

Independent Regulators' Group – Rail

IRG–Rail

Charges Working Group

Initial approach to

market segment definition and criteria for an assessment of mark-ups in consideration of Directive 2012/34/EU

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Executive Summary

1. *Article 32(1) of Directive 2012/34/EU sets out an exception to the basic charging principle that allows, under certain conditions, the infrastructure manager to obtain “full recovery of the costs incurred” by levying mark-ups on different market segments. This paper aims at providing an introduction to the notions of market segments and mark-ups. It constitutes a first contribution to the discussion from IRG-Rail and reflects its Member States’ current understanding and practices.*
2. *It is a well-known problem that in the absence of economic regulation, the market outcome of natural monopolies is not at a social optimum, where social welfare is maximised. Prices are most likely to be too high and output too low. In this context, marginal cost prices, a first-best solution, are not cost covering due to the specificities of natural monopolies such as high fixed costs. In this context, a second best solution to cover the loss of the monopolist is the application of Ramsey-Boiteux prices where fixed costs are spread among rail market segments considering the segments’ competitiveness, meaning their price elasticity. Article 32(1) of Directive 2012/34/EU allows recovering the costs incurred by the infrastructure manager through the implementation of a charging scheme derived from Ramsey-Boiteux pricing and applied to a set of market segments which have to be defined by the IM and controlled by the regulatory body.*
3. *There is an interesting diversity of practices within IRG-Rail Member States concerning the recovery of costs above the directly incurred costs. Indeed, not all charging schemes of Member States rely on market segments and mark-ups. Moreover, even in countries relying on such tools, different market segments are defined in each national charging scheme and a wide diversity of charging units are used to apply mark-ups. This diversity may reflect national specificities.*
4. *IRG-Rail supports the idea that the definition of market segments should pursue at least three objectives: help ensuring that the charging system does not create undue discrimination or distortion of competition within homogeneous services, facilitate the implementation of a Ramsey-Boiteux pricing scheme, and constitute a vector through which the infrastructure manager provides information on the current and potential use of the infrastructure. To define market segments, the Recast specifies three binding market segments as well as a non-binding list of pairs of services that should be considered. IRG-Rail considers that the list of pairs cannot compensate for the absence of methodology to define market segments in the Directive and that infrastructure managers should also consider complementary sources and techniques when defining market segments, such as the approach used by competition law to identify relevant markets. Concerning the assessment of mark-ups, IRG-Rail considers that at least two objectives should be pursued: the recovery of fixed and capital costs, net of public subsidies, and the optimization of the level of use of the infrastructure.*
5. *IRG-Rail then identifies a series of practical challenges and open questions with regard to market segmentation and mark-ups and provides some examples of pragmatic approaches that have been used in Member States to overcome some of these issues.*
6. *In the conclusion of this paper, IRG-Rail underlines the necessity of sound justification and regular review of the market segmentation and the assessment of mark-ups.*

I. Introduction

7. The basic charging principle for the minimum access package is set out in Article 31(3) of Directive 2012/34/EU. This Article states that charges should be set at the “*cost that is directly incurred as a result of operating the train service*”. IRG-Rail has issued four position papers aimed at clarifying its interpretation of the concept of “*cost that is directly incurred*”¹. Article 32(1) sets out an exception to the basic charging principle that allows, under certain conditions, the infrastructure manager to obtain “*full recovery of the costs incurred*” by levying mark-ups on different market segments.
8. This paper aims at providing an introduction to the notions of market segments and mark-ups. As such, this document first details the economic and legal backgrounds of these concepts and explains how they are currently applied by infrastructure managers in IRG-Rail Member States. Then, the paper lays out some initial considerations of IRG-Rail, focusing on the obstacles that may arise from the application of Article 32(1) and detailing some solutions that have been identified to circumvent these problems. Since market segments and mark-ups are complex issues and the implementation of the Directive is incomplete or recent in Member States, this paper only constitutes a first contribution to the discussion from IRG-Rail. It is thus important to underline that the developments included in this paper establish IRG-Rail Member States’ current understanding and practices with regard to market segmentation and the assessment of mark-ups.
9. As an introduction to market segment definition and criteria for assessing mark-ups, this paper may be of interest to railway infrastructure manager (IM), railway undertakings, national regulators and, more generally, to any party interested in these issues.
10. *This paper is organised as follows:*
 - I. Introduction*
 - II. Economic background*
 - III. Legal background*
 - IV. Current practices within IRG-Rail Member States*
 - V. Market segmentation*
 - VI. Assessment of mark-ups*
 - VII. IRG-Rail’s common position and conclusion*

II. Economic background: Market segments and Mark-ups

11. Under the assumption of competitive markets, prices would be set at marginal costs². In this context, marginal cost prices are optimal prices as they are cost-covering,

¹ The four position papers are : (1) *Position paper on the concept of « cost that is directly incurred »*, October 2012, (2) *Position paper on the European Commission’s upcoming draft implementing act on the modalities for the calculation of the cost that is directly incurred as a result of operating the train*, October 2013, (3) *Position paper on the forthcoming implementing act on the modalities for the calculation of the cost that is directly incurred as a result of operating the train service*, November 2014 and (4) *Second position paper on the European’s Commission upcoming draft implementing act on the modalities for the calculation of the cost that is directly incurred as a result of operating the train service*, May 2014.

