

Chapter 4

Key regulatory challenges

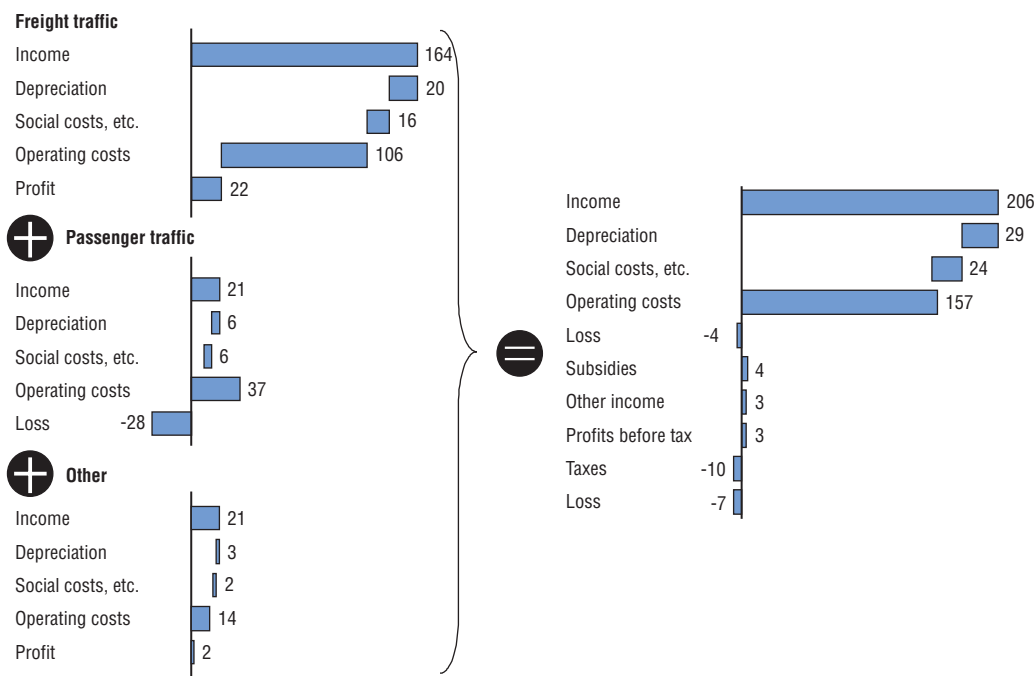
4.1. Accounting

The reform programme rightly stresses the importance of maintaining adequate and transparent accounts for rail sector businesses and progress has been made in improving the accounts for the national railways. Income and expenditure is now recorded in separate accounts for freight, long distance passenger transport, suburban passenger services and non-transport activities. For the last three years financial planning on the basis of budgets has been applied, with a central system of settlement of accounts. Accumulation of debts as a result of late settlement has been brought under control.

The law requires the publication of accounts to Russian accounting standards. In 1999 consultants Arthur Andersen¹ reviewed the financial performance of the railways on the basis of International Accounting Standards. The audit found a loss of seven billion roubles in place of the reported twenty six billion roubles profit. The most important point of divergence in the two accounting systems was the 24 billion roubles identified as social expenditure by Arthur Andersen (see Figure 4.1), which were not reflected in the profit and loss accounts of MPS's consolidated accounts but recorded elsewhere in its accounting system.

Figure 4.1. 1999 financial performance according to international accounting standards

Billion roubles



Note: Reported in Reference Materials for Rail Transport Structural Reform Programme, McKinsey Moscow, May 2001.

Source: Arthur Andersen.

It is important to complete the switch to international accounting standards and independent external accountants should be employed to audit the accounts of the joint stock company RZhD to IAS standards. This is essential to the framework for negotiations between the company and the government over support from public budgets for public services and for providing a transparent framework in which private business can enter rail markets in competition or co-operation with Russian Railways. It will also be an essential foundation to effective economic regulation of access charges and freight and passenger tariffs.

The issue of transparent and IAS compliant accounting was discussed in the Deloitte and Touche study conducted for MPS.² MPS subsequently adopted a detailed accounting data management system (SAP): it will now be critical for RZhD to move quickly to implement line of business management on this basis in order to support the organization defined in the Plan. As of the end of 2003 RZhD is to publish accounts that include data to IAS standards on a voluntary basis (as the law³ does not yet require this). RZhD is encouraged to ensure that accounts by line of business are part of these published accounts.

If non-discriminatory access to rail infrastructure is to be provided for new operators as envisaged in the reform program, then separate accounts will have to be produced for infrastructure and by each of the train operations by type within RZhD. This is provided for by Federal Law No. 27 of 27 February 2003 on features of administration and direction of rail transport property. MPS developed a classification system for accounting income and expenditure by type of activity, and this was made operational by RZhD on 13 October 2003. Experience in the development of EU law shows it is necessary to specify the publication of balance sheets as well as profit and loss accounts⁴ separately for infrastructure and for train operations.

Costs are not always easy to allocate in the production of rail services, as many costs are joint. It is not easy, for example, to allocate infrastructure costs between passenger trains and freight trains that share the same line. Costs are poorly understood on most if not all European railways. Even in Britain, where restructuring has been taken furthest, Railtrack proved to have very poor understanding of its costs or indeed its assets (see Annex B on UK experience).

In Russia the distribution of labour costs is used as the basis for allocating many other costs. Elsewhere, various accounting rules and economic and engineering models have been developed to make more accurate cost allocations. North America has the strongest relevant experience. Though inevitably somewhat arbitrary the models are sufficient to meet the requirements of negotiation between the private freight carriers and of review by the US regulatory agency (Surface Transportation Board – STB) and by courts in cases where companies are in dispute over track access charges. Many of the tools used have been developed by external consulting companies and are available commercially for adaptation by other railways. Russian Railways, and the regulatory authorities, will need to develop their own engineering models, or adapt models available on the market, to define and attribute costs more accurately. This will be useful for ensuring non-discrimination in charges for the use of federal rail infrastructure for Russian Railways and other train operators, and in determining the tariffs charged to shippers when their goods are transported in their own wagons instead of rolling stock owned by Russian Railways. Most importantly it can help structure charges for the use of infrastructure to ensure the

decisions of train operators in their choice of locomotives, wagon bogie design etc., do not impose excessive wear on the track.

Making existing information and, in due course, more accurate information on cost structures, available to shippers and to potential new train operators, in sufficient detail to establish business development plans, will be essential to achieving the goals of the reform programme relating to promoting competition. (Many railways and regulatory agencies charge a reasonable fee to cover the costs of providing such data, as is the case for example with data provided by the Association of American Railroads – see Section 4.3 *Discrimination in Practice* for details).

4.2. Competition policy and the goals of reform for freight transport

The main goals of the reform programme are increasing the efficiency of the railways, cutting costs and improving quality of service. They are to be pursued through two main routes: reform of the existing tariff system; and promoting competition in the railway sector. Competition in non-transport services, such as rolling stock manufacture and maintenance, is being created through spinning-off these businesses. Competition is also envisaged in rail transport services. The initial approach is to separate infrastructure management from train operations and encourage new train operators to run trains on the infrastructure of the Russian Railways. RZhD will own the infrastructure and operate the majority of freight trains, although passenger operations will be separated into subsidiaries that might eventually be spun off to regional or local governments, or even privatised. The reform programme also identifies the possibility of creating competition between vertically integrated railways.

4.2.1. Regulatory arrangements for the initial approach to competition

Whatever structure is chosen for the railways, regulation will be required, partly to ensure the development of competition (which is particularly important given rail's high modal share) and partly to ensure overall efficiency. The required arrangements depend on the structure that is chosen for the industry, especially the relationship between the organisation responsible for infrastructure management and those responsible for freight operations.

The initial industry structure, as set out in the Plan, envisages the emergence of new carriers in competition with the vertically integrated RZhD, which will be both by far the largest freight train operator and the infrastructure monopolist. This structure will require detailed and pro-active regulation if it is to result in more than the emergence of specialised own-account operators and niche carriers, along with private investment in wagons and (possibly) locomotives.

The Government's first objective has been to encourage large industrial rail users to build up their own wagon fleets in the face of a national shortage of wagons. The shortage has resulted from severe under-spending on maintenance and investment in new rolling stock since the early 1990s. The average age of freight wagons is 19.5 years and increasing rapidly as the national fleet deteriorates. The locomotive fleet is also ageing alarmingly (see Table 4.1). The government's goal is thus to transfer some of the financing of rolling stock to operators, carriers or investors beyond the current rail sector. It sees these industrial customers as better placed to evaluate the risks of investing in wagons, and in specialised wagons particularly, as they understand the markets for their products better

than the railways. In return the railway has introduced new tariff schedules for operators with their own wagons and for operators with both wagons and locomotives. Private wagon owners will be aiming above all to assure their wagon supply (both quality and quantity). They will focus on shipping large blocks of traffic and will seek to improve their annual wagon utilization rates levels above those achieved by RZhD. The new tariffs adopted in August 2003 may provide financial incentives for industrial concerns to operate block trains to haul their own traffic, and incentives for their transport companies to operate block trains for other shippers, over and above their interest in controlling rolling stock supply.

Table 4.1. **Age of locomotives**

Age in years	Electric locomotives (%)		Diesel locomotives (%)	
	1995	2001	1995	2001
1 < 5	3	1	5	1
6 < 10	13	3	23	6
11 < 15	20	14	20	27
16 < 20	15	23	21	24
21 < 25	16	19	18	21
26 < 30	12	18	8	15
> 30	21	22	5	6

Source: *Transport and Communication 2001*, Russian Statistics Office.

It is important to acknowledge that “competition” from large companies primarily interested in hauling their own commodities can be motivated more by the incentives in the tariff structure than from a desire to compete with RZhD: this kind of competition will not be the same as entry of “common” carriers which could compete with RZhD for all commodities across the entire rail network. It could be a starting point, however, for railway customers to invest in rail assets, to begin to manage their own rail operations and eventually to offer services to other customers as a common carrier competing with the RZhD.

The entry of new train operators for common carriage is provided for in the Federal Law on Railway Transport. Common carriers are required to obtain a licence from the Ministry of Railways (or its successor), they must enter into a contract with RZhD for the use of national rail infrastructure and they are required to own or lease locomotives. Conditions for award of a licence include presenting a business plan and identifying the skilled personnel needed to run trains. Train drivers are issued route-permits in a separate procedure. Two licences were awarded in conjunction with the entry into force of the Railway Transport Law on 19 May 2003.⁵ The main business for both companies is shipping oil products (Russky Mir, and Linkoil running trains between a refinery near St. Petersburg and Estonia), but they are licensed to carry all kinds of freight. By November 2003, nine carriers had successfully obtained licences. Licensed train operators are free to negotiate their own transport tariffs with customers.

The law provides that where there is free rail infrastructure capacity, access is guaranteed for licence holders. However, the procedures for determining capacity availability and defining capacity requirements have still to be tested. Decree 710 defines non-discrimination and where infrastructure capacity is constrained it provides rules for giving priority to trains. These follow typical European practice and give highest priority to

Box 4.1. **Examples of independent rail operators in steel and oil markets**

The Severstaltrans Group is an agglomeration of 19 transport, logistics and trading companies owned by Severstal, the largest steel producer in Russia, and Morell, a Russian offshore investment company. Three companies in the group manage train operations: Severstaltrans, Sevtechnotrans and BaltTransService, other companies in the group run port operations and one manufacturer's diesel locomotives. Severstaltrans provides domestic freight forwarding services, mainly reselling RZhD rail services. Carrying steel from Severstal plants accounts for nearly two thirds of its revenue, but it also forwards freight for other steel companies and timber producers. The company also leases and operates rail wagons for Severstal and trades coal and other commodities. Sevtechnotrans manages freight forwarding in Russia and freight transshipments in Russian ports. It also finances and leases rail tank wagons. BaltTransService manages unit trains carrying crude oil and oil products from refineries and inland pipeline terminals to ports on the Baltic, White and Black Seas. It operates trains, owning 2 100 tank wagons and leasing 7 300 wagons from RZhD. The company also owns around 600 gondolas, which it leases to other operators. In 2002 it managed the transport of 17 million tonnes of oil and oil products.

Oil company subsidiaries Russky Mir and SFAT own about 13 000 tank wagons. Russky Mir is a licensed rail operator but so far only leases wagons. Another oil company subsidiary, Linkoil operates around 4 000 tank wagons. Oil major Yukos operates 19 000 tank wagons, 6 000 of which are leased from Russky Mir, and Lukoil operates 5 000 tank wagons.

international and express passenger services and lowest priority to domestic freight trains: since the Russian system is quite different from Western Europe (see Figures 2.6 and 2.7), there would be a good reason for regulators to review whether this approach is durable. At the present time, freight traffic on the network is only slightly more than half the level in 1988, so capacity problems on the network are probably resolvable. More important to the development of competition will be the arrangements for access to facilities other than track, especially to stations, freight yards and train marshalling services.

The European Union is in the process of creating a completely new regulatory framework for common public regulation of its railways. The purpose is to promote an integrated European area for railways where cross-border services can be offered under the responsibility of a single operator. This is essential if the railways are to offer the quality of service required by customers for international traffic. It implies that national, state-owned monopoly train operators be authorised to operate in each other's territories, under uniform conditions determined at the European level. This process began cautiously in 1991 with Directive 91/440/EEC, which provided rights of access and transit on the infrastructure of Member States for international groups of railway undertakings to operate international freight and passenger services. It also gave access to infrastructure for all international combined transport services. Conditions for licensing railway undertakings and charging for the use of infrastructure were further defined by Directive 95/18/EC and 95/19/EC.

Given the limited impact of these measures on the market, a new set of Directives was tabled in 1998, leading to the adoption of the so-called "infrastructure package" on 26 February 2001. These rules were required to be transposed into national legislation by 15 March 2003. From that date, railway undertakings duly licensed in one country have the

right of access to the infrastructure of the other countries to provide international freight services. The infrastructure open to access under the rules is in a first phase extended only to trunk lines and access to ports and terminals. From 2008 access will be provided to the whole network. The “package” included 3 directives, 2003/12/EC and 2003/13/EC amending earlier directives on the structure and development of the railways and licensing railway undertakings, and 2003/14/EC on allocation of capacity and charging for the use of infrastructure. The institutional structures and procedures and the charging framework established will have a major impact on domestic rail markets as well as regulating international traffic. Most notably the Directives require a clear separation of infrastructure management from train operations, and where infrastructure is integrated with train operations key functions including allocation of infrastructure capacity have to be removed to an independent body. The Directives require establishment of a regulator in each country and set rules for the formulation of charges for the use of infrastructure. Charges are to be based on marginal costs, with mark-ups allowed where the government seeks to recover more than marginal costs from the system as a whole. Details are provided in Annex E.

The possibilities provided by the infrastructure package have been exploited by a number of new entrant carriers: DLC of Belgium; HGK, RAG and Rail4Chem of Germany; Rail Traction Company of Italy; Shortlines of the Netherlands; and IKEA Rail of Sweden. These companies have demonstrated an ability to offer innovative services on international corridors, leading the traditional national railway undertakings to respond to this competitive pressure. They have also shown that it is possible to offer better services and compete with road haulage. New directives and regulations are scheduled for adoption early in 2004 that will accelerate the process of opening the freight market and increasing competition. Common rules for safety and technical interoperability will also be created together with a European Railway Agency to steer the harmonisation process.

If the approach set out in Russia’s Plan is to work, a number of practical measures will have to be taken along the lines of EU regulations, to ensure that new carriers are encouraged to enter the market. These are set out below.

The key requirement is that **access to infrastructure⁶ and charging** should be carried out in such a way that new (common as well as specialised) carriers can compete with RZhD. Given the proposed interim structure (RZhD being both the main freight carrier and the manager of the infrastructure), this means that the rules for access to infrastructure and for the setting of charges should be the responsibility of a body that is independent of RZhD.

In the EU, in order to ensure that new entrants understand the capability of the network, infrastructure managers are required to produce a Network Statement, which must contain information on the technical nature and limitations of the network, the conditions of access to the network and the rules for capacity allocation, including the tariff structure and the rules of priority to be applied in case of conflicting demands for capacity. RZhD could be required to do the same.

Charges for the use of infrastructure must be free of discrimination between different railway carriers that perform services of an equivalent nature in a similar part of the market (this is a requirement for member states of the EU). Non-discrimination in the formulation of tariffs is not, however, sufficient to achieve the full benefits of competition (higher standards of service, services better matched to the demands of the market and

better value for money). Carriers must have control of as many of their costs as possible. They must be free to find more efficient ways of organising their operations and sourcing supplies. This means that they have to be free to procure services over and above access to essential fixed assets. The scope provided by the existing tariff system to contract separately with RZhD for a limited number of separately identified services may not be sufficient to provide the necessary cost control for new carriers.

