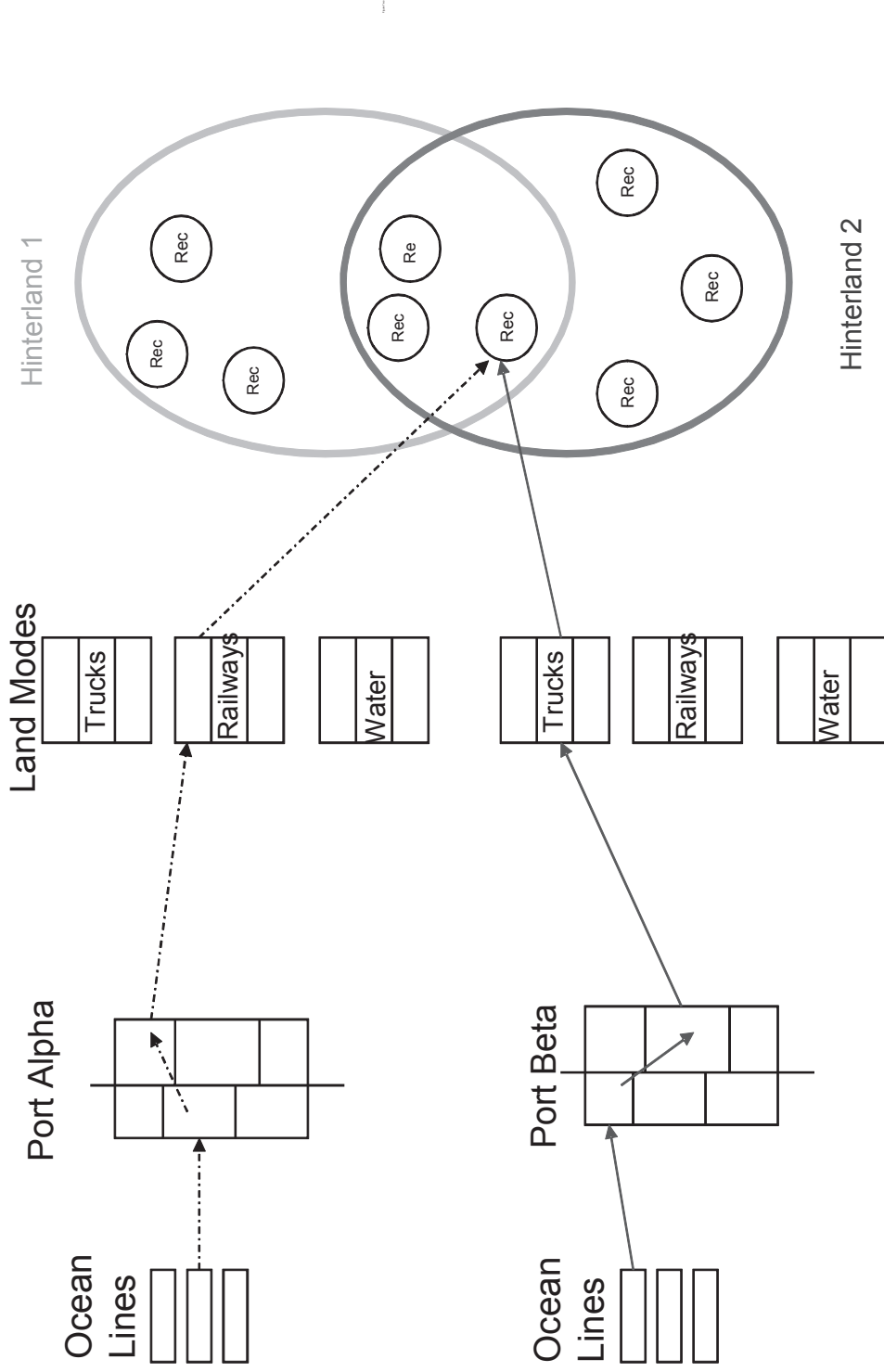


Figure 3. RSA Transport Network

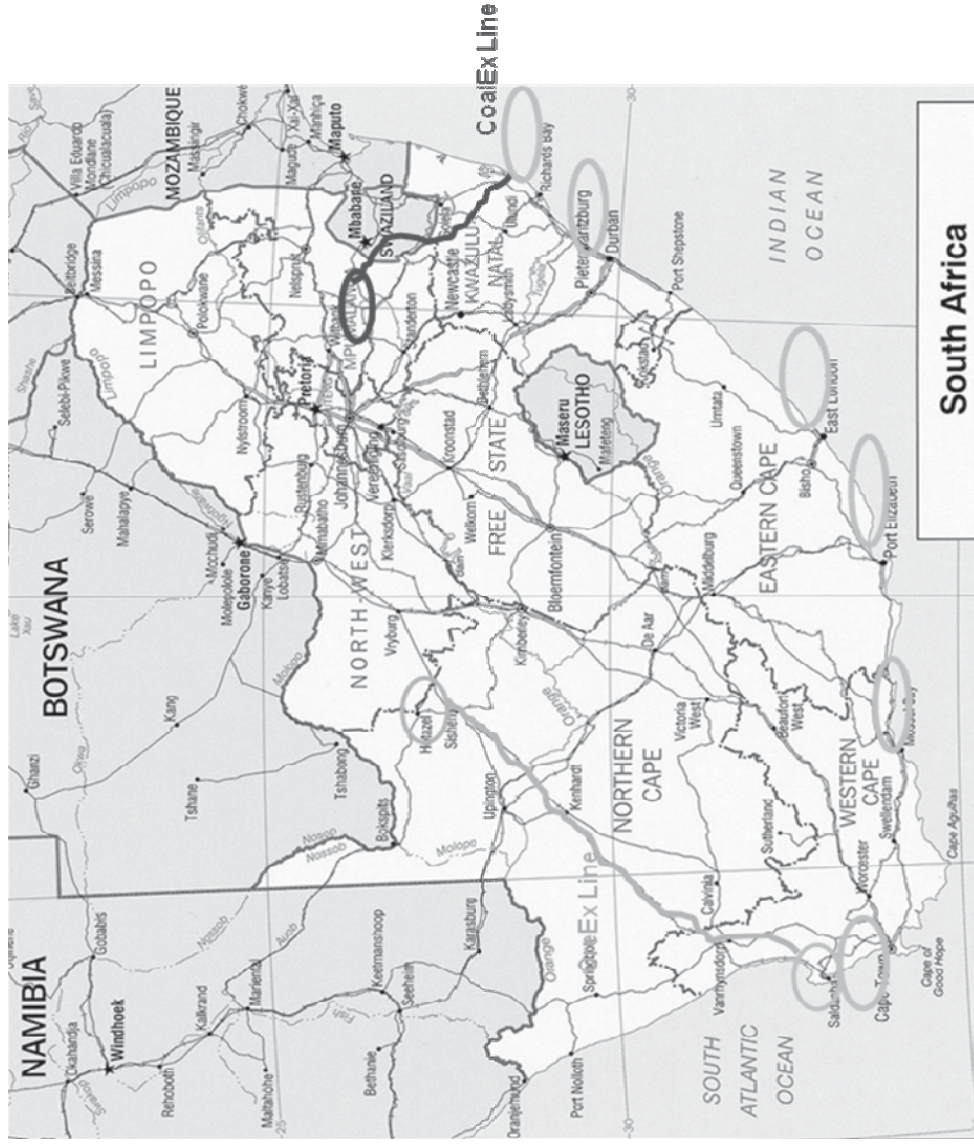
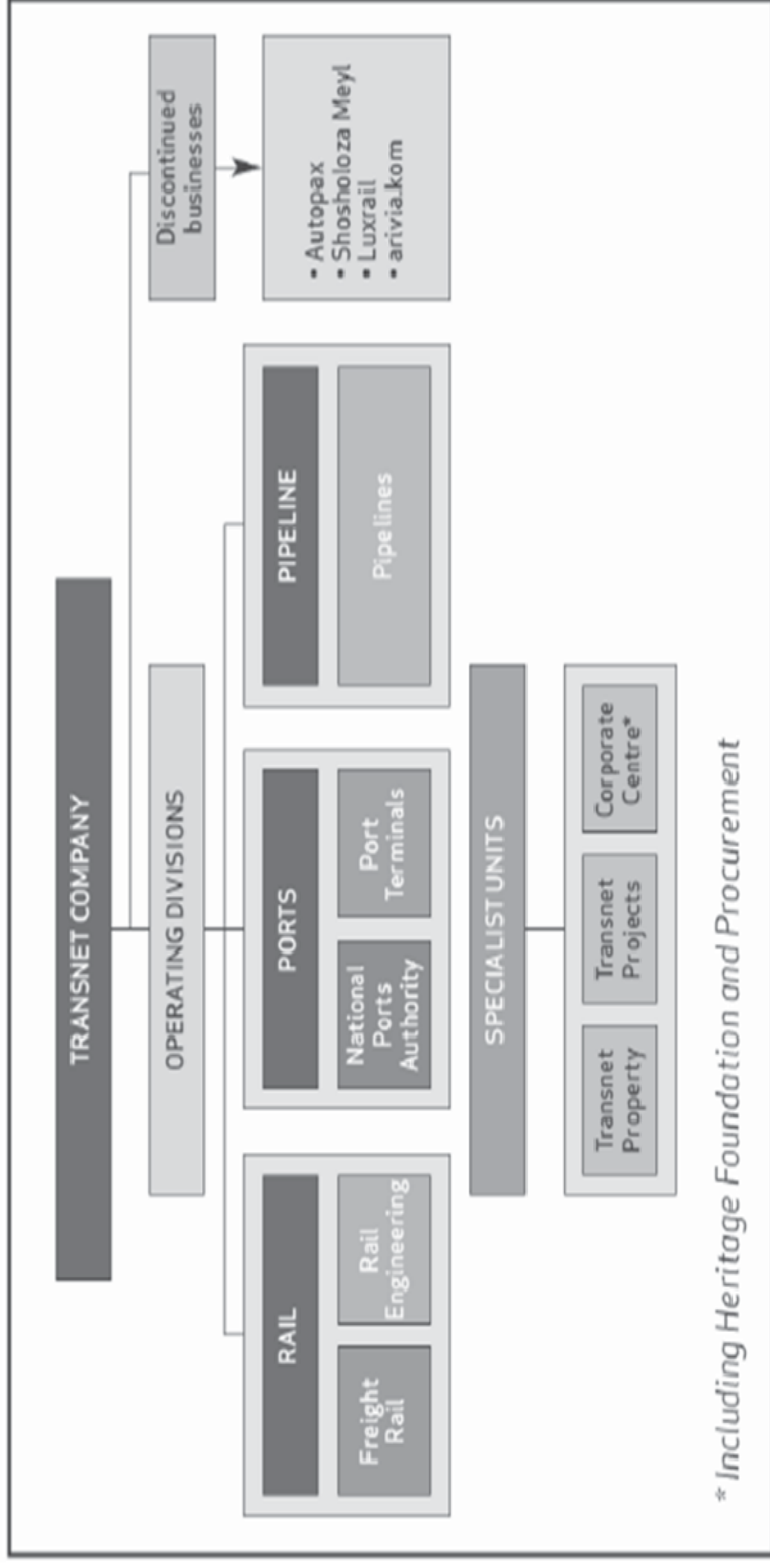
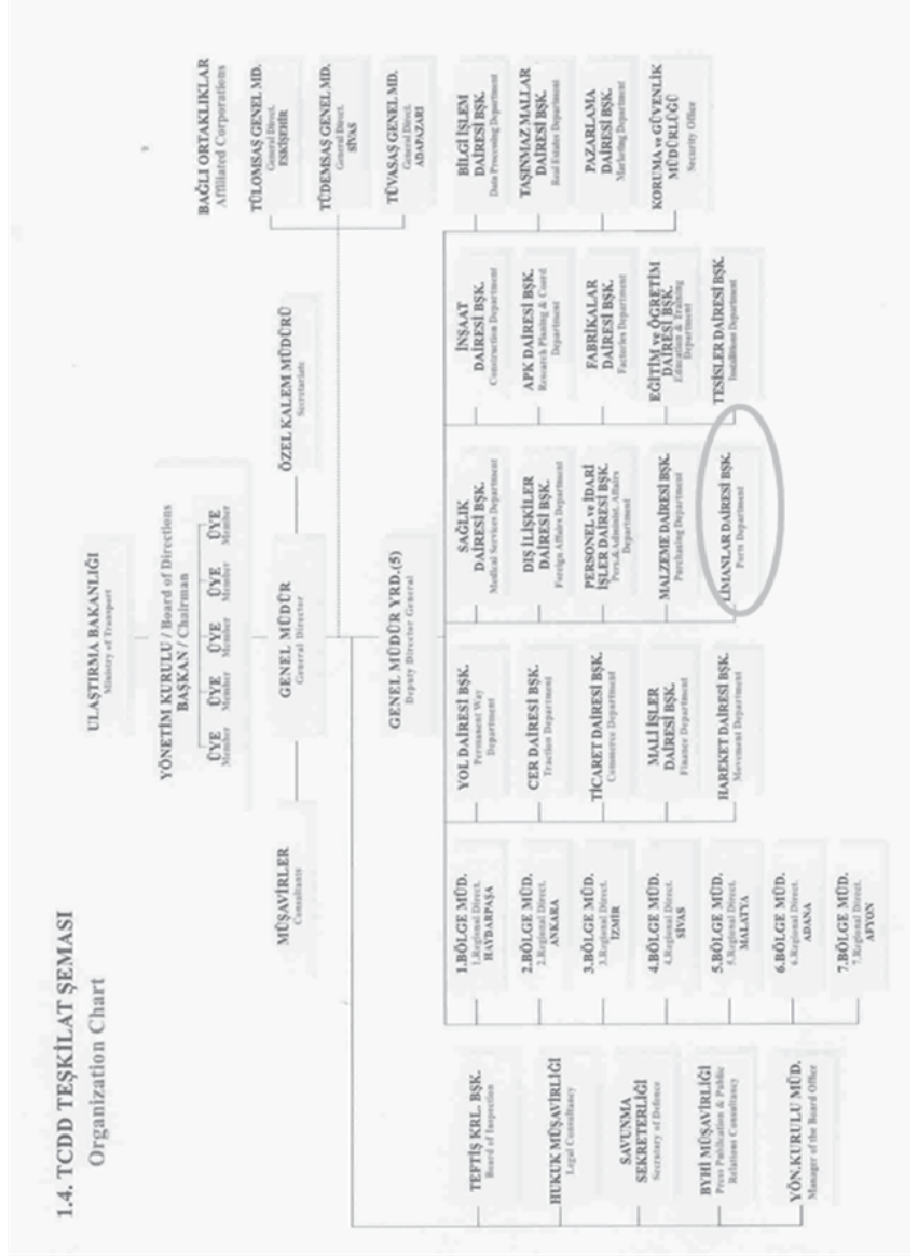