² IRG-Rail’s October 2012 position paper on the concept of the “cost that is directly incurred” defines marginal cost as the “*change in variable cost as a result of an increase in output of one unit. In rail transport (for the use of track), the unit could be the train.km or the tonne.km*”.

transparent and lead to the maximization of social welfare. They are also called first best outcome.³

12. However the railway network presents substantial economies of scale that make it a natural monopoly, a market structure which widely differs from perfect competition. It is a well-known problem that in the absence of economic regulation, the market outcome of natural monopolies is not at a social optimum, where social welfare is maximised. Prices are most likely to be too high and output too low.⁴ An unregulated monopolist would set prices at its profit-maximizing quantity. If regulated prices of the monopolist were based on marginal costs – a condition that is still optimal for the demand side (and therefore a first-best solution) - the monopolist would suffer a loss amounting to the fixed costs, under the assumption of a subadditive cost function. In this context, marginal cost prices are not cost covering due to the specificities natural monopolies such as high fixed costs.⁵
13. The losses that result from marginal cost pricing by the monopolist can be completely or partially subsidized (*i.e.* Infrastructure managers receive some subsidies or state compensation) or covered by mark-ups (to recover the difference between marginal costs and remaining fixed costs not covered by subsidies) – even including a restricted profit for the monopolist. The IM can levy these mark-ups on the marginal costs in order to cover its total costs⁶. By doing so, it is still possible to optimize total welfare, reaching a second best solution in comparison to marginal cost prices.⁷
14. From an economic perspective total welfare can be defined as the sum of producer and consumer surplus. The individual consumer surplus is the difference between the amount that a customer is willing to pay for a good and/or service and the actual market price for that good and/or service. The sum of all individual consumer surpluses is the general consumer surplus. The individual producer surplus is defined as the profit of an undertaking, which is defined as the difference between revenues and total cost of the undertaking. All profits of all undertakings together sum up to the total producer surplus.⁸ However, as the railway infrastructure sector is a natural monopoly, the total producer surplus equals the profit of the monopolistic infrastructure manager. As the objective is to maximize the total welfare taking into account the economic and financial equilibrium of the operator, this means, in this specific economic situation, maximizing total consumer surplus, while applying a profit restriction to the infrastructure manager.

³ Pindyck/Rubinfeld (2015), Mikroökonomie; pg. 485ff.; Stole, L.A. (2007), Price discrimination and Competition, in: Handbook of Industrial Organization, Vol. 3, Chapter 34, pg. 2223-2302.

⁴ Netz, J. (1999), Price Regulation: A (non-technical) overview, Department of Economics, Purdue University

⁵ Armstrong, M.; Sappington, D. E. M. (2007): Recent developments in the Theory of Regulation, in: Handbook of Industrial Organization, Vol. 3, Chapter 27, pg. 1560-1700.

⁶ Another way to recover full costs besides mark-ups can be found in the regulation framework of the Telecom Industry where a long-run incremental cost (LRIC) approach together with bottom-up modelling is recommended as a primary model (Commission recommendations 2009/396/EC and C(2013) 5761). The full efficient cost recovery is enabled, because it is assumed that in the long run, all costs become variable and all assets are replaced. The approach enables full efficient cost recovery of an individual service (LRIC model) to which the common and joint costs may be added (LRIC+ model). The framework also allows benchmarking as an alternative method to determine charges. The objectives of the rail sector price regulation, however, include optimal use of the infrastructure and optimal competitiveness of rail market segments, which considerably limits cost recovery. Consequently, public funding is commonly needed in the rail sector in order to recover full costs.

⁷ Braeutigam, R.R. (1989): Optimal Policies for Natural Monopolies. In: Handbook of Industrial Organization, Vol. II, pg. 1289-1346.

⁸ Braeutigam, R.R. (1989): Optimal Policies for Natural Monopolies. In: Handbook of Industrial Organization, Vol. II, pg. 1289-1346. Further reference: Willig, R.D. (1976) Consumer's Surplus Without Apology. In: American Economic Review, Vol. 66, No. 4, pg. 589-597.

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15. A first possibility for loss coverage and for price setting in natural monopolies is to set prices at average costs. Those prices are cost covering and no further subsidy needs to be paid to the monopolist. Nevertheless, average cost pricing does not lead to an optimal allocation of goods and quantities exchanged are smaller than compared to a marginal cost price setting. The average cost approach is simplistic and cost-covering but it results in lower social welfare compared to the following approach and it is not cost-reflecting as it does not reveal the real costs for the users. As such, the average cost approach is unlikely to set the right incentives for the economy.
16. A second possibility to cover the loss of the monopolist is the application of Ramsey-Boiteux prices.⁹ They allow covering the total costs of the monopolist, including capital costs, but consider an optimized reduction of quantities and consumer surplus by taking price elasticities of consumer groups (*i.e.* market segments) into account. Ramsey-Boiteux prices therefore take the competitiveness of the market segments into account. This second-best solution considers the level of substitution by other traffic opportunities on the demand side. Market segments with homogenous price elasticity are formed. Fixed costs are spread among rail market segments considering the (segments) competitiveness, meaning their price elasticity.
17. The price elasticity of demand is defined as the percentage change of quantities due to a percentage change of prices. In the Ramsey-Boiteux pricing model, mark-ups are distributed/allocated according to inverse elasticities, which means that consumers in segments with the lowest price elasticity have to cover the highest mark-up.

III. Legal background: Market segments and Mark-ups

18. Currently, the European legal basis of market segmentation and mark-ups is determined by Directive 2012/34/EU. It should be noted that the principles set out in Directive 2012/34/EU may also apply to some non-EU Member States which have chosen to transpose its provisions (*e.g.*, Switzerland or Norway).
19. Article 32 provides exceptions to the basic charging principle for the minimum access package. In relation to mark-ups, Article 32(1) states that:

“In order to obtain full recovery of the costs incurred by the infrastructure manager a Member State may, if the market can bear this, levy mark-ups on the basis of efficient, transparent and non-discriminatory principles, while guaranteeing optimal competitiveness of rail market segments. The charging system shall respect the productivity increases achieved by railway undertakings.

The level of charges shall not, however, exclude the use of infrastructure by market segments which can pay at least the cost that is directly incurred as a result of operating the railway service, plus a rate of return which the market can bear (...).”

⁹ Armstrong, M.; Sappington, D. E. M.. (2007): Recent developments in the Theory of Regulation, in: Handbook of Industrial Organization, Vol. 3, Chapter 27, pg. 1560-1700. Braeutigam, R.R. (1989): Optimal Policies for Natural Monopolies. In: Handbook of Industrial Organization, Vol. II, pg. 1289-1346.

