

Restructuring the Railway for Competition

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Few restructuring projects will be as important to the success of the transformation of the economies of Central and Eastern Europe as those of the state railways. Experience throughout the world has shown that a modern, high-quality rail system can be an important contributor to the development of competitive manufacturing, agricultural, and mining sectors. In addition, the location of these economies in transition provides them with the opportunity to reap the benefits of serving as a central part of rail networks connecting Russia, Belarus, Ukraine, and the Baltic countries with markets in Western Europe. Furthermore, the drag of railroad subsidies and losses on the government budgets is so significant -- accounting for hundreds of millions of crowns each in the Czech and Slovak republics, and comparable magnitudes in Hungary and Poland -- that efficiency improvements will have important macroeconomic consequences.

Successful restructuring of the state railway will have to satisfy the following policy objectives: first, to improve the utilization of the existing railroad resources; second, to provide appropriate incentives for investments in railroad infrastructure and rolling stock as well as product and service innovation; third, to protect railroad users from monopoly abuses; and fourth, to reduce the budgetary burden on the Treasury.

But how is the railroad to be restructured in such a way as to ensure that these objectives are realized to the greatest extent possible? Certainly a thorough internal reorganization, improved management information systems, commercialization, and perhaps partial privatization can be expected to move it in the

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direction as a modern, efficient, profit-maximizing enterprise. If the restructuring stops here, however, it may have stopped a step or two before exhaustion of the prospective benefits. This is because these steps will still leave the railroad a monopolist. Although a "commercialized" or privatized monopoly railroad operating subject to some form of government regulation, may be expected to operate more efficiently and more progressively than a state-owned railroad,² still it will be likely both to operate less efficiently and progressively and to charge rates significantly higher than if competition is introduced where feasible.

Unfortunately, injecting competition into the railroad industry is not a simple task. It carries with it difficult business and economic problems. Moreover, it requires an introduction of new, and rather complex, regulatory schemes.

In this essay, we first discuss various means by which competition can be introduced into the railroad business. Next, we outline some of the key regulatory issues. We then say a few words regarding long-term viability of the railroad industry. Our focus here is mainly on the freight, rather than passenger, side of the railroad operations. Where appropriate, we note some of the particulars that may be pertinent primarily to the passenger business.

How can competition in the railroad industry be introduced or stimulated? Governments throughout the world have sought to use or encourage some combination of three forces: intermodal competition, intramodal competition, and regulation.

Intermodal competition refers to competition to a rail carrier from carriers using other modes of transportation -- usually trucks or barges. Trucks and barges seem to be sectors whose inherent structure is reasonably competitive. This is because, unlike railroads, these modes of transportation do not require huge sunk investments, which create barriers to entry by firms seeking to compete. Moreover, the economies of scale, scope, and density in these industries, unlike in the railroad business, are quite modest.³ Consequently, competition among independent enterprises within those sectors can often be

²We argue this general point elsewhere: J. Ordovery and R. Pittman, "Competition Policy for Natural Monopolies in a Developing Market Economy," this volume; R. Pittman, "Should Public Utilities in Post-Socialist Countries Be Privatized?" *Národní Hospodářství* (Prague), 1993:10, 30-32; *Journal for Shareholders* (Moscow), August 1993, pp. 37-39.

³Economies of scale are present when the per unit cost of output (the average cost) declines with the volume

relied upon to protect both shippers using those modes as well as rail shippers from monopoly rates. In the US, intermodal competition from trucks was sufficient to permit the ICC -- the Interstate Commerce Commission, the federal government agency that regulates railroads -- to deregulate both rail shipments of fresh fruits and vegetables and all rail shipments in boxcars.

Unfortunately, in many locations barge traffic will not be important in freight hauling in the countries of Central and Eastern Europe. Truck traffic is and will be, but trucks are limited in the commodities for which they can provide economic competition to rail traffic. In particular, shipments of heavy, relatively low value commodities, especially over distances of more than a few dozen kilometers, are much more suited to rail than to truck, and this means that a monopoly rail carrier frequently is in position to charge monopoly rates for carrying such commodities without fear of losing the traffic to truck carriers.

of output. In the railroad industry, the presence of such economies would mean that the larger the railroad, in terms of ton kilometers, say, the lower the per ton kilometer cost of a railroad service.

Economies of scope are present when two distinct services (e.g., freight and passenger traffic) are most efficiently handled by one enterprise. Scope economies can also be present in the provision of transport and yard switching services.

