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Challenges and Prospects of European Railways

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A B S T R A C T

In the present paper, challenges and prospects of the European railways, along with a proposal for a new strategy policy and specific measures are presented. The declining course of European railways concerning traffic and revenues is first analyzed. Conditions to introduce intra-modal competition are surveyed, among them separation of infrastructure from operation as it has been applied in a mosaic form in the various European countries. Distortions in the transport market are identified and effects of an eventual internalization of external costs are quantified. A new strategy for both passenger and freight rail traffic is presented. Recent developments in the implementation of interoperability are discussed. Moreover, the effects of the debt crisis in Europe on railway costs are explored and specific measures to overcome the current critical situation are suggested. In addition, a framework to implement a more aggressive commercial and tariff policy and to assure a better quality of service is delineated. Finally, the critical question if and why we really need the railways within the present and future context is addressed.

Keywords: Rail traffic, Strategy policy, European railways

1.Scope of the paper

In the present paper, a global analysis of current challenges and future prospects (if any) of European railways is presented. The variety of models of structural reorganization of European railways, which constitutes a real mosaic, is first analyzed. An assessment of effects of intra-modal competition is attempted. Distortions in the transport market are examined and the consequences for railways are assessed. Benefits for the railways from an eventual internalization of external effects are quantified. As interoperability is the only efficient way to tackle technical incompatibilities among European railways concerning differences in track gauge, signaling and electrification systems, it is evaluated what has been achieved and what remains to be done. The debt crisis in Europe pushes toward drastic reductions of state subsidies; therefore, the urgency for a further reduction of railway costs is discussed. Changes in the necessary tariff and commercial policy are presented. Finally an answer to the crucial question whether and why we really need the railways is addressed. Much of the material presented in this paper comes from the analysis the author prepared on behalf of the International Union of Railways in a Strategic Planning for European Railways until 2025. [23]

The future and prospects of European railways (both at European and at national level) have been explored in a number of recent publications. Sánchez-Borràs and López-Pita [18] analyze effects of rail infrastructure charging systems for high speed lines in Europe. Cantos, Pastor and Serrano [2] survey the effects of the vertical and horizontal separation in European railways on productivity, whereas Drew [4] examines the benefits for rail freight customers of vertical separation and open access. Friebel et al. [11] wonder whether restructuring the railways in Russia, Central and Eastern Europe can really constitute a solution to all problems. De Rus and Nombela [17] try to tackle the crucial question of whether investing

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in high speed rail is really socially profitable, whereas González-Savignat [12] studies whether and under which conditions the high speed train can compete against the private vehicle. Bitzan [1] presented a first assessment of reduction of costs from the introduction of competition in the railway sector. Thompson [12] surveyed whether changing railway structure and ownership could really re-orient the path of railways.

2.The declining course of European railways

After a declining course of rail shares in both the passenger and freight transport markets for 6 decades, there are some signs that since 2009 this downward tendency may be reversed. Indeed rail share for passengers (taking all transport modes into account), was 6.5% in 1995, fell to 6.1% in 2006, 2007 and 2009 and increased slightly to 6.2% in 2011. The rail share for freight transport (taking all transport modes into account) was 12.6% in 2009, fell to 9.9% in 2009 and increased to 11.0% in 2011 [10].

Concerning finances, in spite of constant pressure of european authorities to cut down drastically state subsidies and reduce them to the so-called public service obligations covering railway services for isolated areas and reduced tariffs for those who need it, ratios of revenues to expenses, though improved, continue to be far below 1.0 for both rail operators and infrastructure managers in most european countries. What is encouraging, however, is the reduction of share of personnel expenses to total operating costs from 60÷70% some decades ago to 40÷60%, as a result of a drastic reduction of railway personnel and of unit costs per employee [23].

Increase of productivity reflects high contrasts among European railways. For the period 1995–2005 annual rates of increase of productivity were at around 10% for Baltic railways, 5÷10% for Scandinavian railways, 1.5% for Italian railways, 2.1% for French railways, 4.0% for Spanish railways and 4.8% for German railways. If a combined productivity is taken into consideration, by weighing each country's traffic to total European traffic, the productivity of European railways for the year 2005 was around 750 thousand units of traffic (pass-kms + ton-kms) per employee against 500 units of traffic for the year 1995 (an increase of 47% from 1995 to 2005). Productivity in the railways of USA was 17 million ton-kms for the year 2000, against 2 million ton-kms for the year 1970. Geographical scale and nature of transported products cannot justify such a gap between European and American railways [23].