An economic regulator will be required to protect the public interest from an economic and commercial viewpoint. This body should be independent in its organisation, funding decisions, legal structure and decision-making from the infrastructure manager or any carrier. It should also be an independent agency of the government free of potential conflicts of interest that might arise were it to also have responsibilities for regulating prices that are themselves affected by rail charges (such as coal) or have a large impact on rail costs (such as electricity). The principle role of an economic regulator, under the proposed structure, will be to ensure that infrastructure access is fair and charges appropriate. This is a highly complex task given the conflicting objectives that the government is likely to have. For example, in determining whether a train operator can have access to the network for a particular flow of traffic and setting access charges the regulator may need to have regard to government objectives for reducing subsidies to the railways (or increasing payments from them), for encouraging modal shift to rail for both freight and passengers, for encouraging industrial production in particular parts of the country and for developing the network. The weight given to these different objectives will affect access policy.

Any carrier should have a right to appeal to the regulatory body if it believes that it has been unfairly treated or discriminated against. In particular, carriers should be able to appeal against decisions adopted by the infrastructure manager concerning transparency of information, the capacity allocation process and its result, the level or structure of infrastructure fees, safety certification, enforcement and the monitoring of the safety standards and rules. The regulatory body should have the power to demand relevant information from the infrastructure manager, railway undertakings and any third party involved. The regulatory body would arbitrate on complaints and require action to be taken to remedy the situation. Decree No. 710 of 25 November 2003 provides for appeal to the Antimonopoly Ministry and the courts in cases of dispute over access to rail infrastructure. This is an appropriate provision in the current institutional framework of Russia, but the Antimonopoly Ministry already has a heavy case load of complaints from all areas of economic activity and a **sector specific regulator** for the railways is likely to prove necessary if competition is to develop whilst RZhD operates trains as well as managing all public railway infrastructure.

The regulator will need to supervise closely the granting of **access to infrastructure**, especially while RZhD remains an integrated infrastructure manager and train operator. Decree 710 sets out categories of train operation by priority for access to infrastructure where capacity is constrained and provides for access to be awarded on a first come, first served basis. There is an issue, however, of whether the current pattern of use of infrastructure should be taken as the baseline, where it fills capacity, or if some other criteria should be adopted, based on efficiency for example, for determining if some existing operations should be excluded to make way for new operators. Decree 703 of 2003, which governs the negotiation of infrastructure services between RZhD and other train operators, applies only to the general case where capacity is not constrained. It is not clear

what framework applies should new operators seek access to infrastructure deemed already to be operating at full capacity by RZhD. This gap in the regulations will need to be addressed. The issues involved are complicated and a sector specific economic regulator would be best placed to address them.

The economic regulator may also need to take **other measures to reduce barriers to entry** and these are likely to be greater if there is a dominant railway undertaking, as there will be initially under the proposed structure. For example the regulator may need to:

- Ensure that surplus second-hand rolling stock belonging to RZhD, is not unreasonably withheld from potential new entrants, especially where it is specific to a particular type of traffic.
- Intervene to ensure that potential new entrants are able to obtain locomotive drivers or training for new drivers, as well as receiving equal access to train paths.
- Provide assistance to potential new train operators in meeting licensing and safety requirements.

All **train operators require licensing**, and this is provided for by the law, with the Ministry of Railways the issuing authority. Should the institutional framework change, licensing must always remain the task of a public body. Ideally it should be a task for a regulator, since this provides the regulator with powers of enforcement for its decisions. If a specific rail regulator is created, licensing should be one of its duties.

Experience in the EU underlines that **safety certificates** need to be issued by a **safety regulator** that is independent in organisation, funding decisions, legal structure and decision-making from any infrastructure manager or carrier. The safety certificate should set out the railway company's safety requirements and ensure the safety of services on the routes it operates. In order to obtain a safety certificate, the company would need to comply with regulations laying down the technical and operational requirements specific to the rail services being provided and the safety requirements applying to staff, rolling stock and the undertaking's internal organisation. In particular, it should require proof that the staff employed to operate the trains have the necessary training to comply with the traffic rules set by the infrastructure manager and to meet the safety requirements for train movement.

In order to encourage competition under the initial approach adopted in the reform plan, **infrastructure management and transport operations should be separated** to the greatest extent possible, as this will provide greater transparency in the provision of access and charging. Ideally this requires complete legal separation of infrastructure from train operations since even retaining both infrastructure management and transport operations in a holding company may lead to discrimination in favour of the incumbent undertaking.⁷ If it is decided not to make this legal separation, infrastructure management and transport operations should be established as separated divisions of RZhD with their own profit and loss accounts, balance sheets and management teams. This will ensure transparency of the costs on which charges are based and reduce (but not eliminate) the risk that the management of the infrastructure part of Russian Railways will be influenced by the commercial interests of the freight part.

Setting up the regulatory arrangements for the proposed interim structure is a formidable task for the Government. It requires establishment of an economic regulator and a safety regulator. The two regulators would need to co-operate and could be under a common umbrella organisation. Both must be independent of the industry and could be

independent of government (they could also be part of an existing regulatory body but they require specific skills: both require skills in railway technical issues, policy and law, and the economic regulator also requires skills in economics and finance). They must have the legal powers to carry out their duties. To illustrate the potential size of the regulatory task, for the railways in the UK,⁸ the economic regulator⁹ has about 140 staff and the safety regulator¹⁰ has nearly 300 staff who are directly involved in rail.

The team therefore considers that before embarking on the major task of establishing a regulatory system designed to cope with the structure proposed, further thought should be given to reducing the regulatory burden by either creating a vertically separated structure without dominance by a single train operator or by separating the railways horizontally and establishing vertically integrated companies that would compete with one another.

4.2.2. Horizontal separation into competing vertically integrated operators

The second approach, competition between vertically integrated railways, is generally less demanding on regulatory authorities. Freight tariffs to customers who are directly served by more than one railway company, or who are close enough to a second railway company that they can threaten to take their business there, can be determined by competition, usually without the need for regulatory intervention. In addition, if there is a degree of balance between the economic power of each company, the companies may agree voluntarily for each to use the tracks of its competitors, under voluntarily negotiated access terms.

The Plan provides the option for creation of competing, vertically integrated railways in European Russia in the third phase of restructuring. Because the issue of rail versus rail competition is directly related to the need for regulation – how widespread and how comprehensive regulation needs to be – it is worthwhile examining examples of how such competition might be created by appropriate design of the system structure.

Because issues of system structure have been important in the analysis of railroad mergers in the US, the Federal Railroad Administration, the STB and the railroads have access to system models that permit the assignment of each shipment (based on the freight waybill) to an originating station and a terminating station. The waybill includes all relevant information, such as shipment weight, number of wagons (by type), type of train, commodity, tariff class and revenue generated, routing information (if the routing is not obvious), date of shipment, etc., needed to analyse the flows of all commodities over all lines in the system. Use of the model permits identification of the competitive effects of proposed railroad mergers (which might reduce the access of some shippers to alternative railroads). Application of such a model in Western Russia would permit analysis of the degree of competition possible if the system were broken into two or more competing systems.

Such a network model is not available to the public in Russia, so discussion of a competitive rail structure in Western Russia in this report must be based on cruder information. Using data provided by MPS in an 80 x 80 origination/destination matrix, the team was able to construct an approximate matrix of the freight flows among the 17 regional railroads (see Table 4.2). This Matrix suggests that Russia's rail freight flows divide rather naturally between a "Western" section (including Kaliningrad, October, Moscow, South Eastern, North Caucasus, Volga, Kuibyshev, Gorky, Northern, Sverdlovsk and South Ural) and an "Eastern" section (West Siberian, Krasnoyarsk, East Siberian, Trans Baikal, Far Eastern, and Sakhalin) (see Figure 2.1). About 63% of all rail freight tonnage in Russia originates *and* terminates in the Western region, while 26% originates *and* terminates in the Eastern region,

Table 4.2. MPS Regional railroad to regional railroad total freight flows (000 tons) in 2001

Freight West Freight East 

Destinations	Russia	Kaliningrad	October	Moscow	South Eastern	North Caucasus	Volga	Kuibyshev	Gorky	Northern	Sverdlovsk	South Ural	West Siberian	Krasnoyarsk	East Siberian	Trans Baikal	Far Eastern	Sakhalin	Russia	Net tonnes originated
Origins																				
Russia	1 156 840	8 896	142 259	134 825	75 086	89 740	28 112	35 130	48 140	60 564	115 982	80 637	146 094	47 370	35 979	28 781	76 655	2 591	1 156 840	
Kaliningrad	3 230	2 584	79	281	18	28	32	29	46	15	47	48	20	6	1	0	1	0	3 230	-5 666
October	98 269	296	56 687	11 729	1 235	1 076	2 441	998	2 230	15 364	1 931	1 528	1 009	809	359	116	442	26	98 269	-43 990
Moscow	93 751	642	8 676	57 902	3 617	1 855	1 071	1 280	2 327	2 277	3 453	4 888	3 827	518	430	239	701	70	93 751	-41 074
South Eastern	85 355	411	3 117	13 662	44 447	8 039	1 432	2 047	1 465	1 575	1 348	5 123	1 233	890	276	97	205	5	85 355	40 908
North Caucasus	58 872	55	1 447	4 045	2 438	39 423	4 664	1 254	1 122	1 581	1 032	529	623	268	121	109	180	18	58 872	-30 868
Volga	44 462	760	4 090	4 345	1 471	18 123	10 234	1 547	1 221	937	605	414	261	124	123	61	152	3	44 462	16 350
Kuibyshev	49 803	384	5 845	4 369	1 910	3 713	1 534	12 164	6 528	1 864	3 526	4 581	1 354	401	337	531	766	11	49 803	14 673
Gorky	37 365	364	5 727	3 959	810	1 732	629	1 845	14 106	3 674	2 126	984	587	189	158	137	333	16	37 365	-10 775
Northern	69 228	421	21 621	9 134	1 823	1 809	833	1 079	2 882	26 910	1 462	695	230	82	70	56	115	5	69 228	8 664
Sverdlovsk	110 561	565	10 382	5 322	936	3 557	771	2 636	7 291	2 496	61 858	5 798	3 902	623	1 505	575	2 343	13	110 561	-5 421
South Ural	106 673	1 289	3 008	5 954	1 477	4 268	3 491	8 331	5 106	1 114	26 544	39 418	1 904	469	497	346	3 444	19	106 673	26 036
West Siberian	222 110	893	18 887	10 685	14 057	4 517	778	1 306	2 495	2 276	10 162	15 651	115 444	9 231	1 980	1 326	12 285	132	222 110	76 016
Krasnoyarsk	62 624	170	1 751	2 204	624	971	108	421	1 034	372	1 023	544	10 680	28 767	6 778	2 620	4 505	56	62 624	15 254
East Siberian	52 432	63	692	371	72	567	68	100	143	73	380	106	4 489	4 288	21 984	4 969	13 998	72	52 432	372
Trans Baikal	24 507	1	46	260	35	34	6	17	40	20	132	29	81	521	466	15 998	6 823	7	24 507	-4 274
Far Eastern	35 653	1	213	590	126	62	27	76	130	29	339	308	450	188	895	1 601	30 337	303	35 653	-41 002
Sakhalin	1 946	0	7	31	3	3	0	1	2	0	7	3	10	1	2	3	34	1 837	1 946	-645
Russia	1 156 840	8 896	142 259	134 825	75 086	89 740	28 112	35 130	48 140	60 564	115 982	80 637	146 094	47 370	35 979	28 781	76 655	2 591	1 156 840	

West to West	723 368	63%
West to East	34 341	3%
East to West	96 142	8%
East to East	303 161	26%
	1 157 012	100%

Source: MPS.

leaving only 11% that is interchanged between the regions. The Western region, with 63% of the tonnage on 73% of the track-km would still have an average traffic density higher than the average for the US system, so it seems reasonable to argue that it would be able to sustain line versus line competition as in the US.

Guriev, Pittman and Shevyakhova¹¹ have based one interesting example on a Western Russian region that is the same as that identified above. The system they examine would bring line versus line competition between two integrated railway concessions to most markets in the Western region, as shown in Figure 4.2. They make it clear that more than two competitors would be preferable, but without a detailed traffic flow model they did not feel it appropriate to speculate on how a larger number of competitors might be structured. Their two systems could compete for shipments within European Russia, either over parallel portions of their track networks or at common points such as Cheliabinsk, Samara, Kursk, Smolensk, Moscow and St. Petersburg.

The two systems could also be connected to the Eastern region in a way that would permit either system to receive the tonnage flowing across the boundary, and they could compete to deliver the Eastern cargos flowing to European Russia (from Table 4.2, there is almost 3 times as much tonnage – mostly coal and petroleum products – flowing West as there is flowing East). Such a system would reduce the problem of regulating monopoly pricing power to the issue of access charge regulation in the East. Moreover, if the competing Western carriers chose (and, with non-discriminatory access charges, they are sure to do so), they could obtain access slots in the Eastern region and carry their competition all the way to the Pacific coast of Russia.

Guriev, Pittman and Shevyakhova propose creating the competing carriers in European Russia through the award of exclusive concessions. This would bring competition for the market (competition for the concession) as well as the resulting competition in the rail freight market. This has the added advantage of providing a mechanism for introducing competition between vertically integrated companies without changing a law that currently proscribes the division of RZhD core assets. As their paper shows, there has been successful experience with concessioning of railways in this way in Mexico, Brazil and Argentina. Their experience suggests that a 30 or 50 year concession agreement is long enough to encourage private companies to make substantial investments in infrastructure.

A simpler example can be seen in Figure 4.3 in which the existing 17 regional railways have been regrouped into 7 new, contiguous railways (9 in total, including Kaliningrad and Sakhalin). Transferring two short line segments from Northern to Gorky would give a new North-Central railway a direct connection to the October Railway and its ports. Such a simple regrouping would give almost all the Eastern cargos competitive access to Moscow and St. Petersburg, and it would give competitive routes for export and import traffic as well as for Trans Siberian traffic. Even this degree of competition could well reduce the need to regulate freight tariffs to and from the Eastern region, and free most traffic in European Russia from the need for end use tariff regulation.

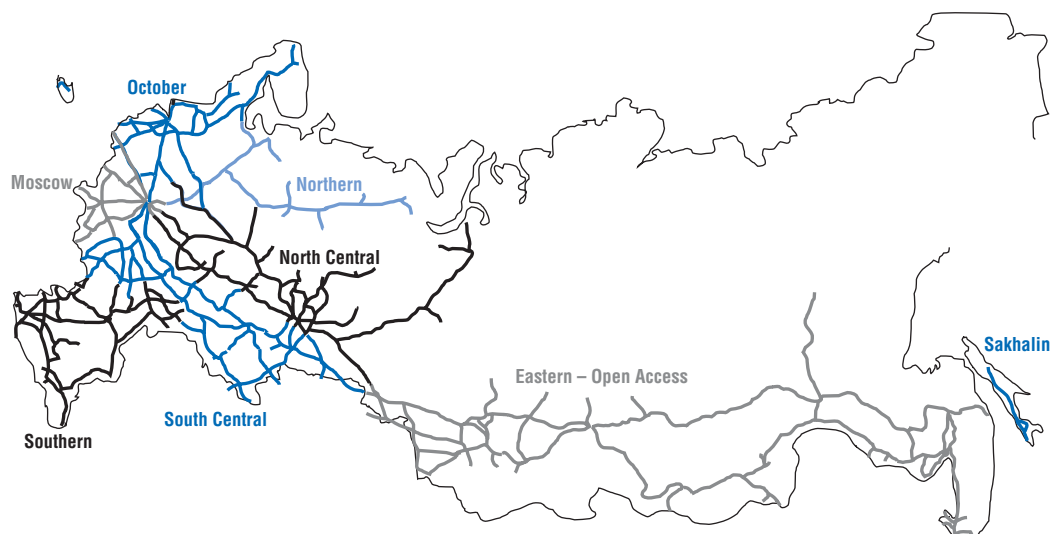
Of course, neither of these examples should be seen as conclusive because they are not based on definitive information. Instead, they are meant to suggest approaches that deserve consideration, preferably sooner rather than later, as the analytical basis for the later phases of the reform is developed. A range of intermediate re-combinations of the existing regional railways could be envisaged to provide for competition between several vertically integrated railways, preferably more than two.

Figure 4.2. **Two competing vertically integrated rail freight companies for Western Russia**



Source: Guriev, Pittman and Shevyakhova, *A Proposal for Railroad Restructuring in Russia*, 2003.

Figure 4.3. **Could the regional railways be reorganised to provide a mix of integrated competitors and open access for rail freight?**



Source: Louis S. Thompson, World Bank.

4.2.3. Choosing the approach to competition

The initial approach to introducing competition set out in the Plan, providing access rights for new carriers to compete with vertically integrated Russian Railways, will be demanding on the regulators if it is to result in more than the appearance of a few specialised niche operators. The structure of the sector concentrates economic power in the hands of Russian Railways, which will be both by far the largest freight train operator and the infrastructure monopolist. Regulation will have to be designed and implemented to limit the exercise of this power. Some preference or at least flexibility in infrastructure use charges may be required to provide sufficient incentive for new operators to enter the market as general freight carriers in these circumstances, although such preferences should not be allowed to jeopardise the ability of the infrastructure manager to recover its full costs.