Economies of density are present when the per ton kilometer cost of a railroad service on any origination/destination movement declines with traffic density. Economies of density arise -- up to a limit -- because a railroad can assemble shipments of several shippers into a single train. Consequently, this reduces the need for separate locomotives and crews to serve a single shipper. (Of course when a shipper is large enough to warrant a "unit train", increases in density do not benefit other shippers.)

Unfortunately, a significant portion of rail traffic in the post-socialist economies consists of such "rail captive" traffic. For example, upwards of two-thirds of the traffic of PKP, the Polish State Railway, consists of hard coal, metal, ores, brown coal, and coke. Intermodal competition cannot be counted upon to restrain monopoly pricing under these circumstances.

Regarding intermodal competition, it is also important to note that a railroad must not be hampered by regulatory or other provisions from competing with barges or trucks for that traffic which it can efficiently carry. This means that the railroad should not be strangled with inflexible, rigid minimum rates that it can charge on competitive traffic. As we will reiterate below, the railroad should be allowed to set rates that cover the incremental costs of serving competitive traffic, rather than being forced to set rates that equal (or exceed) the average costs of railroad operations.⁴ When a railroad is denied such pricing flexibility, it can lose traffic that would be most efficiently carried by it. This danger is especially likely to be present when the competitive modes are not subject to rigid regulatory constraints on their pricing.⁵ In the countries of Eastern Europe, trucks have been privatized to a significant extent, freed from heavy-handed regulatory oversight, and allowed to set prices in response to market conditions. In such a newly-competitive environment, a railroad, privatized or not, should also be free to offer competitive rates.

Intramodal competition -- competition between competing railroad enterprises -- can also offer a powerful constraint on railroad tariffs. This form of competition has been relied upon extensively by both the US and Canada to keep rates down for commodities that cannot economically travel by modes other than rail. Empirical research on railroad rates and costs has shown that when two or more railroads compete for shippers the rates tend to fall relative to the situation where a shipper is served by only one railroad. However, this form of competition as well -- as usually practiced -- may not be feasible as a check on the behavior of the post-socialist state railways. In the US and Canada, intramodal competition usually takes the form of either 1) separate rail companies running competing trains over their own parallel tracks, or 2) separate rail companies offering source and destination competition. The former type of competition is self-explanatory: when a shipper can turn to two or more railroads serving a particular destination, it will most likely end up paying lower rates than in the monopoly situation.

The latter type of railroad competition is best illustrated with two examples. First consider a shipper which can send its shipment -- coal, for example -- to two distinct destinations, each served by a single, different railroad. The railroads may compete with each other for the shipper's business to the destination

⁴An incremental cost of a movement is equal to an increase in the costs of operations of the railroad as a result of providing that movement. Such incremental cost usually should not be burdened with allocation of railroad's overhead that would be incurred irrespective of the additional shipment. One key question is whether some portion of the railroad track should be viewed as incremental due to the wear and tear imposed by any additional movement.

⁵For example, in the United States, regulated railroads were for many years devastated by competition from trucks and barges, which were free to set their prices more freely in response to market forces.

each serves and thus be willing to accept lower rates. Second, consider the case where each shipper (e.g., a coal mine) is served by a single railroad. However, coal shipments from different coal mines compete with

each other at a destination. Then, each monopoly railroad will be constrained in its exercise of monopoly power by the concern that if it overprices its shipper's coal, this coal will become uncompetitive at the destination point.

It is impossible for us to say with any certainty whether or not these types of intermodal competition will be viable for the countries of Central and Eastern Europe in the near future. Perhaps a futurist could contemplate several parallel railroads serving transnational East-West traffic, for example. Moreover, with a general movement towards market-driven economies, source and destination competition are plausible in the future provided, of course, the state railroad monopolies are broken up into several independent railroads. Whether this would entail an unacceptable loss of economies of scale is another matter.

Where a shipper has neither intramodal nor various types of intermodal competition to protect it from monopoly pricing by a monopoly railroad, that shipper is a "captive shipper". Captive shippers are protected in the US by a relatively loose version of regulation: the rate charged is regulated by the ICC through a price cap, but at a level considerably above the marginal or incremental cost of serving a shipper. Moreover, the cap applies only if the railroad as a whole earns adequate profits on its overall operations. Indeed, the current regulatory practice is to set the maximum rates at levels that are commensurate with the stand-alone costs of serving the shippers.⁶ Captive shippers regularly complain that such regulation does a poor job of protecting them from monopoly rail rates and seek tighter regulation better to protect their interests.⁷

Of course tighter regulation has its own economic costs generating inefficiencies, rigidities, and complainers (as the tighter regulation in the US in the past demonstrated with painful clarity, having brought many railroads to bankruptcy).

