IRG-Rail (16) 8

Independent Regulators' Group – Rail

IRG–Rail

Charges Working Group

An introduction to

the calculation of direct costs in respect of implementing regulation 2015/909

9 November 2016

Executive summary:

1. *The Commission Implementing Regulation n°2015-909 foresees a methodology to calculate direct costs based on the difference between total underlying costs of providing railway services and a list of non-eligible ones. In addition, article 6 also allows using econometric and engineering methodologies to calculate direct costs. This paper aims at providing a non-technical introduction to the calculation of direct costs using these two methodologies.*

2. *Engineering methodologies are based on engineering knowledge and techniques* and sometimes are complemented by the information contained in cost accounting models*. They blend bottom-up methods (to evaluate the physical relationship between the operation of train services and wear and tear of the infrastructure) and top-down cost allocation methods (to estimate future maintenance and renewal costs and allocated them to cost categories and reference objects). Operating costs other than maintenance may also be included in the calculation of direct costs provided that the infrastructure manager can transparently, robustly and objectively measure and demonstrate that these costs are directly incurred by the operation of the train service.*

3. *Econometrics is a proven method blending mathematics, statistics, and economics which has the advantage of solely relying on data to calculate the marginal cost of traffic. This methodology requires the infrastructure manager to collect extensive data on operational, maintenance and renewal costs, on traffic and on other characteristics (e.g. infrastructure, geographical or topological characteristics) at a sufficiently disaggregated level to allow satisfactory estimations. The econometric methodology enables to estimate the impact of traffic on costs, all other factors held equal (i.e. controlling for all other characteristics included in the estimation). Using the estimated impact of traffic on costs, it is then possible to deduct or calculate the marginal costs of traffic.*

4. *As the basic charging principle for the minimum access package set out in Directive 2012/34/EU, IRG-Rail Member States consider that a sound estimation of the cost that is directly incurred is of prime importance. Regulatory bodies will thus attach great importance to reviewing the calculations of IMs as well as to making sure that the level of the charge for the minimum access package remains over time a faithful reflection of the direct costs.*

I. Purpose and background of the document

A. Main purpose of the paper

5. This paper aims at providing a short, comprehensible and practice-oriented introduction to the calculation of the "*cost that is directly incurred as a result of operating the train service*" as set out in Article 31(3) of Directive 2012/34/EU. The Commission Implementing Regulation n°2015-909 foresees a methodology to calculate direct costs based on the difference between total underlying costs of providing railway services and a list of non-eligible ones. In addition, article 6 also allows using econometric and engineering methodologies to calculate direct costs. The paper presents these two methodologies. This paper presents these two methodologies..

6. Article 9 of Commission Implementing Regulation n°2015-909 sets out a transitional provision with respect to the calculation of the cost that is directly incurred through the use of the infrastructure: *"[t]he infrastructure manager shall submit its method of calculation of direct costs and, if applicable, a phasing-in plan to the regulatory body no later than **3 July 2017**".* As an introduction to the calculation of direct costs, IRG-Rail thus considers this paper to be of particular interest to railway infrastructure managers (IMs) and national regulatory bodies which have to adapt to the provisions of the Implementing Act. More generally, IRG-Rail considers this paper to be of interest to any party willing to understand the basis and rationale behind the use of engineering and econometric methods to calculate direct costs.

B. Background

7. Article 31(3) of Directive 2012/34/EU sets out the basic charging principle for calculating charges for the minimum access package:
"Without prejudice to paragraph 4 and 5 of this Article or to Article 32, the charges for the minimum access package and for access to infrastructure connecting service facilities shall be set at the ***cost that is directly incurred as a result of operating the train service****."*

8. On 12 June 2015, the Commission adopted the implementing act n°2015-909 on the modalities for the calculation of the cost that is directly incurred as a result of operating the train service. In this document, the Commission notably sets out the scope of costs that need to be considered and the suitable methodologies for the calculation of the cost that is directly incurred.

9. Article 3(1) presents the "difference" methodology and reads as follows:
"*Direct costs on a network-wide basis shall be calculated as the difference between, on the one hand, the costs for providing the services of the minimum access package and for the access to the infrastructure connecting service facilities and, on the other hand, the non-eligible costs referred to in Article 4*[1]".