Experience suggests that there are at least two sets of advantages of competition between vertically integrated railways that should be included in any cost-benefit analysis of different reform models. First are the simple, everyday “economies of scope” or “economies of co-ordination” between administering a track system and running trains. When a railroad system is vertically separated, a large number of decisions and transactions that were formerly made *within* an integrated company must now take place *between* independent companies. The scope for both honest misunderstandings and strategic behaviour may increase exponentially. Second, in the rail sector as in the electricity sector, serious questions are being raised across the OECD as to whether a vertically separated “grid” company receives the right incentives (and enough resources) for investment, both for maintenance and for expansion. Many of the problems of both the UK rail system and the US electricity system have been attributed to a lack of investment in the “grid”, which has been in turn attributed to the fact that in a vertically separated system it is in the running of trains (or the generation of electricity) that money is to be made, not in the operation of a regulated network enterprise. Maintaining vertical integration in the rail sector – through, for example, the creation of integrated regional companies that compete with each other over parallel routes or at common points – may avoid these problems.

Both models for competition could coexist in Russia. Whilst competing vertically integrated railways could be created in western Russia, east of Omsk, and especially east of Taishet (junction of the Trans-Siberian and Baikal-Amur lines), there is only one trunk rail line. This is the part of the railway system where regulated open access to state owned infrastructure completely separated from all train operators would be most appropriate.

4.3. Tariff regulation and charges for the use of infrastructure

4.3.1. Tariff regulations

Approaches to the regulation of freight transport tariffs and infrastructure charges

In Europe and North America, the regulation of charges for the use of rail infrastructure by train operators is distinguished from the regulation of freight transport tariffs. In Russia the regulatory authorities are attempting to regulate both through a single system. Though the full derivation of the new tariff system is not clear, it appears that the long standing freight transport tariff system is being modified to break down the transport tariff into elements structured to match at least partly the distribution of RZhd’s costs between traction and freight wagons, with other costs essentially assigned to the monopoly sector infrastructure use charges.

Freight transport tariffs are no longer regulated anywhere in Western Europe because competition from road haulage and other modes is so universal that regulation is unnecessary. Certain rail freight transport tariffs are regulated in North America¹² and Australia in order to prevent abusive pricing by railways that enjoy market power in the transport of particular commodities over particular routes, usually over long distances. Grain and coal are the commodities most often concerned, although it is actually rare for freight tariffs to be prescribed by the US STB. Tariffs are only regulated where there is no competition for the traffic between train operators or from alternative transport modes. OECD governments tend to prefer to foster competition instead of resorting to tariff regulation whenever possible.

Russian law¹³ identifies natural monopoly sectors of the economy where tariffs are to be regulated and the railways fall under this law. Nevertheless, competition already exists in some markets. Competition from road haulage for higher value freight is developing rapidly in European Russia, particularly over distances below 400 km. Niche rail operators carry more freight than RZhD in some markets. For example own-account transport companies carry 60% of the oil carried by rail in an overall market where pipelines carry 20% of oil products and river barges 5%.

Rail end-user tariffs ought to be free of regulation in markets demonstrating competition. This is necessary if rail is to be able to compete with road haulage and continue to carry the high value traffic that generates most of RZhD's income. If tariffs are not deregulated in markets where rail faces competition from other modes that have themselves been deregulated, the railways risk long term insolvency in exactly the same way that US railways came close to bankruptcy in the 1970s. If tariffs are not freed in markets where rail-on-rail competition develops, some of the benefits of competition will be foregone, and prices to shippers will be higher than they need be. Niche carriers (which are free to negotiate shipping rates) currently charge shippers substantially more than RZhD's regulated tariffs. Freeing tariffs in these markets would immediately require a new approach to setting access charges.

The European Commission believes that infrastructure use charges should generally be calculated according to "marginal" costs: the costs that running a particular train, or train type, imposes on the infrastructure.¹⁴ These costs generally relate to wear and tear of the track (which varies with axle weight, locomotive type, speed, etc.) and train path, the occupation in time and space of the track (which depends on speed and stopping schedule). On busy lines the characteristics of the train path can have an important impact on the availability of capacity to other trains and this is also usually taken into account in setting the charge. In addition, in countries that wish as a matter of policy to collect some portion of fixed¹⁵ rail infrastructure costs from users (discussed in detail in Section 4.3.2), part of the fixed infrastructure costs may be assigned to users by various techniques. In most cases only a small part of the fixed costs are charged to users, with uncovered fixed costs in Europe expected to be paid by Governments. In the United Kingdom and some other countries the fixed part of the infrastructure charge is known as an access charge, and the variable part as a use charge.

In North America, when one rail company uses another company's track, the access charges are usually negotiated without regulatory involvement. In most cases, access rights are reciprocal (Railway A gets access to B's tracks, B gets access to A's tracks) and the access fees tend to be offsetting, so the exact approach is not critical and simple formulae

are typical, for example a set price per wagon-km. In some cases, access rights (called trackage rights in North America) have been mandated by the STB: in some of these mandated cases, the STB has prescribed the access charge which has tended to be based on the variable costs of serving the tenant operator plus some allocation of fixed costs.¹⁶

The charges for the use of rail infrastructure being introduced in Russia are thus formulated in a way that bears no relation to the approach used either in Western Europe or North America. The systems differ most in respect of the linkage to variable costs. The Russian infrastructure charges are derived from socially (and politically) determined freight transport tariffs, which differ from commodity to commodity and are strongly related to distance of haul. By comparison, the EU approach is related only to the cost of providing infrastructure services and applies to a much smaller percentage of rail costs than will be the case in Russia. The North American approach is also basically related to infrastructure cost, and not to the tariff of the commodity being shipped over the infrastructure.

The main objectives of Russian freight transport tariffs

Russian Railways have historically been the only provider of transport services for many types of freight over large parts of the country. Tariffs have therefore been regulated in the absence of a market to establish “fair” transport prices. Currently the price for transport of all commodities is regulated, regardless of where transport takes place and regardless of whether competition exists from road, air or shipping modes. Competition from road haulage is, however, already intense in some parts of western Russia, even if some commodities cannot be hauled economically by road.

The fundamental purpose of rail tariff regulation in Russia in the past has been to help control prices throughout the economy: prices of inputs to industry and prices to consumers. The system emerged naturally as a key part of central planning. Since the beginning of the economic transition, tariff regulation and the tariff structure have undergone successive modifications, aimed at introducing incentives for greater efficiency. Nevertheless, the overriding purpose of tariff regulation remains to help “balance” economic development, contributing to regional development by promoting development of remote parts of the country (or attenuating economic collapse) and assisting industries in financial difficulty. Higher value freight, and particularly freight carried to or from the ports for export or import, is charged higher tariffs and the revenues used to support the transport of low value commodities, especially long distance movements of coal and ore.¹⁷ Periodic revision of the tariff rates and structures are undertaken to respond to changes in economic conditions for socially important parts of the economy including large industrial customers of the railways.

Tariff schedules

Tariffs are calculated according to formulas set out in tariff schedules that run to several hundred pages. The basic methodologies followed by current tariff schedules were formulated in amendments to tariff regulations adopted in the late 1980s and early 1990s as follows:

- 1989, Tariff Price List No. 10-01, which regulates pricing of domestic freight traffic.
- 1993, Tariff Price List No. 10-02-16, which regulates pricing of domestic and international passenger traffic.

- 1993, the Tariff Agreement between CIS and Baltic States that was the model for the *Railway Tariff policy of the CIS for International Freight Traffic*, which regulates the pricing of international freight traffic.

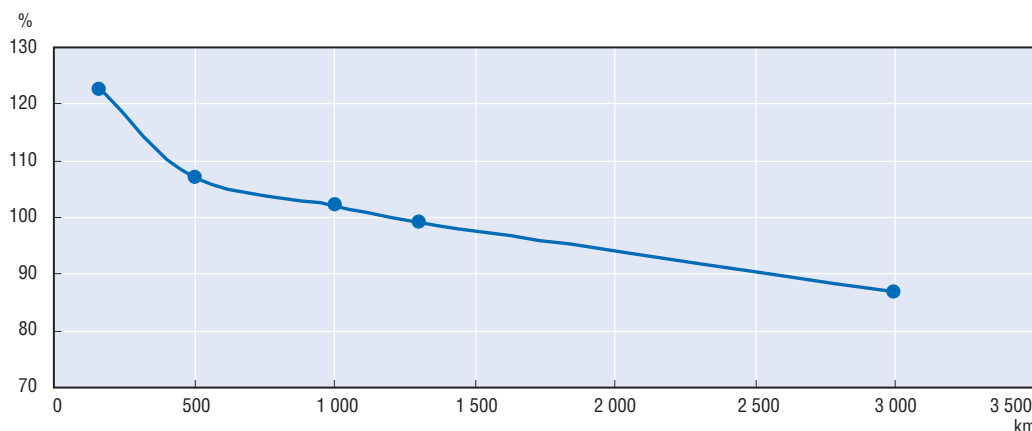
Domestic rail tariffs are currently set under the regulatory supervision of the Federal Energy Commission (FEC), which also regulates electricity and coal tariffs. The domestic freight tariff schedule (Price List 10-01) has been adjusted more or less annually in recent years. The Ministry of Railways draws up new tariff proposals with support from the Scientific Research Institute for Railway Transport. An inter-ministerial committee, the Railway Tariff Commission, then considers these proposals.¹⁸ Each Ministry has a duty to ensure the proposals respect its own specific policy priorities (for example, non-discrimination in the case of the Antimonopoly Ministry). Once the Commission's approval is obtained a decision of the Federal Energy Commission is required to bring the new tariffs into force. Whilst the FEC has the legal responsibility for ensuring the tariffs are properly formulated, tariffs are calculated and applied by the Ministry of Railways. The most recent revision to the domestic freight tariff schedule,¹⁹ agreed on 17 June 2003 by the Federal Energy Commission,²⁰ entered into force on 28 August 2003. The MPS tariff experts became RZhD employees on its incorporation in October 2003.

Transit tariffs have been negotiated with CIS countries at lower rates than the import/export tariffs that are part of the domestic tariff schedule. Inevitably this distorts markets and results in some goods for delivery to Russia being transported in transit to a third country to benefit from the lower tariff, then transhipped and imported by road for distribution in Russia.

Price List 10-01 identifies three broad classes of commodity. Tariff formulas begin with the calculation of a basic tariff for Class II commodities. The tariff for the Class II commodities in RZhD-owned wagons is initially determined by a formula based on shipment size and distance. To this transport tariff (per t-km) is added a loading and unloading charge (per wagon) to arrive at the total tariff. The distance component of the transport tariff is illustrated in Figure 4.4. The tariffs for Class I and Class III commodities are derived from the Class II tariff.

Figure 4.4. Distance taper applied to all classes of freight

Percentage of the average transport component of the base tariff at the distance given



Source: MPS.

The basic objective of the three class tariff system is to ensure that the transport cost is not higher than a target percentage of the delivered price of the product: very low value commodities need to pay low tariffs in order to stay within the target percentage while higher value products can pay more and still not be overly burdened by transport costs. In addition there are over 40 series of coefficients to differentiate tariffs within the classes according to the specific commodity and other circumstances such as particular routings. The three classes of commodities are as follows.

- Class I: coal, ore, timber, aggregates, etc. Class I commodities generally travel at a tariff level of 75% of the Class II commodity tariff at distances below 1 200 km falling in steps to a level of only 55% of Class II commodities at a distance of 5 000 km and more (see Table 4.4). The reference distances are based largely on the distance to market, especially for export commodities.
- Class II: oil, grain, fertilisers, food, semi-finished goods.
- Class III: Chemicals, ferrous and non-ferrous metals, machinery, finished goods. Class 3 tariffs are generally 74% higher than tariffs for Class II commodities at all distances.

Table 4.3. Distribution of freight traffic by class (domestic traffic and traffic to and from ports, %)

	Class I	Class II	Class III
Tonne-km	53	25	21
Tonnes	61	25	14

Source: MPS/RZhD.

Table 4.4. Additional distance taper for Class I commodities

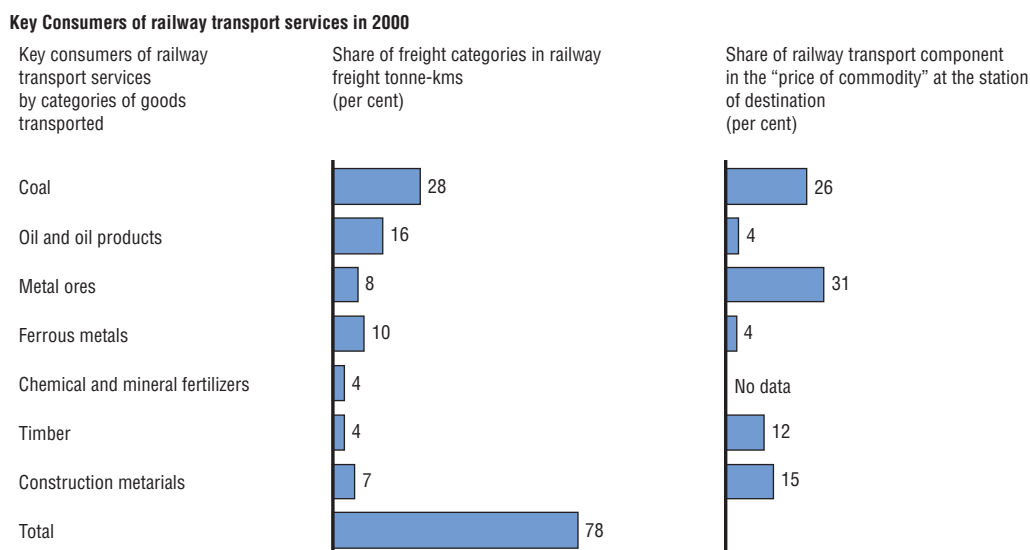
Sample distances	Ratio applied to the base Class II tariff in the tariff formula	Percentage of basic Class I tariff (%)
< 1 200 km	0.75	100
1 200-1 400	0.74	97
1 800-2 000	0.71	95
2 000-2 200	0.70	93
2 400-2 600	0.68	91
3 000-3 200	0.65	87

Source: MPS/RZhD.

Objectives of tariff reforms

The immediate priority for tariff restructuring was to stimulate investment in rolling stock by private operators in order to make up for the shortage in wagons and locomotives following a decade of severe underinvestment by the railway. The reforms have been highly successful in facilitating such investment. However, in some markets private operators are able to charge rates significantly above the regulated tariff for carrying traffic in specialised wagons. This suggests that at least in these markets it is the establishment of a legal framework for the use of private wagons on the network coupled with the overhanging rolling stock shortage, rather than the structure of the tariffs and access charges, that has driven investment so far.

Figure 4.5. **The share of transport costs in commodity prices is a key consideration in setting tariffs**



1. As of May 2000.

2. Types of freight that represent the key categories of freight, namely: power-generating coal, diesel fuel, ferrous ore, rolled sections, chemical and mineral fertilizers, edge-surfaced lumber, cement.

Source: Statistical report on operation of railway transport, Railway Transport Scientific Research Institute (domestic transport); Reference Materials for Rail Transport Structural Reform Programme, McKinsey Moscow, May 2001.

One of the overall objectives of recent modifications to the tariff schedules has been to improve transparency and to a degree to simplify the tariffs. A conscious choice has been made, however, to gradually modify the existing tariffs, rather than reform the system as a whole, in order to avoid shocks to the economy and sudden changes in income for the rail companies. Inevitably the successive layers of differentiation reflected in the adjustment factors make tariff calculations complicated (and actually reduce transparency). Moreover, the various imposed adjustments for particular commodities and for longer distances clearly result from social and political objectives that are not related to the cost of transport. It is difficult to understand or predict the economic incentives that result, or to judge the effectiveness of incentives that changes to tariffs were intended to create. At the same time, the incentives introduced to stimulate improvements in efficiency are differentiated to such a high level of detail that there is little or no room for innovation. The overall effect may be to preserve the status quo in terms of technology and organisation of transport services regardless of performance.

Another stated objective is to evolve tariffs that reflect costs. The differentiation introduced does this to some extent but tariffs are uniform for the whole country. Each of the 17 regional railways applies the same tariffs, despite significant differences in costs. For example, unit costs on the Moscow Railway are estimated to be nearly double those of the West Siberian Railway.²¹ More important, given equal wagon loading and train length, there is essentially no relationship between commodity carried and infrastructure costs. Insufficient linkage of infrastructure use charges to costs will seriously limit the effectiveness of incentives to cut costs and improve efficiency. Paradoxically, since the tariffs charged by the West Siberian Railway are in effect driven up by the higher costs of the Moscow Railway, the cost of the railway charges to ship Siberian coal to major Western

Russian markets is actually higher than it should be, which defeats the stated objective of trying to support coal production in Siberia.²² It also follows that the tariff payments received by the Moscow Railway are probably lower than needed to generate adequate revenues. In both cases, carriers are making inefficient decisions. Most important, uniform tariffs will seriously limit the ability of RZhD to compete in the specific markets that will evolve in Russia as manufacturing industry restructures and competition from trucking intensifies.²³

The overall level of tariffs is designed so that revenues cover the total costs for the railways of transport, maintenance, renewal and expansion (and, at least at present, so that freight revenues cross-subsidize passenger services). However, achieving cost coverage will become increasingly difficult as competition from road haulage intensifies for the higher value categories of freight, as long as averaging of freight tariffs is maintained for the purpose of balancing regional development and favouring particular commodities.