Thus there is widespread interest, especially in Europe, in a forth form of protection for captive shippers: intramodal service competition over a common network of track. A number of proposals are currently under serious consideration:

1. A German government commission has proposed to separate the organization -- but not the ownership -- of track and train services, and "possibly" to allow the entry of competing providers of train services on the track. This proposal is part of a larger plan to consolidate the railroads of the Federal Republic of Germany and the ex-German Democratic Republic. A similar proposal is under study in the Netherlands.
2. The Council of the European Communities (EC) has adopted a directive requiring all EC member countries to separate at least the accounts of the track ownership and train operating units of their national railroads and allow the entry of competing providers of train services under certain circumstances. Specifically, 1) joint

⁶The simplest -- but not entirely precise -- way to think about this type of railroad cost is to consider the amount of money that a shipper would have to invest to build its own railroad to move its own traffic!

⁷Given the level of the maximum rate, such complaints may not seem unreasonable. The main reason is that railroad facilities -- such as track and switching yards -- are shared among many shippers. Consequently, captive shippers demand that maximum rates reflect the savings derived by dividing these joint and common costs among many shippers.

ventures between the railroads of two or more EC countries, and 2) any railway company engaged in the international "combined transport of goods" (what would be called in the US "trailer on flatcar" or "container on flatcar" movements) should be allowed trackage rights (i.e., rights to operate their trains) on the tracks of the national railroad monopolies. The purpose of this directive is both to further EC integration and to promote railroad competition.

3. A draft Polish law on restructuring PKP (Polish National Railroad) contemplates future entry of independent railroads that would use PKP's tracks to offer competitive services. The Ministry of Transportation would set the rules for determining track charges to be collected by PKP, and the Antimonopoly Office would mediate disputes between prospective train operators and PKP. Similar proposals have been made in both the Czech Republic and Hungary.

In the remaining portion of this essay, we examine the various competitive and regulatory issues that would arise if such separation of track and railroad operations were implemented. It must be acknowledged right away that many railroad experts view these proposals as theoretically elegant but operationally suspect or impossible to implement.⁸ The critics point out that there are significant efficiencies in the joint provision of track and railroad services, especially when extensive train assembly and disassembly as well as switching have to be performed.⁹ Moreover, they point to the need to coordinate infrastructure investment decisions with decisions about the provision of future railroad services. This problem, which appears frequently in the electricity sector, can be reduced by allowing the network owner to include in its charges compensation for capital investments on behalf of other users of the network.

Nevertheless, this "unbundling" of the ownership of facilities from the provision of services to final customers envisaged by railroad reformers is taking place in many other infrastructure industries in the US and Europe, such as telecommunications, natural gas and oil pipelines, and electricity. In all of these instances, carefully stated provisions controlling access to the network, as well as prices that the owner of the network may charge, must be put in place so as to ensure that the separation of the network (and network services) from the provision of services that use the network does not lead to new inefficiencies, as discussed below.

Some elements of these proposals have been implemented in the railroad sectors of several countries. Consider the following:

1. In the US, it is common for two railroads to engage in voluntary, unregulated agreements to run train over each other's track. These are called "trackage rights" agreements. It is common for railroads to offer "interlining service", where one railroad "hands over" its traffic to another at the point at which the two railroads meet.¹⁰ It is also common for two railroads to agree -- usually reciprocally -- for each to serve particular customers located on the track of the other. These agreements are called "reciprocal switching" arrangements. The railroad owning the track maintains control over the scheduling and dispatching of the trains of both companies.
2. Also in the US, the ICC may sometimes order one railroad to allow another carrier to run trains over the tracks of the first -- usually to preserve competition for particular shippers following the approval of a railroad merger that is otherwise judged procompetitive. The ICC has imposed such terms in two recent major rail

⁸These critics are not only those who are aligned with the state railroad monopoly.

⁹This observation applies, albeit with lesser force, to passenger traffic. This type of traffic is frequently carried on unit trains that run from their points of origination to their destinations. To the extent that assembly is required, schedule coordination is critical to efficient operations.

¹⁰Trackage agreements differ from interlining agreements in that under the former, the railroad runs its own trains with its crew on the tracks of another railroad. Interlining, as noted, requires the change of crews and locomotives. It will, in general, also entail disassembly and assembly of trains.

mergers -- the Union Pacific/Missouri Pacific (1982) and the Union Pacific/Missouri-Kansas-Texas (1988) -- and, apparently, was prepared to do so in a third -- the Santa Fe/Southern Pacific (1986) -- had it not turned down the merger outright.