Responsibility, however, for this undeniable decline of European railways is often disputed between an indecisive policy of states and a lack of willingness of railways to really change and modernize.

3.Intra-modal competition and separation of infrastructure from operation

Intra-modal competition, i.e. competition of many railway operators running on the same track, has been considered by European authorities as an eventual efficient remedy to reverse this decline and modernize radically the European railways. Threat of closure and disappearance could oblige, in line with this policy, railways to reduce their costs, increase quality of services and adapt better to the needs of the society and the economy. However, the monolithic structure of railways of the time, in charge of both infrastructure and operation, has been (perhaps erroneously) considered as an obstacle towards the introduction of an intra-modal competition. Within this spirit, European policies considered the separation (at least at accounting level) of activities related with infrastructure from those related with operation as a first and inevitable step. Thus, no cross-financing neither between the activities of infrastructure and operation could be permitted, nor between the passenger and the freight sector of operation. Public service obligations are permitted only for a limited number of cases.

This policy of separation affected negatively the unity of the railway activity and could eventually be the origin of some railway accidents. A counterargument to this policy of separation is the situation in the United States, where a railway company operating in a number of tracks owns the infrastructure, without being able to prohibit another railway operator to run on its tracks, by paying appropriate charges.

Introduction of intra-modal competition is still on course, as the sector will be fully liberalized in 2018 (cabotage rights). Thus, it is rather early to assess full effects of competition on railway tariffs, costs and quality of service. However, there is already an increasing skepticism whether it was really necessary to introduce separation of the former unified railway activity and to which extent this separation really favored intra-modal competition efficiently.

4. European railway policy and a variety of models of structural reorganization

The European railway policy has been expressed in a number of Directives (440/91, 18/95, 19/95, 12/01, 13/01, 14/01, 49/04, 50/04, 51/04, 58/07, 59/07, 137/07). Following its usual practice, European Commission described the general framework, within which member-states had a great liberty of action to tailor European Directives to their national law. Some countries have decided to adopt minimal conditions imposed by European Directives, whereas others introduced more radical changes. Thus various models of structural reorganization of European railways are situated among the following two extreme cases (Figure 1, cases a. and b.):

- Organic separation: infrastructure and operation are two business units within an integrated company
- Institutional separation: infrastructure and operation are two distinct and different companies

The more separated the model, the easier could be expected to introduce intra-modal competition. An interesting intermediate model is the holding model, according to which infrastructure and operation are autonomous companies, each one having its moral personality but not totally independent, as they operate within a holding company (Figure 1, case c.). A variation of the organic separation model is the integrated model with appearance of organic separation (Figure 1, case d). However, in the separated model, one or more components of the former unified railway may be privatized, as is the case in the United Kingdom and elsewhere.

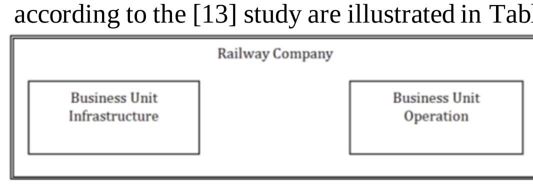
Whatever the chosen model, path allocation and access charging should be the responsibility of bodies not related with the infrastructure manager. Each railway company must possess a license, valid within all European countries and a safety certificate, valid within the country, which has issued it.

This mosaic of models of organization of European railways may lead European authorities to more radical solutions such as the obligation for an institutional separation, bringing to a definite end to the former unified railway.

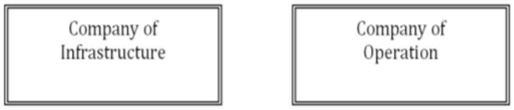
5. Will railways really benefit from a complete internalization of external effects?