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20. The preceding paragraphs imply that, as an exception to the provisions of Article 31, infrastructure managers can be allowed by Member States to impose charges above the cost that is directly incurred, which constitutes the minimum level of charge. The mark-ups above this minimum level of charge should consider the competitiveness of the market segments and should be levied on the basis of efficient, transparent and non-discriminatory principles, while guaranteeing optimal competitiveness of these segments. The levy of mark-ups allowed by Article 32(1) is in principle coherent with the Ramsey-Boiteux pricing scheme in which the relative mark-up on the marginal cost has to be inversely proportional to the price elasticity.

21. In order to recover these mark-ups, Article 32(1) specifies the concept of market segments in the following way: *“Before approving the levy of such mark-ups, Member States shall ensure that the infrastructure managers evaluate their relevance for specific market segments, considering at least the pairs listed in point 1 of Annex VI and retaining the relevant ones. The list of market segments defined by infrastructure managers shall contain at least the three following segments: freight services, passenger services within the framework of a public service contract and other passenger services.*

Infrastructure managers may further distinguish market segments according to commodity or passengers transported.

Market segments in which railway undertakings are not currently operating but may provide services during the period of validity of the charging system shall also be defined. The infrastructure manager shall not include a mark-up in the charging system for those market segments.

The list of market segments shall be published in the network statement and shall be reviewed at least every five years. The regulatory body referred to in Article 55 shall control that list in accordance with Article 56”.

22. Annex VI-1 to Directive 2012/34/EU states that: *“The pairs to be considered by infrastructure managers when they define a list of market segments with a view to introducing mark-ups in the charging system according to Article 32(1) include at least the following:*

- 1. passenger versus freight services;*
- 2. trains carrying dangerous goods versus other freight trains;*
- 3. domestic versus international services;*
- 4. combined transport versus direct trains;*
- 5. urban or regional versus interurban passenger services;*
- 6. block trains versus single wagon load trains;*
- 7. regular versus occasional train services. “*

23. Finally, Recital 41 provides further insights on the definition of market segments: *“When levying mark-ups, distinct market segments should be defined by the infrastructure manager where the costs of providing the transport services, their market prices or their requirements for service quality differ considerably”.*

24. It can therefore be concluded that Directive 2012/34/EU allows to recover the costs incurred by the infrastructure manager through the implementation of a charging

scheme derived from Ramsey-Boiteux pricing and applied to a set of market segments which have to be defined by the IM and controlled by the regulatory body. In order to define the market segments, the Recast specifies three basic segments which should be distinguished (freight services, passenger services within the framework of a public service contract and other passenger services) as well as a list of pairs, opposing different types of services. Finally, the Recast also sets out further criteria which should be taken into account to regroup services into market segments, both on the offer side (homogeneity in costs and prices for the service, types of passengers and commodities transported) and on the demand side (homogeneous requirement for service quality).

IV. Current practices within IRG-Rail Member States

a. Current status of the practice in IRG-Rail Member States

25. There is an interesting diversity of practices within IRG-Rail Member States concerning the definition of market segments and the recovery of other costs than directly incurred costs through mark-ups. Table 1 summarizes the charging practices of infrastructure managers in terms of different charges or levels of charges for various activities (e.g. different levels of direct costs), and market segmentation and mark-ups in relation with Article 32(1) of the Recast in a sample of Member States. This table reflects the charging practices of IRG-Rail Member States in 2016, which are likely to change in the upcoming years with the complete national transpositions of the Recast, as underlined in the last column¹⁰.

¹⁰ A more detailed and up-to-date presentation of the charging practices of Member States can be found in IRG-Rail's public document "*updated review of charging practices for the minimum access package in Europe*", available online from IRG-Rail's website.

Table 1. Current charging practices of IRG-Rail Member States

Country	Different charges according to the type of services	Market segments (in relation to Article 32(1) of the Recast)	Mark-ups (in relation to Article 32(1) of the Recast)	Change in the national charging system foreseen in the next 12 months
Austria	✓	✗	✗	✓
Belgium	✓	✗	✗	✗
Bulgaria	✗	✗	✗	✓
Croatia	✓	✗	✗	✗
Denmark	✗	✗	✗	✗
Finland	✓	✗	✗	✗
France	✓	✓ ¹¹	✓	✓
Germany	✓	✗	✗	✓
Greece	✗	✗	✗	✗
Hungary	✓	✗	✗	✓
Italy	✓	✓	✓	✗
Luxemburg	✓	✗	✗	✗
Netherlands	✓	✗	✗ ¹²	✗
Norway	✓	✗	✗	✓
Poland	✓	✓	✗	✓
Romania	✓	✓	✗	✓
Slovakia	✓	✓	✗	✗
Slovenia	✓	✗	✗	✗
Spain	✓	✓ ¹¹	✓	✓
Sweden	✓	✗	✗	✓
Switzerland	✓	✓	✓	✓
UK	✓	✓	✓	✗

Note: the sample covers 22 out of the 27 IRG-Rail Member States

Market segmentation

26. First, it must be underlined that not all charging schemes of Member States rely on market segments. According to Table 1, approximately two thirds of the Member States included in the sample currently have no market segments in relation to Article 32(1) defined in the Network Statement of their infrastructure manager. This may be

¹¹ While in these countries, the infrastructure manager differentiates the levels of mark-ups for various types of services, the regulatory bodies reject the idea that these types of services constitute market segments in the sense of Article 32(1) given the absence of proper justification by the IM.

¹² Mark-ups are only charged on one high speed line.

explained by the fact that these infrastructure managers do not levy mark-ups. It is important to note that as most countries are undergoing changes in their charging systems with the transposition of the Recast, market segments are likely to be (re-)defined in these countries in a near future.

