

**Independent Regulators' Group – Rail  
IRG–Rail  
Subgroup Charges for Service Facilities**

**Initial report**

**On the charging principle of Article 31 (7) of Directive 2012/34/EU**

**25. November 2019**

**Introductory remarks**

This paper discusses the charging principle of Article 31 (7) of Directive 2012/34/EU on setting charges for service facilities and reflects the problems and decisions of regulatory bodies when investigating the charges of service facility operators. The discussion in this initial report mainly focuses on experiences and ways of setting charges in IRG member states.

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## I. Introduction

### A. Main purpose of the paper

In recent years, charges for the minimum access package (MAP) have been the main focus of charging regulations. For the railway market, access to and charges for service facilities are, nevertheless, equally important. This paper focusses on the charging principle related to Article 31 (7) of Directive 2012/34/EU. According to Article 31 (8), the same charging principle is used for additional and ancillary services when offered by only one supplier.

According to Article 31 (7) of Directive 2012/34/EU, operators of service facilities should set prices such that *“the charge imposed for track access within service facilities referred to in point 2 of Annex II, and the supply of services in such facilities, shall not exceed the cost of providing it, plus a reasonable profit”*. This is the most important provision for regulation of charges for service facilities. Again, according to Article 31 (8) *“Where services listed in points 3 and 4 of Annex II, as additional and ancillary services are offered by only one supplier, the charge imposed for such a service shall not exceed the cost of providing it, plus a reasonable profit.”* The second provision that needs to be discussed is the rule on reasonable profit, as mentioned in Articles 31 (7) and 31 (8). Reasonable profit, as defined in Article 3 (17), *“means a rate of return on own capital that takes account of the risk, including that to revenue, or the absence of such risk, incurred by the operator of the service facility and is in line with the average rate for the sector concerned in recent years”*.

This paper describes the charging principle of Article 31 (7) and of Article 31 (8) of Directive 2012/34/EU on setting charging for service facilities and discusses the most important issues regulators face when reviewing and approving these charges. This initial report provides experiences and views of the regulatory bodies (RB) on the subject. In providing such an overview the paper can assist each RB in its tasks by fostering mutual understanding and learning from approaches used in other countries.

### B. Structure of the paper

After this introduction, the second chapter deals with the specification of the regulated services as described in the Directive 2012/34/EU. The third chapter gives a definition of cost categories, contrasts accounted costs with imputed costs and describes methods for determining a reasonable profit. Additionally, it gives a definition of the WACC, an instrument to evaluate the return on the invested capital, and a definition of *own capital*. Chapter four covers the calculation of the charges and discusses the allocation of cost with the full cost distribution approach, the activity-based costing approach and bottom up and top down approaches. Furthermore, it examines the differences between single and dual-till regulation, the different requirements of these approaches to charging regulation, subsidies, and the selection of an appropriate charging unit, as well as setting charges for a period longer than one year. Chapter five discusses efficiency targets and productivity goals and chapter six draws a conclusion.

## II. Specification of services

There is no specific definition of services in Directive 2012/34/EU. Among the definitions listed in Article 3 (11) of Directive 2012/34/EU, there is only a definition of the term “service facility”. According to this, a service facility means the installation, including ground area, building and equipment, which have

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been specially arranged, as a whole or in part, to allow the supply of one or more services referred to in points 2 to 4 of Annex II<sup>1</sup>.

Annex II, which is also referred to in Article 13 *Conditions of access to services* of the Directive, lays down four points. The first point defines which services the MAP includes. The second point specifies the access to service facilities whose services have to be supplied by the service facility operator in a non-discriminatory manner. Point 3 lists services qualified as “additional” and the fourth point considers “ancillary services”.

Furthermore, Article 3 of Regulation (EU) 2017/2177 states that a service supplied in any of the service facilities listed in point 2 of Annex II to Directive 2012/34/EU shall be qualified as a “basic service”.

Nevertheless, it follows from the above, that points 2 to 4 of Annex II do not identify explicitly all the concerned services. The absence of a strict identification of the concerned services is overcome by Article 4 of the Implementing Regulation (EU) 2017/2177. In accordance with that article, operators of service facilities shall make available to their customers a description of the service facilities and the rail-related services that are provided under their responsibility.

### III. Definition of cost categories

Charges for service facilities may not exceed the cost of providing that service, plus a reasonable profit. Determining appropriate values for “the cost of providing the service” and “reasonable profit” is not straightforward. There are two main ways of determining the cost of providing a service i.e. the bottom-up engineering approach and the cost accounting approach. In any case, in order to determine the cost of providing a service, one must be able to tease out which of the service provider’s costs are to be allowed to count towards this cost.