[1] Article 4 of Implementing Regulation 2015-909 lists non-eligible costs.

10. Moreover, Article 6 allows the infrastructure manager to calculate direct costs using other methodologies:
"*By derogation to Article 3(1) and the first sentence of Article 5(1), the infrastructure manager may calculate direct unit costs by means of* ***robustly evidenced econometric or engineering cost modelling****, provided it can demonstrate to the regulatory body that the direct unit costs include only direct costs incurred by the operation of the train service and, in particular, do not include any of the costs referred to in Article 4.*"

11. According to the Recast, the IM may levy additional charges reflecting, for instance, scarcity of capacity[2] (Article 31(4)) and environmental costs (Article 31(5)). Moreover, Article 32 provides exceptions to the basic charging principle for the minimum access package. In particular, Article 32(1) states that Member States may, under certain conditions, impose charges above the cost that is directly incurred in order to allow the recovery of full costs incurred by the IM. The mark-ups above direct costs should be bearable by 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 thus inspired by a Ramsey-Boiteux pricing scheme in which the relative mark-up on the marginal cost has to be inversely proportional to the price elasticity of the retail market segments.

12. This paper is organised as follows:

  a. Purpose and background of the document
  b. Summary of IRG-Rail position papers on direct costs
  c. Methodology 1: Bottom-up and non-econometric top-down models
  d. Methodology 2: Econometric methods
  e. Practical problems
  f. Conclusion

II. Summary of IRG-Rail position papers on direct costs

13. Between 2012 and 2014, IRG-Rail has issued four position papers[3] on the cost that is directly incurred. These papers were published prior to the Commission Implementing Regulation 2015/909 and aimed at clarifying the concept and sharing the common views of IRG-Rail on this issue. Concerning the interpretation of the concept of costs directly incurred, the October 2012 paper states that:
"The IRG-Rail charging working group supports the view that ***the "cost that is directly incurred" should be interpreted as "short-run marginal cost" (SRMC)****, and that short-run marginal cost should be taken to include:*

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[2] On this topic, we refer the reader to IRG-Rail's position paper "*Initial approach to capacity charging*", 19-20 November 2014.
[3] 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.

> 1. ***Operating costs*** *(e.g. signalling);*
> 2. ***Maintenance costs*** *(e.g. wear and tear repairs);*
> 3. ***Renewal costs****.*
>
> *IRG-Rail underlines that, by definition, all fixed costs shall be excluded from the costs considered (…).”*

14. Moreover, the October 2012 paper also sets out IRG-Rail’s preferred methods of estimation of the cost that is directly incurred:
“There are two main approaches for estimating efficient marginal costs. These are the so-called ***‘bottom-up’ and ‘top-down’ approaches***[4]*. The bottom-up approach provides a good understanding of how costs are incurred from an engineering perspective, but it often relies on a number of disputable assumptions. The advantage of the top-down methodology is that it is based on actual information on wear and tear costs*[5]*. As such, it provides a useful tool to check the robustness of the results of engineering methods.”*

15. Views expressed in IRG-Rail’s position paper remain unchanged.

III. Methodology 1: Bottom-up and non-econometric top-down models

16. Article 6 of the Implementing Regulation allows engineering cost modelling methods for the calculation of direct unit cost. Unlike econometric cost modelling, these methods are based on engineering sciences and techniques and sometimes are complemented by the information and cost drivers included in cost accounting systems. The direct costs of a single output unit are calculated using engineering knowledge, resulting for example in direct unit costs per track-km.

17. On the one hand, bottom-up models follow engineering approaches that are based on technical parameters, technical interrelations, construction or production techniques. They consider natural science knowledge, especially physics, as well as application-oriented findings. On the other hand, top-down models are based on cost allocation methods, usually developed in cost accounting and in regulation. From the starting point of an existing cost accounting system, cost components are evaluated regarding their variability due to the operation of trains with the help of engineering knowledge. In this section, the top-down methods described are different from econometric modelling.

18. Bottom-up methods evaluate the physical relationship between the operation of train services and wear and tear of the infrastructure. Parameters that influence the wear and tear due to utilization such as train mass, speed, type of vehicle, bogie or chassis and axle numbers/weight as well as track parameters like radii or inclination are taken into consideration during the engineering evaluation. The evaluation includes the

[4] Wheat and Smith (2008) describe the **bottom-up methodology** as approaches relying “*on engineering models and judgment to determine the likely wear and tear impact of running an extra vehicle on different components of the infrastructure network*”. As for **top-down methodologies**, the authors describe them as approaches using “*data on costs of maintaining and/or renewing the infrastructure and estimating what proportion of the total (average) costs are variable with traffic*”.