Figure 4. The structure of RSA rail, ports and pipelines



Source: Transnet Annual Financial Results, 31 March 2008.

Figure 6. TCDD Organisation Chart



Source: TCDD İstatistik Yılı 2003-2007

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**ARE HORIZONTAL MERGERS AND VERTICAL
INTEGRATION A PROBLEM?**

Analysis of the rail freight market in Europe

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Brussels/London, January 2009

1. INTRODUCTION

This report examines market power in rail markets in Europe arising from horizontal and vertical mergers in the sector, and was intended to provide a high-level basis for discussion at the Round Table itself. It presents factual information on horizontal and vertical merger cases involving rail freight operators, and highlights the processes used by competition authorities to determine the circumstances in which such mergers should be approved. It also provides commentary on the economics of these markets and, hence, the likely prospects for their future shape.

The topic of the report is timely. The first set of results are available from a preparatory study for the European Commission on whether policy objectives with respect to moving freight onto rail can best be achieved by giving freight more priority on the rail network¹. The “Problem Definition” section of the paper highlights the finding that the “legislative initiatives put forward so far have not produced the expected benefits” as a reason why rail freight’s market share declined until 2005. The perceived limitations of the legislative framework have led the Commission to consider a “re-cast” of the key access charging Directive 2001/14/EC, in order to improve outcomes.

In addition, a number of recent mergers in the rail freight sector have proceeded following investigation by competition authorities. Mergers have included Deutsche Bahn’s (DB) acquisition of both Transfesa and EWS at the larger end of the scale, and Freightliner’s purchase of freight terminals at the smaller end. The need to balance increased competition both now and in the future is crucially important in any discussions around such corporate activity.

The report considers several issues of importance to the assessment of transport mergers by the competition authorities. Section 2 discusses how rail freight fits into the supply chain, and considers how horizontal, vertical and other mergers might occur (and have occurred) in markets involving rail freight operators. Section 3 examines horizontal mergers in these markets, the issues arising and how they might be assessed. Similarly, Section 4 considers vertical mergers in these markets and whether the typical outcome (that there are limited competition issues) is seen here. Section 5 looks at some other types of merger, while Section 6 concludes with some thoughts on the future role of rail in the European logistics market, and questions for discussion at the Round Table.

Each section is illustrated with evidence from competition authorities’ decisions on horizontal and vertical mergers involving rail freight companies, together with an assessment from an economic standpoint of how the issues raised are likely to be taken forward in the future.

2. OVERVIEW OF THE RAIL FREIGHT MARKET

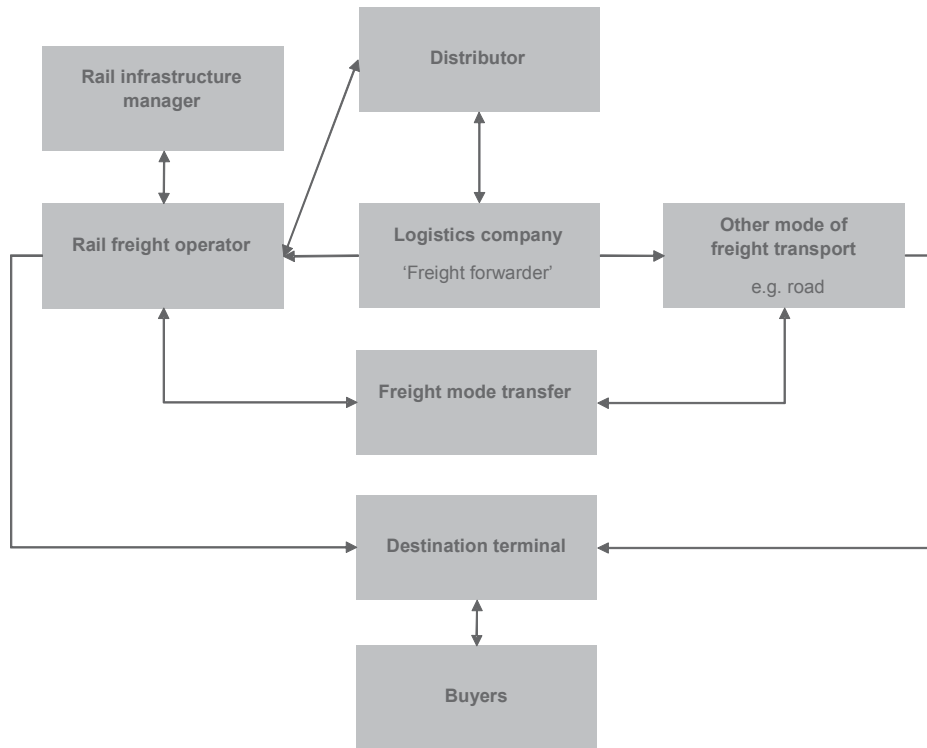
Rail freight operators provide services to logistics companies and producers of intermediate and final goods, typically transporting heavy goods over long distances between freight terminals. In a broad sense, rail freight is in the business of transporting goods and, as such, faces a degree of competitive pressure from all forms of freight transport.

Rail freight operators provide a number of broad types of service²:

- 1) *Single customer-dedicated*: a one-to-one relationship between the customer and service operator, providing a flexible service. Such service is usually reserved for full trainloads.
- 2) *Scheduled intermodal*: use of scheduled routes, timings and paths that generally serve the major intermodal container hubs³. This service does not require any fixed quantity as freight operators consolidate trainloads.
- 3) *Scheduled less than trainload network*: available through a single freight operator, enabling rail to be used for volumes of less than a trainload to be transported to a large number of terminals.
- 4) *Scheduled less than wagonload*: usually a regular timetabled departure on dedicated routes, where capacity is marketed and sold on the basis of a wagonload or less than a wagonload, often through third-party logistics companies.

Figure 1 below shows the value chain for the rail freight industry and how the industry fits into the broader picture. Logistics companies are those that identify freight operators for a distributor's goods (as in service types 2-4 above). Intermodal journeys will require transfer services for containers, and terminals represent the destination point. Loosely speaking, horizontal mergers are combinations of companies in the same part of the value chain (e.g. two rail freight companies), while in vertical mergers companies from different parts of the value chain are combined (e.g. rail freight and infrastructure managers). Traditionally, when rail freight operators and infrastructure managers were both publicly run, this value chain was vertically integrated. In recent years, however, there has been a move towards separation in the value chain.

Figure 1. Value chain of rail freight market



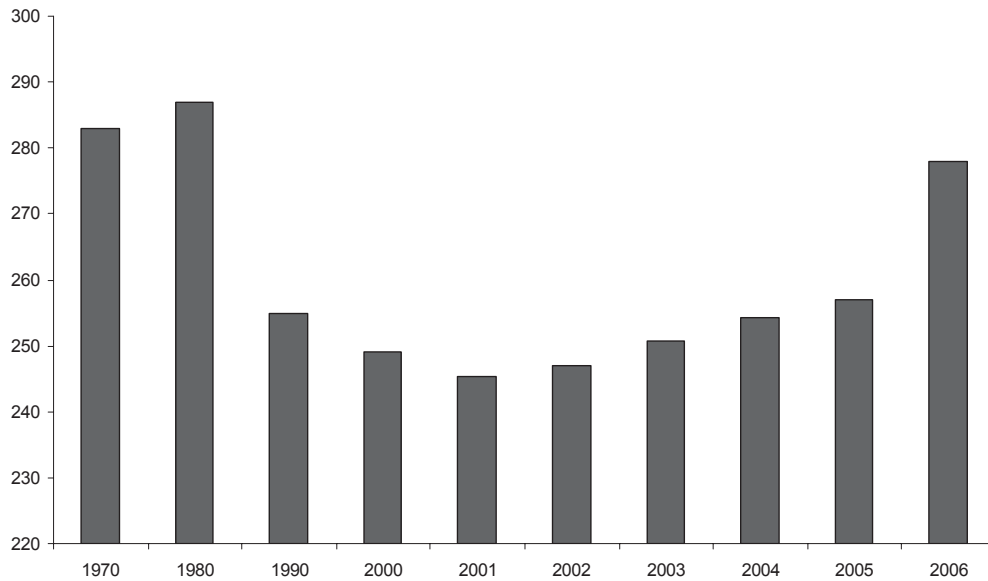
Source: Oxera.