In order for a market to be really competitive, certain conditions should be fulfilled, otherwise the market may present distortions. This is the case, however, of the transport market, in which the following distortions exist:

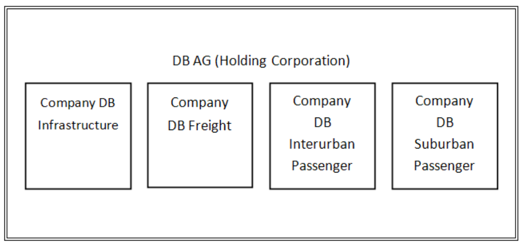
- Railways are charged with *VAT*, the value of which differs from one country to another, whereas air transport is exempted from any taxation charges.
- Depending on the cost of the oil barrel, the component of energy cost represents 6÷10% of total operating cost for rail transport, 15÷30% for air transport, around 20% for road transport [15]. Air transport is exempted for any energy taxation. If the same rules of taxation are applied to all transport modes, railways would experience a slight increase of cost, compared to a much higher increase of air and inland waterway transport costs.
- Inland waterway transport does not pay any *infrastructure charges*, whereas revenues from road tolls and airport charges represent a small part of the respective maintenance and operation expenses. In contrast, revenues from rail infrastructure charges represent more than 50% of the total operating costs in most EU railways.
- *Externalities*, such as air pollution, solar pollution, climate change, accidents (congestion and the resulting loss of time is usually not included in externalities) are not taken into account. Externalities can be quantified in monetary values [13]. Only if external costs are included in railway tariffs, can we speak of an internalization of external costs. This may be done on the basis either of social marginal costs or of medium external costs. In both cases the resulting increases for all transport modes according to the [13] study are illustrated in Table 1.



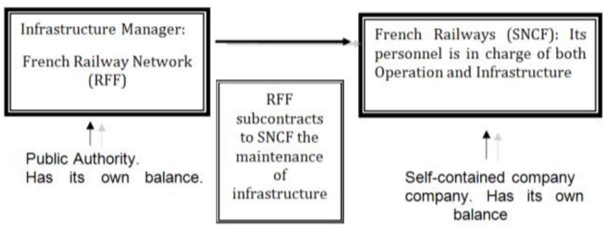
a. The Integrated model



b. The Separated model



c. The Holding model (Germany)



d. The integrated model with appearance of organic separation (French model)

Figure 1: Some representative models of organization of European railways, following European policies for separation of infrastructure and operation

From Table 1 we can conclude that in the assumption of an internalization of external costs on the basis of medium costs, the road costs will be increased in relation to rail costs by 20÷30% for passenger traffic and around 40% for freight. If the basis of internalization is the social marginal cost, then road costs will be increased in relation to rail costs by only 12÷15% for passenger and 24% for freight.

A rough estimation of the impact of such increases of road costs on rail traffic can be conducted by taking into account cross elasticity of rail traffic in relation to road costs, which according to ECMT has a value closed to 0.6 [9]. Thus, an internalization of external costs on the basis of medium costs would result in an increase of rail traffic of 15% for passenger and 24% for freight. Internalization on the basis of social marginal cost would result in increasing rail traffic both for passenger and freight to around only 6%.

6. The new strategy for rail passenger traffic

Marketing analyses suggest the following segmentation of rail passenger traffic:

a. *Intercity* traffic. It serves important population centers; clients have high requirements for short traveling times, low tariffs, a high quality of service, high regularity and good frequencies. Competition comes from airplanes and buses and to a lesser degree from private cars.

A specific case of intercity trains is high speed trains, when speed is greater than 250 km/h. Thus, for distances up to 500-600 km, high speed trains can succeed door to door travel times better than airplanes and attract much of the related traffic (Figure 2).

The European continent has many cities at distances ideal for the operation of high speed trains. This can justify the investment necessary for the creation of high speed tracks, which may be either dedicated to the operation of passenger-only high speed trains (French approach) or both to passenger and freight trains (German approach).

High speed trains combine the rapidity of the airplane, the individualization of space of the private car and the liberty of move of the train. Their success is partially due to a system approach and global conception and not quite the result of pure speed or quality of service. The realization of a European high speed network would further enhance such a system approach and transform radically the European space and accessibility.

Table 1: Increase of operation costs for various transport modes in the case of internalization of external costs on the basis either of medium external cost or of social marginal cost [13]

		Internalization on the basis of medium external cost	Internalization on the basis of social marginal cost
Passenger Traffic	Railways	5÷25%	3÷10%
	Road Transport	36÷43%	14÷15%
	Air Transport	9÷30%	30÷60%
Freight Traffic	Railways	30÷40%	~15%
	Road Transport	70÷80%	~25%
	Inland Waterway Transport	~90%	~10%

High speeds require significant investments. An alternative could be *tilting* trains, which may be either electric or diesel powered. These can tilt in curves and increase their running speed without the need of improving the existing layout. Tilting trains can reduce mean travel times (compared to standard trains) by 12÷20%, with a cost per minute of reduced travel time of 9÷18 million € for electric tilting trains, of 1.5÷4.5 million € for diesel tilting trains, compared to a cost per minute of reduced travel time of 15÷40 million € for high speed trains [16,17].

b. *Regional* traffic, in which railways face the competition of the bus and the private car. Priorities of clients are cost of tickets, quality of service, reasonable travel times and regular frequencies (e.g. all 20, 30, 60, 120 minutes).