There are different notions of cost depending on the purpose they are used for. A common one is that of “Full cost” which is used to determine the entire cost of a service on the basis of a cost accounting approach and cost allocation procedures (see also Section IV, on cost allocation). Other notions of costs exist such as avoidable cost, incremental cost or stand-alone cost. The most common differences between the above different costs concepts rely on the way variable and fixed costs, as well as direct and indirect costs, are considered and included (or not) in the total cost. While variable costs change due to changes in the level of output drivers, fixed costs do not change. Direct costs, on the one hand, are directly related to the provision of a service and can be allocated directly to this service in an objective and feasible manner. Indirect costs, on the other hand, are not attributable to a single specific service and, therefore, must be allocated to different services by means of specific cost drivers. The differentiation between direct cost and indirect cost is important for cost allocation, which will be dealt in a separate chapter.

Some cost information can be obtained from the external accounting system of the service facility operator. However, the expenses that are reported in the external accounting system do not include all costs that need to be taken into account by the regulator. Therefore, some costs are computed and are not part of the external accounting. One example is the reasonable profit, which will be discussed later in subchapter C.

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<sup>1</sup> See Appendix for a list of these services.

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There are, however, other methods used to derive costs which do not involve the use of external accounting systems, such as bottom-up models.

### A. Accounted costs

In accounting, expenses are usually displayed by the nature or the function of the expense. Both methods are foreseen in the IAS<sup>2</sup>; *“An entity shall present an analysis of expenses recognised in profit or loss using a classification based on either their nature or their function within the entity, whichever provides information that is reliable and more relevant.”*<sup>3</sup>

The “nature of expenses” method differentiates expenditures them according to their type. Usually, they are first differentiated between operating and capital expenses. On the one hand, the operating expenses usually cover all ongoing expenditures for running a business or providing a service. This covers cost for raw materials and used consumables, personnel expenses and other expenses. On the other hand, the capital expenses are related to capital goods (for example, depreciation (tangible assets) and amortization (intangible assets)).

In the IAS, it is defined as: *“The first form of analysis is the ‘nature of expense’ method. An entity aggregates expenses within profit or loss according to their nature (for example, depreciation, purchases of materials, transport costs, employee benefits and advertising costs), and does not reallocate them among functions within the entity. This method may be simple to apply because no allocations of expenses to functional classifications are necessary.”*<sup>4</sup>

If the expenses are displayed by function, they will be classified according to a functional classification. The following functional classification is used: manufacturing, selling, general administrative, and financing. According to the IAS: *“The second form of analysis is the ‘function of expense’ or ‘cost of sales’ method and classifies expenses according to their function as part of cost of sales or, for example, the costs of distribution or administrative activities. ... This method can provide more relevant information to users than the classification of expenses by nature, but allocating costs to functions may require arbitrary allocations and involve considerable judgement.”*<sup>5</sup>

### B. Computed costs

As mentioned earlier, not all costs can be derived from external accounting. Therefore, it is necessary to compute some costs as valuation in internal accounting provides a more detailed point of view than external accounting. This might stem from a different approach of determining the depreciation of assets.

If computed costs are used, it is essential to note, that they always need a sound argumentation and a clear and transparent method of calculation. Otherwise, there is the risk that the Service Facility Operator ( SFO) gains a higher profit by basing the charges on excessive cost.

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<sup>2</sup> International Accounting Standards (IAS). These standards were issued by the International Accounting Standards Council (IASC), and they set internationally recognized accounting standards.

<sup>3</sup> IAS 1, recital page 99.

<sup>4</sup> IAS 1, recital page 102.

<sup>5</sup> IAS 1, recital page 103.

**C. Reasonable profit, WACC and CAPM**

A definition of reasonable profit can be found in Article 3 (17) of Directive 2012/34/EU. *“Reasonable profit means a rate of return on own capital that takes account of the risk, including that to revenue, or the absence of such risk, incurred by the operator of the service facility and is in line with the average rate for the sector concerned in recent years.”*<sup>6</sup>

This subchapter focusses on the Weighted Average Cost of Capital (WACC)<sup>7</sup>, the definition of *own capital* and the Capital Asset Pricing Model (CAPM) , because these are the most common approaches to determine reasonable profit in finance and in regulation. However, other methods of determining reasonable profit are also possible under Article 3 (17) of Directive 2012/34/EU. Furthermore, it is possible that in some countries the national legislation contains further regulations and guidelines on how to determine reasonable profit.

*General approach of the WACC*

Calculating the allowed rate of return on capital is one of the main elements in defining cost-oriented prices, carrying out price/margin squeeze tests and implementing the regulatory accounting obligations. In the EU, the main method to evaluate the allowed rate of return on the capital invested is the calculation of the WACC.

The WACC plays an important role in setting cost-oriented regulated prices because it determines the reasonable rate of return on the capital employed. The determination of the WACC is generally based on historical information and it is considered as forward looking (proxy). It is possible to estimate the parameters in the WACC formula in different ways, and RBs may take different approaches according to parameters such as national economic conditions, availability of data, specific risks (e.g. the degree of wholesale and retail competition, regulatory goals/strategy etc.). When estimating the WACC, RBs have the flexibility to take an approach which supports their national circumstances.