2.1. Recent market trends

Historically, rail freight has largely focused on heavy and high-volume goods, such as coal. Over the past 30 years, demand for transporting these goods has fallen by nearly two-thirds⁴. Compensating for this reduction there has been an increase in the transport of manufactured goods in containers. Figure 2 illustrates the changing traffic in 15 of the EU Member States from 1970 to 2006, and shows a clear decline until the year 2000, after which usage began to rise gradually towards previous levels.

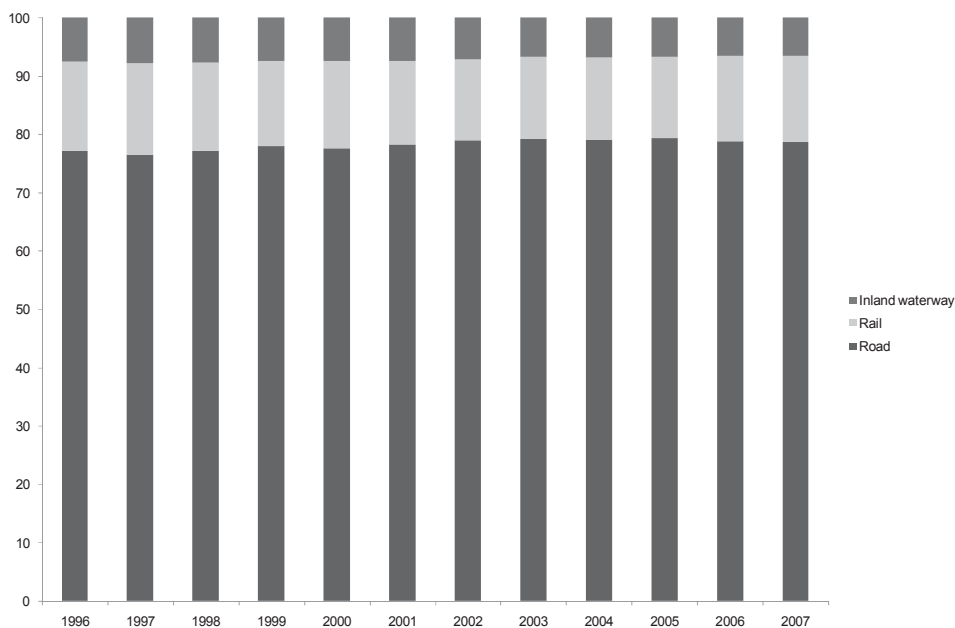
In comparison to road, the key alternative mode of transport, rail freight, by its nature, tends to transport higher volumes and over longer distances⁵. At an aggregate level, data shows that road has a much higher market share than rail freight (see Figure 3). This differential has been less extreme in eastern European countries, although this has begun to change since the late 1990s. (Rail's share of the overall freight sector fell from 43.5% in 1998 to 39.1% in 2002⁶.)

Figure 2. Rail freight traffic in 15 EU Member States (billion t-km)



Source: Eurostat (various years), Transport Data.

Figure 3. Freight industry market shares by t-km, 15 EU Member States (%)



Source: Eurostat (various years), Transport Data.

A comparison of Figures 2 and 3 suggests that, despite the changes in volume of rail freight traffic, there has been little change in the proportion of overall freight going by rail over the past ten

years. This may indicate limited substitutability between the two modes – although competition at the margins for transport of certain commodities (especially those moved in containers) can be fierce. In addition, rail's proportion of the market will be considerably higher for the transport of certain commodities (e.g. coal) than lighter, less dense goods.

The European Commission is, however, clear that it is keen to promote the movement of freight by rail, explicitly recognising rail's environmental advantages over road freight. In its 2001 White Paper, the Commission states:

The growth in road and air traffic must ... be brought under control, and rail and other environmentally friendly modes given the means to become competitive alternatives⁷.

To achieve this objective, a number of packages have been introduced in recent years through several EC directives⁸, with the aim of opening up the EU rail freight market by encouraging competition in the market and stimulating usage levels. These packages have three broad objectives:

- Ensure non-discriminatory access charges and conditions for use of the infrastructure;
- Deal with barriers to competitors entering the market posed by safety regulation and lack of interoperability of rolling stock;
- Improve interoperability by introducing an international rail drivers' licence, together with incentives for improvements in quality⁹.

The last of the three packages was introduced in 2008. It is not clear whether these regulatory changes are responsible for the observed increase in rail freight traffic -- particularly as the Commission's objective of substituting usage from road to rail freight does not appear to have affected the proportion of freight being moved by rail -- and suggests that the increased usage of rail for freight is as much about an increase in freight traffic as a whole across all transport modes.

The directives are aimed at increasing competition through ensuring non-discriminatory access to infrastructure – including both track and rail-related services such as stabling points. Liberalisation and unbundling freight operators from infrastructure managers are expected to deliver gains in efficiency, innovation and customer service.

Since Member States' market structures – in terms of the degree of separation between infrastructure and operations – vary considerably, any response at an aggregate EU level may be difficult to identify in the short term. The differences at the national level are discussed next.

2.2. National rail freight markets

Within the EU, the structure of each national rail freight market can vary owing to a number of factors, such as the degree of privatisation. As the Member States begin to implement the EC directives (discussed earlier), there may be closer alignment between markets, although the magnitude of change required may vary.

The key differences in national markets lie in the structure of ownership of freight operators and infrastructure managers. The degree of separation between these two components of the value chain is relevant when considering vertical integration. If not separate, the potential control over the infrastructure can give a certain freight operator a competitive advantage. Part of the EC directives aims to ensure that this advantage is minimized in national networks, to facilitate a more open market.

In addition to these structural differences, the average quality of service can vary between markets. This is measured by the number of delays, and is cited as a typical problem encountered with rail freight services when compared with alternative modes of transport. The International Union of Combined Road-Rail Transport Companies (UIRR), which includes operators across Europe, reports that 29% of all rail freight in Europe experienced delays of at least three hours in 2003. In comparison, road freight in Europe experienced delays of longer than 15 minutes only 8% of the time over the same period. For companies requiring timely distribution – for example, those employing “just-in-time” principles – this may significantly restrict their demand for rail freight¹⁰. By stimulating competition, market forces may bring about an improvement in quality of service and potentially encourage switching from road to rail freight.

In the context of service quality, mergers (both vertical and horizontal) may give companies more control over the distribution of goods. An example of this may be in the increased level of co-operation and communication present when moving through the value chain if certain components are vertically integrated. If delays are reduced as a consequence, this might allow rail freight to compete more effectively on quality with road freight services.

3. FRAMEWORK FOR COMPETITION ASSESSMENTS

The European Commission’s promotion of competition in rail freight is predicated on the fulfilment of several factors, such as fair and non-discriminatory access conditions for use of the infrastructure and the removal of barriers to entry¹¹. It is therefore important to ascertain whether the competitive effect of mergers between rail freight companies may lead to a significant impediment to effective competition.

With evidence from actual decisions taken by competition authorities, this section provides a conceptual framework for the competition assessment of mergers involving rail freight companies. Setting out an overview of the methodologies and principles applied by competition authorities, it shows the analytical steps involved in a competition assessment.

Mergers affecting the rail freight industry broadly fall into three categories:

- *Horizontal mergers*: mergers between firms that produce and sell competing products. Examples in the rail freight industry may include mergers between two or more rail companies providing freight-forwarding services, as well as companies supplying logistic and ancillary services, such as inter-modal inland terminal handling services.
- *Vertical mergers*: mergers between firms in a buyer-seller relationship. In the rail freight industry, this could include mergers between a freight-forwarding company and a company providing maintenance services to rail companies.
- *Conglomerate mergers*: mergers between firms that are not operating in the same market and do not have a buyer-seller relationship. An example of a conglomerate merger is that between a sportswear company and a soft drinks company. There are few, if any, examples of this type of merger in the rail freight industry.

The preliminary step in a competition analysis is the definition of the relevant market, which determines the relevant set of competing products and services. The analytical steps involved in identifying the relevant product and geographic markets are similar for all three types of merger. The European Commission's Notice on the definition of the relevant markets for the purpose of Community law provides guidance on identifying competitive constraints faced by the merged identity¹².

Once a relevant market has been defined, competition authorities evaluate the impact of the proposed merger on the competitive environment. Central to this assessment is whether the merger would lead to a significant lessening of competition in any of the relevant markets. There may be more than one economic market relevant to a given merger. As the anti-competitive effects of the three types of merger differ, this report discusses separately the competitive assessment of horizontal, vertical and conglomerate mergers in the rail freight industry (see sections 4, 5 and 6, respectively).

3.1. Market definition

Answering the question of whether a merger would lead to a significant lessening of competition requires a thorough understanding of competing products and services that may be affected by the merger. Consequently, a market definition exercise is conducted to determine the competitive pressure that each product of a firm places on other potentially substitutable products.

There are two dimensions to conducting a market definition: defining a relevant product market and a relevant geographic market. The former will include all the products (which may differ by the time of day the product is needed, and the type of purchaser) and the businesses supplying the products, that constrain the behaviour of a company with regard to each of its products, and consequently, all those companies supplying services that end-consumers regard as substitutes¹³. The definition of the latter determines the extent to which demand switches between companies based in different locations, and consequently whether a market is local, regional, corridor- or origin-destination (O&D)-based, national or international in geographic scope.

In general, when delineating relevant markets, competition authorities consider two sources of competitive constraint: demand-side substitution and supply-side substitution¹⁴.

Demand-side substitution assesses which products or services are regarded as substitutes for the focal services by end-consumers. The generally accepted approach to assessing the degree of demand-side substitutability is the SSNIP test. This considers whether a hypothetical monopolist would be able profitably to sustain a small but significant non-transitory increase in price (SSNIP) or lower the product offering equivalently in terms of quality or variety. An SSNIP test seeks to establish how many customers would switch to an alternative product if a hypothetical monopolist increased prices. A market is defined as a product or group of products and a geographic area in which a hypothetical, profit-maximising firm, which would be the only seller of those products in that area, could profitably raise prices by a small and non-transitory amount¹⁵. In cases where it is not possible to obtain clear evidence as to the likely outcome of price rises, the SSNIP test still serves as a conceptual framework for the purpose of delineating the relevant product market.

Supply-side substitution evaluates whether suppliers can switch production in a timely manner and without incurring significant costs in response to a price increase in production. For example, in the *Deutsche Bahn/English Welsh & Scottish Railway Holdings* case, the European Commission adopted a national geographic market definition for rail freight services because it was considered to be difficult to switch to international suppliers due to technical and procedural barriers, such as the

lack of interoperability and national safety certificates, and the need for specially trained staff with language skills and licences¹⁶.