Some European rail managers attributed a secondary priority to their regional network with the risk of having a poor regional network in contrast to a rich high level and high speed intercity network. Such a situation should be avoided, in order to have a homogeneous (regarding quality) rail network. A realistic objective for regional trains could be a medium speed at the range of 100÷120 km/h.

c. *Urban* traffic. Increasing road traffic congestion and high traffic capacities of railways give new prospects for this segment of traffic, provided that railways offer attractive tariffs, competitive travel times, accessibility, security in stations and a good quality of service during travel.

7. The new strategy for rail freight traffic

Railways must be oriented to the market and by the market, which for freight traffic has the following clear requirements:

- Quasi-immediate response to demand and the soonest possible time of delivery,
- Competitive tariffs,
- Door-to-door and uninterrupted transport (in the borders)
- Punctuality, reliability, quality of service, security, safety
- Simple, quick, direct and flexible administration procedures.

The average speed of rail freight trains in Europe is 18 km/h, which is quite low compared to the medium speed of 50 km/h of road freight vehicles [23]. Such a low average speed of rail freight trains is principally the effect of long waiting times in marshaling yards and in the borders, to a rail traffic management which gives priority to passenger trains and to a much lesser degree to a maximum speed of rail freight trains at the range of 100÷120 km/h.

The creation of a network of tracks dedicated exclusively to freight traffic has been considered by most European railways as the most efficient way to tackle this problem in the long run. Such a dedicated network should: (i) include the densest rail freight corridors, (ii) assume homogeneous criteria of

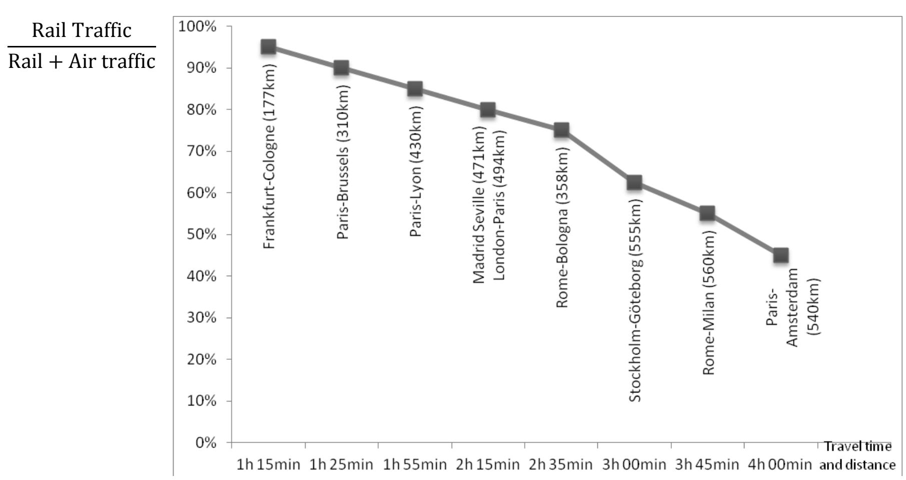


Figure 2: Rail share in the rail + air market in relation to travel time (terminal to terminal) and distance (Source: Compiled by the author)

operation and performance and (iii) be justified by a realistic feasibility study.

A dedicated rail freight network could have the following technical characteristics [23]:

- *speed*: A realistic target for the medium speed of this dedicated network could be the actual medium speed of road vehicles in Europe, i.e. 50 km/h. Operational studies suggest that it is not necessary to increase actual maximum freight train speeds (100÷120 km/h) in order to approach medium speeds of 50 km/h, provided a better organization in marshaling yards and frontiers is achieved
- *Punctuality*: It is observed that 95% of road vehicles have a delay in delivering times smaller than 60 minutes. A similar target for the dedicated rail freight network would be reasonable.
- *Load per axle*: It took four decades for the railways to increase axle load (for the normal gauge tracks) from 20 tons to 22.5 tons, due to the fact that track fatigue is not a linear function of axle per load but an exponential one, with an exponent between 3 and 4 and more close to 4. A further increase of load per axle from 22.5 tons to 25 tons would in turn require new investment for track renewal which would be difficultly (or never) counterbalanced from lower freight operating costs. Thus, the maximum value of 22.5 tons/axle should remain at the dedicated rail freight network.
- *Track equipment-signaling-telecommunications*: A double track, equipped with ERTMS level 2 or 3, GSM-R (see next paragraph), with possibility to be run by multi-current locomotives is suggested. All marshaling yards and intra-modal nodes should assure the horizontal charging of containers and full compatibility between track and rolling stock.

8. Interoperability: what has been achieved and what remains to be done

The lack of a unified worldwide rail system results in significant differences between railway networks concerning gauge, electrification and signaling systems. *Interoperability* has been defined as the ability of the rail system to allow continuous and safe operation of trains while achieving specific performance levels. Interoperability can refer to either technical or operational issues and more particularly to the following subsystems of the rail system: infrastructure, energy, maintenance, signaling and control-command, rolling stock, traffic, telematics, operation and management. European Directives 48/96, 16/2001, 50/2004 and 32/2007 describe the details of interoperability implementation.

At European level, interoperability is known under the initials ERTMS (European Rail Traffic Management System) which is composed of the following constituents: signaling system ECTS, telecommunication system GSM-R and traffic management system ETMC.

We can distinguish three levels of application of ERTMS:

- ERTMS level 1. Track-based equipment, usually track circuits or axle counters, does the detection of a train. The information is transmitted to the driver from either the line side or more frequently by cab signaling.
- ERTMS level 2. In addition to the functions of ERTMS level 1, in ERTMS level 2, transmission of data along the track is done by radio (GSM-R).
- ERTMS level 3. Transmission of data along the track is done by radio (GSM-R) and there is no need for track circuits and lateral signaling.

Many European countries (along with the USA, China, India and others) apply level 1 and level 2 ERTMS systems to their tracks. The implementation of ERTMS in Europe is rather slow and actual schedules predict full implementation around 2020 [21]. However, this kind of goal is too distant, and efforts should be made to aim for full implementation around 2015. Moreover, it is vital that neighboring countries to the EU, such as Turkey, Ukraine, Russia and others decide to implement ERTMS systems on their tracks, too.

9. The debt crisis in Europe-Reduction of state subsidies and the urgency for a further reduction of railway costs

The debt crisis in many European countries is inevitably leading to a drastic reduction of state subsidies, a fact that will have a negative impact to many deficitary rail operating services. In the meanwhile, the rail market is gradually becoming fully competitive. By 2018, the rail services will have become fully liberalized, with the last step yet to be implemented the removal of the cabotage rights.

Thus, a further reduction of railway costs is vital for the survival of the railways. Some measures for the reduction of railway costs are the following:

- A further reduction of personnel, while outsourcing as many activities as possible (among them: track maintenance, etc) towards a further increase of productivity.
- Reduction of purchase costs of rolling stock, which are per seat-km and per year: 0.122€ for the German ICE1, 0.173€ for the ICE2, 0.109÷0.116€ for the French TGV, 0.208€ for the Spanish AVE, 0.212€ for Thalys (the Paris-Brussels-London train), compared to similar costs per seat-km and per year of 0.167€ for the Boeing 767-200ER, 0.157€ for the Boeing 757-200, and 0.204€ for the Airbus A320 [20].

It is clear that rolling stock constructors must also make serious efforts to reduce costs and that the rolling stock market must become more transparent and competitive. A further reduction of railway operation costs (of up to 30%÷50%) could come from an optimization of the life cycle of the various components and materials by performing a preventive maintenance that would improve technical responsibility. However, there are no European norms concerning track quality (particularly values of track defects, wear of wheels), which therefore should be implemented. As such methods also improve the availability of tracks, empirical studies suggest that for tracks at the threshold of saturation, they may lead to an increased traffic capacity of up to 40% (UIC, Eurail 2025, 2008).

- Reduction of the maintenance costs of the track, which are allocated to its various components as follows: 65% for the track and subgrade, 30% for electrification, signaling, telecommunications and 5% for tunnels and bridges.
- Reduction of operation costs of rail infrastructures, which are allocated to traffic management (92%) and to traffic schedule planning (8%).