[5] It should be noted that operating costs also need to be taken into account for the calculation of direct costs.

assessment of costs to the observed relationships and dependencies. The evaluation process will reveal possible cost drivers, e.g. for maintenance and renewal costs, due to the utilisation of tracks. The knowledge of the cost drivers helps to calculate the direct unit costs per output unit. The result of the engineering evaluation will be very detailed knowledge about actual cause and effect relationships. However due to a restricted view (i.e. restricted to physical relationships) it is possible that effects on the total system are overlooked. This is why IRG-Rail considers bottom-up methods should be complemented by top down methods.

19. Top-down cost allocation methods use accounting data from the books of the IM as a starting point. Direct costs cannot directly be computed out of existing accounting systems. For this reason, the costs that are not relevant for the calculation of direct costs are subtracted from the total costs for the provision of the services of the minimum access package. For this purpose, cost categories and reference objects from the accounting system of the infrastructure manager are selected for the cost allocation process and their relevance for the calculation of direct costs is assessed. Based on current accounting data, maintenance and renewal costs can then be allocated to cost categories and reference objects**.** The criterion for this assessment is the variability of costs due to a change in traffic. In order to identify direct costs, a possible method could be to observe if and how cost categories vary as a direct consequence of given percentage of change in traffic. For example, cost categories like “financing costs” do not vary with a change in traffic, while reference objects like “railway crossing” and “tracks” vary with a change in traffic and are considered to be relevant for direct cost calculation. Article 4(1) of the regulation provides a list of cost categories and reference objects that are not eligible for the direct cost calculation.

20. In a second step of the top-down approach cost drivers are identified for each cost category on the basis of engineering knowledge. All of the above-mentioned influencing parameters can be taken into consideration. The variability of the cost category due to a change in traffic is evaluated and expressed in a percentage value that shows the dependence of the cost category in relation to a change of traffic. For example, the costs for the maintenance of overhead catenary could show to be 50 % variable due to traffic. The value of 50 % is determined by expert opinion on the basis of their (engineering) knowledge of causation (speed, mass, etc.). In order to allocate this variable cost share for maintenance of overhead catenary the costs have to be attributed by using cost drivers or influencing parameters to the single cost unit.

21. However direct costs are not limited to maintenance and renewal costs. It is well known that operating costs other than maintenance can also vary with the change in traffic. If the IM can transparently, robustly and objectively measure and demonstrate that costs are directly incurred by the operation of the train service, additional cost categories, as given in Article 3(4), can be part of the calculation of direct costs. An example is staff costs for the preparation of timetables and allocation of train paths.

22. The cost allocation process for these additional cost categories of train operation is exactly the same as for the maintenance and renewal costs. To this extent, the top-

down method leads to a very detailed and yet broad view on the direct costs. Only the assessment of the degree of variability of costs is based on engineering knowledge.

23. In Germany, direct costs are calculated from the total costs of the provision of the minimum access package. After the deduction of costs that are not relevant for the calculation of direct costs - as they obviously do not vary with the operation of trains (for example imputed costs, other operating income or other non-operating results) – relevant cost blocks with similar cost centers are identified. In Germany, the relevant cost blocks for the calculation of direct costs are timetabling, operation, maintenance, depreciation and costs of nodes. Those costs blocks are all – apart from the cost block depreciation - evaluated by expert engineers regarding their variability due to train operations. The experts define the degree of influence of a change in the amount of traffic on the respective costs in the cost blocks. Only the variable parts of the costs blocks are taken into consideration. Further, the experts evaluate which tasks and services are performed under the cost blocks to identify cost drivers: For each task or service decisive driving activities can be isolated (for example the number of track applications). With the help of these cost drivers, the costs are divided up between the market segments, resulting in the end in the total amount of direct costs per market segment. The cost block depreciation undergoes an econometric analysis. Using data based on observations of the German market, a regression analysis isolates the usage-dependent part of the depreciation. This is added to the direct costs per market segment calculated as described above.