3. The UK government has recently enacted a restructuring plan for British Rail (BR) that privatizes BR and divides it into two enterprises, one operating the track system and the other operating freight trains on the track. (Here again we ignore the separate issue of passenger trains.) Would-be train operating competitors may purchase time from the track operator to run their own trains on the track. The purpose of this proposal seems principally to create competition for the train service of BR and thus to promote greater efficiency.

4. Sweden has separated track services and train operation into two public agencies, with the train operator paying charges for track use. There has been a small amount of track use by competing train operators as well. However, the purpose of the separation was not to create such competition, but rather to facilitate comparison and equalization of the policy treatment of rail and truck carriers.

5. Japan has reorganized its single national railroad into six regional passenger railroads, with a single national freight operator using trackage rights over all six. No intramodal competition was thus created, but track use by trains from separate enterprises must be coordinated.

It is important to acknowledge that the organizational separation of track ownership and train operation -- into organizations that we will call the "Track Owner" and the "Train Operator" -- raises several difficult policy questions. To pretend otherwise would only increase the danger that adequate regulatory and antitrust safeguards will not be in place before restructuring. What are the public policy problems raised by proposals like that of the PKP restructuring legislation, and how can they be addressed?

First, does this organizational separation reduce the efficiency of the railroad system? Second, how much freedom in the pricing of track and other track-related services (switching, train assembly and disassembly) should the Track Owner have? Third, given that track ownership is likely to be in the hands of one enterprise, should that enterprise be also allowed to participate in the (potentially) competitive provision of railroad services? Fourth, if the Track Owner (perhaps through a subsidiary) will also offer service, what standards should be used to determine whether or not the Track Owner discriminates in prices and service in favor of its service subsidiary and against the independent railroad competitors? Fifth, what pricing restrictions on the dominant service provider should be put into place in those markets where independent competitors are (or are likely to be) ineffectual?

It is impossible to provide exhaustive answers to all these and other complex policy questions. Some basic insights, derived from economics and regulatory experience in the US and elsewhere, can be offered.

At the simplest level, the answer to the first policy question seems clear: practice in the United States and in Japan has demonstrated that it is possible to coordinate rail activities on a common track among many railroads. There are probably some transactions costs associated with scheduling of trains but these do not seem to be inordinate.¹¹ These coordination problems are smaller, the larger is the proportion of rail

¹¹Clearly, the separation of ownership of airports from that of airlines in many countries has not brought airline traffic to a standstill. The airline experience does demonstrate, however, that there are benefits in

service that relies on scheduled unit trains, which do not require much in terms of switchyard services. It is also in switchyards that the owner of the track can discriminate in favor of one railroad versus another.

It seems that more serious problems are likely to arise in the planning of railroad investments in new track, switching facilities, telecommunications, and so on. These investments will have to take into account future needs of possibly many independent railroads. Of course, if the Train Operator were to maintain its dominance for the foreseeable future, this coordination problem would be diminished. And so would effective competition. Still, experience from the US electricity industry, for example, indicates that such coordination is possible. It is also the case that, at least in the US, railroads frequently cooperate with each other in the construction or upgrading of railroad facilities. The main obstacle to efficient coordination is the divergence of interests between the owner of the network, who would like to charge a high rate for the construction of the additional railroad facilities, and the future user of these facilities, who would like to pay the least amount possible. To resolve this type conflict requires, unfortunately, an assessment of the costs of raising additional capital by the Track Owner. This type of information cannot easily be calculated in the absence of reasonably well functioning capital markets. Such markets are only in their infancy in the countries of Eastern Europe. Consequently, some approximate measures will be needed. For example, if the Track Owner is a state corporation, the cost of capital may be measured by the government's cost of borrowing in the world market. (This is not a bad approximation, if the alternative is to run a budgetary deficit.)

The answer to the second question depends significantly on the extent of the degree of public subsidies that the Track Owner is likely to receive. Simple economics suggests that the tighter the budgetary constraint on the owner of the track, the more pricing freedom is required. If the government is willing to defray all the fixed costs of the track, then marginal cost pricing -- including congestion fees -- of access is an appropriate solution.