Passenger transport costs on the one hand may be substantially reduced by drastically cutting down distribution costs. This can be achieved by implementing a more extensive use of information technologies and the internet. On the other hand, it should be noted that transport costs represent approximately 20% of the final cost of a product transported by freight trains (especially for medium and long distances transports). This cost can be cut down by reducing the time lost in marshaling yards and the borders. Inspired by the Eurocontrol techniques, which regulate any flight of any airplane in the European sky, railways must create a similar entity. This should make an extensive use of GPS technologies by following the itinerary of any railway vehicle (real position, speed, delay of schedule, etc.).

10. The necessity of a more aggressive tariff and commercial policy

Railway tariffs (both passenger and freight) have been calculated for years while having the travelled distance as a basis. However, in the era of merciless competition, this method is clearly insufficient, as it does not properly take into account the offer of competitive means.

Efficient pricing is based on generalized cost and tries to establish an equilibrium among: optimization of offered capacity, forecasts of traffic and elasticities, coverage of the various costs (at least those of operation) and the orientation of clients to some targeted rail services.

An old dilemma for railways, upon establishing their tariff policies, has been choosing between profit and traffic increase. Choosing profit growth will naturally lead to a drastic reduction of deficits and inevitably the abandonment of non-profitable rail services, unless the state covers the deficit resulting from the operation of such services through public service operation contracts. On the contrary, choosing to increase traffic requires that the owner of the railway company (usually the state) affords huge financial resources to cover the resulting deficits.

The debt crisis in Europe puts an end to this old dilemma. Profit must become the only goal set by rail companies. Deficitary local rail services may still continue to exist, but only if they are necessary to supply other central rail operations or if their deficits are covered by the state subsidies.

Passenger trains in Europe have a load factor of less than 50%, which is too low compared to the notable 70% of the air transport. The truth is that even the high speed trains have low load factors; in 2007 these were 60% for all the French TGV, 67.6% for the TGV departing from Paris, 59.8% for Thalys (Paris – Brussels), 60.8% for the Spanish AVE, 60.9% for the German ICE, and 54.5% for the Eurostar [18,24].

Unused rail capacity, due to low load factors, may be reduced if yield management techniques are introduced. Moreover, it should be noted that many railways do not make any differentiation in the tariffs set for the same journey and quality of service. Differentiation in the tariffs may be due to the time of the ticket purchase (the earlier you buy, the cheaper) and/or the time of the journey (lower tariffs for slack hours/days/seasons). Thus, capacity and revenues may be maximized, new market segments may be penetrated (usually the less busy passengers) and even a more social policy may be presented. However, yield management techniques presuppose a certain maturity of clients, which is usually not the case for the railway market and should therefore be applied gradually and with great consideration in advance.

Finally, it should be noted that personnel expenses constitute around 40-60% of the total rail operation expenses of the railways in the European Union [23]. However, by adopting the use of modern technologies such as the internet and SMS technologies, distribution costs, the cost of booking a ticket, buying a ticket at a train station (instead of booking on-line) and the cost of informing the clients, can be greatly reduced.

11. Increase and assure quality of rail transport

Many rail market surveys suggest that clients usually ask for higher quality services. With the exception of high speed and some regional rail services, the usual request of clients for higher quality concerns the arrival times or the conditions of transport. Rail operators usually try to maintain equilibrium between clients' exigencies and technical and operational capabilities. Quality requires an optimal collaboration and perfect comprehension between, on the one hand, the commercial and production sectors and, on the other hand, rail operators and infrastructure managers. Railways may face a better future only if they keep improving their quality of service so as to increase their customers' loyalty and attract new ones, too.

A measure of railway traffic quality, in terms of customers' satisfaction can be seen below (Table 2). It is clear that the railway stations, which function as the nodes of the displacement chain, are the weak spots.

More specifically, in the separated and fragmented railway, achievement of quality affects the formerly unified railway as follows:

- Infrastructure should ensure punctuality, which is measured by the percentage of trains having a delay greater than a given value (usually 5 minutes).
- The passenger transport sector should ensure punctuality, reliability, security, safety, comfort (air conditioning, ergonomic rolling stock), aesthetics, friendly personnel, cleanliness and information. These characteristics should apply not only during the very trip itself, but from the time a passenger enters the departure station until he leaves the arrival station. It should be noted, though, that some passengers consider accessibility to the public transport as an essential component of the trip
- The freight transport sector should ensure punctual delivery, keeping the transported products in the best possible state.