WACC is a calculation of a firm's cost of capital in which each category of capital is proportionately weighted according to the following formula<sup>8</sup>:

$$WACC = k_e * \frac{E}{D + E} + k_d * (1 - t) * \frac{D}{D + E}$$

Where:

*k<sub>e</sub>*: Cost of equity

*k<sub>d</sub>*: Cost of debt

*E* : Value of equity

*D*: Value of debt

*t*: Tax rate.

<sup>6</sup> Article 3 (17) of Directive 2012/34/EU.

<sup>7</sup> Weighted Average Cost of Capital (WACC).

<sup>8</sup> In Germany, for example, a pre-tax WACC is applied, whereby the WACC is divided by (1-t).

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To calculate the WACC, the cost of each capital component is multiplied by its proportional weight. All sources of capital are included in the calculation of the WACC. The WACC represents the blended cost of capital across all sources, including common shares, preferred shares, and debt. The cost of each type of capital is weighted by its percentage of total capital and they are added together.

### *Definition of own capital*

A possible question that arises when reading the definition of “reasonable profit” in directive 2012/34/EU is what is meant by the term “*own capital*” and if this term includes both equity and debt or just equity. Explained differently, *own capital* could be interpreted to mean either capital that is owned by the SFO, i.e. equity, or capital that is employed in the business of the SFO, i.e. meaning both the capital that is strictly owned by the SFO (equity) and the capital that is borrowed (debt). In Austria, Germany and Norway for instance, the term *own capital* is interpreted as equity only, and actual debt costs correspond to the interest rate a lender would charge exclusively for the regulated service. In Norway this has been translated in the national legislation. In France and Spain, as well as in Italy, it is understood as capital employed.

Additionally, the definition of *reasonable profit* in directive 2012/34/EU also mentions that the reasonable profit should be “*in line with the average rate for the sector concerned in recent years*”. This implies that RBs will have to determine *which sector is concerned* and how many years to take into consideration when calculating a reasonable profit. A possible approach in this regard might be for RBs to calculate a sector-wide reasonable profit based on a study that takes into account a specific number of years and compare that with the cost of equity that a given SFO charges to users. In GB although the charges to access the storage sidings in light maintenance depots is not directly regulated ( they are negotiated between the SF owners and users), the RB has the powers to request that they be reviewed if it considers that they are inflated as compared to the charges for similar facilities in the same geographical area. The German RB interprets the second half of Art. 3 (17) 2012/34 in a way, that it specifies the method, which should be used to calculate the return on equity. That means, that the risk of demand (fluctuating revenues) and the average yield in the sector of the previous years should be considered during the calculation of the return on equity. As a result, this leads to an exclusive usage of the Capital Asset Pricing Model (CAPM), since it complies with above given interpretation. Based on a wide range of benchmark companies, the sector and the risk of demand are considered. The determining beta data are calculated on the basis of historical capital market yields. Essential deviations compared to previous years are prevented because of the consideration of historical yields for example when choosing a 3 years average.

### *CAPM – Capital asset price model*

The capital asset price model is commonly used to calculate the cost of equity. The CAPM describes the relationship between the systematic risk of an asset and the required rate of return. This model is widely used in finance for pricing of stocks, but also for calculating the cost of capital.

The model takes into account the asset's sensitivity to non-diversifiable risk (also known as systematic risk or market risk), often represented by the quantity beta ( $\beta_i$ ), as well as the expected return of the market ( $R_m$ ) and the expected return of a theoretical risk-free asset ( $r_f$ ). The following formula is commonly used:

$$k_e = r_f + \beta_i * (R_m - r_f)$$

Where:

$k_e$ : Cost of equity

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$r_f$ : Risk-free rate

$\beta_i$ : Systematic risk

$R_m$ : Expected return of the market.

A common approach for determining the risk-free rate is to refer to a governmental bond. Usually, for developed countries, the data for a government bond are easily available and this is seen as the most secure investment. The expected return of the market is usually analysed per country by different studies and these data are also publicly easily available for historical data. It is rather difficult to determine the systematic risk in the railway market and therefore this problem will be dealt with in a separate subchapter later.

The CAPM approach is used by many SFOs and railway regulators in Europe. Through the consideration of risk of the industry in the model, the CAPM approach fulfils all requirements of Art 3 (17) to determine the reasonable profit.

### *Calculating the Beta*

Beta is a measure which is used to determine the volatility of an asset in relation to the market situation.

A key component in determining the WACC is the determination of the Beta, which shall indicate whether the service offered is more or less volatile than the market as a whole and so it reflects the risk exposure to general market movements.

Beta is important because it measures the risk of an investment that cannot be reduced by diversification. It measures the amount of risk the investment adds to an already-diversified portfolio. In the CAPM, beta risk is the only kind of risk for which investors should receive an expected return higher than the difference between the expected return of the market and the risk free rate.