The governments of Central and Eastern Europe cannot and should not maintain that level of subsidy. Consequently, flexible pricing of track that reflects different shippers' (hence railroads') willingness to pay for railroad services would defray the fixed costs (net of subsidy) with the minimum loss in efficiency. Conversely, uniform pricing policy would, in the long-run, constrict the use of railroad services below the attainable level. In theory, this policy prescription translates into access tariffs for those shippers who have access to other modes of transportation.

In practice, there are limits to how differentiated the actual access prices can be. For example, the Track Owner may not be in a position easily to determine the differences in the willingness to pay. Hence, we would expect that the actual rates may differ for broad categories of traffic instead of being tailored to individual shipments.

There is another problem which we may rise here. To the extent that railroad access is unbundled from the railroad tariff, i.e., the price paid by the shipper, there is a possibility that the ultimate tariff will have two layers of inefficient distortion. First, the Track Owner will set an access charge which exceeds the relevant marginal cost. Then, on top of that access fee, the service provider will apply its mark up. If

coordinating traffic. This explains the emergence of "hub" airports, such as Chicago, Frankfurt, Heathrow, and many others.

services are provided competitively, this mark-up will reflect only costs incurred by the service provider. However, if competition in the provision of railroad services is less potent, the mark-up may reflect also the degree of market power possessed by the service provider. As a result, the tariff may even prove to be higher than would be set by a vertically integrated railroad monopolist.

This observation suggests that the benefits of unbundling of track services from railroad services may not be as one would expect, unless service competition is present.

In any case, competition policy has to take a less severe attitude towards "price discrimination," which, under some antimonopoly statutes, may be evidence of abuse of dominance.¹² Such strict interpretation will prove counterproductive to efficiency goals in infrastructure industries characterized by substantial fixed costs.

On the other hand, the Track Owner should not have unrestricted freedom in setting rates for the use of track and other services it will provide. For example, Track Owner could (and should) demand above average rates from high-value shippers -- those customers who fill up regularly scheduled unit trains with such commodities as coal, iron ore, or grain -- for whom truck transport is not an effective alternative. Track Owner's ability to raise rates is not unlimited; because of the nature of their demand, such shippers can frequently also run their own trains and are thus likely to demand low access rates to save on freight costs. Nevertheless there will be shippers who cannot use trucks or unit trains who may require the protection of a price ceiling; in the US, as noted above, such a ceiling is related to the expense that a shipper would have to incur in order to actually build its own railroad, bypassing the monopoly owner of the track. (This level of cost is referred to as stand-alone cost.)

¹²See, e.g., Competition Protection Act of the CSFR, Article 9; Act on Protection of Economic Competition (Slovak Republic), Article 7. For a discussion, see R. Pittman, "Some Critical Provisions in the Antimonopoly Laws of Central and Eastern Europe", The International Lawyer 26 (1992), 485-503; Národní Hospodářství (Prague), August 1992, pp. 33-38; USA: Economics, Politics, Ideology (Moscow), August 1992, pp. 14-26.

The answer to the third question seems rather clear: unlike air transport, where airports and air traffic control services can easily be provided by entities that have no equity interest in transport services, such separation of functions is not likely to occur commonly in railroads. This follows not necessarily from the fact that such separation is not feasible or that it is inefficient. Rather, it flows from the historical structure of railroads, which enjoyed a monopoly over all aspects of railroad operations; i.e., usually they were fully vertically integrated.¹³ Hence, we must anticipate that in most settings the Track Owner will also participate in the provision of railroad services.

What follows from that is the need to devise a workable organizational structure for the entity. One possibility would be to set up a fully-owned subsidiary -- what we have been calling the Train Operator -- that would provide freight services. This is the structure that is being used in the US, for example, in the telecommunications and natural gas industries, where the regulated monopolist participates in (potentially) competitive markets through an independent subsidiary.

Clearly, once the Track Owner also offers service, either directly or through a subsidiary, there is a need to ensure that its un-integrated rivals are offered access to the track on terms similar to those offered to the freight operations of the Track Owner. This is the issue raised in our fourth policy question. The policy problem is controversial among competition policy experts and railroad practitioners. Some economists believe that a track monopolist would have no incentive to discriminate against independent railroads: after all, the monopolist has all the efficiency incentives to sell the trackage rights to the most efficient railroad because that guarantees the maximum amount of profit from monopoly track operations. Others believe that some safeguards are necessary. There are several possible rationales for policy safeguards on access. The most important one is to insure that railroad rates will not be inefficiently set. Note that the Track Owner's incentive not to engage in discriminatory treatment of rival Train Operators stems from the fact that it can appropriate for itself the full profits (net of efficiency differentials) on the movement from the origination point ("O") to the destination point ("D") subject to whatever constraints there may be on the end-to-end rates. Now, it is quite possible that the regulatory regime in place will not only place caps on end-to-end rates but will also control the division of rates among the participating railroads. In such a case, the Track Owner may have a strong incentive to give an advantage to its own trains. Plainly, the reason is that the Track Owner has to leave some rents (profits) on the table for the interlining train operators. When there are such unextracted profits, the owner of the track wants to capture them for itself.