27. When the pricing scheme distinguishes market segments, a standard distinction is made between freight and passenger activities, as required by the Recast. In addition to these two basic market segments, service trains¹³ may also be distinguished (for instance in Austria, Italy and Sweden). Further distinctions of freight activities primarily rely on the commodities transported. For instance, Poland distinguishes freight trains transporting dangerous goods from those transporting other commodities. In the UK, a list of 20 commodity types is used for charging purposes. However, currently only three commodities (coal for the electricity supply industry, spent nuclear fuel, and iron ore) pay a mark-up charge subject to the market can bear test. Concerning passenger services, sub-distinctions include, for instance, passenger services within a public service contract (e.g. in Italy, Hungary or France), high speed lines (as in the Netherlands, in Italy, Spain or France) as well as further distinctions based on geographical considerations. Regarding the latter, Poland for example distinguishes regional services from inter-regional services. As for France, the infrastructure manager for instance distinguishes a market segment for services which do not run through Paris. Finally, it is important to note that in some countries such as France or Spain, while market segments are used by the infrastructure manager to levy different levels of mark-ups, these market segments have not been properly defined nor justified in the Network Statement¹⁴.

Mark-ups

28. Not all Member States levy mark-ups as the Recast only offers the possibility to do so, as stated in Article 32(1): “*In order to obtain full recovery of the costs incurred by the infrastructure manager a Member State **may**, if the market can bear this, levy mark-ups (...)*”. This is even the case in some countries which have defined market segments but which do not currently levy mark-ups (see Table 1). Finally, it is interesting to note the diversity of charging units used to apply mark-ups. These are expressed in terms of train.km, of train-path.km, of thousand gross-tonne.km, of train-km.100seats or according to the percentage of turnover of the service¹⁵.

b. Country specific case studies

29. As previously mentioned, a large proportion of Member States' charging schemes are currently undergoing an overhaul, following or in anticipation of the national implementation of the Recast. This section aims at providing a short presentation of two selective examples of future charging practices concerning the definition of market segments and the recovery of fixed costs through mark-ups.

¹³ Service trains for instance include loco trains, technical trains and empty trains.

¹⁴ For the case of France, see for instance opinion n°2015-004 of ARAFER.

¹⁵ See table at page 14, “Main charging units”, in IRG-Rail, 2015, Overview on Charges for passenger stations, IRG-Rail (15)7.

Pricing scheme of Directive 2012/34/EU: Costs directly incurred by the operation of the train and mark-ups that guarantee the optimal competitiveness of rail market segments – the German case¹⁶

The German railways law, that provides the basis for the charging of track access, changed due to the transposition of Directive 2012/34/EU. DB Netz AG, the German infrastructure manager, developed a track pricing scheme in cooperation with Bundesnetzagentur, the German regulator. The new track pricing scheme will be implemented with the timetable change 2017/2018.

Following Directive 2012/34/EU, the components of the track pricing scheme are the costs directly incurred by the operation of the train service and mark-ups that help to cover full costs (considering subsidies).

The direct costs of the train operation are defined as additional costs that follow a 10% change in the operating performance (*i.e.* an increase or a decrease of 10% in train operation and therefore a change in train path kilometers) while the size of the network remains the same.

Due to differences in the costs drivers of freight traffic, regional and long-distance passenger traffic the cost directly incurred of the regional passenger traffic are the lowest, while the long distance passenger traffic has higher direct costs due to higher velocities. Freight traffic incurs highest direct costs due to high loads transported.

As the cost directly incurred by the operation of the train service and subsidies only cover a certain part of the full costs, the law foresees levying mark-ups. Those mark-ups are differentiated at least according to freight, regional passenger or long distance passenger traffic and respect the price sensibility of the pre-defined market segment. The calculation of the mark-ups follows the Ramsey-Boiteux pricing rule that considers the price elasticity of demand of the market segments: A change in the track price will only lead to a relatively low change in demand for segments with low price elasticity, segments with high price elasticity will suffer a higher reaction of the demand side.

With the Ramsey method the gap between costs directly incurred and the full costs of the train operation is covered relatively to the price sensitivity of the market segments.

On the basis of the provisions of the Directive market segments have been formed: The final customers were grouped in market segments according to the similarity of their needs.

The rail passenger traffic was divided into regional and long distance passenger traffic.

Market segments in the long distance passenger traffic are distinguished according to whether the train connects metropolitan stations with more than 50.000 travelers per day. Further, the time of the day and the speed of the train are considered within the segmentation. DB Netz AG therefore built the following segments for the long distance passenger traffic: Metro Day, Basic, Night and Loco run. Moreover, there are segments for charter and museum traffic and low cost traffic.

For the regional passenger traffic the German federal states (the "Länder") receive "regional" funds from the state (the "Bund"). DB Netz AG has to set the charges for the usage of rail infrastructure and for the usage of passenger stations per federal state, per "Land". The average charges per federal state have to be calculated such that they equal the average charges paid in the timetable period 2016-17 by the railway undertaking providing regional passenger transport in that federal state.

For freight trains the new track pricing scheme will distinguish between trains with dangerous goods, according to the train weight and to the profile of the train. DB Netz AG set the following segments: regional freight trains, standard freight trains, dangerous good trains, heavy train and loco run.

As this segmentation does not yet cover all needs and requirements of the final customers, DB Netz AG offers another possibility of self-segmentation: the customer can self-select and opt for time flexibility, spatial flexibility and priority in operation.

Further charging components in the new track pricing scheme of DB Netz AG are cancellation charges. The performance scheme and noise differentiated track access charges remain part of the track pricing scheme.

¹⁶ The information for the description of the new German pricing scheme is taken from DB Netz AG's homepage: <https://www1.deutschebahn.com/tps2017/start>, dd. 24.06.2016.

Pricing scheme of Directive 2012/34/EU: Costs directly incurred by the operation of the train and mark-ups that guarantee the optimal competitiveness of rail market segments – the Italian case

In Italy the Recast was implemented in July 2015 (Legislative Decree 24 July 2015 n° 112/2015) and subsequently Autorità di Regolazione dei Trasporti, the Italian Regulatory Body, issued a new set of criteria and principles on access charges both with reference to the MPA and the other services offered to the railway undertakings (Decision 96/2015), consistent with the new legislative setting.