It is essential that market surveys are carried out regularly in order to: assess the gap between the measured and the targeted level of quality, locate the poor quality components of the rail service and find possible measures to improve it. It is therefore necessary to establish quantitative rather than qualitative criteria, throughout the European continent, in order to measure the market quality evenly.

Be that as it may, the rail clients will remain suspicious about this system if it does not determine specific means of penalty for the operator, in case he does not offer the promised level of quality. The solution to this problem comes from the Charter of Rail Services, which is established in all European Union countries by the Regulation (EC) 1371/2007 and aims to define the relationship between the operators and the clients on a contractual basis. The usual form of penalty to the operators, in case of delays, lack of comfort, etc., is issuing a ticket refund to the passengers.

Quality includes all the prerequisites for a rail trip (i.e. offering real-time schedule information, and prices of tickets, the purchase of a ticket, the reservation of a seat, etc.) and all services after arrival of the train (information, accessibility of public transport, etc.).

Table 2: Railway usage deterring factors and the grade of discomfort they cause (5: full satisfaction, 0: null satisfaction)[15]

Part of the trip	Problems arising	Degree of satisfaction: (5:full satisfaction,0:null satisfaction)
Departure from place of residence or work	Trip organization: difficulty to obtain schedule information, uncertainty regarding fares and their probable changes.	2.9
	Trip to the station: the traveler will have either to walk to areas which are usually unsafe at certain times of the day, or to use public transport, or finally drive to the station by car, in which case he will be faced with the trouble of finding an empty parking slot.	3.9
Departure Station	Inside the station: ticket issuing, a probable wait in a queue, a difficulty of orientation towards platforms, unpleasant decoration and problematic ascend and descend of stairs.	2.6
	Waiting: at the platform or in the train	2.0
	Rolling stock: unpleasant exterior and interior, poor cleaning and lack of air-conditioning.	2.1
Transfer Station	Transfer: even the most effective and shortest transfer causes displeasure to the passenger, as he/she is forced to carry luggage and wait.	3.8
	Change of train: since many seats are usually taken, passengers experience difficulties in finding a seat, they are travelling with strangers and they experience a change of environment, all of which are always unpleasant.	1.8
Arrival Station	Inside the station: a usually unknown and unfamiliar to the passenger environment, which may cause doubts about whether it is the right place, while the passenger faces problems handling his luggage.	2.1
	Trip to the passenger's final destination: passengers may experience lack of orientation, a risk of getting lost and a difficulty in catching a taxi or the appropriate public transport.	2.7
Final Destination	Waiting time: the risk that the traveler may arrive too early or too late.	2.2

12. Why do we need the railways?

This kind of question has been raised on many occasions, namely in one famous ECMT seminar in 1995 [5]. Today, in the era of competition, drastic reductions in railway deficits and public service obligations ought to be implemented. It is therefore a prospect, in this conjuncture of events, for European railways to respond clearly and justifiably to this question.

Obstinacy of European authorities to separate infrastructure from operation as much as possible has led to a transparency in the finances of the rail sector of finances in the rail sector but did not boost intra-modal competition to the degree some would have expected. Through this process, a great variety of organizational models have arisen with strong differences among them; for instance, the French model keeps the former SNCF practically intact, whereas in the Swedish model there are two separate companies: one for the infrastructure and another one for the operation. The situation is even more complex concerning infrastructure charges. Railways are clearly a sector in which Europe pretends to be unified, while this is definitely not the case.

In the era of merciless competition, operators should optimize their offer in order to achieve maximum occupancy, greater speeds and minimize environmental impact. A possible solution to harmonize policies of competition would be to internalize external costs; however there are no signs of such a perspective.

Railways must change their principal and central target. For years they have been technologically oriented, but now they must focus on trying to meet their clients' expectations and then choose the appropriate technology. At the same time, while there should be a decrease in the personnel to cut costs down, the remaining employees should become more motivated and try to reach higher productivity levels. This should be done in Europe in order to approach the levels of productivity achieved in the USA.

Interoperability methods and the implementation of the ERTMS can greatly contribute to this direction. However, these are only just a few tools and they are not enough to really justify the “raison d'être” of the European railways. A new strategy of European railways should be accompanied by consistent policy and measures which must be implemented in a short time period. The goal of the present paper was to describe and suggest such a strategy.

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