3.1.1 *Relevant product markets in the rail freight industry*

The objective of a product market definition is to identify the set of products that exercise competitive constraints on each other. Since the relevant product market definition is instrumental to the competitive assessment, it is important to establish which products and services compete with the products and services supplied by the merging parties.

In the rail freight industry, competition authorities have previously defined a number of different product markets, depending on the range of products and services supplied by the merging parties. Examples of relevant product market definitions adopted in merger cases between rail freight companies include the following:

- *Freight forwarding*: this market would comprise the organisation of transportation of items on behalf of customers. Freight forwarding has occasionally been further segmented into domestic and international freight forwarding and freight forwarding by air, land and sea¹⁷.
- *Contract logistics*: the relevant market would consist of the planning, implementation and control of the efficient flow and storage of goods, services and related information from the point of origin to the point of destination¹⁸.
- *Maintenance services*: the relevant product market consists of freight wagon maintenance services¹⁹.

An important question raised in many merger investigations is whether the relevant product market comprises forwarding by rail and road, or just by rail. When analysing whether road freight forwarding exercises a competitive constraint on rail freight forwarding, in line with the framework for market definition, it is important to assess whether consumers perceive road freight forwarding as a substitute. For example, would a sufficient number of customers switch to road freight forwarding in the event of a 5-10% price increase in rail freight forwarding?

In the *Freightliner Limited/Deutsche Post AG* case, the UK Office of Fair Trading (OFT) gave a market definition for the supply of inter-modal inland terminal handling services by road and rail (see Box 3.1 below). Drawing on customer surveys, the OFT concluded that the relevant market consisted of the haulage of inter-modal containers (IMCs) by road and rail. In the *Deutsche Bahn/Transfesa* case, the European Commission also acknowledged the existence of at least partial substitutability between freight-forwarding services by rail and road²⁰. The formal market definition was, however, left open, as a broader market definition would not have changed the outcome of the competitive assessment.

The logistics of particular goods may also comprise a separate relevant product market. For example, in the case of finished vehicles logistics (FVL) service providers²¹, suppliers often need to respond to numerous requirements from car manufacturers and must have dedicated equipment, such as special wagons and trucks. It is therefore highly likely that other logistics services are not viewed as close substitutes by consumers²². There may also be a lack of supply-side substitutability because it may be expensive to switch supply in a timely manner.

Box 3.1. OFT product market definition in *Freightliner Limited/Deutsche Post AG*

This case, which received OFT approval in June 2008, concerned the acquisition by Freightliner Ltd, a UK rail haulage operator, of two inter-modal inland rail ports, located at Daventry and Doncaster in the UK, from Deutsche Post. The merging parties are both active in the supply of inter-modal inland terminal handling services to third parties in the UK. Terminal handling services refer to the provision of rail access to the terminal, which involves the lifting of IMCs between trains and lorries and the provision of other services, such as container storage. Freightliner provides only rail-based IMC haulage. In the UK, 80% of the volume of freight transported in IMCs is moved by road.

The OFT considered that the competitive constraints from road to rail are also relevant to the local assessment around the two inter-modal inland rail ports acquired by Freightliner from Deutsche Post. It found that a hypothetical monopolist supplier of the relevant rail-based IMC haulage would not be able profitably to sustain a small price increase, because many customers would switch to road-based IMC haulage services in the UK. This conclusion was based on a customer survey and studies by the Office of the Rail Regulator (ORR) and Network Rail, which concluded that road haulage is by far the most popular form of IMC haulage. Rail and road are thus deemed to be part of the same relevant market for IMC haulage in the areas around Daventry and Doncaster.

Drawing on this wider market definition, the OFT consequently concluded that the proposed merger would not result in a substantial lessening of competition, as the competitive constraints imposed by road-based hauliers would prevent the merging parties from behaving anti-competitively.

Source: Office of Fair Trading (2007), “Anticipated acquisition by Freightliner Limited of two inter-modal inland rail ports located at Doncaster and Daventry from Deutsche Post AG”. ORR (2006), “Periodic Review 2008 – Consultation on Caps for Freight Track Access Charges”. Network Rail (2007), “Freight-Route Utilisation Strategy”, March.

3.1.2 *Relevant geographic markets in the rail freight industry*

Another important element of market definition is the identification of the geographic boundaries of each relevant product market. For example, competition authorities have previously adopted the following relevant geographic markets in the rail freight industry.

- The relevant geographic market for freight-forwarding services has often been considered to be national rather than international due to the lack of supply-side substitutability between country-specific certificates and the language skills of staff in different countries²³.
- The geographic market definition for ancillary services has often been narrowly defined. For example, in the *Deutsche Bahn/Transfesa* case, the European Commission considered the relevant geographic market for axle-changing services to consist of stations located at the Spanish–French border (see Box 3.2)²⁴.

An issue raised in many cases was whether certain corridors, which concern routes with similar origins and destinations, should be defined as separate relevant geographic markets²⁵. The geographic dimension of such markets has often been delineated with the help of customer surveys.

Box 3.2. Geographic market definition in *Deutsche Bahn/Transfesa*

This case concerns the acquisition of the Spanish-based logistics operator, Transfesa, by Deutsche Bahn. Transfesa provides rail and road forwarding and logistics services in Spain. Deutsche Bahn's activities involve rail passenger transport and rail transport in Germany, the Netherlands and Denmark, as well as worldwide freight forwarding, logistics and ancillary services.

The European Commission defined the relevant geographic market for several product markets.

- *Freight forwarding.* The outcome of the market investigation suggested that the relevant geographic market may be either national or EEA-wide. Some respondents suggested that there would be a separate market for rail freight forwarding to and from Spain because of the characteristics of the Spanish market. The relevant market definition was, however, left open since the market definition did not have the potential to change the overall assessment of the merger.
- *General contracts logistics services.* The outcome of the market investigation was not conclusive. It found that there is increasing demand for cross-border logistics services. This would imply that the market would be wider than national. The relevant market definition was left open.
- *FVL.* All major contracts are tendered EU-wide. Furthermore, major players are active across the EU. This implies that the relevant market would have an EEA-wide dimension, as was confirmed by the Commission's market investigation. Nevertheless, this also revealed that there may be a separate market for FVL services to and from Spain due to the characteristics of the Spanish railways. The precise scope of the geographic dimension was left open.
- *Car components logistics.* Most car manufacturers indicated that the relevant market would be wider than national because the O&D points matter when deciding which company will provide car component logistics. Moreover, most rail-forwarding companies perceive this market to be EEA-wide. The relevant market definition was left open by the Commission.
- *Transport.* The Commission found indications that the relevant market might be wider than national because it comprises cross-border activities. However, the geographic dimension for this market was left open.
- *Axle-changing stations.* The European Commission considered the hypothetical market for axle-changing stations to be limited to the French-Spanish border.

Source: Commission of the European Communities (2008), "Case No. COMP/M.4786 – *Deutsche Bahn/Transfesa*", 18 March.

In the *Deutsche Bahn/EWS* case, the European Commission considered whether the major north-south corridors from the Belgian, Dutch and German ports to northern Italy comprised a separate geographic market (see Box 3.3). The Rotterdam-Italy rail corridor was not considered to be a true O&D market by the European Commission as only some of the goods were transported the whole distance.

Box 3.3. Geographic market definition in *Deutsche Bahn/EWS*

The European Commission's assessment of the acquisition by DB of EWS, a successor of the freight business of the former UK national rail monopoly, raised several issues in relation to the relevant geographic market definition.

Rail freight services were considered to be national because of different technical and regulatory requirements in markets and the need for specially trained staff to provide cross-border services.

The Commission also outlined the importance of certain “corridors”, primarily routes from the Belgian, Dutch and German ports to northern Italy. Each particular route on these corridors may not be substitutable with others, from a demand-side perspective. Nevertheless, the choice of a harbour for incoming traffic to Europe is part of an overall transport solution, according to the Commission. Goods may use alternative routes to reach their destination, implying that the north-south corridors may include alternative points of origin and routes. The Commission furthermore questioned the importance of those corridors, as there are multiple stops between the origin and destination of a route.

The Commission consequently identified the relevant geographic market to be national in geographic scope, with the possibility of becoming larger than national, in particular with respect to certain international routes being part of a corridor or having special characteristics.

Source: Commission of the European Communities (2007), “Case No. COMP/M.4746 - *Deutsche Bahn/English Welsh & Scottish Railway Holdings*”, 6 November.

In the *SNCF/Trenitalia/AFA* case, the European Commission also defined the relevant geographic market by O&D pairs. The relevant geographic market was considered to consist of rail freight services on the Lyon-Turin axis, which links north-west Europe with north-west Italy (see Box 3.4)²⁶.

Box 3.4. Geographic market definition in *SNCF/Trenitalia/AFA*

The creation of Autoroute Ferroviaire Alpine (AFA), a 50/50 joint venture between SNCF and Trenitalia, provides a new rail shuttle service for lorries and semi-trailers through the Fréjus Tunnel under Mont Cenis. SNCF and Trenitalia provide passenger and freight railway services.

The European Commission defined the relevant geographic market by O&D pairs. To verify the arguments put forward by the parties, the Commission undertook a market investigation. The degree of demand-side substitutability of different routes on the Lyon-Turin axis was determined through the use of a survey. Third parties argued that, in the case of an SSNIP, companies would still operate on a route linking north-west Europe and north-west Italy. Routes through the Saint Gothard Tunnel and the Mont Blanc Tunnel would not be substitutes because they are subject to different regulatory requirements, such as limitations in weight and safety regulation.

The Commission therefore concluded that the relevant geographic market would consist of the Lyons-Turin axis, linking north-west Europe and north-west Italy.

Source: Commission of the European Communities (2003), “Case No. COMP/M.3150 - *SNCF/Trenitalia/AFA*”, 4 August.

Box 3.5. Geographic market definition in *Arcelor/SNCF/CFL Cargo*

The European Commission took a similar approach to that examined in Box 3.4 in the *Arcelor/SNCF/CFL Cargo* case, where the relevant geographic market was defined through the use of O&D pairs. The case concerned the acquisition of joint control by Arcelor Profil Luxembourg and SNCFL of newly created CFL Cargo, by way of purchase of shares. Arcelor Profil is a producer and distributor of long carbon steel products and SNCFL a provider of railway services. It was intended that CFL Cargo would take over all railway transport of goods previously provided by EuroLuxCargo (Luxembourg), Neg Uetersen (Germany) and Dansk Jernbane Aps (Denmark), subsidiaries of SNCFL, as well as the internal transport realised by Arcelor Profil Luxembourg and Arcelor Rodange.

The Commission's approach was to define the relevant geographic market by O&D pairs. The results of the market investigation indicated that there may be two distinctive O&D markets:

- O&D long-haul – the points of origin *or* destination are located in Luxembourg;
- O&D short-haul – the points of origin *and* destination are located in Luxembourg.

The short-haul operations are complements, not substitutes for long-haul operations. Furthermore, there were some indications that the relevant market would be national in geographic scope because rules, regulations and technical details may differ across countries.

The relevant market definition was nevertheless left open, since a different market definition would not give rise to competitive concerns.

Source: Commission of the European Communities (2006), "Case No. COMP/M.4294 - Arcelor/SNCF/CFL Cargo", 9 October.