In the following months, the procedure foreseen in the Decision 96/2015 took place and eventually at the beginning of July 2016 a new system of access charges for the national railway network was published by **Rete Ferroviaria Italiana** Spa, the Italian infrastructure manager¹⁷. The new system was validated by ART under the decision 75/2016 and it will be fully implemented in the operating year 2017-18¹⁸.

Among the novelties, (i) a five year regulatory period; (ii) the identification of the direct costs of the exercise of the rail network operated by the IM, subdivided in three components, following a cost based approach: the one related to mass, then to speed and the one to contact wire; (iii) a full cost based approach, where the cost of capital follows the WACC methodology; (iv) the consideration of a 2% annual efficiency rate applied on operative costs¹⁹; (v) the adoption of a market segmentation for the application of mark ups to recover the full (efficient) cost (considering subsidies).

As far as this last characteristic, the Decision 96/2015 defines (measure 24) a minimum set of “pairs” that the IM must consider when defining mark-ups (7 “pairs”) and allows the IM to introduce a more detailed segmentation on the basis of well ground motivation and market analysis of the railway services concerned. As a result, presently the new Italian access charges system presents a very high number of segments:

- **Technical services**, for no commercial trains, as loco runs, empty trains, etc.;
- **Maritime services**, concerning services to/from Sicily and Sardinia;
- **PSO regional passenger services**, 8 market segments: promo; no node; no node holy; ring; ring holy; hub; hub holy; hub sprint²⁰;
- **PSO national passenger services**, 2 market segments: day and night;
- **OA International passenger services**;
- **OA National Basic passenger services**;
- **OA National Premium passenger services**, 5 market segments: promo; Milan&Rome / Saturday; Milan&Rome / other days; Milan or Rome&other origin/destination on less than 30% of “HS service lines”²¹; Milan or Rome&other origin/destination on at least or more than 30% of “HS service lines”;
- **Freight sector**, 5 market segments: promo; night; international; national basic; national top²².

In total 24 market segments have been envisaged by the Italian IM, and specific mark ups have been identified under the conditions set by the regulatory framework: they must be “consistent with the railway market sustainability, while ensuring optimal competitiveness within market segment. In addition, the charging scheme must comply with the productivity increases achieved by railway undertakings.” (Measure 31, Regulatory criteria for sustainability of market segments, Decision 96/2015). Some constraints on the level of average kilometer access charges have been foreseen for specific segments, such as freight services, PSO regional passenger services and OA premium passenger services; they should not be higher than those in force in 2015 (Measure 31, quoted).

All the proceedings have been open twice to consultations (call for input and final consultation on the regulatory model devised). Last July ART declared the conformity of the new AC system, after deep analysis including those concerning the impact on the market segments.

¹⁷ The average access charges for each identified market segments applied within the regulatory period are available at the link: <http://www.rfi.it/rfi/NOTIZIE-E-DOCUMENTI/Novit%C3%A0-on-line/15-luglio-2016>

¹⁸ Until December 2017, a transitory period is considered by applying to the previous access charges the inflation rate (1%).

¹⁹ For this reason, it is possible to qualify the methodology as “Efficient Total Cost”.

²⁰ The node services are those whose path interests even if partially sections of the “city network”; Hub stations: Turin PN, Genoa PP, Milano Cle, Milano PG, Milan PG underground, Bologna Cle, Venice SL, Florence SMN, Rome Termini and Naples Cle.

²¹ HS service lines are the ones where the maximum speed reaches at least 200 km.

²² The national basic differ from the national top because of the length of the track: 100-800 km (top); any other track with a different length (basic). The night services are those performed in night slot time, from 22:00 to 6:00.

V. Market segmentation

a. **General goals of market segmentation**

30. An essential prerequisite to the application of a Ramsey-Boiteux scheme to the charges for the use of the railway infrastructure is the definition of market segments. Annex VI-1 of the Recast states that the list of market segments shall be defined by the infrastructure manager *“with a view to introducing mark-ups in the charging system”*. Indeed, market segments will constitute the grounds over which the mark-ups will then be applied.
31. IRG-Rail supports the idea that the definition of market segments should pursue at least three objectives. First, market segments should help ensuring that the charging system does not create undue discrimination or distortion of competition within homogeneous services. By regrouping comparable services, market segments enable controlling that these services are subject to the same charges. Defining market segments is thus needed to prove that the charging system complies with the principle of non-discrimination under Articles 29(3), 32(1), 32(5) and 56(2) of the Recast.
32. Second, market segments should facilitate the implementation of a Ramsey-Boiteux pricing scheme. A Ramsey-Boiteux pricing scheme aims at implementing different prices for different market segments (a segmentation of consumers into groups with different willingness to pay). Market segments should thus regroup comparable services to allow the implementation of a Ramsey-Boiteux pricing scheme. The Recast identifies factors to identify different markets segments. Recital 41 for instance states that services included in a given market segment should be homogenous in terms of *“the costs of providing the transport services, their market prices or their requirements for service quality”*.
33. Third, market segments constitute a vector through which the infrastructure manager provides information on the current and potential use of the infrastructure. Indeed, on the latter, Article 32(1) states that: *“[m]arket segments in which railway undertakings are not currently operating but may provide services during the period of validity of the charging system shall also be defined”*. This dissemination of information is crucial to help railway undertakings decide on the services they will be providing. In this sense, market segments help fulfil the objective set out in Recital 44 which states that *“[r]ailway undertakings should receive clear and consistent economic signals from (...) charging schemes which lead them to make rational decisions”*.

b. **Evaluation of the “List of pairs” of Directive 2012/34/EU**

34. The list of pairs defined in Annex VI of 2012/34/EU is not binding with only one exception: freight services versus passenger services. Another pair quoted in the Directive, yet not included in the list, is binding for the IM: passenger services within the framework of a public service contract versus other passenger services. Indeed, Article 32(1) explicitly says that *“Before approving the levy of such mark-ups, Member States shall ensure that the infrastructure manager evaluates their relevance for specific market segments, considering at least the pairs listed in point 1 of Annex VI and retaining the relevant ones. The list of market segments defined by infrastructure managers shall contain at least the three following segments: freight services,*

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passenger services within the framework of a public service contract and other passenger services”.