If the company is not quoted on the stock exchange, the Beta of the company (or of an investment) is commonly derived by using the beta of similar companies (or investments), often referred as peer group. The difficulties in determining the Betas for service facilities are that the Beta must reflect a peer group. In the majority of Member countries the IM is the major provider of service facilities, and is owned by the State which holds all the capital shares. This means that the IM is not listed on the stock exchange. Therefore, it is important to correctly identify the peers in order to estimate the Beta.

In Germany, the RB has commissioned a study<sup>9</sup> on the cost of capital, which also deals with the determination of the Beta. This study calculates the beta for the IM and for service facilities by using a wide selection of peers. The result is a range of betas, which are seen appropriate for determining the reasonable profit. In GB the RB uses the adjusted WACC approach to determine the IM allowed return.

In 2016, the Austrian RB used a peer group from the Website of *Damodaran*<sup>10</sup> for determining the beta for a decision on the railway electricity network.

<sup>9</sup> Frontier Economics / Frontier Economics / Iges "Gutachten zur Bestimmung der Kapitalkosten für Eisenbahninfrastrukturunternehmen unter den besonderen Bedingungen des deutschen Eisenbahnsektors – Zweite Aktualisierung 2016. Ein Bericht für die Bundesnetzagentur"  
[https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Eisenbahn/Unternehmen\\_Institutionen/Veroeffentlichungen/Gutachten/KapitalkostenGutachten2016.pdf?\\_\\_blob=publicationFile&v=1](https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Eisenbahn/Unternehmen_Institutionen/Veroeffentlichungen/Gutachten/KapitalkostenGutachten2016.pdf?__blob=publicationFile&v=1).

<sup>10</sup> Website of Damodaran: [http://pages.stern.nyu.edu/~adamodar/New\\_Home\\_Page/home.html](http://pages.stern.nyu.edu/~adamodar/New_Home_Page/home.html).



In Italy, the RB has set all WACC parameters for the IM and SFO (on specified services) by using a peer group to fix the Beta parameter (0,70) including DB ML Group Infrastructure. This decision has been published in 2015<sup>11</sup>.

In Spain, the RB has computed the beta by analysing a peer group compound of national and international companies, which, among their main activities, manage infrastructures related to transport and logistics. This approach was chosen due to the difficulties in finding comparable peers in the field of service facility operation. This is a problem all RBs recognise.

### *Ownership of the assets*

Another common difficulty that RBs face is that the service facility operator is not necessarily the owner of the service facility. In that case, the reasonable profit remunerates the owner of the service facility for its investment, as, according to Article (3) of Directive 2012/34, reasonable profit means “a rate of return on own capital”. However, the actual distribution of the reasonable profit between the owner and the service operator depends on their respective bargaining powers when negotiating the contract between them. From the viewpoint of price regulation, what matters is that the price charged to the customers does not include more than the reasonable profit (on top of the costs of providing the service).

### **D. Calculating profit for services with no capital employed**

As mentioned in the paragraphs above, the reasonable profit is defined as a return on *own capital* employed which takes into account the risk incurred by SFOs. Some RBs experienced cases where calculating this reasonable profit became problematic due to a very low level of own capital employed of the SFO. There are two sides to this issue: 1) the economic argument for why the reasonable profit depends on the own capital employed and 2) the reason why some operators have only very little own capital employed.

### *Economic argument for the calculation of reasonable profit*

Service facility operators are to be rewarded for the risks they have taken to run the business. Economically speaking, the main risk of operating a service facility comes from the opportunity costs of the own capital employed. The reasonable profit of a service facility varies according to the amount of own capital employed and the interest according to the systematic risk of the SF. Hence, if there is almost no own capital employed, the reasonable profit is accordingly supposed to be lower.

### Reasons for a low level of fixed own capital

Some service facilities have near to no own capital employed. There are two cases; 1) they perform a service that does not require own capital employed or 2) they only operate the SF and do not own it.

For the first case, if the reasonable profit, calculated using the WACC approach or another method, is not sufficient to remunerate the risk, an additional remuneration may be considered, if the national legislation allows it. In France, for example, the SUGE is a police service provided by SNCF in passenger stations or in trains. This service is an example where systematic risk<sup>12</sup> in the sense of CAPM exists, yet there is

<sup>11</sup> <https://www.autorita-trasporti.it/delibere/delibera-n-96-2015/>.

<sup>12</sup> This includes systematic risks of demand, systematic cost risks and systematic risk arising from regulation. Risk arising from regulation could be positive or negative. Regulatory measures often reduce systematic risk.

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almost no own capital employed<sup>13</sup>. A specific national legislation applies to this service, that allows to include a reasonable profit to calculate the charges for this service.