24. In Great-Britain, direct costs that vary with traffic (maintenance and renewal costs) are calculated using the Infrastructure Cost Model (ICM). The ICM contains estimates of long term costs by asset type for each strategic route section, based on assumptions regarding asset life derived from asset type, usage and asset management policy. Modelling direct costs using ICM provides a bottom-up approach which can be refined with expert engineering assessment. Once the variable costs are estimated, they are allocated to cost drivers based on the characteristics of the vehicle types, by their impact on track and structures. For track, the allocation is made by looking at both vertical and lateral forces and using a rail surface damage (RSD) term. The RSD model evaluates the damage caused by a single vehicle based on speed, axleload, unsprung mass and vehicle group (loco, multiple unit, 2-axle freight).

IV. <u>Methodology 2: Econometric methods</u>

25. Econometrics is a proven method blending mathematics, statistics, and economics which has the advantage of relying on actual data to calculate the marginal cost of traffic. The econometric methodology enables to express costs as a function of traffic and other characteristics (*e.g.*, characteristics of the network). Estimating this function yields the impact of traffic on costs, all other factors held equal (*i.e.* controlling for all other characteristics included in the estimation). Using the estimated impact of traffic on costs, it is then possible to deduct or calculate the marginal costs of traffic. Graph 1

summarizes the steps needed to calculate marginal costs using econometric methodologies.

26. To calculate marginal costs using econometric methods, the IM first needs to collect recent data on operational, maintenance and renewal costs, on traffic (expressed in terms of (gross)tonne-km or train-km and, if possible, disaggregated between traffic types), and on other characteristics (*e.g.* infrastructure characteristics as well as geographical or topological characteristics such as climate, population density or territory morphology) at the network section level (*e.g.* track or track segment level). Fixed and other non-eligible costs that are identifiable without econometric modelling may optionally be extracted from the cost base already in this phase. The datasets on costs, traffic and other characteristics should be merged into a single dataset to allow econometric estimation.

27. The data used should be available over a representative part of the network for a minimum of one year, although academics recommend using multiple years of data in order to obtain more precise results[6]. Indeed, multiple years of data enable the use of fixed effects estimation methods, which capture invariable unobserved infrastructure, managerial and climate effects that are expected not to change with respect to a base year. Longer term data also allow exploring the dynamic aspects of railway infrastructure operation and maintenance[7]. For this reason, IRG-Rail considers that it is important for IMs not to change the network section level over which they collect data over time, in order to enable the econometric analysis of data over a long time span. If multiple years are used, the cost data should be adjusted in the national currency of a given year[8]. In any case, the sample size resulting from the segmentation of the network and the number of years considered should be large enough to enable the use of econometric analysis[9].

28. For operational and/or maintenance costs, the annual costs at the track or track section level are assumed to vary with the characteristics of the infrastructure and the level of traffic that circulated during the year. In other words, annual operational and/or maintenance costs can be expressed as a function of the annual level of utilization to estimate the marginal effect of traffic on costs. A variety of functional forms have been used to econometrically estimate this cost function, including log-log (e.g., Marti et al. 2008), translog (e.g., Johansson and Nilsson 2004) and box-cox transformations (e.g., Gaudry and Quinet 2003)[10]

29. It should be noted that the estimation of renewal costs may differ from that of operational and maintenance costs, especially if the estimation is based on an annual relation between costs and traffic, as above. Indeed, in a given year, most assets will not be renewed, resulting in a large number of renewal costs equal to zero at the track

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[6] Andersson (2007) states that *"(…) collecting data over time will give the research community and the infrastructure manager a possibility to provide better analyses*".
[7] Andersson (2008) for instance shows that infrastructure operation and maintenance costs are reduced prior to a major renewal.
[8] See for instance Johansson and Nilsson (2004).
[9] On this issue, we refer the reader to the formulae described in Harris (1985).
[10] Including their variations, e.g. Cobb-Douglas is a simplified form of translog.