35. The Directive itself does not give any precise principle or indicate which methods shall be used for the definition of market segments. Instead a list of pairs is stipulated, which cannot compensate for the absence of methodology to define market segments. The list of pairs in Annex VI only separates between different types of services; a general method to define market segments according for instance to time, geography or goods transported is not specified in the Annex. Some geographical distinctions can be found in the pairs “*urban or regional versus interurban passenger services*” or “*domestic versus international services*” but no clear reason to distinguish amongst these services is given, nor is there an identification of the services that should be charged more. Again, the Directive states, in Article 32(1) that “*Infrastructure managers may further distinguish market segments according to commodity or passengers transported”, but there is no mention of a precise criteria to be applied, with the notable exception of “*trains carrying dangerous goods*” in the Annex.*
36. Furthermore, the pairs of market segments in Annex VI are overlapping. For example, the pairs of market segments “*combined transport versus direct train*” and “*block trains versus single wagon load trains*” overlap: both pairs of market segments deal with freight trains with and without manipulation during the train run like shunting, train disassembling or addition of trains, these market segments will overlap each other. In any event, this problem could be overcome by building the market segmentation in an appropriate manner: suppose two segments overlap, the IM should identify four different access charges, one for each combination of the segments involved.
37. Finally, Annex VI also lacks clarity on the rationale behind some of the pairs listed. An example can be found in the proposition to differentiate between “*regular versus occasional trains services*” as it is not clear that the frequency shall necessarily have an impact on the price elasticity of the train service. Consequently, if the infrastructure manager uses a pair of market segments distinguishing regular versus occasional train services, it must be proved that the different frequency of train runs result in a different ability to bear the mark ups.
38. Therefore, the list of pairs should be considered with caution and it may be useful for the infrastructure manager to also consider complementary sources and techniques when defining market segments. One possibility is to consider the approach of competition law, as presented in the following section.

c. Approaches of competition law

39. The approach used by competition authorities when identifying *relevant markets*²³ may constitute an interesting complement to the consideration of the list of pairs. A general principle in the identification of relevant product markets in competition analysis is “*substitutability on the demand side*”²⁴. Indeed, a relevant product market should

²³ In its notice on the definition of relevant market for the purposes of Community competition law (Official Journal C 372 of 9.12.1997), the European Commission defines the relevant market as combining “*the product market and the geographic market, defined as follows: (1) a relevant product market comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer by reason of the products’ characteristics, their prices and their intended use; (2) a relevant geographic market comprises the area in which the firms concerned are involved in the supply of products or services and in which the conditions of competition are sufficiently homogeneous*”.

²⁴ Commission notice on the definition of the relevant market for the purposes of Community competition law, Official Journal EU C 372, 9.12.1997, p. 5–13.

include all goods and services that are substitutable in the view of the consumer/final user. Under this approach, freight services belong to different markets than passenger services²⁵. For the latter, distinct markets for each origin-destination (O-D) pair can be identified²⁶. Again, intermodal substitutability is also an important issue to be considered, both for freight and passenger services²⁷. The European Commission (EC) further distinguishes between “time-sensitive” and “non time-sensitive” customers²⁸.

40. It is apparent that this approach may contribute to the identification of different segments in order to apply mark-ups “on the basis of efficient, transparent and non-discriminatory principles” (Article 32(1) of the Recast). However, since the competition law approach may identify a large number of relevant markets (initially one relevant market per O-D), a next step is needed to identify similar parts of the market and services of equivalent nature (Article 29(3)). For instance it may be possible to identify distinct market segments for long distance passenger traffic between cities affiliated to the network. Their market conditions will often be alike, but will likely differ from the conditions of local traffic. In such cases, for the purpose of elasticity-driven price-calculation, market segments may be defined for urban or regional versus interurban passenger services.
41. Limiting the analysis to the case law and the practice of the EC, the list of pairs is coherent with the decisions in Merger and Antitrust cases (cartels and abuses of dominant position): block trains and single-wagon trains belong to different product markets²⁹; interurban rail passenger services with PSO identify a separate product market³⁰. Again, following the EC approach, a further segmentation within the rail cargo services according to the transported goods³¹ or between domestic and international services should be taken into account³². Often, the analysis has to be founded on a case-by-case evaluation³³. Interestingly, the case-by-case analysis is coherent with the principle of defining market segmentation at the national level. Indeed, depending on the specific characteristics of the traffic within a given Member State, the set of segments might be different from another country.
42. From the above, one can conclude that *relevant markets* under the market competition analysis can usually be made to coincide with *market segments* under the Directive Recast and vice versa^[1]. Considering the competitive analysis is therefore important to

²⁵ Case AT.39678/Deutsche Bahn I, AT.39731/Deutsche Bahn II, December 2013;

²⁶ Case M.5655 – SCNF/LCR/Eurostar, June 2010. In this case, two different geographical markets were identified: the London – Paris route and the London – Brussels route for international high speed rail passenger services. In case M.2446 – Govia/Connex South Central, July 2001, the EC identified markets for public passenger transport services, distinguishing among interested O&D pair. In other cases, the geographic dimension was left open (as in M.7146 – Govia/Thameslink, Southern and Great Northern Passenger rail franchise, August 2014).

²⁷ In the Case M.5096 – RCA/MAV Cargo, November 2008, the European Commission inquired if the market for rail freight transport services was distinguished from the markets for other types of land freight transport services, but it left the exact definition open. For passenger services, intermodal substitutability was considered in Case M.7449 – SNCF Mobilités/Eurostar International Ltd, between train and air services on the international routes: London – Paris; London – Brussels, even if no conclusion was eventually reached.