¹³Possibly, passenger railroad station -- like airports -- could be easily separated from the (potentially) competing passenger railroads.

The policy insight that follows from this discussion is this: inasmuch as regulation of railroad rates is likely to be desirable because intermodal (truck and barge) competition is not likely in all cases to be adequate in constraining the rates, the preferred mode of regulation is price caps on end-to-end rates (i.e., origination to destination) rather than on the components of the end-to-end rates. Such end-to-end price regulation is feasible, despite a large number of rates. However, for it to be conducive to economic efficiency, remunerative ceilings on rates must be allowed. The lesson from the US experience is that when such ceilings are set too low to enable the railroads to earn adequate rate of return, shippers and the public will ultimately suffer because of inadequate investments in railroad infrastructure and rolling stock.¹⁴

It may be useful to restate what the correct safeguard should be: to ensure efficient allocation of traffic among competing Train Operators (including companies who both own track and provide train services), Track Owners in a monopoly position should be required to follow the efficient, parity-pricing access policy. This policy simply requires that the trackage rates that the monopolist charges to independent Train Operators be the same as those it charges directly (or implicitly) to its service subsidiary. To ensure such equal treatment, the Track Owner may be required to disclose its transfer prices and offer the same prices to the independents. If such prices are not available, they can be deduced by subtracting estimates of variable costs (including both the costs of operating the train and the costs of the depreciation of the track) from current shipping tariffs and treating the residual amount as an implicit contribution to overheads from any particular movement under that tariff. Then all Train Operators would have the right to get trackage rights for similar movements at this rate.

Again, it must be emphasized that as long as the regulatory regime does not artificially set the divisions of revenues among the railroads participating in the move, the private incentive of the track owner will be to implement the parity principle. However, when regulation or other objectives set for the industry generate distortionary incentives, the parity principle may have to come into play. The principle may also be important in protecting against discriminatory conduct that results from the incentives to lessen competition in distant or unrelated portions of the railroad network, as we shall discuss later. First, however, we bring out the content of the parity pricing principle with the help of a simple example, which has become standard among railroad economists and regulators. To see what is involved, assume first that the dominant railroad, called RRD, owns track and operates trains from the origination point "O" to the destination point "D". The distance OD is 1 000 km. Assume also that the shippers located at "O" would be willing to pay ECU 1 000 for the shipment to "D". Assume that RRD's cost of operating a train on OD is 85 ECU and that when a train runs on the track it causes 15 ECU of track depreciation. Thus if RRD charges shippers 1 000 ECU for OD service, it earns 900 ECU contribution to its fixed costs.

Consider now a request from Train Operator, RRC, for trackage rights so that it can operate trains and offer service over OD. How much should RRD charge for access to its track? One possible answer might be that access should be priced at ECU 15, the direct cost that RRC imposes on RRD by running trains over its track. Such a price would be highly unprofitable to RRD. If access is priced at that rate, RRD would lose the entire 900 ECU contribution to its fixed costs and gain nothing in return!

¹⁴This does not imply that the government should never subsidise some portions of railroad operations. While we do not advocate such subsidies in general, we are cognisant of the fact that they may be appropriate in some limited situations.

The parity-pricing access principle requires that, as long as the ECU 1 000 price is not regarded as abusive, RRD charges the amount equal to ECU 915 for the provision of trackage rights to RRC -- that is, the direct cost of ECU 15 imposed by RRD's use of the track plus the amount ECU 900 that RRD would have earned as a contribution to its fixed costs had it run the train itself. Only such a pricing rule ensures, in principle, that RRD has no incentive to discriminate against rival Train Operators and that these railroads will obtain the traffic when they are more efficient. And, as we noted, the Track Owner has an incentive to adopt this principle in practice.