or track section level. This is likely to lead to a low correlation between renewal costs and utilization as a majority of observations with a positive annual traffic will be associated with a renewal cost of zero. In fact, the occurrence of renewal operations is more correlated to the cumulated traffic since the last renewal operation than to a given annual level of utilisation. Since IMs often lack data on such extended periods of time, academics have relied on more advanced methodologies that enable to circumvent these methodological issues and derive a marginal cost of renewal. These methods for instance include survival analyses[11] (e.g., Andersson et al. 2016) as well as censored and truncated models[12] (e.g., Andersson et al. 2012). Another way to address the issues related to the renewal costs is to one common cost function for operational, maintenance and renewal costs. In other words, renewal costs could be estimated together with operation and maintenance costs (as a bundle). Although this approach has sometimes been applied to circumvent the issues discussed above, Link (2015) underlines that the problems may only be solved "*if cross-sectional data for a sufficiently long time period is available*". Unfortunately and as underlined above, the data needed for such estimations is often unavailable for such extended periods of time.

30. The final step of the analysis consists of determining marginal costs and, optionally, deriving the elasticity of costs with respect to traffic, which yields the percentage of costs that vary with traffic. These estimates can be directly derived from the previously mentioned models, especially the log-log and the trans-log ones.

31. The estimation of direct costs through an econometric model can be performed also to implement an efficiency/productivity analysis[13]. The objective of this type of analysis is to gauge the relative performance of decision making units, thus providing a benchmark for efficiency gains achievable by each unit. In the case at hand, the relative operation and/or maintenance performance can be assessed at different levels: at the national level (using data from foreign IMs) or within the country (for instance by comparing performance between different regions or maintenance centres). The efficacy of the econometric analysis strongly depends on the quality and quantity of data that are available. The models of efficiency analysis can be parametric (such as the stochastic frontier analysis) and non-parametric (such as the DEA). Models of stochastic frontier analysis of production and cost functions have already been used in

[11] In the context of the estimation of marginal costs of transports, Link (2015) explains the rationale behind the use of survival analysis: "*[i]t uses physical measurements of infrastructure damages or infrastructure condition to estimate a functional relationship, a so-called lifetime or duration function, between these measurements, infrastructure characteristics, traffic volume, climate information and other explanatory variables. The obtained damage-traffic relationships are evaluated in monetary terms by using costs for renewal work. The change in the lifetime as a consequence of traffic change affects the present value of future renewal costs and is thus the base for the marginal cost calculation. In contrast to econometric studies, duration approaches derive marginal costs based on renewal requirements independent of the actual spending for renewals*."

[12] Andersson et al. (2012) explain the underlying differences between censored and truncated data as follows: "*[w]hen a relevant part of the population generating the data is unobserved, the data is said to be truncated. In this case, data on both the dependent and independent variables is not observed. For example, in a study of household income, the sample may only contain data for low-income households. Censored data is different. In this case, the dependent variable is not observable for some part of the population (though data on the independent variables are available). Again, using the study of household income as an example, above a certain threshold, income may only be recorded as being above that threshold (the actual income level is not recorded in the data set, perhaps for confidentiality reasons).*" The authors then argue that censored and truncated econometric models "*(…) have properties that make them suitable for estimation when data holds a large fraction of true zeros in the dependent variable*", which is the case for renewal data.

[13] The benchmark for this analysis is Farrell (1957). For an application to utilities industries, see Coelli and Lawrence (2006).

regulated sectors and sometimes applied to cases with only one firm (but with different branches or business units considered)[14].

Graph 1. Estimating marginal costs using econometric methodologies

Step	Aim	Description
1 a	Collect data on costs	- Cost data on operation, maintenance and renewal costs - A preferred approach is to disaggregate these costs by type - Should be collected at the network section level, for at least one year - Identifiable fixed and non-eligible costs may be excluded from the cost base
1 b	Collect data on traffic	- Should be collected at the same observation unit as costs, for the same period - Usually expressed in tonne-km or train-km and a preferred approach is to collect data on each traffic type
1 c	Collect other data	- Collect data on infrastructure characteristics (*e.g.* number of tracks, type of rail, age of different components) at the same level as cost and traffic data - Additional data such as the different climates or regions can also be collected
2	Assemble datasets	- Data on costs, traffic and infrastructure characteristics should be merged into a single dataset to enable econometric estimations
3	Econometric estimation	- Estimate econometric models where the dependent variables are the types of costs, the variables of interest are the traffic types and control variables include for instance infrastructure characteristics, climate and region variables
4a	Derive elasticity	- From the results of the econometric model, it is possible to estimate the elasticity of costs to traffic - The elasticity represents the percentage of costs that vary with the level of traffic.
4b	Calculate marginal costs	- Marginal costs should then be calculated. They represent the costs per unit of traffic considered (*e.g.*, per train-km or (gross)tonne-km) - If an elasticity has already been derived then the marginal costs may be calculated as elasticities times average costs

V. <u>Practical problems</u>

32. A series of practical issues regarding the calculation of direct costs have been identified by IRG-Rail RBs. The issues concern both econometric and engineering methodologies.