For the second case, the operator usually pays a fee or rent to the original owner of the service facility. It is essential for the RB to keep track of this ownership structure to estimate the correct overall profit.

Economically, one would expect the owner to rent out the asset at the rent just as high as the rent on capital that would be possible, if they were to operate the service facility themselves. Then the final price for customer would be expected to be the same regardless of the ownership structure. In reality, it could happen that the rent is higher or lower than the regulated reasonable profit.

In case that it is lower, users of the service facility would pay a lower price for the service because of the ownership structure.

The case that the rent is higher could happen if the owners of the service facility are a non-regulated entity. If that was the case, they could try to rent out the service facility at a higher price to take advantage of the possible monopoly nature of the service facility. The operators would then just forward that increased rent to users, because they are allowed to charge a price high enough to recover all their costs. The rent paid to the service facility is now part of the operator's net costs basis used to calculate charges. Hence, users of the service facility are at a disadvantage because they would pay a higher price depending on the ownership structure.

In GB, the RB considers the rents for service facilities are commercial matters which are negotiated between the SF owners and SF operators. For stations, the long term charge (LTC), which is designed to cover the cost of maintenance, repair and renewal of station assets, is payable by the SFO to the IM. The SFO can recover some of this charge from any beneficiaries that use the station. The beneficiary's contribution is based on its number of departures from the station as a proportion of the total number of departures. In addition, the Qualifying Expenditure (QX) at stations is a charge to recover the costs that the SFO incurs in the day-to-day running and operation of the station. The SFO can recover some of these costs from any beneficiaries that use the station. The beneficiary's contribution is calculated in the same way as that for the LTC. Another example is the charges to access the storage sidings in light maintenance depots. In GB, the Access Agreement between the SFO and the users of light maintenance depots contains a section/ schedule indicating the charge for storage (which they negotiate). The RB approves this agreement. However, the RB has the power to request a review of the charge if, for instance, it is considered inflated as compared to the charge for the same services in similar facilities. The regulator in GB remedies this by comparing the charge to the market prices in the vicinity of the service facility.

## **IV. Calculation of charges**

For the calculation of charges it is necessary to allocate the right costs to the right service. If this is not done properly, there is a risk that users of the service facility cover additional costs, therefore charging an

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<sup>13</sup> Staff of this police service are sworn officers with long official training and staff cannot be adjusted according to the level of the activity. This implies a risk which can be covered by a reasonable profit.

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unreasonable profit or cross-subsidizing another activity. Only costs that are necessary for providing the service should be allocated.

After earmarking the specific costs for each service, an appropriate charging unit is chosen which reflects the use of the service. Differentiation in charges may be introduced (for example to reflect the differences in the use of the service), if it is not discriminatory.

To elaborate on this, the next six paragraphs deal with cost allocation, Single-till versus Dual-till regulation, subsidies, charging unit, differentiation in charges, projected demand and cost of providing a service and multi annual charges.

### **A. Cost allocation**

As mentioned above, for the calculation of charges it is necessary to allocate the right costs to the right service. In general, costs can be differentiated in costs which are directly caused by the service, *the direct costs*, and costs which are necessary for providing the service but cannot be allocated to the service directly, *the indirect costs*.

Only in exceptional cases does the SFO offer only one service. This makes the allocation of costs easy. When the SFO offers more regulated services or other unregulated services, the cost allocation becomes more complex.

In general, direct costs can be directly allocated to a specific service and are often directly accounted with the different services. The allocation of indirect costs is more difficult.

There is a diversity of cost allocation methods. On the one hand, top-down approaches are based on accounting costs allocations. In a "pure" top-down approach, cost allocation is based on proportionality rules (according to the level of the direct costs for example). On the other hand, bottom-up approaches allocate constructed costs<sup>14</sup>. A "pure" bottom-up approach aims at allocating constructed costs of an efficient operator. However, in practice, allocation methods are rarely "pure" top down or bottom up approaches but rather "hybrid" approaches, more flexible. There is a diversity of cost allocation methods, as well as a wide range of cost allocation keys applicable. Many allocation rules may be used, like proportionality rules depending on cost drivers, sequential allocation rules, economic allocation rules (Shapley-Shubick...) or allocations based on bottom-up modelling for example.

In practice, two top-down methods are commonly used for the allocation of indirect costs: full costs distributing and activity based costing. Only when it is not possible to allocate costs directly or it is not economically feasible to do so, a full costs distribution or an activity based cost approach could be used. As requirement for a top-down cost allocation to different services is that the cost base is clear and any costs without relation to the service facility are excluded from the cost base.

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<sup>14</sup> In a bottom-up model, the activities of the service facility are broken down into functional units. The cost of each functional unit (operating expenses and investments) is based on cost drivers and unit cost assumptions from different sources (including data from other sectors for example).