It is not the purpose of this report to try and indicate whether tariffs for particular freight movements are too high or too low. The point is that Russian Railways will operate inefficiently, with real costs to producers and consumers, if charges for shipping or for infrastructure access are calculated without accurate and location-specific cost information.

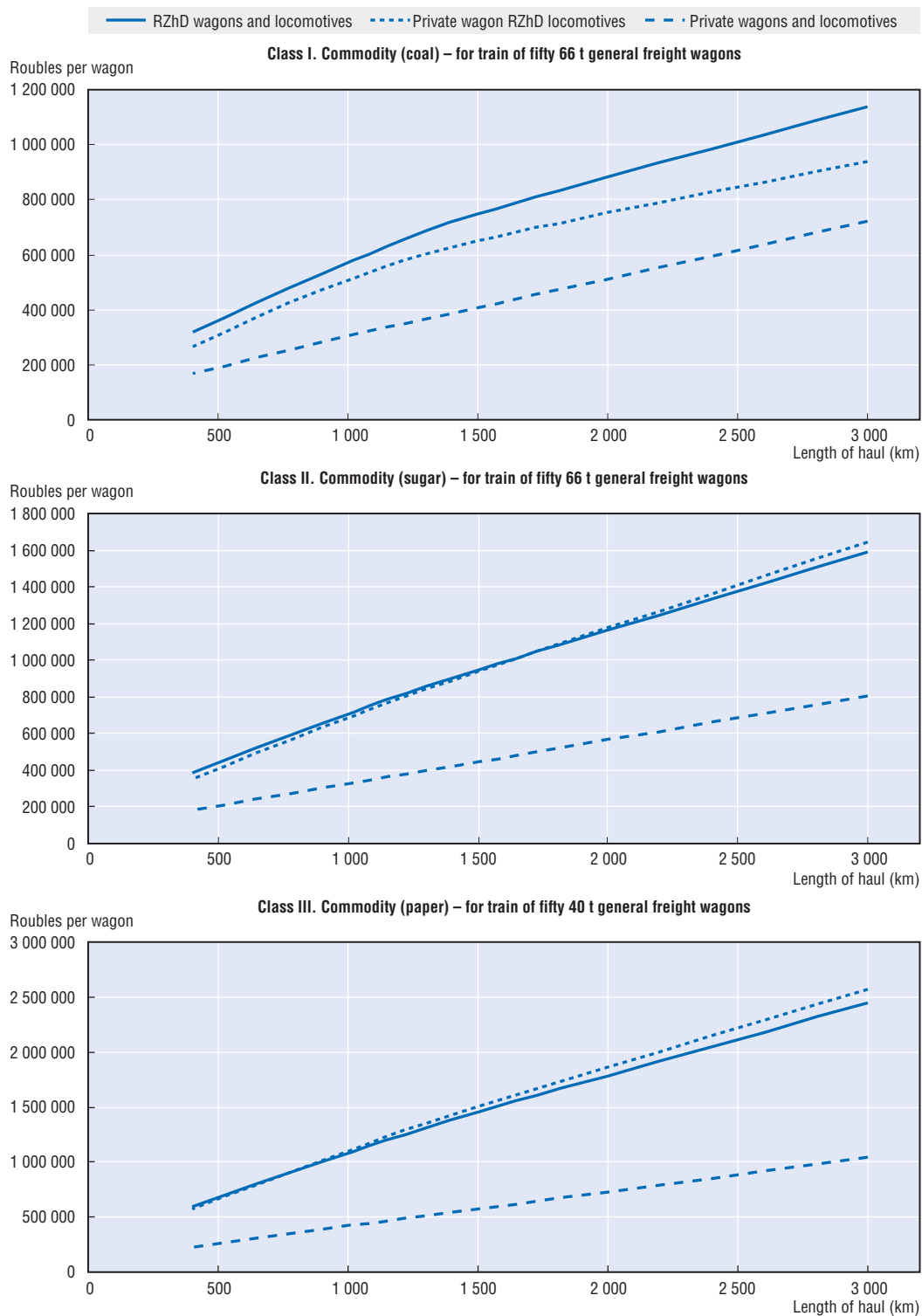
Cost structures

The most recent revisions to the domestic freight tariffs have introduced differentiated tariffs for shippers that provide their own wagons and for shippers that use their own locomotives. These act to provide a discount for shippers that provide their own wagons and a larger discount for those that provide both wagons and locomotives. The difference in tariffs are designed to correspond in part to the national railway's estimated average costs of providing and operating rolling stock, as distinct from costs related to infrastructure, diesel oil, electric power etc. The resulting structure of charges is illustrated in Figure 4.6. To derive the final differences in tariffs that result, appropriate empty return wagon run rates have to be applied. The average empty return run rate for RZhD across all traffic is 60%, and this figure is generally employed to establish the internal charge for RZhD. For private operators a 100% empty return rate is assumed. If the private operator can improve on this in practice he can enjoy a tariff advantage by using private wagons. This choice of load factors is deliberate to ensure charges do not discriminate in favour of RZhD wagons. In some specific markets where 100% empty return rates are the norm, as for example with oil tankers, the rate for using RZhD wagons is adjusted upwards to account for this.

For Class II and Class III commodities, the tariff including use of private wagons is actually higher than using RZhD wagons, based on the assumption of a 60% empty return ratio for RZhD wagons versus a 100% empty return ratio for the private wagons (and ignoring for the moment the specific markets mentioned in the previous paragraph). This is a significant barrier to overcome. It is especially significant for specialized wagons (higher purchase cost, high-productivity wagons made of aluminium, for example) operating in unit trainloads which, almost by definition, return empty. The key to running a successful business as an independent rail operator for Class II and Class III commodities is therefore in achieving higher wagon utilisation rates than RZhD. Independent operators therefore will seek customers that ship large quantities of freight between a limited number of points of origin and destination in order to be able to organise train-load movements with minimal requirements for marshalling. Private operators design services that minimise delays, working within the constraints of RZhD, for example changing routings to relieve RZhD bottlenecks where this is possible. They work closely with RZhD,

Figure 4.6. **Tariff charges for operators using private and RZhD rolling stock**

Based on diesel locomotives and standard empty return run rates:
RZhD 60%; other operators 100% – see preceding paragraph



Source: MPS/RZhD.

with offices in RZhD yards and stations, often employ former MPS staff and typically contract with RZhD for wagon maintenance and other services. Private operators therefore concentrate on niche markets and are often mainly own-account transport companies, and will be at a disadvantage in system-wide competition.

The Table 4.5 illustrates the significance of the infrastructure charges in a different way. The tariffs for use of private wagons and locomotives range between 38 and 64% (depending on commodity and distance) of the full tariff using RZhD locomotives and wagons. Comparison with average cost ratios in North American railways (see Figure 4.7), where conditions are not too dissimilar to Russia, suggests this allocation may be appropriate for wagon and locomotive costs; but, by leaving all other costs in the monopoly infrastructure charge rather than identifying additional and more precise cost categories, it almost certainly allocates far too much to infrastructure. Other operators will have to pay the remaining costs despite potentially being able to operate more efficiently than RZhD. Tariff list 10-01 has been modified to identify some additional services provided by RZhD for separate payment but developing this route to yielding access charges stripped of non-essential services still arrives at charges that bear little relation to costs because they are based on average costs for the network. Thus, as already noted, a shipper in relatively low cost Siberia will be paying charges designed to reflect Moscow Railway's relatively high costs. Moreover, an operator with much higher crew utilization than RZhD would be unable to realize the savings in lower infrastructure access charges.

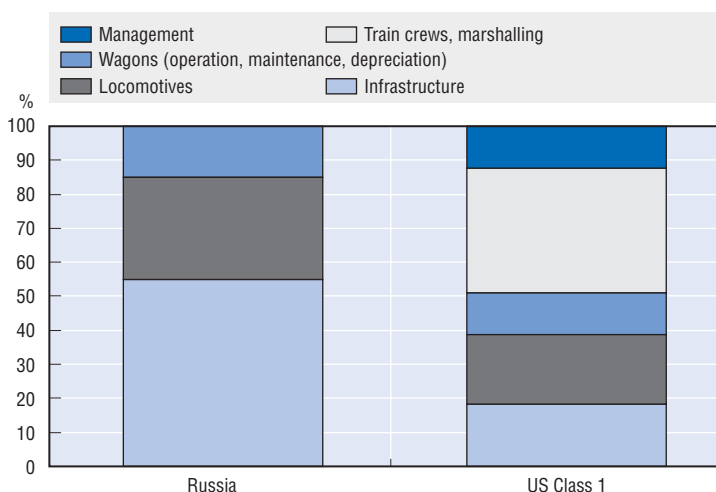
If new freight carriers are to enter the Russian market and compete with RZhD in all markets, as foreseen in the reform programme, then the team suggests that the tariff

Table 4.5. Tariffs for trains of shipper-owned wagons and locomotives as a proportion of the tariff for a standard RZhD railway shipment (%)

	400 km	900 km	1500 km	3000 km
Class I Cargo	53.3	52.9	54.7	63.5
Class II Cargo	46.7	46.1	46.8	50.6
Class III Cargo	37.9	38.3	39.3	42.9

Source: MPS/RZhD.

Figure 4.7. Allocated distribution of average railway costs



Source: Ministry of Railways; Louis S. Thompson on the basis of AAR data.

structure be more clearly divided into charges for those services which the infrastructure part of RZhD is required to offer in a non-discriminatory way as distinct from the services to be offered by the freight operators, including the RZhD freight operator. The services that should be provided without discrimination include access to and use of infrastructure, use of wagons, use of locomotives including, at the new carrier's option, crews and energy. The freight operators need freedom in the way they procure and charge for the provision of operating crews, wagon and locomotive maintenance, operations planning and management, marketing, etc. The monopolistic component of the services provided by the infrastructure provider should be reduced to the absolute minimum: to the greatest extent possible carriers should have full freedom to provide services for themselves and the RZhD freight carrier should not have preferential access or prices for any services. If new operators are to be able to compete, they must be able to take responsibility for a much wider spectrum of cost components, over which they can seek to achieve efficiencies in competition with Russian Railways.

The main innovation in the August 2003 revision to the freight tariff schedule is the establishment of separate charges for infrastructure use and the use of wagons, each in two parts (part fixed, part related to distance), all of which are commodity dependent. They are, therefore, not comparable with charges for the use of infrastructure in Western Europe, which are designed to relate charges to costs of infrastructure use only. This innovation is nevertheless designed to pave the way for the separation of infrastructure management from train operations envisaged in the reform programme.

4.3.2. Competition and pricing for the use of infrastructure

Pricing structures and efficiency

The economic argument in support of marginal costing for rail infrastructure access is well established, but it makes several crucial assumptions which, if not true, can change the argument. First, it is based on the belief that governments will reliably pay the fixed costs, every year, on time, and in the full amounts needed. Experience shows that this assumption is rarely true over any significant period of time. A second issue with marginal cost pricing is that there is little agreement on how to actually calculate marginal costs. In most cases, the source data on rail infrastructure costs maintained by the railway do not support a fully detailed analysis of the relationship between use and cost changes. Moreover, the calculation of "marginal" is critically related to the time frame: virtually all rail infrastructure costs are "fixed" in the very short term (i.e. the next train or the next wagon load), but become quite variable with use in the mid-term (two to five years or longer). The real question is, which cost measurement is needed for the decisions to be made? A single wagonload shipment would appropriately use short run marginal cost: a 20 year contract to haul millions of tonnes per year would use Long Run Variable Cost as a basis for pricing of both access and the tariff to the shipper.²⁴

Perhaps the most important issue in marginal costing of rail infrastructure arises when capacity is being reached. When the infrastructure nears its capacity, an extra user begins to cause delays for all other users (and itself) and the "marginal" cost of serving the extra user becomes high. In the example in the accompanying box, on a line approaching its capacity the cost of adding an additional ton-km (or passenger-km) might rise well above 10 Kopecks/tonnes-km and, as capacity is strained, might rise well above one Rouble per tonne-km. In fact, this is exactly what happened in the United Kingdom when the traffic on the Railtrack network grew rapidly after private carriers took over from British

Box 4.2. Efficient infrastructure pricing

The basic economic issues of infrastructure pricing can be summarised with a simplified example (they are discussed in technical terms in Annex A). Imagine a rail infrastructure enterprise with total annual costs of 100 roubles. This infrastructure is expected to carry 100 tonne-km in the next year. The total costs of the facility are composed of fixed costs (costs that do not vary with the level of traffic – classical examples are amortization, signal maintenance, weed control on the tracks, etc) and marginal costs (costs which do vary with the level of use). Assume the fixed costs are 90 roubles per year, and the marginal costs 10 roubles per year. In this case, the average cost per unit of traffic would be one Rouble per tonne-km, and the marginal cost would be 10 Kopecks per tonne-km. The infrastructure enterprise can cover its costs fully by either: 1) charging its users 10 Kopecks per tonne-km and looking to someone else (the government) to pay the remaining 90 roubles; 2) charging its user a 90 Rouble fixed fee* and 10 Kopecks/tonne-km (this would be a form of “two-part” tariff); or, 3) it can charge its user one Rouble per tonne-km and no fixed fee at all.

Economic theory demonstrates that approach one is more efficient (output maximised at the least resource cost in total) than approach two, which is in turn more efficient than approach three. In approach one, marginal revenues from access charges can be made equal to the marginal costs of using the infrastructure and the operator will make optimal use of the facility. In option two, after the operator pays the initial fixed charges up front (which might limit the number of potential users) the operator still sees an additional cost of only 10 Kopecks per tonne-km, so should still have the flexibility of charging only marginal cost to those shippers who can only pay marginal cost access fees. In option three, paying one Rouble per tonne-km would discourage any use for which revenue from customers of the train operator falls between 10 Kopecks and 1 Rouble per tonne-km. Moreover, the risk exposure of the infrastructure manager is increased because infrastructure income would vary directly and only with traffic levels.

* If there were two or more users the fixed fee would be split between them.

Rail. The operators were paying the equivalent of 90 roubles up front and then a total of 10 roubles annually for running trains.²⁵ The operators thus had an incentive to run all trains on which the revenue exceeded their marginal access cost, and they did so. Unfortunately, as increased traffic began to cause congestion, Railtrack was collecting far less from operators than it cost Railtrack to provide the added infrastructure services, and was not collecting enough at the margin to finance an increase in capacity. Congestion is a marginal cost, and should have been translated into substantially higher marginal charges – although actually making the detailed calculation would not have been straightforward. Infrastructure pricing, especially the marginal component, can have perverse effects when incorrectly applied.

Collecting the fixed costs of infrastructure from users

Although EU Directive 2001/14/EC recommends that rail infrastructure managers base infrastructure use charges on marginal costs, with remaining support coming from government sources, it recognises that countries might, for a number of reasons (including some of the above considerations), want to develop access fees that collect a higher share of the financial costs from users. So long as the resulting access fees are “non-discriminatory”, the Directive raises no objection to charging fees that are above strictly marginal cost when a country chooses to do so.²⁶

Unfortunately, the word “discrimination” has several meanings (although in Russian it is generally employed in a narrow, pejorative sense, in English, French etc. it has many meanings). Much damage can be done through imprecise use of the word. Very briefly, the social and political (and thus, legal) use of the word refers to the application of unacceptable prejudice or preference. Discrimination between persons for reasons of race, gender or nationality is generally discouraged. Charging a higher ticket price for a French passenger than for a German passenger on a Lufthansa flight purely because one passenger is French would not be acceptable on political grounds. In railway terms, the equivalent question – can the French infrastructure manager (RFF) charge a German operating company more for track access than a French company purely because one is local and the other not – is a primary concern for the European Commission in developing a single rail market for the EU. National champions supported by their governments in trying to exclude other EU railways from their home markets through the way regulations are designed and implemented, rather than competing in the market, is anathema to the Commission because of the damage it does to development of the single market. Similarly, European law has ended the German Government’s practice of arranging low tariffs for rail freight services to the port of Hamburg and high tariffs connecting to the port of Rotterdam, purely to encourage DB Cargo to use Hamburg. In general, this kind of “discrimination” based on unjustifiable prejudice or preference should be discouraged.