3.2. Competitive assessment

Following the identification of the relevant market, it is necessary to assess whether the proposed merger would have any anti-competitive effects on the market²⁷. Central to such an assessment is whether the merger creates problems by limiting effective competition between firms operating in the same market. The European Commission's horizontal and non-horizontal merger guidelines provide further guidance on the conceptual framework for competitive assessment²⁸.

As previously indicated, horizontal, vertical and conglomerate mergers may cause different competitive problems. By reducing the number of competitors in a market, horizontal mergers may create or strengthen market power. Non-horizontal mergers are generally less likely to engender competition concerns than horizontal mergers because they do not result in the loss of direct competition between merging firms in the same relevant market²⁹. The threats to competition from vertical and conglomerate mergers are less obvious, and can in principle be viewed as unilateral actions with the potential to harm rivals. These types of merger concern markets without horizontal overlaps, and the anti-competitive effect is often caused by exclusionary practices: by denying access to essential facilities, a vertically integrated firm may, for example, leverage its market power into the downstream market.

Because some merging parties deliver a full range of services, it may be necessary to assess horizontal, vertical and/or conglomerate effects in a single case. The *Deutsche Bahn/Transfesa* case is

an example of where the European Commission examined potential horizontal, as well as vertical, effects. In addition, in the *Freightliner/Deutsche Post* case, the two merging parties, Freightliner Limited and Deutsche Post, were both active in the provision of inter-modal inland terminal handling services to third parties. Nevertheless, the focus of the OFT's competitive assessment was whether the merger had the potential to lead to vertical foreclosure because the acquirer was also active in the market for IMC haulage.

Assessments of the competitive effects of mergers in the rail freight market also draw on the principles set out in Articles 81 and 82. For example, for possible competition concerns, such as foreclosure of access to essential facilities, the normal competition rules on abuse of dominance could be applied. Moreover, the analysis of vertical effects between merging parties is similar to the assessment of vertical restraints between undertakings and concerted practices under Article 81.

4. HORIZONTAL MERGERS

The most important threat to competition from horizontal mergers between existing firms in a market is that, by reducing the number of competitors in the market, the merger may result in giving the merged party market power. Competition problems may also be created if the merger is with a firm currently not operating in that market, as it eliminates a potential entrant into the market.

Competition authorities must take into account any significant impediment likely to be caused by a concentration. A competitive assessment of horizontal mergers would involve several analytical steps. First, competition authorities must examine market shares and concentration levels. These horizontal effects are discussed below, together with other reasons why a merger may lead to a lessening of effective competition – for example, by eliminating one of the merging parties as a potential entrant. Section 4.2 then discusses whether the merging parties' ability to abuse a dominant position may be constrained by other factors, such as buyer power or potential competition, while section 4.3 reviews potential remedies.

4.1. Horizontal effects

4.1.1 *Horizontal overlap*

Market shares and concentration levels may provide useful information about the market structure and the competitive importance of the two merging parties.

Even though market shares are not, by themselves, evidence of market power, they may provide some insight into the relative strengths of companies and changes to those positions over time. The post-merger market share of the merged parties is based on the assumption that they are equivalent to the sum of their pre-merger market shares. As stipulated in the EC's horizontal merger guidelines, a merger resulting in a post-merger market share of 50% or more may be considered evidence of a dominant market position according to case law. Anything less than 25% is usually taken as an indication that the merger would not lead to a significant impediment of competition, and hence is

likely to receive approval, although such mergers may still raise competitive concerns, due to a number of other factors³⁰.

Overall concentration in a market may also provide an indication of the competitive strength of the two merging parties. The Herfindahl-Hirschmann Index (HHI) is a commonly used measure of concentration. It calculates the sum of the squares of individual market shares of all firms in a market. The absolute level of the HHI indicates whether the market is competitive (the lower the value, the more competitive is the market), while a change in HHI provides a good proxy of the change in concentration due to the merger. HHI levels are a useful initial indicator of the absence of competition, but are not sufficient to draw conclusions on the absence of competition concerns³¹.

The combined market share following a merger in the rail freight industry focuses on the relevant market and the instances in which market shares would be particularly high post-merger. For land-based freight-forwarding services, for example, this approach would establish the combined market share of the two merging parties and the incremental increase in their market shares on particular routes. Market shares are usually expressed in terms of total sales.

Many mergers between rail freight companies were not investigated further because the combined share in the market in question was considered to be too low. For example, in the *Deutsche Bahn/Bax Global* case, the European Commission concluded that the competitive effect of the merger in the market for contract logistics did not need to be considered in detail because the merging parties' combined market share did not exceed 10% in any of the eight countries in which both parties operated³².

Other examples include the *Deutsche Bahn/Stinnes* case, where the merging parties argued that there would be no anti-competitive concerns because the combined market share was below 5% in Germany and below 10% in the EU's internal market for freight and transport services. The competitive assessment of the European Commission identified no competitive concerns, even if the relevant product markets were more narrowly defined³³.

4.1.2 *The elimination of a potential competitor*

A horizontal merger may also limit competition in a relevant market by removing one of the merging parties as a potential entrant into that relevant market. Such a situation could occur in the absence of any horizontal overlap. An assessment of the elimination of one of the merging parties as a potential entrant is particularly relevant if the two merging parties operate in different markets, but are significant in size.

The *Deutsche Bahn/EWS* case is an example of where the European Commission investigated whether the removal of either party as a potential entrant might have led to a significant lessening of competition in some markets (see Box 4.1). The Commission investigated whether there were any competition concerns due to the elimination of EWS as a competitor on the major routes from the north-western European ports to northern Italy. As an incumbent, DB had a significantly high market share of the corridor in question. However, the proposed transaction was not considered to lead to a significant lessening of competition on those routes because there were alternative competitors on the routes, and EWS did not provide any rail freight services on the north-south corridor. Moreover, the European Commission examined whether the merger would lead to the elimination of potential competition in domestic and cross-border rail freight transport within the UK and Germany, and to the elimination of potential competition in the UK³⁴.

Box 4.1. *Deutsche Bahn/EWS competitive assessment*

Despite the lack of horizontal overlap between DB and EWS, the European Commission nevertheless investigated whether the merger was likely to give rise to competition concerns by examining whether there would be:

- A potential lessening of competition in domestic and cross-border rail freight markets in France. The Commission was concerned that the proposed transaction would strengthen the dominant position of SNCF in the provision of rail freight services in France by removing EWS as a competitive force in France. There were concerns that EWS might compete less aggressively with SNCF in France because DB had a close business relationship with SNCF;
- Elimination of potential competition in domestic and cross-border rail freight transport within the UK and Germany. Entry barriers were considered to be high in the UK for single-wagon services (both domestic and cross-border) due to the extensive costs of setting up a comprehensive distribution network. It was thus considered to be unlikely that DB would enter the market. In Germany, the elimination of EWS as a potential entrant did not raise any concerns about anti-competitive effects, as there were already a large number of operators.
- Elimination of potential competition and possible foreclosure of single-wagon services in the UK, relating to cross-border rail freight transport on the route between Germany and the UK. Due to technical and economic constraints, DB and EWS were not considered to be likely entrants in the provision of single-wagon and block train services;
- Elimination of potential competition on the north-south corridors — the proposed transaction was furthermore unlikely to result in a lessening of competition on any north-south routes, because EWS did not operate on any of these;
- Possible foreclosure of single-wagon services in the UK — the merger was not considered to result in possible foreclosure of single-wagon services in the UK relating to cross-border traffic on certain routes from countries (other than Germany) where DB is active to the UK.

The merging parties subsequently submitted a number of commitments (see section 4.2), which removed the concerns raised by the Commission.

Source: Commission of the European Communities (2007), Case No. COMP/M.4746
- *Deutsche Bahn/English Welsh & Scottish Railway Holdings (EWS)*, 6 November.

4.1.3 *Offsetting factors*

In line with the principles set out in the European Commission's horizontal merger guidelines³⁵, the competition assessment of horizontal mergers needs to go beyond the definition of the relevant market and an estimate of the relevant market shares. It should also allow for factors that may prevent the merging parties from acting anti-competitively, such as countervailing buyer power, efficiencies created by the merger and the failing-firm defence³⁶. Decisions on mergers between rail freight have addressed, for example, whether countervailing buyer power or potential market entry by third parties could offset the market participants' ability to abuse their market power.

4.1.4 *Countervailing buyer power*

Countervailing buyer power is a factor that is often examined in the context of mergers between rail freight companies. If the buyers have purchasing power in relation to their purchases of rail freight services from the merging parties, they may be able to constrain the freedom of the merging parties to set prices. For a firm with large market shares, it is more difficult to raise prices or reduce the quality of services when buyers have a strong bargaining position. Buyer power may therefore offset any additional market power arising due to mergers.

In the rail freight market, buyer power is particularly relevant because rail freight products are often purchased by a small group of buyers who are well informed and highly concentrated. In the *Deutsche Bahn/Transfesa* case, the Commission concluded, for example, that car manufacturers have some bargaining power over their finished vehicle collection providers³⁷. They could easily switch to road and/or move capacity to other providers in the case of a price increase. The fact that the EEA market for finished vehicle collection by rail was characterised by a limited number of customers with very specific needs and know-how in logistics, motivated the European Commission's decision to conclude that the merger would not lead to a significant lessening of competition.

4.1.5 *Barriers to entry*

Potential market entry may also constrain the behaviour of the merging parties. For entry to be considered a sufficient competitive constraint on the merging parties, it must be shown that entry is likely to occur if prices move above competitive levels. This depends substantially on the associated sunk costs of market entry. Entry may be constrained by barriers such as technical advantages or the experience and reputation of a firm. Moreover, entry would be more likely to occur in a market that is expected to grow³⁸.

The EC Liberalisation Directive led to new market entry in many national markets for rail freight services. Despite ongoing market liberalisation, there are still high barriers to entry in these markets. Incumbents tend to have high market shares and a competitive advantage over new market entrants due to their existing infrastructure network and reputation. New market players often need to undertake large, sunk investments in infrastructure before entering the market. This is a possible reason why new entrants often start operating in a restricted geographic area, serving a few, large customers.

Long-term access contracts between a freight operator and an infrastructure manager are one example of barriers to entry in the rail freight industry. The time-consuming and costly process of attaining such contracts makes further market entry less likely. The European Commission considered that barriers to entry are also relatively high because new entrants would need to invest in rolling stock, training of staff, marshalling and other facilities to compete in the block-train market³⁹.

4.2. Remedies

In some cases, mergers may be allowed to proceed, but be made subject to certain remedies, to mitigate potential harm arising from the proposed merger. Merging parties often offer remedies to offset the potential problems identified by the competition authorities.

Further guidance on the appropriateness of remedies is provided in the European Commission's 2008 Notice on remedies. The principles which apply to the acceptance of remedies are similar in the

case of horizontal and non-horizontal mergers. The question of whether a remedy is appropriate to eliminate the competition problems identified has to be evaluated on a case-by-case basis⁴⁰.

Remedies broadly fall into two categories:

- *Behavioural*: The purpose of behavioural remedies is to resolve problems relating to the future behaviour of the merging parties. For example, the merged party may be required not to raise prices, reduce product ranges or remove brands. According to the Commission, behavioural remedies are only acceptable in very specific circumstances;
- *Structural*: These remedies may relate to divestitures or the granting of access to key infrastructure. Divestiture remedies are considered by the Commission to be the best means of resolving competition problems arising from horizontal overlaps. They may also remedy problems arising from vertical or conglomerate concerns⁴¹.