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### *Full costing, full cost distribution and Activity based costing*

Full cost distribution or full costing is a commonly-used approach to determine the entire cost of a service, and is also used in the IFRS as well as in the US GAAP for financial reporting. The concept is most commonly used for recording the full cost of inventory in the financial statements.

The essential concept behind full costing is to assign all variable costs to a service, as well as an allocation of overhead or fixed costs. A cost object is anything about which cost information is collected, such as a customer, product, service, store, geographic region, product line, and so on.

### *Full cost distribution*

The overhead and indirect costs are allocated to the different service by using different cost keys/drivers. The cost allocation keys should be closely linked to the causation of the costs. For example, costs for cleaning can be allocated by the number of the square meters of ground. For the overhead cost, the cost key can be the already allocated costs for the service.

Full cost distribution is a rather simple approach for cost allocation and requires rather less information on the service than other cost allocation approaches. Therefore, it is a common approach, especially in accounting. The selection of the cost key is essential to avoid a wrong cost allocation and a possible cross-subsidy.

### *Activity-based costing*

Activity-based costing (ABC) is an accounting method that identifies and assigns costs to activities and then assigns those costs to services. An ABC-system recognizes the relationship between costs, activities, and offered services, and through this relationship, it assigns indirect costs to services. This is less arbitrary than traditional methods, like the full cost distribution. For the allocation of indirect costs, activity-based costing uses no cost keys, but uses activities for cost allocation. The requirements for an ABC cost distribution are far more available data and a deep understanding of the processes in the specific service facility.

## **B. Single-till / Dual-till regulation**

This chapter discusses the single-till and dual-till regulation approaches related to service facilities in the railway sector. The choice between single-till and dual-till is heavily debated in the literature and there are different arguments for the possible pros and cons of either approach. This paper does not show a preference for single-till or dual-till, but it only briefly highlights the possible arguments and gives some case-studies.

Since most service facilities show features of natural monopolies, authorities consider it necessary to control the charges for service facilities and access to the service facility infrastructure. When a service facility operates both commercial and non-commercial activities (non-regulated and regulated activities), an issue arises. For example, the success of the commercial activities at railway stations is predominantly related to the RUs' demand for train services. This results in a relation between regulated activities like access to the network/train services and commercial activities with potential cross externalities. Due to these mutual dependencies between both activities, it appears to be worth considering a regulation of charges following a dual-till or a single-till approach.

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### 1. Single-till versus dual-till

Under the single-till principle, all activities of service facilities (including commercial and non-commercial) are taken into consideration when determining the level of charges. This contrasts with the dual-till approach, where only regulated activities are taken into consideration when setting charges, and common costs are split and charged to each separate activity.

It could be argued that the single-till approach is justified when there is interdependency between the regulated and commercial activities. However the existence of this interdependency between regulated and commercial activities is a necessary requirement for applying a single till approach. Charges under a single-till approach might result in the sharing of profits generated by commercial activities. In this case, the commercial services subsidise the regulated service and eventually leads to lower charges for regulated activities.

To illustrate this, let's use the case of passenger stations. Since regulated activities bring in passengers who use commercial services and contribute to their profitability, it could be considered reasonable that charges for regulated activities should also benefit from profits of commercial activities. Employing single-till instruments could be advantageous over dual-till regulation, since monopoly rents from commercial activities are shifted to the users, who also created these revenues as passengers<sup>15</sup>.

In the economic literature, passenger stations (like airports) may be regarded as a two-sided market (or platform)<sup>16</sup>. On the one hand, the service facility operator of a passenger station provides rail related services to RUs and, indirectly, to passengers. On the other hand, the service facility operator provides areas for commercial services (shops, restaurants, etc.). The passenger station plays the role of a platform which enables passengers and shops to meet: the more passengers use rail transport services, the higher turnover the shops and restaurants in the passenger station get. The positive externality<sup>17</sup> on the commercial/unregulated activities may argue for a single till approach, or a compensation mechanism from the unregulated activities to the regulated activities. If the unregulated activities subsidize the regulated activities, through a single till, it may be beneficial to the passengers (if RUs lower the prices of transport services because they incur lower charges or if they offer additional transport services for example) and may increase the number of passengers in the station.

However, there is also a risk that the opposite occurs when the regulated services cover costs of the commercial activities. The risk is increased by the fact that the SFO gets the incentive to invest in projects which are seen economically risky and in which the SFO would not invest, if the costs could not be transferred to the infrastructure charges. This may result in higher regulated charges. As Article 31 (7) mandates that RUs should only bear costs of the regulated service, this would violate the Directive.

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<sup>15</sup> A. I. Czerny and Anmin Zhang, Single-Till versus Dual-Till Regulation of Airports, 2015, <https://papers.tinbergen.nl/15049.pdf>.