The economist’s use of the term “discrimination” is not necessarily so value-laden. Charging a different access price because of a different cost to serve is not discrimination at all. High-speed tracks cost more to operate than conventional lines, and higher prices for access should be charged. Running a train during rush hour when capacity is strained costs more than a train in the off peak, and access prices should necessarily be higher (though governments are often reluctant to follow this advice when their publicly financed suburban carriers have to pay the higher access costs that rush-hour services require). The costs of serving a small carrier running one train per day might not be much different from those of serving another carrier running ten trains per day: if so, then the access costs per train-km and per tonne-km might properly be higher for the small carrier than for the large carrier. Truly cost-based access prices are not “discriminatory”, and ignoring the distinction (in order, for example, to promote social or political objectives) will inevitably result in economic inefficiency.

The question that must be addressed, however, is how to charge for the non-marginal costs that, by definition, do not vary with use and often cannot accurately be assigned to a particular use or user. In practice, making users pay fixed costs is an exercise in more or less arbitrary allocation that has troubled railways, and their regulators, for many years. In the old US regulatory system, the Interstate Commerce Commission (the ICC, which has now become the STB) used three alternative methods for allocating fixed costs: per cent of wagonloads and wagon-km, per cent of tonnes and tonne-km and per cent of revenue when it was judging the fairness of a tariff. Each approach yielded a somewhat different answer (coal, for example, tends to generate a large number of tonnes and tonne-km, but relatively less revenue, so coal would carry a higher share of fixed costs under the tonne and tonne-km allocation than under the revenue allocation) leading to endless argument and litigation. Other railways have developed similar methods of cost allocation, none of which is satisfactory because the problem, by its very definition, is insoluble.

If the question is changed, however, to ask how access prices could be set to pass on fixed costs to users, rather than trying to develop a precise mathematical formula to

calculate cost responsibility, there is an answer. The answer, often called “Ramsey-Boiteux Pricing” after the economists who first articulated the idea, is that the least economic distortion is caused in passing along fixed costs to users when the prices to each user both cover at least the marginal cost of serving that user and reflect the price elasticity of that user. If the objective is to collect both marginal and fixed costs from infrastructure users, then the approach to setting prices most efficiently is to discriminate among users in relation to their ability to pay more than others. This kind of **economic discrimination** is both efficient and important: deviation from the principle, for whatever reason, has an economic cost. It also forms the basis for the fully developed, market-based regulation of rail freight tariffs in the US and Canada, where there are remnants of market power. No shipper pays less than marginal cost, and all shippers pay in relation to their individual price elasticity. Note that, in principle, Ramsey pricing can be applied at two distinct levels: for access to infrastructure; and also in determining the prices that the carriers charge to the ultimate customer (the shipper or the passenger). Because it will have both separated infrastructure and freight carriers with potential market power, Russia faces **both** levels of the issue.²⁷

Ramsey pricing for access charges can be applied in a set of access prices per tonne-km, with different prices charged to different train operating companies depending on their elasticity of demand for access. It can also be set up – perhaps with greater transparency and less danger of favouritism – as a “menu” of two-part charges, a variant on the “two-part tariff”. As mentioned above (and to return to the numerical example in the box), one problem with charging 90 roubles for the right to use the track and 10 kopecks per tonne-km is that some potential train operators may be discouraged from using the track at all by the 90 rouble fixed fee. Since, as noted above, the question of the source of payment of the 90 roubles for the fixed track charges is essentially an arbitrary one, it could be inefficient to deny access to such operators, assuming that the benefit that they derive from using the track is at least 10 kopecks per tonne-km. A solution used by some train infrastructure companies (and companies in other sectors with similarly large fixed costs to cover) is to post a “menu” of two-part tariffs, and allow companies to reveal their value of track usage by “self-selecting” their favoured menu option. For example, a small operator might be allowed to use the track for a small or even zero fixed charge, but then be required to pay a higher variable charge (somewhere between the 10 kopecks marginal cost and the 1 rouble average cost). At the beginning, these two options might be all that were required, but eventually, as smaller train companies grow larger, intermediate menu options might be made available as well, so that a train operating company could “buy” its way to a lower variable charge by paying a higher fixed charge. Such a menu of two-part tariffs is more economically efficient than either option 2 (the single two-part tariff) or option 3 (average cost pricing), while allowing the infrastructure company to rely less on state financing than does option 1 (marginal cost pricing).

In summary, access charges pose two broad choices: first, should the charging system be based on an arithmetic allocation formula (ensuring some arbitrary allocations if fixed costs are to be recovered) or should it be based on Ramsey pricing principles; and, second, should the charge be based on some simple and average measure of use, or should it have several parts reflecting a fixed charge and a charge that varies with use.

As with regulating the tariffs for shippers, the complications inherent in setting access charges are a good reason to create a system that allows competition rather than regulation to do the job wherever possible. One advantage of creating vertically integrated

train companies is that such companies set their access “charges” internally and perhaps even implicitly. They compete with other companies for traffic at common points, and they may face regulation for tariffs to captive shippers, and in both cases they must rationally “charge” themselves access “charges” that cover variable costs and contribute to fixed costs but do so in a way that distorts final demand as little as possible. The more that competition can be created, and the more that access charges and tariffs can be determined by competition and by private rather than government decisions, the better.

The accompanying table illustrates these choices, and all have been used in practice. Simple, arbitrary formula allocations have been used in the US and Canada to price trackage rights agreements (for example, a flat charge of 25 US cents per wagon-km), and they are currently in use in cases, like China, where the current access pricing is for accounting separation purposes and there is currently no commitment to competition on the same tracks. Multi-part, arbitrary allocation approaches are quite common for electric utilities and they formed the basis for the DB Netz access charges instituted before review by the German anti-monopoly agency simplified the charges. This type of approach is also found in the infrastructure access pricing regimes in France and Belgium, among others. Simple Ramsey pricing is prevalent in US and Canadian rail freight tariffs but has not been applied in rail infrastructure access pricing. Multi-part Ramsey pricing was originally the proposed basis for the Railtrack freight access charges in the United Kingdom; in fact, the original Railtrack approach attempted to charge different freight access fees in accordance with the commodity in the train, and a remnant of this approach remains in the current access charge regime for freight.

Table 4.6. **Choices in recovering fixed costs**

	Simple	Multi-part
Arbitrary allocation formula	Divide total costs by a measure or measures of use. Set fees accordingly. Example: charge one Ruble/train-km for all trains.	Carriers pay a two (or more) part tariff, one part related to marginal cost of use, and one which contains a formula-based allocation of fixed costs. There can also be a menu of several two-part tariffs. Example: all carriers pay ten kop./gross tonne-km plus 50 roubles/year.
Ramsey pricing	All carriers pay in relation to demand elasticity. Example: passenger trains pay 11 kop./gross tonne-km, freight trains pay 150 kop./gross tonne-km, suburban trains pay 110 kop./gross tonne-km.	All carriers pay their marginal costs, fixed costs are allocated by demand elasticity. Example: freight pays 9 kop./gross tonne-km plus 30 kop./train-km, plus 40 roubles/year: passenger trains pay 20 kop./gross tonne-km plus 50 kop./train-km plus 50 roubles/year.

Note: Numbers in examples above are all hypothetical, and are for illustration only.

Source: Louis S. Thompson, World Bank.

Discrimination in practice

Lack of adequate information to make good decisions. Decisions are rarely better than the information they are based on, and a failure to require disclosure of essential information cannot be rectified through intervention in other areas. This suggests that, no matter what the short-term structure of the rail system is in Russia, a maximum effort is needed to upgrade the information about the costs of infrastructure available to the railway and to regulators. It is also important to make this information available to the public and to the academic community in order to foster constructive debate. In the US, for example, the STB demands and publishes extensive information about each of the larger (Class I) railroads (the Form R-1). In addition, the Association of American Railroads

publishes (and sells) extensive financial information about their (Class I) members. Finally, the Securities and Exchange Commission (the regulator for financial markets) publishes detailed financial data and requires the data to be published in the Annual Reports of the carriers and in so called 10-K Annual Reports.²⁸ Russia would benefit greatly from making similar information available for public discussion and debate.

Corruption. As a general rule, corruption becomes a major problem when the incentives within the system are unclear. Corrupt discrimination can be attacked through proper structure of the access regime, through clear and enforceable regulation and, of course, effective law enforcement; but, the best approach is to make the rules of the game clear (often by simplifying them) and consistent.

Favouring affiliated companies. In principle, the access regime could be designed so that all train operators pay the same price and have equal, non-discriminatory access. In the world of railways, however, if the infrastructure manager wants to discriminate in favour of an operating partner (if it has one), it will be able to do so, no matter what the access rules and prices say. The tools are well known: manipulating the dispatching priorities, declaring that there is no capacity available, excessive “safety” inspections and unreasonable technical standards among many others. Regulation and enforcement cannot fully prevent this type of potential discrimination and, even if they could, potential entrants would always be discouraged by the threat of favoured treatment. One effective approach, discussed in detail in Section 4.2.2, could be to leave the freight and infrastructure integrated, but divide the infrastructure between vertically integrated rail freight companies. This would create line versus line competition between integrated carriers (the North and South American approach). An alternative approach, as discussed in the Reform Plan, is separation of ownership between public infrastructure and private carriers so that the infrastructure provider has no incentive to favour any carrier over another.

Favouring national companies. This is the primary concern for the European Commission in developing a single rail market for the EU. Access rules and regulation will not suffice (indeed, they have often been structured precisely to support national discrimination and exclusion): complete institutional separation will help, and private ownership of the carriers would also help.

Favouring large over small companies. DB Netz previous infrastructure charging regime used a two part tariff with a relatively large fixed component. This was ruled anti-competitive by the German Federal Cartel Office. One could argue whether DB Netz access charges were actually intended to favour DB Cargo over others, but the requirement that any carrier pay a large fixed charge in addition to a marginal use charge had the clear effect of limiting access only to those large companies that could pay a significant fixed charge.²⁹ The same was true of the freight access pricing regime that Railtrack initially instituted. Simple formula access charges will reduce this problem, but at the cost of economic efficiency. Multi-part charges can correct the inefficiencies, but they create the opportunity for manipulation of the results. Striking the right balance is not easy and a decision will need to be made whether to err on the side of economic efficiency or of promoting small new entrant carriers. But as noted in the preceding section of the report, a menu of tariffs providing a range of combinations of fixed and variable charge might offer a reasonably non-discriminatory way of distributing fixed costs between operators of different sizes.

Favouring existing over new companies. Another objective of the European Commission in its Directives is simply to ensure that the infrastructure manager does not set prices which are aimed at protecting the existing carrier by freezing out new entrants.

Political. The opportunities for politically inspired discrimination are unlimited. Pressures to favour particular constituencies or regions, to allow commuter trains to travel below cost without compensation, to favour Russian ports at the expense of competing Baltic ports, and many others, could all find their way into infrastructure charges. If the infrastructure entity is only recovering its marginal costs, then it will have no defence against pressures from those who provide the remaining money (which is actually an argument that full cost recovery access pricing approaches may promote efficiency). Full cost recovery access charging approaches create an incentive to charge more efficient and less discriminatory (in the political sense) prices. In regard to passenger services, explicit subsidy agreements for public service (PSO contracts) also bring clarity into the provision of social services.

4.3.3. Regulating the tariffs charged to the railway customer

Suburban passengers, intercity passenger services and freight

Access prices for infrastructure are only a part of the picture – we also need to account for the prices shippers and passengers pay to the operating companies. In broad terms, this breaks down into three different questions: suburban passengers, intercity passengers and freight.

Suburban passengers. Suburban passenger services lose money almost everywhere, and Russia is no exception. The EU is moving to require that such “social” services be provided under contracts in respect of public service obligations (PSOs) between railways and government and in the future European law is expected to require that these contracts be open to competitive tendering. They already are in the United Kingdom, Italy, Germany and Sweden. PSO contracts usually define the services to be provided and the tariffs to be charged and, as a result, regulation of the tariffs is through contract enforcement.

In the United Kingdom, for example, the Strategic Rail Authority (SRA), as the specifier of services and the contract manager, controls only the standard tariffs (season ticket prices for commuters and non-booked tickets for long distance trips, each type limited by a price escalation formula) while the large range of demand sensitive tariffs (first class surcharge, booked tickets for long distance trips, all short distance trips not using season tickets) are not directly regulated. The infrastructure charges paid by the UK passenger train operating companies (TOCs) are not entirely independently determined because the Government pays an operating subsidy and a large part of this goes to pay the infrastructure charges. In this case, the issue of Ramsey pricing is unclear since access charges are effectively moving from one pocket of government to the other and it is difficult to say what the price elasticity of demand for government really is. This issue – the role of Government as both purchaser of infrastructure access services as well as a subsidizer of carriers (notably suburban passengers, but also in other areas) – will be a regulatory issue for Russia as well as in the EU.

Intercity passenger services. The question of regulation of intercity passenger tariffs is more complex. First, a large percentage of the passengers on Russian intercity trains currently travel under advantaged or privileged fares and it is not clear what would happen if those fare reductions were eliminated. Second, for the other passengers, it is not clear

what degree of market power the railway carriers actually have. For longer haul markets, airlines should have a strong competitive position and it is less likely that the rail carriers have significant market power to abuse. In shorter haul markets, buses and cars are more competitive (and will be more so as highways are built or improved). Moreover, if government decides to create competitive carriers for intercity passengers, the need for tariff regulation can be reduced. The possible creation of competition in the intercity passenger sector in Russia is discussed in more detail below.

Freight. The regulatory regime for freight tariffs is going to be a crucial issue in Russia, given the very high share of freight tonne-km carried by rail. Although trucking is already becoming an effective competitor for freight in European Russia, it is not likely that there will be effective intermodal competition for rail freight transport in Asian Russia or for many bulk cargoes in European Russia. Control of the abuse of potential market power by rail freight carriers will therefore be dependent on either the creation of rail versus rail competition (mostly on the same tracks except, possibly, in European Russia where competition between integrated companies would be possible) or by regulation (or both).

As the next table shows, even if there is a perfectly “efficient” solution of the infrastructure charge regime, issues of discrimination in pricing will remain because rail infrastructure costs are only between 20 and 30% of total operating costs. In the US (the only country for which reliable, detailed data are readily available), rolling stock costs are about the same as infrastructure costs, and rolling stock fixed costs (depreciation plus leasing) are currently around 60% of total rolling stock costs. Carriers who own (or have financial leases for) rolling stock and who pay significant fixed charges for infrastructure will have to face the issue of passing on fixed costs to their customers; and, even if the infrastructure access charges do not include a fixed component, the fixed costs of rolling stock alone will still be significant in the customer pricing calculation. Thus whilst independent carriers who rent RZhD rolling stock will see the rental charges as marginal costs to be passed on to customers in marginal tariffs, carriers that own their own rolling stock will have a large fixed component in their costs and will have to engage in Ramsey

Table 4.7. **Infrastructure costs as a proportion of total costs**

	Per cent	Year	Source
US	17-27	2001	AAR
UK	25	1995	UIC
France	20.5	1999	UIC
Sweden	30.9	1997	UIC
India	10	2000	Annual report
Russia			
Freight	45	1999	MPS
Intercity passenger	20	1999	MPS
Suburban passenger	27	1999	MPS

Notes: US numbers vary depending on treatment of depreciation versus investment.

UK, France and Sweden are calculated as the ratio of the total cost of the infrastructure company (Railtrack, RFF and Banverket respectively) to the total cost of infrastructure and operating companies.

French ratio is low because much of the track maintenance is actually in the SNCF budget.

India taken from IR Annual Report. IR has been under-maintaining their infrastructure and has understated depreciation, which lowers their ratio.

The estimates for Russia are minimums. Actual percentages might be even higher.

Source: Louis S. Thompson, World Bank.

type pricing to recover it. The regulatory regime will have to make allowance for these two contrasting types of independent train operation.

Regulation of Charges for the use of other assets owned by the Russian Railways

The current policy that the infrastructure company in Russia will also own and provide locomotives and wagons for the operating carriers could add yet another level of complexity – and potential for discrimination – to the issue of access tariffs. There will clearly need to be regulation of the charges for locomotive and freight wagon usage, and many of the same issues of discrimination will arise on wagon and especially locomotive charges (should they be leased on a daily charge and charge/km, or annual lease, can the user lease one unit at a time, or must a fleet be leased in a single transaction, etc). Probably more important, access to locomotives, crews and wagons could be a powerful tool whereby the infrastructure provider could exert an influence over the competing carriers. This, again, could be of particular regulatory concern if there is an ownership or control relationship between the infrastructure provider and any of the freight and passenger operating companies. The playing field might actually be level, but it probably would not appear to be so and investors, especially external investors, are strongly averse to ambiguous, discretionary, or unpredictable factors.

The relevance for Russia of experience in regulating freight tariffs and infrastructure charges elsewhere

It will be critical to ensure that Russian rail freight tariff regulation is consistent with the demands of a more competitive, market-driven economy and is consistent with the incentives that are created by the Russian infrastructure access regime. Inappropriate, intrusive and unbalanced rail freight regulation came very close to bankrupting the railroad systems in North America,³⁰ and the circumstances for the same outcome exist in Russia.