Many mergers between rail freight companies have been approved by competition authorities without the imposition of further remedies. The merger between DB and EWS is an exception. DB offered to fulfil the expansion plan in France, relating to investments in locomotives and the hiring and training of personnel, to address the European Commission's concerns that the merger might eliminate EWS as a potential entrant in France. DB also offered to remedy any potential concerns in relation to the UK-Germany route and the possible foreclosure of cross-border rail into the UK. Following the European Commission's initial assessment, DB proposed to commit to:

- fulfil the objectives of the Locomotive Plan of Euro Cargo Rail, EWS's subsidiary in France, aiming to maintain competitive constraints in the French market;
- use a certain percentage of locomotives and personnel for a mix of cross-border and domestic operations in France;
- provide access, during the Business Plan Periods, to any interested third party (except SNCF) to its driving schools, maintenance facilities and services in France.

Following a review of the proposed remedies, the Commission concluded that these remedies were sufficient to remove the competition problems identified⁴².

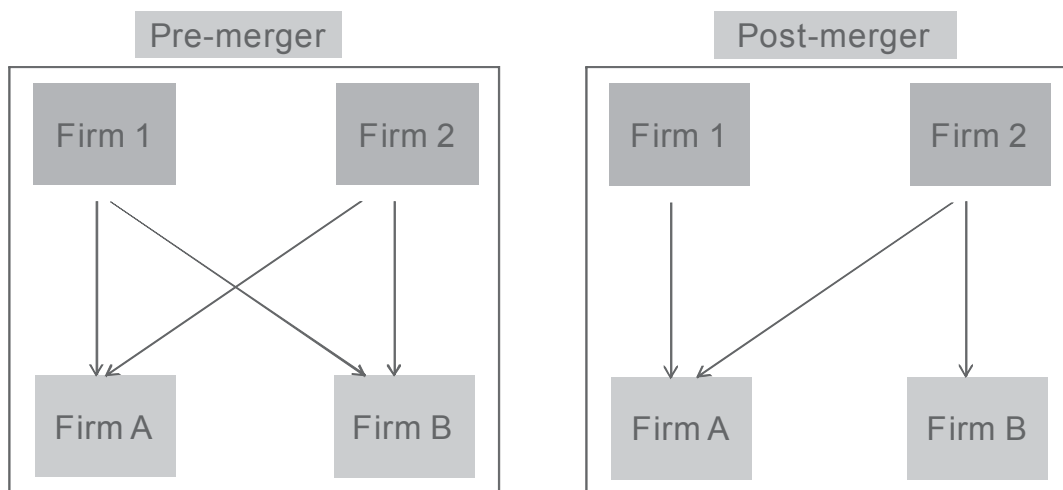
5. VERTICAL MERGERS

Vertical mergers describe a situation where firms that operate at different levels in the supply chain merge. In the rail freight industry, for example, this could be a merger between a freight-forwarding company and a supplier of maintenance services.

Figure 5.1 shows the vertical effects in a generic, stylised way, and forms a helpful guide for identifying any potentially adverse effects on competition. Imagine the acquisition of Firm 1 by Firm A. After the acquisition, Firm 1 may be incentivised to provide its services on worse terms to Firm A's rivals. By charging higher prices to Firm B for Firm 1's inputs, Firm A may be able to gain a competitive advantage. Nevertheless, Firm B may be able to switch to the input supplied by Firm 2 in

the case of a price increase in Firm 1's input. Firm A will therefore obtain a competitive advantage only if Firm B cannot switch to Firm 2, or doing so is more costly for Firm 2.

Figure 5.1. Competition problems with vertical mergers



Source: Oxera.

Firms 1 and 2 could be seen as rail infrastructure managers and Firms A and B as rail freight operators, as shown in Figure 2.1. Without having access to the essential facilities of the infrastructure manager, such as depots or stabling points, rail freight companies may, for example, not be able to provide cross-border rail freight services.

Examined next is the approach taken by competition authorities in assessing market power in the case of vertical mergers between rail freight companies. The main vertical effects are then outlined in section 5.2, followed by a review of factors that may limit the merged parties' ability to act anti-competitively (see section 5.3). The section ends by looking at remedies imposed by competition authorities to offset the adverse effects of vertical mergers.

5.1. Market power

In general, it can be said that the greater the market power at one level of the supply chain, the more attention should be devoted to vertical issues. The threat of switching to alternative firms would limit the ability of a vertically merged firm to increase prices or reduce the level of service quality. In the absence of competing upstream competitors, vertical effects might lead to foreclosure of all downstream rivals and monopoly prices⁴³.

Nevertheless, an upstream monopolist may not want to set higher prices for its downstream competitors due to the double-marginalisation problem, as discussed in subsection 5.3.3. The monopolist could extract all its revenue at the upstream level without leveraging its market power into the downstream level. Market power at one level of the supply chain is thus a necessary, but not a sufficient, condition for the existence of vertical effects.

In considering the vertical effects of a merger, it is therefore important to ascertain the degree of concentration at all levels of the supply chain. If none of the merging parties had significant market power, the merger would be unlikely to lead to a significant lessening of competition.

Market shares are considered to be an indicator of a firm's ability to act independently of its competitors. However, by themselves they may not be evidence of market power. Other factors, such as barriers to entry and exit, may also be taken into consideration when deciding whether one of the merging companies has market power. For example, the decision of the UK Competition Commission (CC) on the proposed transaction of Marcroft by Railway Investments established that Marcroft had a degree of market power in the market for wagon maintenance services before the merger (see Box 5.1).

Box 5.1. *Railway Investments/Marcroft Holdings Limited competitive assessment*

The Competition Commission (CC) examined vertical issues in relation to the merger between Railway Investments, a wholly owned subsidiary of EWS and Marcroft, a supplier of rail freight wagon maintenance in the UK. EWS is the largest provider of freight haulage services in the UK and through the Channel Tunnel. Marcroft's main customers were leasing and haulage companies and companies that transport goods for their own use. The CC examined whether the merger would have any adverse effects on the wagon maintenance market and on the haulage market.

Marcroft was found to have a substantial degree of market power. As national coverage was required to compete effectively in this market, Marcroft only faced one significant competitor. The CC therefore determined that the merged entity would be able to lower service quality or raise prices charged to EWS's main competitors.

In considering the vertical effects of the merger on the haulage market, the CC concluded that the merging firms would have incentives to reduce Marcroft's service quality. In this case, service quality primarily relates to the time taken to maintain a wagon and to respond to a maintenance need from a lowering of service quality. This had the potential to increase the costs of EWS's competitors, as they face financial penalties for missing delivery deadlines. There was also the risk that they might lose customers if performance standards were not met. According to the CC, the merger would also create incentives to raise prices for wagon maintenance. Such a price increase might also reduce the competitiveness of EWS's competitors in the haulage market.

Furthermore, the CC examined whether potential entry or countervailing buyer power would offset the finding that the merger would lead to a significant lessening of competition. It concluded that new market entry in the wagon maintenance market would be unlikely, due to fixed sunk investments. Moreover, EWS's competitors had insufficient buyer power to constrain Marcroft's ability to set high prices or reduce service quality.

The CC concluded that divestment of part of Marcroft's outstations business was necessary to remedy the lessening of competition, and subsequently approved the merger.

Source: Competition Commission (2006), "Completed acquisition of Railway Investments Limited of Marcroft Holdings Limited", 12 September.

Freightliner's acquisition of two intermodal rail ports from Deutsche Post is an example of a case where the competition authority was not concerned that the merger would materially change the merging parties' ability to engage in foreclosure strategies, because the parties in question had no significant degree of market power in the relevant markets (see Box 5.2).

Box 5.2. *Freightliner Limited/Deutsche Post* competitive assessment

The focus of the competitive assessment in the *Freightliner/Deutsche Post* case was whether the merging parties could foreclose access to terminal handling services by, for example, raising the costs of, or refusing to supply, rail competitors. Another concern was whether the merger would lead to foreclosure of certain maintenance services which are necessary for rail freight haulage.

However, because Freightliner had no market power at the terminal and IMC haulage level, the OFT deemed that the merger would be unlikely to change the merging parties' ability or incentives to engage in foreclosure strategies against rail-only companies. Raising the costs of competing rail companies would furthermore benefit Freightliner's road competitors, which were considered to be in the same relevant market.

The OFT therefore concluded that the merger should be approved, implying that it would not be referred to the UK Competition Commission⁴⁴.

Source: Office of Fair Trading (2007), "Anticipated acquisition by Freightliner Limited of two intermodal inland rail ports located at Doncaster and Daventry from Deutsche Post AG."

5.2. Vertical effects

Another issue raised in competitive assessments is to what extent the merged parties have the incentive and ability to foreclose third parties from entering the market. A vertically integrated firm may, for example, raise its rivals' costs by supplying the inputs at higher prices to its competitors than to its own downstream units. The following vertical effects are particularly relevant to mergers between rail freight companies:

- *Customer foreclosure:* Upstream suppliers are denied access to selling to downstream divisions of an integrated firm. This could prevent suppliers from having a sufficiently large customer base, which may be necessary to cover their fixed costs⁴⁵. As a consequence, more firms may decide to exit or not enter the market⁴⁶;
- *Input foreclosure:* The upstream part of an integrated company either excludes companies from purchasing their input, or raises the costs of doing so. An integrated firm may also raise the costs of its downstream rivals by lowering the level of service quality supplied by the upstream company. Denying access to essential facilities is a particular form of input foreclosure.

5.2.1 *Customer foreclosure*

Customer foreclosure is particularly relevant in cross-border, rail-based freight forwarding. There are several examples where competition authorities investigated whether a merger would impede third parties' abilities from providing cross-border rail freight services.

Because EWS is the only provider of single wagon services in the UK, the European Commission considered several theories of harm, such as whether, after the acquisition by DB, the company would have incentives to stop co-operating with other rail operators wishing to provide cross-border services. EWS accounts for virtually the whole railway network for single-wagon services in the UK. The Commission examined whether competitive concerns would arise for cross-border markets where

third parties compete with DB. Following a review of competition in those markets, the Commission concluded that there were no competition concerns⁴⁷.

The European Commission also examined whether the merger between DB and Transfesa would lead to foreclosure of other rail companies from cross-border, rail-based freight forwarding. However, the merger did not raise any competitive concerns because the merging parties had no market power in the domestic market for freight forwarding⁴⁸.

5.2.2 *Input foreclosure*

Several decisions have addressed input foreclosure as a potential threat to competition.

In considering the vertical effect in the *Deutsche Bahn/Transfesa* merger, the European Commission examined, for example, whether the merger would lead to input foreclosure from DB's traction services to third parties (see Box 5.3). It concluded that competitive pressure stemming from other modes of transport, such as the port and shipping network, would be likely to constrain DB from foreclosing its competitors⁴⁹.

In the *Railway Investments/Marcroft* case, the CC concluded that the merging entities would have incentives to lower the quality of Marcroft's maintenance services. This, in turn, would increase the costs of its downstream competitors. The merger was also found to create incentives for raising Marcroft's prices for the supply of wagon maintenance. This would enable EWS to gain a competitive advantage at the downstream level⁵⁰.