<sup>16</sup> According to Jean Tirole a two-sided market (or multi-sided market) is "a market in which an intermediary enables sellers and buyers to interact" (Jean Tirole (2017), "Economics for the common good", Princeton University Press. According to Glen Weyl (2010), a two sided-market denotes a style of industrial organization modeling with three features : the platform is a multi-product firm (it provides distinct services to two sides of the market, with different prices), the platform generates cross network effects (user's benefits from participation depend on the extent of user participation on the other side of the market), the platform holds a bilateral market power ( the platform is a price setter on both sides of the market (Glen Weyl (2010), "A theory of multi-sided platforms", American Economic review 100.

<sup>17</sup> By externality one means an economic effect that results from an economic choice of an economic agent (a firm, a consumer ...) on other agents, [without monetary compensation](#) set by market prices.

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Therefore any single till approach needs to ensure that this can't happen. A dual-till approach makes sure that the regulated activities do not cover more costs than necessary for providing the service.

Single-till regulation is often assumed to be simpler to control as there is no need to determine the costs of regulated activities separately from commercial activities. However, due to the rule in Article 31 (7) that RUs should only bear costs of the regulated service, any operator not using dual till would have to prove that this limit is not exceeded. The logical tool for that would be to use a separated accounting system for the two types of activities.

Furthermore, within a single-till approach, the RB needs to extend the scope to non-regulated activities, e. g. defining the costs of capital for unregulated activities (WACC). In practice this may raise some problems, as for WACC the beta of similar companies is needed and such similar companies usually do not have regulated activities.

On the other hand, single-till regulation may give less incentive for efficient investments to develop commercial services.

## **2. Single-till or dual-till per country**

The choice for single-till or dual-till approach differs among the countries. Most countries use a dual-till approach to calculate the charges of the regulated activities. However, there are also a few countries which have a different approach or use combination of a single-till and dual-till approach. This paragraph highlights these case-studies.

### **France**

In France, the service facility operators have usually opted for a dual-till approach, except for passenger stations. Regarding passenger stations, a hybrid approach applies: 50 % of the profits generated by the unregulated activities are transferred to the regulated activities and lower the costs and the charges of the regulated services. A single-till approach, following the same costing methodology, would have increased the charges in many passenger stations because many "commercial areas" are vacant. This hybrid approach ensures that the commercial services subsidise the regulated services and not the opposite. This rule is in the French legislation for passenger stations only. French law mandates neither approach for the other service facilities.

### **Germany**

German law mandates neither approach. The largest operator of passenger stations has opted for a dual-till approach. Thus, there is a separation of costs which is examined by the RB every year. Using the dual-till approach, there are no direct benefit from commercial profits. However, currently the operator of passenger stations does not entirely charge the allowed rate of return for its regulated activities due to sufficient profits in the commercial area. So directly there is no benefit for the infrastructure charges, but there is one indirectly, as the SFO does not set the charges at the maximum level which is allowed according to the regulation law (costs plus profit), but below this level because of the high profit ratio in the commercial activities. This is an own decision by the SFO and primarily not inherent in the dual till-approach.

### **Italy**

In Italy, some services included in the basic station services enter in the MAP and for the MAP itself a hybrid system is foreseen: commercial activities (not connected with the rail infrastructure) contributes to

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reduce the total cost of MAP for half of their net margin, while other commercial activities from the use of rail infrastructure contributes for 100% of their gross margin. For other services, a dual till approach is foreseen.

### **GB**

In GB, a single-till approach is used. Track and station access charges are set every five years during a Periodic Review in which the RB sets the outputs that the IM has to deliver and the funds it needs. During this process, the IM submits its strategic plans to the RB. The submission includes the income that the IM expects to earn on activities such as commercial properties including service facilities (most of SFs are owned by the IM but are operated by private SFOs subject to a rent/lease fee negotiated between the IM and the SFO). This income is called “Other Single-Till Income” and is scrutinised by the RB. This income is then deducted from the gross revenue requirement. This leaves the RB with the “net revenue requirement” that it uses as the basis to set track and station access charges.

### **Spain**

In Spain, a dual-till approach is in place for the access to and the services provided in service facilities. Since last amendment of the Spanish law there is a definition for “basic services”, which are charged at the cost of providing them plus a reasonable profit. The same regulation applies to additional and ancillary services when there is just one provider (otherwise, no regulation applies).

Nevertheless, the Spanish law establishes a different treatment depending on the type of SFO. Nearly in all of the SF operated by the IM (except for freight or intermodal terminals and maintenance facilities), access tariffs (not the service itself) and the so-called minimum basic services (a category different from other basic services) are cost oriented, including mainly maintenance and replacement of the facilities. The Law, however, does not allow for charging a reasonable profit. On the contrary, normal basic, additional and ancillary services are charged at a cost of providing them plus a reasonable profit, applying the same regulation that applies to other SFO.

## **C. Subsidies**

In a number of countries, some SFOs receive subsidies from the state for offering a regulated service. The state provides the subsidy as it has an interest that the service is offered or that it is offered at a lower price than full cost. However, it is clear that the subsidy needs to be taken into account when the charge for using the service facility is set at the cost for providing the service, as this subsidy is given to cover costs that are not to be paid by the RUs.