In this regard, the railways in the EU occupy such a small freight market share (maximum 15% in most cases), and competition from trucks and water is so intense, that rail freight tariffs throughout the EU are essentially unregulated. China's rail freight tariffs are still completely embedded in their prior command and control system. They have only a few commodity classes, offer no contract rates, are nearly inflexible to cost circumstances or demand elasticity, and essentially vary linearly with weight and distance. In addition, the Chinese practice of adding a flat charge per tonne-km to finance construction of new lines further limits the rail company's ability to achieve market-sensitive pricing. The current Chinese regulatory model, while having the same roots as the past Russian approach, has little to offer Russia today. Because of the similarities in the market pressures on Russian and North American railways, the regulatory approach adopted in North America is highly relevant for Russian regulatory reform. The North American system reflects both the effects of a market system, including the need to recover fixed costs through tariffs while, at the same time, trying to deal with areas where railroads have market power.

This said, there are also lessons to be learned from countries where there is vertical separation of infrastructure. EU legislation, as already noted, provides for mark-ups above the basic approach of charging according to marginal costs, in order to recover costs where public financing is unable to cover them. This mechanism is highly flexible, although may require additional regulatory effort to determine when such mark-ups are justified.

As already noted, it is difficult to characterize the current Russian rail freight tariff system in terms of its economic effects. The new tariff schedule has a relatively simple set of commodity categories (three). In the absence of accurate costing information, it is not possible to tell whether the socially imposed tariffs on low value commodities (for example, coal hauled from Siberia to the West) are actually below their variable costs. Overall, one commodity class (manufactured commodities) probably does support the others (all of the cross-subsidies to passenger services must also come from the profitable commodity class as well). Some flexibility for demand responsive pricing, and some ability to develop contract rates is being introduced. The system simultaneously pursues a number of other objectives through schedules of coefficients applied to the basic commodity tariffs. Rather than attempting a detailed critique of the current system the purpose of what follows is to highlight some issues and questions that may be important as the Russian rail system of infrastructure and carriers begins to evolve.

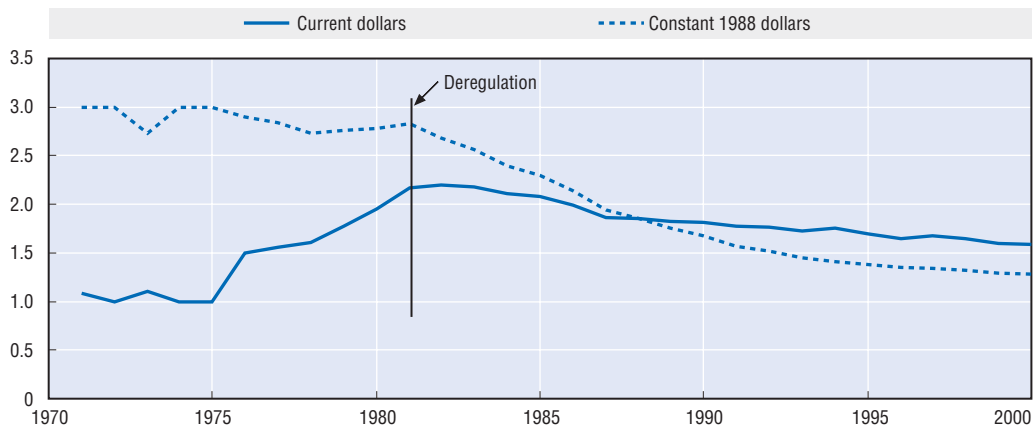
For about five years after World War II, the US rail system continued essentially on the momentum of the war years in which highway fuel was rationed and new vehicles were hard to obtain. Beginning in the early 1950s, though, when wartime production had been re-converted to peacetime purposes, auto ownership grew, truck fleets increased, highways were built, and the civil aviation industry began to develop. Especially after the advent of the Boeing 707 in 1954, and the start of the Interstate Highway System in 1956, the competitive position of the railroads began to erode rapidly. By the end of the 1960s, the privately owned rail network³¹ was nearing a financial collapse. The initial response of the US Government was to create Amtrak, the nationally owned intercity passenger rail carrier, in order to end the cross subsidy from freight to passenger services.³²

Although creation of Amtrak helped, the freight industry continued to suffer from the effects of adverse regulatory interference. For nearly 100 years, the ICC exercised its power to intervene deeply into freight rail tariffs, and this led to a system of politically imposed distortions in the rail freight rate structure that harmed the competitive position of the railroads and prevented them from being managed as commercial businesses in full competition with trucks and barges. Moreover, the regulatory system for trucks and for airlines had also become so obviously inefficient and expensive that the Congress passed, in rapid succession, deregulatory legislation for airlines (1978), then railroads (1981 – the so-called “Staggers Act”), and then trucks (1982).

The results of the three regulatory packages have been highly successful, certainly from the point of passengers and shippers. Freed from regulation, US rail freight tariffs fell significantly both in current and real terms, the rail market share stabilized, and productivity of labour and assets increased so quickly that rail earnings actually increased (though they are still arguably less than the cost of capital to the railroads, at least as calculated by the STB) (see the accompanying figures). Truckload tariffs also fell and rail and truck tariff decreases brought barge tariffs down with them, saving the economy tens of billions of dollars per year in transport costs. The greatest driver of the decrease in rail freight tariffs and the increase in productivity is believed to be the advent of contract tariffs which were prohibited prior to deregulation but which, today, appear to apply to more than 60% of all rail tonnage. Contract tariffs permitted railroads and shippers to invest in specialized facilities (rolling stock, loading and unloading facilities) and commit to stable volumes to be shipped: this, in turn, rapidly boosted efficiency. These contract tariffs, being voluntary agreements between railroad and shipper (shippers can always resort to a public tariff if they wish), are generally not public and they are not subject to regulation at all.

Figure 4.8. **US rail freight revenue**

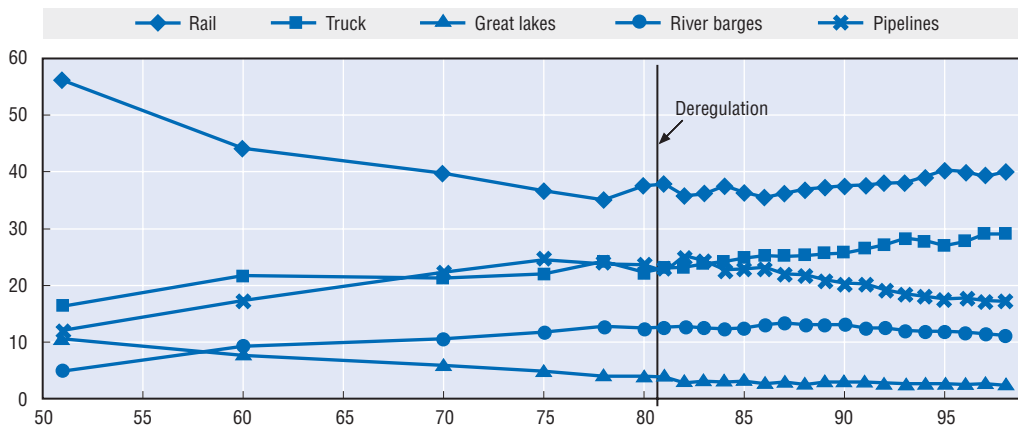
US cents/tonne-km



Source: AAR Handbooks of Railroad Facts.

Figure 4.9. **Freight modal shares in the US**

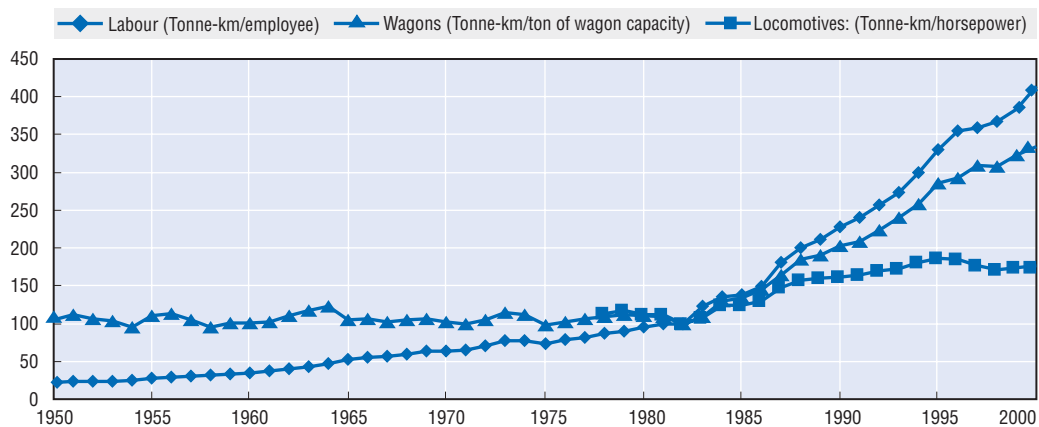
% tonne-km



Source: Louis S. Thompson, World Bank.

Figure 4.10. **Productivity in US railroads**

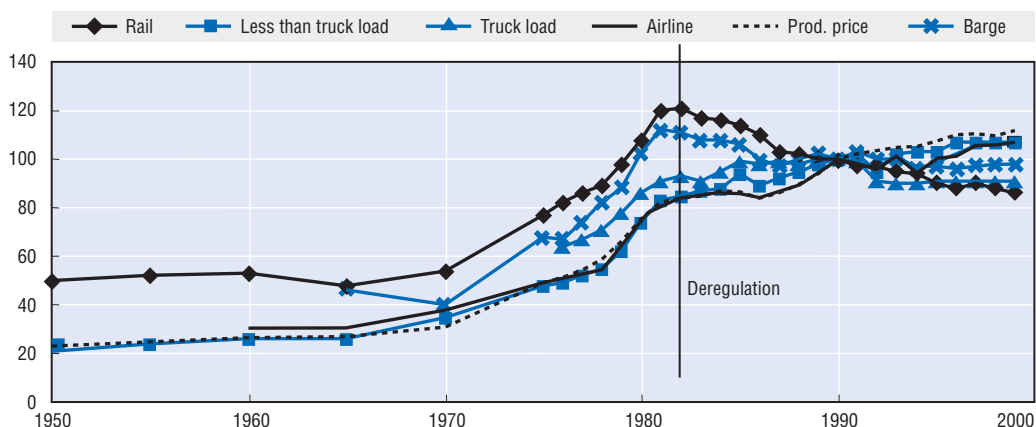
Index: 1982 = 100



Source: Louis S. Thompson, World Bank.

Figure 4.11. Average US freight and airline tariffs

Index: 1990 = 100



Source: Louis S. Thompson, World Bank.

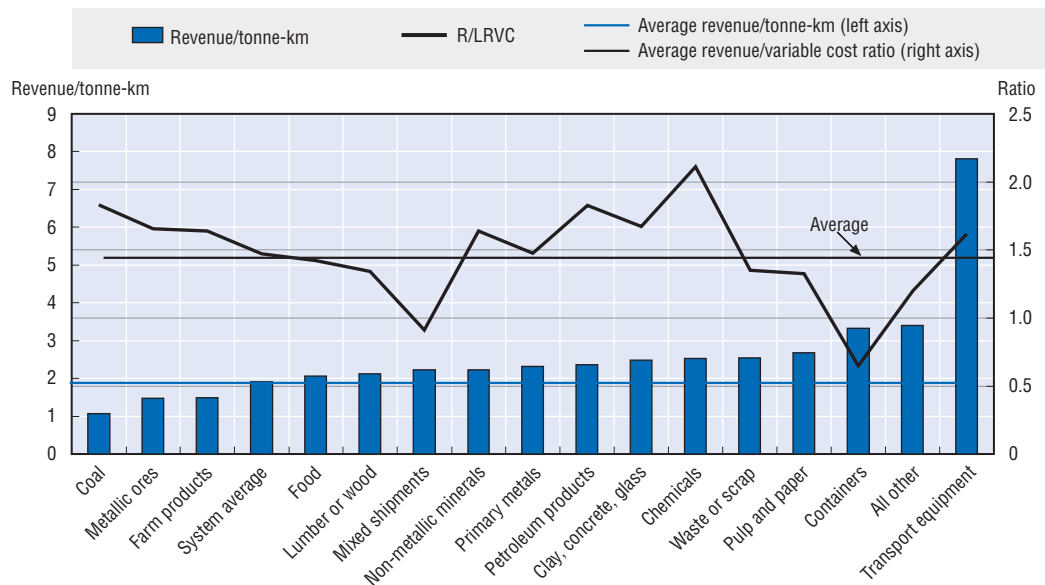
The principles behind the US rail freight regulatory system deserve consideration as the Russian system develops. In broad terms, the foundations of the US approach are:

- The presumption is that adequate competition exists, either from trucks, barges, other railroads, or competing sources, so that rail freight tariff regulation is normally deemed to be unnecessary. So long as the total earnings of a railway do not exceed the cost of capital for the railway, and so long as its total revenues from freight operations do not exceed a stated ratio (180%)³³ of its “variable costs”, the presumption of adequate competition is difficult for a shipper to challenge.
- When a shipper believes that a quoted rail tariff may reflect abuse of market power by the railway, the shipper has the responsibility to demonstrate that the railway *does* have market power *and* that the proposed rail tariff exceeds a ratio of 180% of its variable cost, or that the proposed tariff exceeds its “stand alone cost” (that is the cost of an efficient railroad providing service only to the shipper in question). If all these tests are met, then the STB *may* (but does not have to, and usually does not) prescribe a tariff that it considers reasonable.³⁴ None of these issues apply to voluntarily negotiated contract tariffs that are, for the most part, unregulated and confidential.

As a result of this approach, essentially no US rail freight traffic moves under prescribed tariffs, and little or none moves under a simplified commodity tariff grouping. Instead, virtually every shipment is unique, with a tariff specific to the circumstances (contract tariff, commodity, equipment type, railroad, distance, competition, etc). The net result can be seen in the accompanying figure for US railroad freight tariffs, which shows the variation in average revenue per tonne-km for the most important 15 commodities in 2001 (98% of tonne-km). As expected, the range of tariffs is quite broad. There is an attempted to compare this roughly with Russian practice in the next figure, which compares the Russian tariffs for the three major tariff groupings as represented by coal, steel ingots and wheat (tariff data provided by MPS) with the average tariff at the average length of haul for some of the major commodity groups in the US.

There are many caveats for this comparison, including the conversion of Russian tariffs into purchasing power parity (PPP) adjusted dollars; this said, it is significant that the

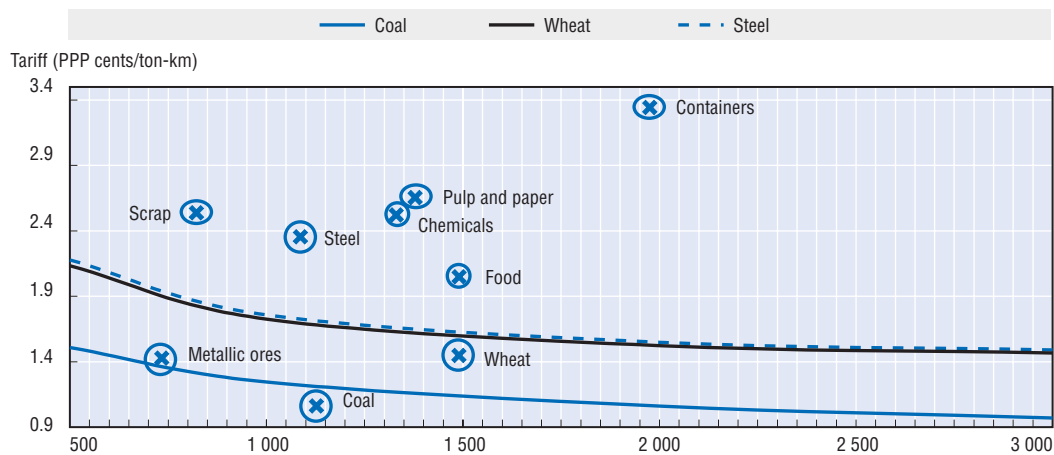
Figure 4.12. **US railroad freight tariffs in 2001: Revenue/tonne-km (US cents) by commodity and ratios of revenue to variable cost**



Source: STB data.

Figure 4.13. **Freight tariff comparisons: US and Russia**

Solid lines show Russian tariff schedule versus distance for 50 wagon train. Circled points show US average tariff for commodity chosen at average distance of haul for the commodity



Source: Russian tariffs from MPS, US tariffs from STB Costed Waybill Data for 2001.

US tariffs for these commodities show a significantly wider **range** of variation than the Russian tariffs as a result of greater flexibility to adapt to market conditions. Russian tariffs should never be the same as US tariffs because both competitive conditions and cost conditions are different; but the need for a wider range of variation than exists at present seems clear if the Russian freight carriers are to be able to fully cover their fixed costs in the face of growing competition. This will be particularly true if (as discussed below), limited market rail freight carriers are to be able to compete (“cherry pick”) with general cargo

railway carriers by using the public infrastructure to haul in-house cargos (e.g. a coal mine which elects to run its own trains from mine to power plant).