²⁸ CASE A.38.477/D2 (British Airways / SN Brussels Airlines). For the first group, time is of the essence, either as regards the need to ensure a minimum travel time or the need to travel at a precise time of the day and not at any other given moment, or both. Also, certain time-sensitive passengers may need to book a trip at short notice or require flexibility (the possibility to miss one train and book onto the next). Time-sensitive passengers are willing to pay a premium to have their requirements satisfied. On the contrary, for non-time sensitive passengers, savings on the price of the trip have priority over time constraints and flexibility.

²⁹ Case AT.40098 /Blocktrains, July 2015.

³⁰ Case M.5557 – SNCF-P/CDPQ/Keolis Effia, October 2009.

³¹ Case M.2905 Deutsche Bahn/Stinnes, September 2002.

³² Case M.4746 Deutsche Bahn/EWS, November 2007.

³³ Case M.5096 quoted, par. 25

[1] For example, under the new Italian access charges system, a specific market segment was identified with respect to the so called technical services, *i.e.* empty trains, only loco.

identify possible *market segment* candidates as, by definition, the competitive conditions are homogeneous within a *relevant market*. If the competitive conditions are homogeneous then it is likely that the services included within a *relevant market* will be comparable in terms of elasticity.

d. General and specific problems of a market segmentation

43. IRG-Rail Member States have identified a series of challenges and open questions with regard to market segmentation.
44. Among the issues identified, IRG-Rail Member States have repeatedly underlined the challenge faced by regulators and infrastructure managers to identify relevant criteria to perform a satisfactory market segmentation. Indeed, although Article 32(1), Annex VI and Recital 41 of the Recast provide some suggestions of criteria that may be used, these may in some instances appear irrelevant due to country specificities or may need to be complemented by other criteria. Moreover, even when infrastructure managers have identified relevant criteria, the information required may not always be readily available. It can for instance be the case that characteristics of different traffics are missing. Germany and Slovenia for example reported that their infrastructure manager did not have information on the types of goods transported by freight trains, thus preventing them from using this criterion to segment the market. Missing data may also concern information on railway undertakings. Indeed, Recital 41 identifies "*the costs of providing the transport service*" as a potential criterion to define market segments. However, for obvious reasons, such sensitive data on the cost structure of railway undertakings is usually not available to infrastructure managers. Given the data limitations, some regulators have expressed concerns over whether the market segmentation proposed by their infrastructure manager will actually regroup homogeneous services in terms of "*costs of providing the transport services, their market prices or their requirements for service quality*" inside a given market segment, as required by Recital 41.
45. Some open questions on the market segmentation process were also identified by railway regulators. For instance it is not clear how market segments should be defined for passenger services within a public service contract: should a single market segment be identified for all services at the public service contract level or should such services be subdivided into more than one market segment? It is likely that the answer to this question will depend on national specificities, in particular regarding the national organisation of public service contracts. Moreover, the extent to which the market segmentation process depends on the industrial organisation of the sector appears unclear. In other words, should the segmentation of the market take into account the fact that the low profitability of certain services may not provide an adequate breeding ground for competitive entry? Again, it appears that the specificities of the national railway market should be assessed when answering this question. Finally and more generally, it is apparent that there is a trade-off between a more extensive segmentation, which may open the door to undue price discrimination, and a too narrow segmentation, which hinders the proper implementation of Ramsey-Boiteux prices. It is then important to ensure that a given segmentation is respectful of the principle of non-discrimination while allowing an efficient recovery of costs.

e. Different pragmatic approaches in practice

46. Different approaches have been used in IRG-Rail Member States to overcome the challenges presented in the previous section.
47. Some Member States have chosen to define a limited number of market segments, often closely inspired by the provisions of the Recast. As such, the current charging framework applied in Slovenia only distinguishes the three basic market segments defined in Article 32(1): freight services, passenger services within the framework of a PSO and other passenger services. In Spain, other passenger services were further subdivided into high speed services and conventional services. Poland has chosen a more direct implementation of the list of pairs contained in Annex VI of the Recast. In Poland passenger services were subdivided between regional and inter-regional services as well as between occasional and regular services. As for freight services, intermodal transport is distinguished from rail transport and trains carrying dangerous goods are differentiated from trains carrying other goods.
48. In Germany the process of definition of market segment started with a theoretical approach: segmentation criteria from the final customer perspective were enumerated and classified according to criteria used in competition law. The next step of the process questioned if the infrastructure manager was able to observe these criteria. As this was not possible in all cases, derived segmentation criteria were figured out and assessed according to their suitability³⁴. In Italy, the final segmentation proposed by the IM is quite extensive (see case study in Section IV), especially for open access premium passenger services (high speed services). ART, the regulatory body, has verified the non-discrimination principle considering the actual pattern of traffic of the two operators active on that sector and comparing the average access charge between them. ART has announced that it will continue to closely monitor the situation in light of the evolution of the traffic.

VI. Assessment of mark-ups

a. General goals of levying mark-ups

49. An important feature of a Ramsey-Boiteux charging scheme is the calculation of mark-ups that will be applied to market segments. Article 31(3) of the Recast states that charges for the minimum access package “*shall be set at the cost that is directly incurred as a result of operating the train service*”. By definition, fixed costs as well as the cost of capital are excluded from this perimeter. A first objective of levying mark-ups according to Article 32(1) is thus to recover such costs, net of public subsidies. It should however be noted that a variety of charging schemes could enable the infrastructure manager to recoup these costs. For instance, charges could be set at average costs or a Ramsey-Boiteux scheme could be used. Contrarily to other charging schemes, levying mark-ups according to Article 32(1) leads to apportioning the costs incurred by the infrastructure manager to market segments according to their elasticities. As argued in Section II, and in the context of recovering costs above the cost that is directly incurred, levying mark-ups thus has a second objective of

³⁴ To give an example for passenger traffic: from the final customer perspective the segmentation criteria “start and destination of the train usage” are decisive. From the point of view of competition law this is a geographical criterion for segmentation. For the infrastructure manager the travel projects of customers are not observable. But it has information on a derived criterion, the train route: this aspect is known to the infrastructure manager and it is a suitable criterion for market segmentation in passenger transport.