To see this, suppose that RRC is a more efficient Train Operator than RRD and can operate a train over OD at a cost of ECU 80. Then it could afford to pay RRD ECU 915 for the use of the track and still capture the traffic by charging a price of slightly less than RRD's price of ECU 1 000. On the other hand, if RRC is a less efficient Train Operator than RRD and can operate a train over OD only at a cost of ECU 90, then it will find that it cannot compete for this traffic; once it pays the ECU 915 price for trackage rights, it must charge ECU 1 005 for the traffic if it is to cover its costs. Again, the parity-pricing access principle insures that the most efficient Train Operator carries the traffic, and it provides the railroads with the correct incentives to become more efficient.

Now let us complicate matters slightly and assume that RRD provides its OD service through an intermediate point, "I". RRD's cost of serving OD can be broken down into a cost of ECU 70 for the OI segment (700 km), which consists of ECU 60 of train operating expenses and ECU 10 of track depreciation, and a cost of ECU 30 for the ID segment (300 km), which consists of ECU 25 of train operating expenses and ECU 5 of track depreciation. Note that again if RRD charges shippers 1 000 ECU for OD service, it earns ECU 900 contribution to its fixed costs. Finally assume that RRC has its own track connecting "O" to "I" on which it offers service, but has no track of its own from "I" to "D", i.e., there is a "northern" (RRD) and "southern" (RRC) track running from "O" to "I" and just one track, owned by RRD, from "I" to "D".

Consider now the request by RRC for trackage rights so that it can offer train service over the entire OD route. How much should RRD charge for access to its 300 km of track on the ID segment?

Again one possible answer might be that access should be priced at the direct cost to RRD of RRC's use of the track -- in this case, ECU 5 for track depreciation. And again we see that such a price would be highly unprofitable to RRD -- costing it its entire ECU 900 contribution to overhead.

A second possibility in this situation might be to pro-rate net revenue on a per-kilometer basis, which yields ECU 0.9/km, and then add the direct cost for the ID segment, to yield a trackage-rights price of ECU 275 (ECU 5 for track depreciation plus 0.9 ECU/km x 300 km). Under this pricing policy, RRD foregoes ECU 630 (calculated as 0.9 ECU/km x 700 km) in contribution to overhead and retains ECU 270. Such a pricing rule may appear fair and reasonable; after all, it allocates profits to the length of haul, which seems to be an objective criterion.

The trouble with this, and the previous, access tariff is that they discriminate against RRD's own traffic! As a result, even if RRC were less efficient than is RRD in offering service on the OD segment, it could nevertheless capture that traffic to itself.

The parity-pricing access principle this time requires that, as long as the ECU 1 000 price is not regarded as abusive, RRD charges ECU 905 (its total contribution to overhead from carrying the OD shipment itself, plus the cost of track depreciation) for the provision of ID trackage rights to RRC. Again, only such a pricing rule ensures that RRD has no incentive to discriminate against rival Train Operators and that these railroads will obtain the traffic when they are more efficient. Again, only a railroad that can operate trains over the OD segment for a lower cost than RRD's cost of ECU 85 will be able to compete the traffic away from RRD.

In this case the desired efficiency outcome also includes an incentive for the traffic to travel over the more efficient OI routing (assuming that the RRD OI track and the RRC OI track are not identical). For example, if the OI segment owned by RRC is only 690 km long and if, as a result, its operating and/or

depreciation costs over this segment are lower than are RRD's costs over its OI segment, the parity-pricing access principle will ensure that this is taken account of in the competitive outcome, as it should be. It is relevant to note that on the traffic under discussion, only the RRD railroad earns any contribution to its fixed costs. That contribution can be applied, obviously, to all the fixed costs incurred by it. Conversely, if RRC were to carry the interlined traffic, it would earn only the amount adequate to recover its operating costs on the traffic in question. This could create the problems of "revenue-adequacy." That is, in the absence of any contribution, the RRC may not be able to cover traffic-independent costs of its operations. This creates a broader public-policy question as to the social desirability of parallel lines in those corridors where there is not enough traffic to make both railroads revenue adequate. It would be a grave error, however, to solve this problem by means of deviations from the parity principle. Such deviations would create disincentives for efficient routing of traffic, which should be maintained at all times. If parallel railroads are desired when there is insufficient traffic to make two lines revenue adequate, the necessary subsidies should be provided from a general fund with the least distorting effects.

One may object that this pricing policy does not lead to lower prices to shippers following RRC's entry. This is not correct. If RRC is a more efficient service provider, it will bid away RRD's business by passing a portion of its efficiency advantage to the shippers. It is true, nevertheless, that RRC entry has only a limited effect on tariffs. This fact should not be bemoaned, as long as the original tariff (ECU 1,000, in our example) was not considered abusive. It is, however, true that the potential benefits to shippers are lower than they would have been if RRC were to have parallel tracks from Q to D. Indeed, it is generally the case that in network industries "facilities" based competition engenders more rivalry than does "service" competition that must rely on the access to the bottleneck.