The difficulties in covering costs created by commodity tariffs could be multiplied greatly if charges for the use of infrastructure are commodity-specific and based on the same regulated end-user freight transport tariffs. If this happens, almost all of the ability of the carriers to engage in demand-sensitive pricing could be removed. This approach will likely benefit the infrastructure agency, but will make life difficult for the carriers.

The figures for the US also show the relationship between the revenue generated by the various commodities and the calculated “long run variable cost” (LRVC) to move them. LRVC is the approach used by the STB to compare the revenue in a proposed tariff with the appropriate cost of the movement in question. The approach can also be used, as in the figure, to compare the total revenues for a given set of traffic with its LRVC costs. The STB’s LRVC is not the same as the economist’s short run marginal cost: the LRVC concept was developed in order to use real-world data and in a longer run time frame that covers a period of several years, so LRVC is a higher percentage of total operating costs than are short run marginal costs. Two points emerge from this: first, costs of particular movements and aggregated movements can be calculated (at least approximately) and usefully compared with the revenues they generate; second, there is no direct relationship between the tariff on a commodity group and its profitability (see coal, where the average tariff per tonne-km is the lowest, but the ratio of revenue to variable cost is the second highest). There is no substitute for knowing costs as well as tariff levels if tariffs are to be regulated in a way that permits market-sensitive pricing.

It could be very important to subject the tariffs shown in Schedule 10-01 to the same kind of costing exercise as done by the STB in the US, and also laid down for the EU in Directive 2001/14/EC, to ensure that all Russian rail freight tariffs are at least covering their variable costs (questionable for the extremely long haul coal traffic due to the system of discounts with increasing distance of haul for this category of freight) and to identify circumstances in which the tariffs are far above costs. It would also be quite helpful to the Regulator to be able to compare costs with the tariff revenues.

As already noted, access rules and charges must be consistent with the regulation of the final prices charged to the shipper (or passenger). The reason for this is that, relatively quickly the infrastructure agency will come to understand that, if it is to cover its full costs, it must view infrastructure access as a *product to sell* – and it has a very limited set of customers. The second change is that, as soon as they become profit driven (and all enterprises with “hard budgets” are), then the freight and passenger carriers will view access charges as price signals, just like any of their other inputs. They will react to prices both in their level and their structure. In the short run, they will adjust the way they use the infrastructure; in the longer run, they will adjust all of the access charging variables under their control in order to maximize the distance between what they generate in revenue and what they pay in access fees.

Russia is in the process of creating a market for rail infrastructure services that will have an immediate impact on the behaviour of the carriers in the directly linked market for rail freight services. The interaction between the freight carrier(s) and freight shippers will clearly be affected by the prices and services the rail freight carriers provide (and, of course, by the prices and services offered by trucks and water transport and by the restraints imposed by the freight tariff regulatory regime). It should be equally clear that the

interaction between the infrastructure manager and its customers – the freight and passenger carriers – will also be defined by the infrastructure prices and services offered. Though the infrastructure manager is a “monopolist”, its customers are not monopolists, and they will have to react to the access charges they face. Just as the infrastructure agency will have to be mindful of the reaction of its users to its charges, so the infrastructure regulator will not be able to issue (or accept) commands to accomplish social or political objectives through infrastructure use charges without having a significant effect on the way the carriers perform and/or on the earnings of the infrastructure agency.

The overall argument is that all regulatory interventions, no matter how purely motivated, have consequences. Many countries have tried to impose cross-subsidies from freight to passenger services, or from one freight category to another, through regulation of tariffs: in every case, if the mis-regulated carrier has effective competition, market forces have frustrated the regulators and damaged the carriers. In the US case, in the period before deregulation in 1981, mis-conceived regulation nearly destroyed the private railroads. Countries have also attempted to make freight tariffs “fair” to small and remote farmers who believe that they should pay the same tariffs as larger farmers closer to markets. The result – overcharging the best customers in order to support the less profitable ones – has an inevitable outcome. Trucks get the best traffic and the railroad carrier is left with the less productive market.

A good example of the potential risk for Russia is the following. Assume that freight tariffs are regulated so that there is a relatively simple set of commodity groups. Let us assume that one of the commodities (for example, fabricated steel) carries a high tariff that the regulated freight carrier has no power to reduce and that the carrier has a prescribed, low tariff for iron ore and coking coal. If the steel tariff is high enough, trucks will be able to compete for the steel, and the rail carrier will be left with the less profitable, bulk commodities. If the track access regime is set up to be non-discriminatory as between large and small freight carriers, the steel mill itself may decide to haul steel and leave the railway to bring in the raw materials. In either case, the carrier, the steel mill and the economy are actually worse off than they would be if the access regime and the tariff regime were more flexible and adjustable to market forces. These are not hypothetical examples: these kinds of distortions are exactly what happened in North America in the period before the passage of the Staggers Act in 1981, and it has taken the better part of two decades to recover from the damage.

4.3.4. Conclusions on tariffs

Responsibly, the Government has taken pains to avoid shocks to the system. It has therefore preferred so far to preserve and gradually modify tariffs, rather than introduce a new system of tariff regulation in the midst of all the other reforms. However, there are risks to that approach as well.

Within the regulatory framework, the Russian Railways must be given the freedom to price their services according to the market. If they do not get this freedom they will lose their most profitable business to competition from road haulage and from industrial customers who decide to run their own trains. Within only a few years the capacity for the railway pricing system to contribute to governments’ regional development aims will disappear as Russian Railways sees its revenues decline. It will become increasingly difficult even to cover the railway’s own total costs, even if the costs of supporting suburban passenger services are transferred to separate government budgets.

The Three Class commodity tariff system should be replaced with a much more flexible system of regulation adapted to the market environment the Government is creating for the railways, and for the economy as a whole. Like RZhD, private railway companies, whether vertically integrated or only operating trains, will need the flexibility to set tariffs – subject to broad regulatory constraints in parts of the market where necessary – that cover costs but also allow the company to respond to competitive conditions and so keep high-value cargos.

Once a decision to move to more flexible pricing is taken, the Government will have to decide which if any of its goals should continue to be pursued through modifications to the existing tariffs, in the period before the new approach to regulation is formulated and adopted. The financial incentives that result from the new layers of differentiation introduced into the tariff system are difficult to gauge. The response of different parts of the rail sector as it undergoes legal and structural reform, with new freedoms for some parts of the industry, is even harder to predict. Some of these changes might accelerate the loss of traffic foreseen. They may also have unforeseen impacts on the allocation of resources to investments that are essential to maintaining the asset value of the system. Budgets for maintenance and renewal tend to be vulnerable to reduction in periods of change, or financial uncertainty that arises for any other reason. The overall risk is that when the time finally comes for reform of the tariff regulations the railways will have been overtaken by financial crisis.

As noted in the section on competition above, the regulatory task in overseeing freight tariffs would be greatly reduced if and where competition between vertically integrated freight railways can be established through appropriate adjustments to the structure of regional railways. Universal prescription of freight rates would be replaced by rates established through competition, with regulatory oversight, with a right of appeal to a regulatory agency in cases where customers believe they are victim of monopoly abuse. There would be few circumstances where oversight of access charges is required as for the most part they would be set internally and implicitly by the vertically integrated railway companies themselves. The rules according to which judgements are made will need to be devised according to the quality of data available to the authorities. It will be important that the regulator have both adequate information and economic expertise to make these judgements. The Regulator should be making economic assessments, not simply overseeing application of the letter of the law. Even without competition between vertically integrated railways, for many markets competition from road haulage will limit the market power of the railways (as is the case in most of Europe and the United States) and reduce the need for detailed prescriptive regulation, allowing some freedom for negotiated freight rates in place of tariffs, although a more prescriptive specific regulatory regime may be needed for coal.

The way charges for the use of infrastructure are set under the new arrangements depend in part on the model adopted for competition: whether new carriers operate on track owned by Russian Railways in competition with Russian Railways' freight division; or whether competition between vertically integrated companies is established over parts of the network. Where vertical separation is chosen, a two-part tariff is probably indicated, and perhaps a menu of two-part tariffs that seeks to achieve cost recovery while maintaining the ability of smaller companies to afford access. As the system is expected to cover its full costs, the charges will have to include a large element determined according to ability to pay, and this would be assigned to the fixed part of the tariff. The variable part

would be based on marginal costs of running particular trains. It is essential that infrastructure charges be structured to provide strong incentives to manage the infrastructure efficiently and favour train configurations and equipment that does not impose excessive wear on the tracks.

The role of the regulatory authorities in assessing the conformity of infrastructure charges with policy is somewhat different under the two models for competition. In the model set out in the Plan for the short term there may be a policy imperative for reducing the level of fixed charges paid by the smaller operators, or new operators seeking to enter markets where margins are small, as a way of helping to balance the many barriers to market entrance they will inevitably face.

The Commission for Tariff Regulation should begin to explore appropriate designs for end user tariff regulatory oversight in Russia and the design of charges for the use of infrastructure suited to the goals of competition policy as this becomes more clearly defined.

4.4. Passenger rail public service obligations and concessionary fares

Despite its larger scale, the Russian rail passenger services are similar to services in other OECD countries. They fall into two distinct categories – suburban/regional versus long haul/intercity. In 2002, MPS carried about 1.15 billion suburban/regional passengers and 121 million intercity passengers. The average suburban/regional trip length in Russia was 41 km (roughly the same as the average for all rail passenger trips in Germany), whereas the average long haul trip length was 876 Km (slightly longer than Amtrak, VIA in Canada, and China). These two distinct types of services have very different markets to serve, and very different cost and demand characteristics.

The distinction between suburban/regional services and intercity services has been well recognized and developed in most OECD countries. In most cases, suburban and regional passenger services are provided under socially controlled³⁵ fare structures, which cause them to operate at a loss. The European Commission has concluded that most long haul passenger services ought to be commercially viable and should not receive state support. It is an EU requirement that all social services requiring state support be provided under a contract between the appropriate government agency at the local, regional and/or national level. The contract must be supported by transparent accounts separating costs and revenues of each service, and the support must be adequate to cover the costs of the service provider.

The existing EU regulation (Regulation No. 1191/69/EEC) states that in order to ensure adequate transport services that take into account social, environmental and regional development factors, or offer special fares to certain categories of passenger, the competent authorities may conclude **public service contracts** with a transport undertaking. A public service contract may cover notably:

- Transport services satisfying fixed standards of continuity, regularity, capacity and quality.
- Transport services at specified rates and subject to specified conditions, in particular for certain categories of passenger or on certain routes.
- Adjustments of services to actual requirements.

Where a transport undertaking not only operates services subject to public service obligations but also engages in other activities, the public services must be operated as **separate divisions** meeting at least the following conditions:

1. The operating accounts corresponding to each of these activities shall be separate and the proportion of the assets pertaining to each shall be used in accordance with the accounting rules in force.
2. Expenditure shall be balanced by operating revenue and payments from public authorities, without any possibility of transfer from or to another sector of the undertaking's activity.

“**Public service obligations**” are defined as obligations that the transport undertaking in question, if it were considering its own commercial interests alone, would not assume or would not assume to the same extent or under the same conditions. Public service obligations consist of the obligation to operate, the obligation to carry and tariff obligations and should be granted **compensation** from the public authorities in respect of the financial burdens that result.

The European Commission has proposed amendments to this regulation with the following objectives: a) to stimulate more efficient and attractive public transport, through the use of controlled competition³⁶ and other measures; b) to promote legal certainty for authorities and operators. The proposal establishes common rules:

- For the use of contracts between authorities and operators.
- For compensating operators for the fulfilment of public service requirements.
- For the award of exclusive rights.
- For introducing and managing competition.
- On transparency.

Controlled competition in the countries of the EU is associated with more efficient and attractive public transport. The accompanying table compares trends in public transport in 30 large EU cities during the 1990s. Cities using controlled competition attracted most new passengers. They also had the best financial performance. Similarly, the two member States that made most use of controlled competition in heavy rail – the UK and Sweden – were those where passenger numbers grew fastest between 1994 and 1999.

The Plan and the legislation clearly call for an approach in Russia that is similar to the EU approach of having passenger support for social services provided under contract with the rail carrier. The Plan also recognizes the need for at least part of the support to come

Table 4.8. **The impact of controlled competition on performance of public transport systems**

	Annual rates of change	
	Numbers of passenger trips	Proportion of operating costs covered by fares
Cities using controlled competition	+1.8%	+1.7%
Cities without competition in public transport	-0.7%	+0.3%
Cities using deregulation without significant control by public authorities	-3.1%	+0.3%

Source: COM(2002) 107, final 21 February 2002, Amended proposal for a Regulation of the European Parliament and of the Council on action by member States concerning public service requirements and the award of public service contracts in passenger transport by rail, road and inland waterway.

from local or regional governments. The potential scope of the problem is shown in Table 4.7 which shows separately for long distance and for suburban/regional trains, passengers carried, passenger-km, estimated operating losses, and the ratio of the revenue from passengers to the operating costs of the services.

Suburban/regional services are concentrated in relatively few regional railways, with Moscow and St. Petersburg together accounting for almost half the suburban activity and losses. The total suburban losses (roughly estimated at 16 billion roubles in 2001, though all estimates of “losses” should be understood as approximate and probably calculated on a basis inconsistent with IAS standards), constitute a significant burden on the rail system,³⁷ and they are clearly absorbing earnings that could otherwise be generating badly needed investment resources. The program of moving quickly toward separating the suburban/regional operations financially and, as soon as feasible operationally, deserves high priority. Only through clear separation of accounts and operations can the needs for PSO relationships be fully justified. The table also shows that “losses” on the long haul trains are significant – larger, in total (about 30 billion roubles), than the suburban services but having a much higher ratio of revenues to operating costs and therefore closer to break-even.

Both types of passenger services suffer from the problem of revenue losses due to reduced fares (and, for suburban services, fare evasion). It has been estimated that 43% of

Table 4.9. MPS passenger operations in 2001

	Passengers carried (000)		Passenger-km (000 000)		Estimated operating losses (000 roubles)		Ratio of revenue to costs (%)	
	Long distance	Suburban/ regional	Long distance	Suburban/ regional	Long haul	Suburban	Long distance	Suburban/ regional
October	17 564	179 749	12 432	5 750	2 522 047	3 202 241	58.2	13.9
Kaliningrad	463	8 249	112	230	14 548	197 563	68.5	13.0
Moscow	28 003	548 564	17 472	17 158	4 465 148	4 630 169	52.5	30.0
Gorky	7 316	74 338	9 856	2 484	1 109 682	1 070 408	71.5	16.6
North	10 216	28 650	7 056	1 242	2 247 478	409 946	47.0	18.8
North-Caucasian	10 831	39 629	8 624	2 208	2 638 941	1 061 070	48.0	10.5
South-East	4 468	42 886	8 736	1 748	2 127 542	962 401	53.7	6.1
Volga	5 791	23 347	4 816	736	1 810 607	563 229	42.9	6.5
Kuibishev	6 828	38 299	7 280	1 656	783 900	588 829	72.4	18.7
Sverdlovsk	13 032	81 432	11 088	2 530	2 122 986	747 089	59.6	25.8
South-Ural	4 883	28 282	4 368	1 610	1 042 576	656 858	54.2	18.9
West-Siberian	8 862	112 746	6 720	4 876	1 860 553	533 307	50.5	26.4
Krasnoyarsk	3 992	17 052	3 024	644	936 535	343 855	47.7	12.3
East-Siberian	4 071	23 462	3 808	1 334	1 567 170	405 942	40.7	21.1
Baikal	3 922	13 098	3 360	828	2 152 466	268 087	30.6	10.2
Far-East	7 450	19 818	2 912	920	2 053 442	385 749	28.6	14.5
Sakhalin	768	719	224	0	245 369	29 075	20.5	10.5
Total	138 460	1 280 320	112 000	46 000	29 700 990	16 055 818	51.7	20.2

Sources:

Passengers carried: Deloitte and Touche, Table 8, p. 24.

Passenger-km: estimate based on Deloitte and Touche, Table 10, p. 35 showing percentage of total passenger-km by category, and data provided by MPS showing total passenger-km by long and suburban travel.

Ratios of revenues to costs: Deloitte and Touche, Table 11, p. 35.

Estimated operating losses: Deloitte and Touche, p. 19, and estimate based on the Deloitte and Touche revenue/cost ratios and revenues calculated assuming that revenue percentages for each railway are the same as their passenger-km percentages.

all suburban passengers travel on free or reduced fares (and another 10% are fare evaders). These fare reductions total about 6.8 billion roubles per year, which is a sizeable portion of the annual losses. Long haul services are not so affected by fare reductions, with about 14% travelling on free or reduced fare tickets (with very little evasion).³⁸

Based on experience outside Russia, and the differences in the two types of passenger service in Russia, separate models deserve consideration. For suburban services, separating the services and devolving them to local planning and at least partial local funding is a good approach. Because of the high percentage of privileged travel, and the high losses over and above the privileged travel losses, the EU approach of requiring PSO contracts for each service would be an effective way of ensuring that decisions about ticket privileges and overall services are made in the right place: clearly these services are far from potential commercial status, and a contract with local agencies to provide each service in its entirety will be more effective.