Another important issue in the context of vertical mergers is whether the merging parties would deny access to essential facilities. Important European case law in the rail sector, in which essential facilities were addressed, applies to the two timetable cases involving DB (see Box 5.3). Guidance from EU case law suggests that an input will be deemed an essential facility when it fulfils three conditions:

- Refusal to allow access to the service or facility would lead to an elimination of all competition at the downstream level;
- The service or facility is indispensable to the operation of an equally efficient operator⁵¹;
- There is no objective justification for the refusal to supply the service or facility.

Box 5.3. *Deutsche Bahn timetable cases*

In February 2003, the German competition authority, Bundeskartellamt, initiated investigation proceedings against DB in relation to its refusal to include timetable information and fares on two long-distance routes (Gera-Berlin-Rostock and Zittau-Berlin-Stralsund) in its information and timetable systems. Connex was the first competitor to enter this market for long-distance passenger traffic, albeit on a limited scale.

Since Connex had also brought proceedings against DB before the civil law courts, the case was ultimately resolved by a decision of the court of appeal of the *Land* of Berlin, the Kammergericht, on 26 June 2003. The Kammergericht concluded that DB was not allowed to discriminate against competitors by refusing to include their services in the timetables.

In a second timetable case, on 27 April 2004, the regional court of Berlin, the Landgericht Berlin, confirmed DB's obligation to include the train services of competitors in its timetables. According to the court, the inclusion of competitors in the DB timetable was an essential service that could not adequately be substituted by alternatives available to DB's competitors.

Source: KG 2 U 20/02 Kart.

In the rail freight sector, the conditions for an essential facility or service seem more likely to apply to core infrastructure, such as axle-changing stations (see *Deutsche Bahn/Transfesa* case, Box 5.4)⁵².

A competitive assessment would establish whether the merger would change the merging parties' incentives and ability to refuse access to those essential facilities. The European Commission examined, for example, whether DB would refuse access to axle-changing stations, which could be deemed essential facilities for rail transport and rail-based freight forwarding between countries, after the acquisition of Transfesa. It concluded that there would be no concerns because Transfesa was not in full control of the stations, due to its contractual agreement with SNCF.

Box 5.4. *Deutsche Bahn/Transfesa* competitive assessment with regard to foreclosure

The European Commission analysed the extent to which the proposed transaction between DB and Transfesa could foreclose other rail-based forwarding service providers from having access to the customer base of DB and Transfesa.

The issue of customer foreclosure was particularly relevant in relation to cross-border, rail-based freight forwarding. The vertical effect would stem from the vertical link between traction and freight forwarding. Owing to the lack of market power downstream, the merger did not, however, raise any competitive concerns. The two merging parties had only a small market share in the UK. Furthermore, DB was already vertically integrated in the German and Dutch markets. Moreover, Transfesa already purchased rail traction/transport services from DB. The merger would therefore not lead to a significant increase in the latter's market power.

Another focal point of the Commission's assessment was whether the merger would lead to input foreclosure of DB traction services to third parties. Traction is an important input for Transfesa's rail-based forwarding services. Because DB is already a vertically integrated market player in Germany and the Netherlands, the merger was, nevertheless, not considered to change DB's incentives in the relevant Member States, according to the Commission. Competitive pressure stemming from other modes of transport, such as the port and shipping network, were likely to constrain DB from foreclosing its competitors. Moreover, DB may have limited incentives to foreclose competitors in the UK because the same firms are their customers in other parts of the EEA.

Another issue raised during the market investigation was that DB would be in control of two axle-changing stations at the borders between France and Spain. Such stations may be regarded as essential facilities if transshipment were not regarded as a full substitute for axle-changing stations. Transfesa's axle-changing stations are, however, located on land owned by SNCF. The contractual agreements require Transfesa to grant access to third parties at prices set by SNCF on non-discriminatory terms. Owing to this contractual situation and SNCF's countervailing influence, the Commission concluded that there would be no competitive concerns in relation to axle-changing services.

Source: Commission of the European Communities (2008), Case No. COMP/M.4786 *Deutsche Bahn/Transfesa*, 18 March.

5.3. Offsetting factors

Once it has been deemed that a merger could lead to a significant lessening of competition, competition authorities may examine whether there are any factors that may constrain the merging

parties from abusing their dominant position. Another factor outlined by the European Commission's non-horizontal merger guidelines is that vertical mergers could provide substantial scope for efficiency gains⁵³.

5.3.1 *Countervailing buyer power*

As in the competitive assessment of horizontal mergers, countervailing buyer power may be an important factor when assessing vertical mergers between rail freight companies. The assessment of such power would establish whether competitors at the downstream market have sufficient bargaining power to constrain the ability of the merging party operating at the upstream level to increase prices, deny access or reduce service quality.

For example, the CC examined whether the presence of countervailing buyer power would change its finding that the merger between EWS and Marcroft would be likely to lead to a significant lessening of competition. It concluded that there would be significant risk for EWS's competitors in moving their maintenance arrangements because smaller suppliers of maintenance services may not be able to provide sufficient coverage. This would limit the negotiating power of EWS's competitors compared with Marcroft⁵⁴. The CC thus concluded that countervailing buyer power was not sufficiently strong to constrain Marcroft's ability to raise prices to EWS's competitors.

5.3.2 *Potential competition*

Potential competition may also constrain a merged firm from abusing its market power. Rail freight markets are often characterised by significant barriers to entry, which is why potential market entry is seldom considered to be able to offset the merging parties' ability to abuse its dominant position.

In the *Railway Investment/Marcroft* case, the CC concluded that market entry into the wagon maintenance market is unattractive due to some significant barriers to entry and expansion. Market entry of a scale sufficient to offset the significant lessening of competition arising from the merger was considered to be unlikely by the CC⁵⁵.

5.3.3 *Efficiency benefits*

The most common benefit of vertical integration is that companies may create a more cost-efficient organisation. For example, such benefits may arise from technological economies (the integration of technological processes, such as the integration of iron- and steelmaking). Another benefit could be the lowering of transaction costs, the main source of which are the costs involved in bringing buyers and sellers together⁵⁶.

By aligning the incentives of firms operating at different levels of the supply chain, vertical mergers may also reduce the double-marginalisation problem, which describes a situation where every firm in the supply chain wants to maximise its profits. When the supplier or retailer has a certain degree of market power, it would set its prices above marginal costs. Without vertical integration, the price of the input would therefore be marked up twice: by both the upstream and downstream firms. Vertical integration allows a firm to control for the problem by internalising the profits made at other levels of the supply chain. When two firms are managed by the same company, the end-user price may be lower, as this price would be chosen so as to maximise profits for the whole entity.

A merged party may furthermore choose a level of output that is inefficient for the vertical structure as a whole. A vertically integrated firm could oblige an upstream firm to increase sales to the

level that is optimal for the integrated structure. The elimination of these problems may therefore bring some efficiency benefits⁵⁷.

In considering the competitive effects of vertical mergers between rail freight companies, competition authorities have not addressed potential efficiency gains in great detail, although it is not clear why this might be the case.

5.4. Remedies

As with horizontal mergers, remedies are intended to address the adverse effects identified during the competitive assessment.

In the *Railway Investments/Marcroft* case, for example, the CC investigated whether the proposed remedies would be sufficient in limiting the anti-competitive effects of the merger. It considered the behavioural remedies proposed by EWS and different divestiture remedies. EWS's suggested behavioural remedy – to appoint an independent non-executive member to the EWS board or to create a supervisory board – was deemed insufficient to remedy the CC's finding that there would be a significant lessening of competition. Furthermore, the CC decided that EWS should be required to divest the disposal of the whole part of Marcroft's outstation businesses. The purpose of this divestiture package was to remedy the adverse effects identified in the decision by enabling the divested entity to act as a competitor in the wagon maintenance market⁵⁸.

6. CONGLOMERATE MERGERS

A merger may be of a conglomerate nature when the involved firms are not operating in the same market and are not in a buyer–seller relationship. Such mergers are neither horizontal nor vertical. The Federal Trade Commission (FTC) placed such mergers into three categories:

- *A product extension merger*: between firms that are not competing in the same market but use the same marketing channels (e.g. the acquisition of Pizza Hut by PepsiCo).
- *A market extension merger*: between firms offering the same product, but in a separate geographic market. The merger between Wal-Mart and Woolco Canada is a good example in this context.
- *A pure conglomerate merger*: such a merger describes a situation where two firms have no obvious relationship⁵⁹.

Even though conglomerate mergers rarely lead to competition concerns, there are examples where mergers have not been approved on the grounds of their effects. General Electric's acquisition of Honeywell is one such case (see Box 6.1). There are not many conglomerate mergers in the rail freight industry, although conceivably the recent takeover by DB of EWS might be viewed as a “market extension” merger. Nevertheless, such mergers could raise significant anti-competitive concerns in the rail freight industry, which is why they would justify further consideration.

Box 6.1. General Electric/Honeywell competitive assessment

The General Electric/Honeywell merger is probably one of the most prominent examples of a merger where conglomerate aspects have been analysed. Honeywell is only active in the markets for avionics. General Electric, on the other hand, is an important purchaser of aeroplanes through its leasing company, GECAS.

According to the European Commission, there was a risk that GE could use its market power to extend its dominance to product markets in which Honeywell operates. The Commission justified its finding on the basis of three arguments:

- GE Capital could use its financial strength to provide buyers, airlines and airframe manufacturers with favourable terms. Its competitors would not be able to match those terms;
- The merged entity could use its buyer power to persuade airframe manufacturers to buy Honeywell's products;
- The merged entity could have incentives to offer pure or mixed bundles, consisting of packaged offers.

Source: Commission of the European Communities (2001), Commission Decision of 03/07/2001 Declaring Concentration to be Incompatible with the Common Market: Case No. COMP/M.2220 - *General Electric/Honeywell*.

6.1. Market power

Finding market power in one or more markets is a necessary condition to argue that a merger between non-competing firms would lead to a significant lessening of competition. As in the case of vertical mergers, such a finding would be based on an assessment of the merging parties' market shares and barriers to entry.

6.2. Conglomerate effects

The most obvious way for conglomerate mergers to harm competition is to remove potential competition through agreements. Reciprocal dealing and predatory pricing are prominent examples of such agreements, which could lead to a significant lessening of competition.

Reciprocal dealing refers to a practice where a firm buys from a supplier only when the supplier buys from that firm.

Predatory pricing would enable a firm to drive out rivals by pricing below marginal costs in a relevant market. A merged firm may have better financial resources to finance such a strategy in the short and medium run. This tactic is not confined to conglomerate mergers.

The elimination of the merging party as a potential competitor may also lead to adverse effects in the case of conglomerate mergers. The acquisition of a company may eliminate the possibility of that company entering the market itself.

A hypothetical example would be a locomotive leasing company buying a wagon manufacturer and offering those leasing its locomotives preferential deals in respect of purchasing wagons.

6.3. Offsetting factors

As in the case of vertical mergers, anti-competitive effects may be offset by countervailing buyer power in the rail freight market.

Because the internal operational structure of the firms may vary widely, it is difficult to draw general conclusions about potential efficiency gains.

In the hypothetical example referred to above, if rail freight operators possessed countervailing power, then any anti-competitive effects of the merger might be lessened.