We need to point out that even this method of pricing access can be subject to abuse and manipulation by the Track Owner. First, as we implicitly pointed out, if access pricing is biased against the Track Owner, that company will try to advantage its affiliated service provider, even if the competing Train Operator is more efficient. Second, there may be circumstances in which it would be to the advantage of Track Owner to use track pricing to try to "leverage" its monopoly position on the OI portion of track to the ID portion as well. Ordinarily, as we have argued, it will be to the advantage of Track Owner to use a more efficient supplier to ID transportation as part of the OD transportation of traffic. However, this may not be the case where the following conditions are observed:

- a. There is a significant amount of traffic that travels on the ID route, or a portion of the ID route, alone.
- b. This traffic could be "monopolized" by rail monopolist -- that is, the geography, distances, and commodities are such that trucks and barges cannot provide significant competition to rail carriers for this traffic.
- c. By discriminating against the competitor seeking trackage rights on the OI portion of OD trips, Track Owner could impose such harm on the competitor's overall operations as to make bankruptcy significantly more likely.
- d. If the competitor went out of business, no other competitor would appear to take over the tracks and run its own trains on them.¹⁵

Under such circumstances, Track Owner could perhaps increase its profits by acquiring a monopoly on local ID traffic in addition to its monopoly on OI traffic, and in spite of the fact that this additional monopoly would not, under most circumstances, increase its profits for OD traffic.

In either of these situations, then, even the parity-pricing principle does not protect society and competitors against abusive behavior by the Track Owner to favor its own Train Operator, and regulatory diligence may be called for.

¹⁵These conditions are discussed in greater detail in Henry McFarland, "The Economics of Vertical Restraints and Relationships Between Connecting Railroads," *Logistics and Transportation Review*, v. 23, no. 2 (June 1987), pp. 207-222.

Efficient access pricing ordinarily offers a reasonably clear principle that can be applied to adjudicate discrimination issues. The worst mistake would be to label treatment unequal where, in fact, the Track Owner is following the correct policy of trying to recoup the major share of fixed costs from price-insensitive customers. As we noted, if the Track Owner is forced to charge everyone the price that reflects marginal cost, we have a prescription for railroad bankruptcy or for continued subsidy from the Treasury. Neither outcome is desirable.

This brings us to the last policy issue. Just because entry into the provision of rail services is opened by legislative fiat, there is no assurance that such entry will actually occur. Moreover, even if it does, there is no guarantee that all shippers will benefit from it. There are also economies of scale and scope in the provision of services (e.g., length of train, frequency of service) so that we cannot expect the industry to be highly competitive, even after the transition period. It is important, therefore, to put in place some oversight of rail rates. One possibility, which would minimize regulatory burden, would be to deregulate service tariffs altogether and accrue all the "excess" profits to track operations. In that way, as long as the track operations overall are not making excess profits correctly calculated, then rates should be left to the discretion of railroad providers.¹⁶

Conclusion

A restructuring of the state railways of Central and Eastern Europe that does not create some form of real competition for its shippers will require an extensive system of regulation to insure that captive shippers are not confronted with monopoly prices. Such a system of regulation is certainly feasible, but it is likely to prove at least as cumbersome and inefficient in Central and Eastern Europe as it was in the US. The restructuring legislation proposed for PKP and under discussion elsewhere as well follows a different path, the path down which other European countries seem to be headed, by seeking to create the conditions for railroad competition in serving these shippers. Since the restructured railways are likely to continue both to own the tracks and to run trains on them, such a proposal requires some kind of regulation of track use terms for competing Train Operators if real competition is to be created. The PKP legislation's vision of terms set by the Ministry of Transport and disputes resolved by the Antimonopoly Office meets this requirement.

As one part of the overall plan for a restructuring and commercialization of the state railway, provisions such as these protecting shippers from monopoly abuses and society from monopoly stagnation appear both feasible and reasonable.

¹⁶P.W. Blackshaw and L.S. Thompson make a similar recommendation: "The railway's freight tariffs should not be regulated at all, except in those cases where the railway is shown to be abusing its monopoly position," where an indication of an abuse of monopoly position would be "the generation of total revenues greater than those needed to provide earnings adequate for capital replacement and expansion requirements." "Railway Reform in the Central and Eastern European Economies," World Bank Policy Research Working paper WPS 1137 (May 1993), at 12.