Practices vary as to the share of the suburban support that is paid by national governments and by local governments. The funding balance between national and sub-national authorities is usually determined in large part by the relative ability to raise taxes. Where local tax bases are minimal, the national share can be as high as 100%. Strong local tax bases can result in local shares as high as 100% of operating losses and as much as half of capital costs. The correct balance for Russia needs discussion among the various levels of government.

By contrast, as Table 4.10 shows, long haul passenger flows do not easily break down by single regional railways. It is interesting, though, that the Western part of Russia (Kaliningrad, October, Moscow, Southeastern, North Caucasus, Volga, Kuibyshev, Gorky and Northern)³⁹ does seem to constitute a relatively distinct set of passenger flows from those of Eastern Russia (Sverdlovsk, South Ural, West Siberian, Krasnoyarsk, East Siberian, trans baikal and Far Eastern). About 61% of all long haul passengers originate and terminate within the Western group of railway, and another 29% originate and terminate within the eastern group of railways – leaving only 10% of the passengers to interchange between the regions. This suggests that Russia might have two long haul passenger companies which could each focus on trips within their region and interchange passengers at their boundaries. Moreover, by giving the Eastern company operating rights into Moscow, another 5% of passengers could be handled without having to change passenger companies.

This grouping would not, of course, introduce competition into the passenger market. Given that the passenger carriers will be totally separated from infrastructure, there is no strong reason why there could not be competitive operating rights, particularly in the large markets like Moscow to St. Petersburg and the international markets to the West. It is also likely that the “losses” of the long haul passenger companies will be strongly related to the infrastructure access fees they are charged in addition to the free or reduced fare burden they bear. Consistent with EU practice, it is reasonable to expect that a combination of carefully designed track access fees for passenger trains based on marginal cost combined with fare deregulation (particularly if the passenger companies are structured to permit competition) and direct compensation for any imposed fare privileges⁴⁰ would yield long haul passenger companies that can operate without major budgetary support and some might possibly be fully commercially viable.

Table 4.10. MPS regional railroad to regional railroad total long haul passenger flows (000 passengers) in 2001

Destinations	Passenger West										Passenger East							Russia
	Russia	Kaliningrad	October	Moscow	South Eastern	North Caucasus	Volga	Kuibyshev	Gorky	Northern	Sverdlovsk	South Ural	West Siberian	Krasnoyarsk	East Siberian	Trans Baikal	Far Eastern	
Origins																		
Russia	108 012	426	14 667	20 682	3 373	8 041	4 075	5 699	6 472	8 299	11 038	3 427	6 733	3 220	3 625	3 473	5 187	108 012
Kaliningrad	341	8	75	248	0	13	0	3	0	0	0	2	0	0	0	0	0	341
October	14 633	79	12 009	520	198	459	118	87	283	734	149	49	24	1	0	0	0	14 633
Moscow	20 692	329	524	6 309	2 025	2 262	941	1 811	2 588	2 214	906	452	329	103	101	49	78	20 692
South Eastern	3 286	0	193	1 995	354	362	164	82	38	13	20	32	22	2	3	2	4	3 286
North Caucasus	8 100	13	457	2 251	395	3 034	577	362	217	163	251	175	157	34	15	2	9	8 100
Volga	4 145	0	138	975	149	554	1 633	272	99	1	166	89	55	9	5	0	0	4 145
Kuibyshev	5 547	2	86	1 782	77	313	239	1 739	216	29	356	577	86	14	13	7	15	5 547
Gorky	6 397	0	280	2 563	47	215	100	222	1 874	237	727	24	69	11	9	4	14	6 397
Northern	8 355	0	749	2 247	23	165	1	34	235	4 823	56	5	10	4	2	1	1	8 355
Sverdlovsk	11 025	0	155	900	34	269	150	366	767	58	7 233	407	573	49	33	14	16	11 025
South Ural	3 499	3	52	481	29	175	81	572	28	6	443	1 290	265	29	23	10	13	3 499
West Siberian	6 855	0	23	349	24	168	53	98	87	11	601	256	4 309	500	215	81	78	6 855
Krasnoyarsk	3 213	0	0	102	3	38	11	16	13	4	54	27	478	2 169	239	33	24	3 213
East Siberian	3 619	0	0	89	4	17	5	14	12	2	38	20	215	239	2 669	222	72	3 619
Trans Baikal	3 502	0	0	47	4	2	0	7	4	2	17	10	76	33	231	2 631	436	3 502
Far Eastern	5 144	0	0	72	8	9	0	16	7	1	22	14	65	21	67	417	4 427	5 144
Russia	108 012	426	14 667	20 682	3 373	8 041	4 075	5 699	6 472	8 299	11 038	3 427	6 733	3 220	3 625	3 473	5 187	108 012

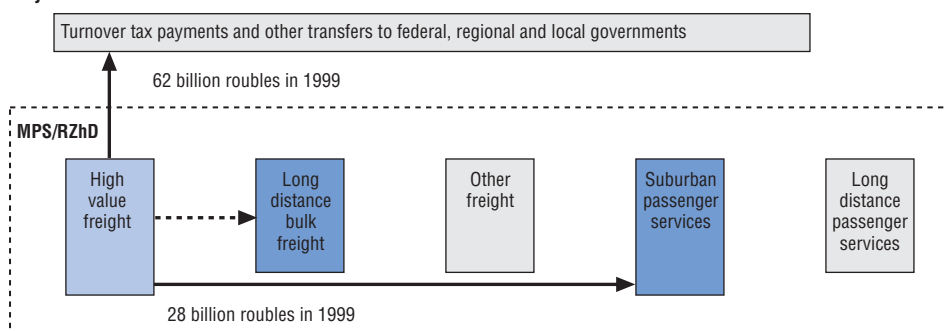
West to West	66 628	Moscow to East	2 018
West to East	5 221	East to Moscow	2 040
East to West	5 453	Gorky to East	858
East to East	31 406	East to Gorky	920
	108 708		5 836

Source: MPS.

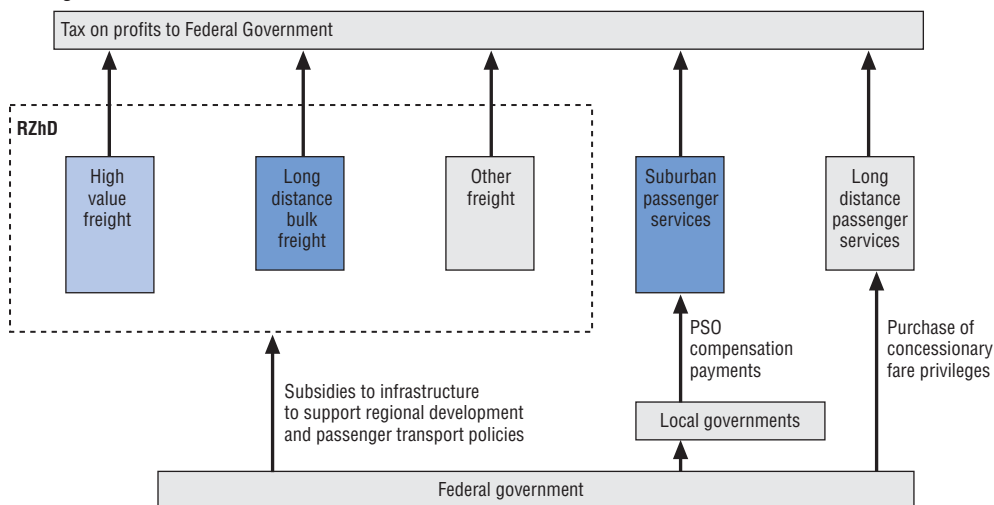
Even with marginal cost access charges for passenger trains, it is probable that a new financing approach will be needed to support passenger services. Suburban services in all EU countries and the US operate at a loss because tariffs are kept low for social and environmental reasons. The current Russian model in which income from freight subsidizes social passenger services will not survive the advent of intra-rail competition and growing competition from road transport: this model is actually prohibited by EU regulation. Figure 4.14 illustrates a different financing model in which passenger infrastructure would receive direct support from the Federal Government (while it owns the infrastructure) and the operating losses of local services are supported by local Governments (who are the primary beneficiaries of the services).

Figure 4.14. **Current financial flows and a model for the future**

Current system



Future arrangements



Notes

1. Reported in *Reference Materials for Rail Transport Structural Reform Programme*, McKinsey Moscow, May 2001.
2. Deloitte and Touche, and Wilson Consultancy, “Methodological and financial grounding for raising financial transparency of operations of railway enterprises”, Moscow, 2002.
3. Federal Law No. 208 of 26 December 1995 on Joint Stock Companies amended on 27 February 2003.
4. The initial Directive 91/440/EEC required only the publication of separate profit and loss accounts. This was found insufficient to make judgments on the existence of cross-subsidies between infrastructure and train operations, or more exactly to prevent public money provide for one activity passing to the other. In a series of amendments to the initial regulations, Directive 2001/12/EC requires both profit and loss accounts and balance sheets to be published.
5. There were 85 initial applications for licences. Some of the other 83 failed to meet the requirements for common carriage but in most cases a licence was not required for the traffic concerned, which was limited to transporting the applicants own freight over private branch lines.
6. The term infrastructure is used to refer to track infrastructure, marshalling yards, terminals, maintenance depots and equipment and sidings – all fixed assets required to provide railway services and which would be uneconomic for the competing carriers to provide themselves.
7. This was the case in Germany where regulatory authorities have experienced considerable difficulty in ensuring new operators have fair access to infrastructure and other assets such as rolling stock.
8. A far smaller railway, on which there is complete separation of ownership, reducing the need for intervention by the authorities to promote competition.
9. The Rail Regulator regulates access and Network Rail’s stewardship of the network, grants licences and investigates complaints under competition law.
10. The Health and Safety Executive covers health, as well as safety, across a range of sectors. In addition there is now a Railways Safety and Standards Board and a Railway Accident Investigations Branch, both independent.
11. S. Guriev, R. Pittman and E. Shevyakhova, *Competition vs. Regulation: A Proposal for Railroad Restructuring in Russia in 2006-2010*, Centre for Economic and Financial Research, Moscow.
12. Truck and barge tariffs are not regulated in the US.
13. Federal Law No. 147 of 1995 on Natural Monopolies.
14. According to Directive 2001/14/EC “the minimum access package to track and service facilities shall be set at the cost that is directly incurred as a result of operating the train service.” In order to obtain full recovery of the costs incurred by the infrastructure manager a member State may, if the market can bear it, levy mark-ups on the basis of efficient, transparent and non-discriminatory principles. This approach enables the infrastructure manager to take into account the long-term costs of specific investment projects when necessary. The determination of the level of charge for the use of infrastructure is generally the responsibility of the infrastructure manager. But where the infrastructure manager, in its legal form, organisation or decision-making functions, is not independent of all train operators, these functions must be performed by a charging body that is independent from all railway undertakings.
15. Those that do not depend on use.
16. See below for details on the variety of charges used to cover fixed costs and see the Annexes for details of national charging systems.
17. This system applies equally to variable and fixed costs, to the limited extent that these costs have been separately identified. The approach therefore does not correspond to the theory of Ramsey-Boiteux price discrimination, which is directed only at the efficient allocation of fixed costs.
18. On which serve representatives from the Ministry of Railways, the Ministry for Economic Development and Trade, the Antimonopoly Ministry, the Ministry of Defence, the Ministry of Transport and the FEC.
19. Entitled Pricelist No. 10-01, Tariffs for Freight Transportation and Infrastructure Services Provided by Russian Railways.
20. Decision 47-T/5.

21. See *Reference Materials for Rail Transport Structural Reform Programme*, McKinsey Moscow, May 2001, fig. 11.
22. Which of these countervailing factors most affects the price of moving coal and ore from Siberia is unclear.
23. Discussion by the team with Russian authorities indicated that one of the reasons that tariffs were made largely uniform was a desire to eliminate what was perceived as corruption in the old system in which local rail managers had the authority to introduce tariff discounts that may or may not have reflected real competitive conditions. While tariff uniformity may reduce abuses, it also reduces the legitimate ability of rail managers to respond to competition. Since the new structure of Russian Railways should act to eliminate corrupt local decisions, the need for totally uniform local tariffs will be reduced.
24. A third aspect of the theory is the assumption that the tax source for collecting the public funds used to pay the fixed costs of the infrastructure is efficient (that is, the tax system itself has the least possible distortionary impact on the economy). A perfectly constructed and efficiently administered progressive income tax system might meet this test, but a poorly managed sales tax system, or even an income tax system in which there is a lot of "leakage" would not. With inefficient taxing, it is not at all clear that the pure marginal cost approach is necessarily any more efficient for the overall economy than approach two above. In fact, when the general taxation system is not optimal, it is quite possible that the economy would be better off making the users pay the full costs of infrastructure directly rather than asking the general taxpayer to pay.
25. The ratio for the freight user was closer to 70 fixed/30 variable. Subsequently, the Government has adjusted the access charges to put more emphasis on the variable component and less on the fixed component. The new access charging system also includes a capacity component in addition to the fixed components and the marginal cost component.
26. The European Community recognizes that access charges may go above marginal cost when the market can bear such charges, when there are specific investment projects to be started, or when there is a shortage of capacity. In the latter case, there must be a plan for increasing capacity and there must be clear rules of priority of access during periods of shortage of capacity. See Directive 2001/14/EC.
27. Russian tariff commodity classes may go some way towards pricing carriage according to ability to pay, but a much higher degree of differentiation than the 3 commodity classes and the subdivision of these classes provided for in tariff list 10-01 would be required to achieve something approaching Ramsey pricing. Moreover the differentiation of charges would have to be based on marginal costs, which have not so far been assessed in Russia. The relation of tariffs to efficiency is further undermined by the distance taper for Class I commodities, which is based neither on costs nor ability to pay, but on political concerns.
28. Publicly held corporations in the US are required by the Securities and Exchange Commission to publish an annual report and in addition an annual 10-K report and quarterly 10-Q reports. Unlike the standard annual reports, the 10-K and 10-Q reports have a strictly defined standard format that ensures transparent reporting of financial performance. They are public and posted on the Commission's website.
29. It is true that DB Netz also offered small entrants the option to pay a higher average access fee with no fixed component but the Federal Cartel Office still found this fee structure discriminatory and instructed DB Netz to abandon it.
30. Government policies subsidising highways and barges, and regulatory decisions forcing the freight railroads to cross-subsidize rail passenger services, also played a major role in the near-demise of the North American freight railroads. The US experience shows that bad Government promotional and regulatory policies can do a great deal of damage to the transport sector and, in the US case, to the railroads in particular.
31. Intercity railroads – freight and passenger – have mostly been privately owned in the US. In Canada, the Canadian Pacific has always been private, but the Canadian National was publicly owned until 1996 when it was privatized.
32. When Amtrak was created in 1971, intercity rail passenger amounted to less than 1% of public passenger-km, but was absorbing over 25% of the total net income from freight operations of the freight railroads, leaving them with inadequate resources for their own financial needs. This is an experience with direct relevance to Russia.
33. The 180% ceiling is an arbitrary figure set by Congress on the basis of data showing an average ratio of freight revenues to variable costs for the rail industry as a whole of 140%.

34. In Canada, tariffs are negotiated between railway and shipper, and the regulatory authority can only intervene by choosing between the best and final offers of parties in dispute. In addition, shippers located on a line of one vertically integrated railway company but within 30 km of another have an automatic right for access to be provided to the second company's line at a regulated rate. This competitive access provision has rarely been used in practice.
35. The reasons for reducing fares can be to ensure transport for students, for war veterans, pregnant women, the poor, reduction of road congestion or air pollution, or many others. In all of the cases, the market will not naturally set tariffs at a level that would permit the social objective to be reached.
36. The Commission uses this term for two things: *a)* an exclusive right (*e.g.* a concession) awarded by a competition authority; *b)* strict quality standards and/or service provision standards laid down as a condition for entry to a market.
37. By one measure, the operating profit for 2001 was about 51 billion roubles – see Russian Institute for Railway management, *The Railway System of the Russian Federation in 2001*, Moscow, 2002, p. 27.
38. Source of data in this paragraph: Deloitte and Touche study and briefing charts.
39. This Western grouping is slightly smaller than the Western grouping for the freight flows because the passenger flows are somewhat more concentrated in the West of Russia than are freight flows.
40. A typical and effective way of accomplishing this is for the railway company to sell full fare tickets to government and then government can sell the tickets to privileged groups at whatever fare is considered appropriate for the group.

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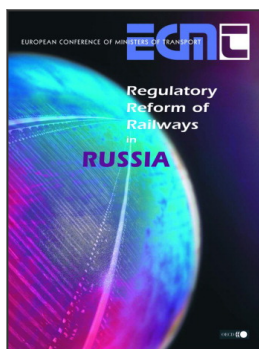
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