6.4. Remedies

In assessing the appropriateness of remedies, competition authorities would apply the same principles as those set out in sections 4.3 and 5.4.

7. CONCLUSIONS AND AREAS FOR DEBATE

Drawing on evidence from actual decisions taken by competition authorities in relation to horizontal and vertical mergers involving rail freight companies, it is evident that competition authorities have been particularly concerned about whether mergers could lead to a strengthening or creation of market power by acquiring operators with infrastructure access agreements in countries that are otherwise difficult to enter. By eliminating one of the merging parties as a potential entrant, such mergers may lead to a significant impediment to potential competition. The acquisition of operators operating in other national markets may also lead to customer foreclosure because third parties may not be able to provide cross-border services without having access to the customer base of the main network provider in a country. However, recent decisions have not prevented such mergers from taking place.

Another issue raised in the context of mergers between rail freight companies is whether such mergers may lead to input foreclosure. Vertical integration of firms operating at different levels of the value chain may result in a lessening of competition by denying access to essential facilities or increasing the input prices for its competitors. Vertical mergers may also create efficiency gains by, for example, eliminating the double-marginalisation problem and reducing transaction costs. These issues have not been addressed at great length in recent decisions.

The competitive constraint of other transport modes, such as road haulage, may also play a more important role in the future, especially if rail is successful in regaining market share from road haulage for some commodities. For example, in the *Freightliner/Deutsche Post* case, the OFT concluded that road haulage should be part of the same relevant product market, owing to a significantly high degree of demand-side substitutability.

Another important question is whether issues that may raise competitive concerns should be addressed by *ex post* competition law, by legislation or by regulatory policies. For example, should regulators proactively intervene to allow more access by competing operators to terminals and

freight-only lines? Alternatively, should legislation be amended to be specific about which rail-related services are akin to essential facilities, or should the issue be left to *ex post* competition law?

Finally, how should capacity allocation procedures be amended to take account of their impact on competition? Currently, there is a sense in which capacity allocation decisions taken by regulators are an issue of compliance, and not necessarily about fulfilling European Commission objectives on rail freight liberalisation. Should regulators' duties be amended in this regard?

NOTES

1. PricewaterhouseCoopers *et al.* (2008), “Preparatory Study for an Impact Assessment for a Rail Network Giving Priority to Freight”, Final Report to DG TREN, 11 November.
2. www.rfg.org.uk
3. Interchanges where containers can be transferred to different modes of transport.
4. House of Lords European Union Committee (2005), “Liberalising Rail Freight Movement in the EU: Report with Evidence”, 4th Report of Session 2004-05, March, p. 11.
5. Office of the Rail Regulator (2000), “National Survey of Rail Freight Users: Summary of Results”, August, p. 4.
6. House of Lords European Union Committee (2005), *op. cit.*, p. 10.
7. European Commission (2001), “European transport policy for 2010: time to decide”, White Paper, p. 26.
8. Directive 2001/12/EC of the European Parliament and of the Council of 26 February 2001 amending Council Directive 91/440/EEC on the development of the Community’s railways [2001] OJ L 075; Directive 2001/13/EC of the European Parliament and of the Council of 26 February 2001 amending Council Directive 95/18/EC on the licensing of railway undertakings [2001] OJ L 075; Directive 2001/14/EC of the European Parliament and of the Council of 26 February 2001 on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification [2001] OJ L 075; Directive 2004/49/EC of the European Parliament and of the Council of 29 April 2004 on safety on the Community’s railways and amending Council Directive 95/18/EC on the licensing of railway undertakings and Directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification [2004] OJ L 164; Directive 2004/50/EC of the European Parliament and of the Council of 29 April 2004 amending Council Directive 96/48/EC on the interoperability of the trans-European high-speed rail system and Directive 2001/16/EC of the European Parliament and of the Council on the interoperability of the trans-European conventional rail system [2004] OJ L 164; Directive 2004/51/EC of the European Parliament and of the Council of 29 April 2004 amending Council Directive 91/440/EEC on the development of the Community’s railways [2004] OJ L 164; Directive 2007/58/EC of the European Parliament and of the Council of 23 October 2007 amending Council Directive 91/440/EEC on the development of the Community’s railways and Directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure; Directive 2007/59/EC of the European Parliament and of the Council of 23 October 2007 on the certification of train drivers operating locomotives and trains on the railway system in the Community.
9. House of Lords European Union Committee (2005), *op. cit.*, pp. 12-13.
10. House of Lords European Union Committee (2005), *op. cit.*, p. 15.
11. European Commission (2001), “European transport policy for 2010: time to decide”, White Paper, 2001.

12. Commission of the European Communities (1997), “Commission Notice on the definition of relevant market for the purposes of Community competition law”, 9 December.
13. European Commission (1997), “Commission Notice on the definition of the relevant market for the purposes of Community competition law”, 9 December.
14. *Ibid.*
15. US Department of Justice and Federal Trade Commission (1997), “Horizontal Merger Guidelines”, April 8.
16. Commission of the European Communities (2007), “Case No. COMP/M.4746 – *Deutsche Bahn/English Welsh & Scottish Railway Holdings (EWS)*”, 6 November.
17. The *Deutsche Bahn/Bax Global* case is an example of where the relevant product market has been segmented into domestic and international freight forwarding by air, land and sea. See Commission of the European Communities (2005), “Case No. COMP/M.4045 – *Deutsche Bahn/Bax Global*”, 22 December.
18. In the *Deutsche Bahn/Transfesa* case, the European Commission defined the relevant market along these lines. See Commission of the European Communities (2008), “Case No. COMP/M.4786 – *Deutsche Bahn/Transfesa*”, 18 March.
19. See, for example, the *Railway Investments/Marcroft* case. Competition Commission (2006), “Completed acquisition of Railway Investments limited of Marcroft Holdings Limited”, 12 September.
20. Commission of the European Communities (2008), “Case No. COMP/M.4786 – *Deutsche Bahn/Transfesa*”, 18 March.
21. FVL describes the transportation of special wagons and trucks.
22. See, for example, Commission of the European Communities (2008), “Case No. COMP/M.4786 – *Deutsche Bahn/Transfesa*”, 18 March.
23. For example, the rationale given for choosing a national geographic market of rail freight services in the *Deutsche Bahn/EWS* case was that it is difficult to switch to international suppliers due to existing technical and procedural barriers, such as the lack of interoperability and national safety certificates, and the need for specially trained staff with language skills and licences. *Source*: Commission of the European Communities (2007), “Case No. COMP/M.4746 – *Deutsche Bahn/English Welsh & Scottish Railway Holdings (EWS)*”, 6 November.
24. Commission of the European Communities (2008), “Case No. COMP/M.4786 – *Deutsche Bahn/Transfesa*”, 18 March.
25. Such markets are commonly referred to as origin and destination (O&D) markets, as they consist of particular routes with similar origins and/or destinations.
26. Commission of the European Communities (2003), “Case No. COMP/M.3150 – *SNCF/Trenitalia/AFA*”, 4 August.
27. The Council Regulation (EC) No. 139/2004 of 20 January 2004 on the control of concentration between undertakings (the EC Merger Regulation).
28. Commission of the European Communities (2004), ‘Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentration between undertakings’, 5 February. Neven, D. and S. Albaek, “Economics at DG Competition 2006-2007”.

29. Neven, D. and S. Albaek, “Economics at DG Competition 2006-2007”.
30. Commission of the European Communities (2004), “Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentration between undertakings”, 5 February.
31. *Ibid.*
32. Commission of the European Communities (2005), ‘Case no. COMP/M.4045 – Deutsche Bahn/Bax Global’, December 22nd.
33. Commission of the European Communities (2002), ‘Case no. COMP/M.2905 – Deutsche Bahn/Stinnes’, September 17th.
34. Commission of the European Communities (2007), ‘Case no COMP/M.4746 – Deutsche Bahn/English Welsh & Scottish Railway Holdings (EWS)’, November 6th.
35. Commission of the European Communities (2004), ‘Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentration between undertakings’, February 5th.
36. A merger that would otherwise be blocked due to its adverse effect on competition, permitted when the firm to be acquired is a failing firm and an alternative, less detrimental merger is unavailable.
37. Commission of the European Communities (2008), ‘Case no. COMP/M.4786 – Deutsche Bahn/Transfesa’, March 18th.
38. Commission of the European Communities (2004), ‘Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentration between undertakings’, February 5th.
39. Commission of the European Communities (2007), ‘Case no COMP/M.4746 – Deutsche Bahn/English Welsh & Scottish Railway Holdings (EWS)’, November 6th.
40. Commission of the European Communities (2008), ‘Commission Notice on remedies acceptable under Council Regulation (EC) No 139/2004 and under Commission Regulation (EC) No 802/2004’, October 22nd.
41. *Ibid.*
42. Commission of the European Communities (2007), “Case No. COMP/M.4746 – *Deutsche Bahn/English Welsh & Scottish Railway Holdings (EWS)*”, 6 November.
43. Motta, M. (2004), *Competition Policy– Theory and Practice*, Cambridge: Cambridge University Press, p. 341.
44. A referral to the CC by the OFT means that the merger has not been approved by the OFT and requires further investigation by the CC.
45. This is likely to happen in a market where there are large economies of scale in the wholesale market.
46. Viscusi, W.K., J.E. Harrington, Jr. and J.M. Vernon (2005), *Economics of Regulation and Antitrust*, Cambridge: MIT Press, p. 248.
47. Commission of the European Communities (2007), “Case No. COMP/M.4746 – *Deutsche Bahn/English Welsh & Scottish Railway Holdings (EWS)*”, 6 November.

48. Commission of the European Communities (2008), “Case No. COMP/M.4786 – *Deutsche Bahn/Transfesa*”, 18 March.
49. *Ibid.*
50. Competition Commission (2006), ‘Completed acquisition of Railway Investments limited of Marcroft Holdings Limited’, September 12th.
51. For example, in the *Ladbroke* case, the European Court of Justice viewed televised sound and pictures of the horse races to be an “additional”, not an essential, feature to the existing service for those placing bets. See Case T-504/93 [1997], *Ladbroke SA v Commission*.
52. Oxera (2006), “Essential or nice to have? A competition-based framework for ‘rail-related services’”, *Agenda*, available at www.oxera.com
53. Neven, D. and S. Albaek, “Economics at DG Competition 2006-2007”.
54. Competition Commission (2006), “Completed acquisition of Railway Investments limited of Marcroft Holdings Limited”, 12 September.
55. *Ibid.*
56. Inducing people to behave in a manner necessary for trade involves costs (also known as “coordination costs”). These may be the legal costs of signing agreements or monitoring other companies’ behaviour. Viscusi, W.K., J.E. Harrington, Jr. and J.M. Vernon (2005), *Economics of Regulation and Antitrust*, Cambridge: MIT Press, p. 241.
57. Motta, M. (2004), *Competition Policy – Theory and Practice*, Cambridge: Cambridge University Press, pp. 307-8.
58. Competition Commission (2006), “Completed acquisition of Railway Investments Limited of Marcroft Holdings Limited”, September 12th.
59. Viscusi, W.K., J.E. Harrington, Jr. and J.M. Vernon (2005), *Economics of Regulation and Antitrust*, Cambridge: MIT Press, p. 203.

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