33. A first strand of practical problems concerns the availability and quality of data used for such estimations. Regarding engineering estimations, Germany for instance underlined that the current book keeping system of its IM contained too many transactions and cost positions in the cost block "maintenance" which affected the practicability of the calculations. To enable experts to assess their relevance for direct cost calculation, these transactions and positions had to be clustered into more

[14] See Coelli et al. (2013); and Cambini et al. (2014).

aggregated cost postitions. As for econometric analysis, France underlined that a non-negligible part of the observations meant to estimate maintenance costs had to be dropped prior to the final econometric estimations due to reporting errors which lead to abnormal values in the data. Moreover, a substantial part of IMs do not currently collect information on some traffic characteristics (*e.g.*, axle loads or speed of trains) that could be used to improve the quality of the econometric estimations of direct costs.

34. With respect to the engineering methodology, another aspect to be considered is the lack of transparency in the use of costs drivers when assessing direct costs. Following the standard definition, a “direct cost” refers to all cost items attributable to a cost center without the use of cost drivers or any allocation criteria. Consequently, costs are “direct” when the accounting system is capable of tracking activities and show that such activities are not joint with more than one service or network resources but attributable to a sole activity. For this reason, IMs need to adopt systems of accountancy that will keep close track of direct costs in a near future.

35. Another strand of practical problems lies in the fact that no turnkey solution can be provided for engineering or econometric methodologies. Indeed, both methodologies have to be tailored to fit national specificities. Regarding engineering methods, this can for instance be reflected in the fact that each IM has its own book keeping system and that transactions and booking positions will necessarily vary from one country to another, thus preventing the definition of a single methodology to deal with these issues. As for econometric methodologies, the absence of a turnkey solution may best be reflected in the fact that the choice of control variables or functional form will depend both on the type and quantity of data available as well as on the national characteristics of the network.

36. Closely related to the lack of turnkey solutions, a final strand of practical problems identified by some IRG-Rail RBs relates to the level of expertise needed to master the calculation of direct costs using these methodologies. This issue may concern both IMs and RBs who are respectively given the task of applying and reviewing one of these methodologies. For some IMs or RBs, the required expertise may not necessarily be available inhouse. In such cases, the actors may call on the assistance of an outside and independent consulting firm or expert to guide their respective tasks regarding the estimation of the directly incurred costs.

VI. <u>Conclusion</u>

37. As the basic charging principle set out in Directive 2012/34/EU and, potentially, the minimum level of charges for the minimum access package[15], IRG-Rail considers the correct evaluation of the cost that is directly incurred to be of prime importance. RBs

[15] See Recital 70 and Article 32(1) of Directive 2012/34/EU.

will thus attach great importance to reviewing the calculations of IMs as well as to making sure that the level of these charges remains over time a faithful reflection of the direct costs. To this end, IRG-Rail considers that:

- IMs need to ensure continuity in the disaggregation level of the data collected to estimate direct costs using econometric methodologies, notably to allow the use of panel data which increase the precision of the estimations. The level of disaggregation of the data should be in line with the methods applied to calculate direct costs;
- In a near future, IMs need to ensure that their cost accounting systems is capable of tracking the costs directly attributed to the use of the rail network, with reduced use of cost drivers;
- IMs need to provide RBs with the full datasets, information and documents which allow reproducing IMs' calculations of the direct costs. This will enable a thorough assessment of the calculations of direct costs by the RBs;
- Calculations of directly incurred costs should be periodically reviewed by the IM. The periodicity of updates should be in line with other relevant periods regarding the general review of the charging system, with a maximum of five years between two calculations;
- For comparison and verification purposes, RBs may request the IM to use an alternative methodology to calculate directly incurred costs under the provisions of Article 6 of Commission implementing regulation n°2015-909.

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