optimizing the level of use of the infrastructure. This enables to pursue the general objective of charges set out in Article 26: “Member States shall ensure that charging and capacity-allocation schemes for railway infrastructure (...) allow the infrastructure manager to market and make optimum effective use of the available infrastructure capacity”.

b. General and specific problems with the assessment of mark-ups

50. Member States have identified certain concerns which may prevent from achieving an optimal assessment of mark-ups.
51. A first strand of interrogations concerns the methodology that should be adopted by the infrastructure manager to calculate mark-ups. There are a couple of frame conditions given in railways like high public and political interests, a given legal frame and the fact that not all member states cover the fixed costs of their infrastructure managers completely. Without considering these conditions, the objective of levying mark ups and the objective of achieving optimal competitiveness of train market segments both stated in Article 32(1) as well as the objective of intermodal rebalancing stated in Recital 40 may be seen as concurring objectives. Infrastructure managers are allowed to levy mark-ups if they do not receive a full state compensation of their fixed costs. When levying mark-ups, *i.e.* setting prices above direct costs, the competitiveness of the rail undertakings is always deteriorated in comparison to a situation without mark-ups and the position of railways in comparison to other modes is also worse off. In this respect the aims mentioned in the directive are concurring. When determining the mark-ups, the correct level is the one that deteriorates the competitiveness of railway undertakings less. Each price rise does deteriorate the competitiveness, but the loss can be minimized, if considering the price elasticities of the downstream market (Ramsey-Boiteux pricing). This problem is all the more complex when considering services within the framework of a public service contract. These public services are further subsidized and therefore the determination of a price elasticity for these market segments is more complicated. Within the framework of a public service contract, it may be necessary for infrastructure managers to resort to a different mechanism to define the level of mark-ups.
52. A second strand of obstacles in assessing mark-ups concerns the availability and quality of data. These obstacles directly echo the lack of information already underlined as a limit to the definition of market segments. To perform a satisfactory market can bear test, extensive data on the characteristics of demand is necessary (e.g. to calculate elasticities or the degree of pass-through costs from railway undertakings to the final customers). However this information is not always available and, should the data be available, its quality might not be sufficient. Considering data restrictions, it appears impossible for regulatory bodies to agree on a common position regarding the adequate body of evidence required to justify the level of mark-ups. Indeed, depending on the availability and quality of data in the country, national railway regulators will necessarily set different thresholds to assess the evidence presented by their infrastructure manager.

c. Different pragmatic approaches in practice

53. Different approaches have been mobilised in Member States to circumvent the obstacles presented in the previous section.

54. Different approaches have been used in IRG-Rail Member States to evaluate the price elasticity of market segments (*i.e.* railway undertakings, final consumers, or a mixed approach). It is likely that this variety of approaches could be at least partly be explained by national specificities. In Spain, for instance, the situation is evaluated through a double checking analysis. On the one hand, a demand model at the railway undertaking level. It is used to estimate demand elasticity by taking into account incomes and costs of railway undertakings at the line level. On the other hand, as long as domestic passenger transport is not liberalised, the profits of incumbent RU are also used to estimate the possible pass-through of access charges increase. In Germany, a mixed approach is pursued to assess the mark ups: different elements are appraised to determine the level of the price elasticity of the track path demand. This price elasticity is influenced by the reaction of end customer prices to changes in the track path demand, by the demand reaction of the final customer due to a change in ticket prices and by the reaction of the track demand of the railway undertakings due to the change in the final customer demand. To determine the level of the respective reactions, available market data, surveys, and expert estimates are used. In some countries, to overcome the conflicting objectives of full recovery of costs while guaranteeing optimal competitiveness of rail segments, some countries have imposed caps on the total amount of access charges, following a sustainability analysis. In Italy, for example, caps were used to “protect” some market segments as in the case of freight, PSO market segments and open access premium passenger services. Under the new system, their total access charges were capped to avoid being higher than the ones in the previous system.
55. Different approaches were considered in Member States to overcome the issue of data limitations to assess the level of mark-ups. In Germany, the lack of data led the infrastructure manager to the following procedure: if the relevant demand details were not available for the market segment, the infrastructure manager tried to draw conclusions from those areas where data was available. The assessment of the mark-up for specific freight market was hindered as only data for the freight service in general was available. As a result, only small variations in the level of mark-ups for different freight market segments were considered feasible. Moreover, a re-assessment might be necessary after observing market reactions. In France, the infrastructure manager has attempted to evaluate the costs and revenues of a representative high speed railway undertaking using an economic model. Provided that such a model was approved by the regulator, it could be used to estimate the railway undertaking’s profitability and thus check whether the level of mark-up is sustainable. Finally, stakeholder reactions gathered through consultations of the market on the level of charges should also be considered. In any case, IRG-Rail recommends infrastructure managers to use a combination of assessment methodologies which will enable to present a body of corroborating evidence from different sources.

VII. Conclusion

56. Article 32(1) of the Recast sets out an exception to the basic charging principle that allows, under certain conditions, the infrastructure manager to obtain full recovery of the costs incurred by levying mark-ups on different market segments. As underlined in the preceding paragraphs, the provisions of this Article are commonly applied by infrastructure managers in IRG-Rail Member States.

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57. This paper also shows that the charging practices resulting from the application of Article 32(1) differ from one country to another. A substantial part of these differences may be explained by the fact that the definition of market segments and the assessment of mark-ups should be tailored to fit national specificities of the railway markets.
58. Given the absence of a turnkey solution and to ensure that the charges set by infrastructure managers comply with the principles of efficiency, transparency, non-discrimination, and optimal competitiveness of rail market segments, IRG-Rail considers that IMs should provide sound justification of their application of the provisions of Article 32(1) in their Network Statements.
59. Moreover, to ensure that their charging practices stay consistent with the evolutions of the railway markets, IRG-Rail considers that infrastructure managers should regularly review their list of market segments as well as their assessment of mark-ups. The periodicity of reviews should be in line with other relevant periods regarding the general review of the charging system, with a maximum of five years between two updates.