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Integration and Competition between Transport and Logistics Businesses

SUMMARY AND CONCLUSIONS

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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;
- 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;
- 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.

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-marginalisation[1] 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 sector[2].

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 the route extension 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 Fremont (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. The current economic recession may provoke further mergers across the transport and logistics sector, to the extent that some companies suffer more than others financially. In much of the sector, however, the costs of exit from the market and re-entry are not excessively high and any concentration that results may be reversible. Ongoing research at the University of Antwerp[3] 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.

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

Transit Time From (days: hours)	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. http://sso.conferenceboard.ca/e-Library/LayoutAbstract.asp?DID=2145

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.

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 8 or 9 vessels for Europe–Asia, 6 or 7 vessels for transpacific and 3 or 4 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 precompetitive 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.

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 the abuse of 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 form 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 terminals connected to 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 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 at any cost. 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 property rights at interchange points confiscated 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. 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 companies[4]. 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 to “export taxation” 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 railways[5] 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, they 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 come at the price of excessive transaction costs.

It should be noted that there has been a very large increase in rail 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). 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 vertical unbundling has not undermined efficiency and was necessary to permit the introduction of competition in Europe, which has had a positive effect on productivity.

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 for 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.

Conclusions

A key goal of antitrust policy is to promote economic efficiency (Posner 2001)[6]. 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 are now required to demonstrate public benefits to obtain approval for mergers from the STB. In Europe, mergers between freight train operators have so far involved route extension through international acquisitions and 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 large fixed costs, as to offer global services large vessel fleets are required. This implies significant barriers to entry and 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 and voluntary arrangements have resolved charging, capacity and slot allocation problems in Antwerp and Rotterdam. It is difficult to establish that facilities really are essential in competition law, requiring proof that alternative services do not exist or cannot be replicated. In rail markets, competition from road haulage is sometimes a viable substitute under these rules. This favours the adoption of voluntary arrangements rather than seeking imposed access rights at published tariffs. Competition authorities are also generally reluctant to impose rights of access because of the risk of deterring investment in such facilities.

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 – for example, the Staggers Act, removing controls on tariffs and access rights in the US. 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. 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.

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 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 Commission[7]. 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 discrimination rather than abuse of market power, as the barriers to entry in these markets are not excessively high.

The key competition issue in ensuring global transport and logistic services are efficient 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. 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.

5. This makes the regulation of vertically separated railways more complicated than the regulation of airports and airlines. See also Pittman, 2005.

6. 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).

7. See Fox, 1998.

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