When the subsidy is granted to cover a specific cost, it must reduce this cost when determining the cost for the service. If the subsidy is granted for offering a specific service, it must reduce the costs for offering this service.

However, subsidies can be granted for operational expense as well as for investments. If these are granted for specific investments, they usually reduce the cost of capital as the subsidies are deducted from the net book value of the assets and the depreciation for the useful time of the investment.

## **D. Charging unit**

Before the calculations of the charges are done, the correct charging unit must be selected.

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The used charging unit should reflect the utilization of the service properly. Any unit that may lead to a discrimination of users must not be used. In order to provide accurate charges and to avoid cross-subsidies, the selection of the charging unit reflects the cost drivers.

### **Differentiation in charges**

When charging units are selected it is possible to differentiate charges to reflect a different use of the service. When there is a differentiation in charges, this must be based on solid evidence and needs to reflect different needs/uses of the customers. Otherwise, it may result in a discrimination of groups of customers.

Differentiation in charges may encourage a most efficient use of the service. The charging units may then reflect incentives that lead to an efficient use or to avoid bottlenecks.

Here two examples, where the differentiation of charging units was judged by the RB discriminatory for station prices:

- In Austria, the IM charged differently for stops at stations for short-distance trains and long-distance trains. The argument was that passengers of long-distance trains need more and different services than customers of short-distance trains. Therefore, the charges for long-distance trains were about 25 % higher than for short-distance trains. As the IM could not provide proper evidence for the higher costs, the RB declared the higher charges for null and void.
- In Germany, the charges for passenger stations were amended in 2011 and the charging system included a differentiation of charges for stops at passenger stations depending on the length of the trains. Trains with a length between 90 and 170 m had to pay 20 % more per stop than trains with a length shorter than 90 m and trains with a length of more than 170 m had to pay 200 % more than trains with a length of 90 m. After complaints from the market and an investigation of the German RB, the IM changed the station price scheme in 2013 and introduced a new charging scheme.

### **E. Projected demand and cost of providing a service**

Usually, the costs for providing the service will be set into relation with the projected demand volume per charging unit.

The projection of the demand volume is essential for setting the charges and the overall cost of the SFO providing this service also depend on the volume of demand for his services. On the one hand, if the projection is too high, it may lead to charges below the correct level and therefore to a loss of the SFO for providing this service. On the other hand, if the projected volume is too low, it would result in charges that are set above the appropriate level and may lead to an additional profit for the SFO.

The risk, that the projected volume of demand is not met, is part of the usual business risk of a company and this risk must be reflected in the reasonable profit. However, the risk is that the demand volume is rather projected too low, than too high. Therefore, reasonable evidence for arguing the estimated demand volume needs to be provided. Usually, historic data are a good starting point and major deviations need to be explained. Also, further market developments need to be taken into account and need to be discussed with reasonable evidence.



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### **F. Multi-annual charges**

This chapter focuses on discussing the principles of calculating multi-annual charges, the different methods to calculate multi-annual charges, including indexation, price indices, correction mechanisms, and touches upon some case studies in the EU.

#### **1. Principles of multi-annual charges**

As the directive 2012/34/EU does not foresee any regulation on setting the charges on a yearly basis, it is possible to calculate charges for service facilities for more than one year. There are several reasons for setting multi-annual charges. An important argument to calculate multi-annual charges is efficiency, since it reduces the administrative costs of RBs and operators of service facilities. In addition, multi-annual charges provide predictability to investors and allow RUs to develop clear strategic plans because they know the level of charges for a longer period of time.

There are, however, a few conditions for setting multi-annual charges. First of all, the growth paths of the underlying costs should be relatively steady over the years. The growth path of costs can be increasing or decreasing, but it has to be predictable. If costs vary too much it is difficult to use methods to predict future costs in an accurate manner. Second, the tariff bearer – for example the volume of demand - should be steady or any changes in demand should be predictable in the same way. This ensures a good representation of the actual costs over multiple years.

#### **2. Indexation**

A technique to adjust annual charges to multi-annual charges is indexation. Indexation is used to set charges for upcoming years based on a level of costs which is in pace with the expected inflation. Cost which are in pace with the expected inflation are supposed to be a good predictor of the expected level of actual costs in future years. To predict inflation and purchasing power several price indices are developed.

Price indices are usually developed for a specific category of goods or services, during a specific time period and a specific geographical location in the form of a normalized average or a weighted average of price variables. It compares how these price variables, taken as a whole, differ between time periods or geographical locations.

There are broad (national) indices, for example indices which measure a society's general cost of living or more specific indices for a sector, or user group. In this case, the better the price index is pegged to service facilities, the rail, or transport sector in general the better it is expected to reflect the actual costs in future years.

In the Netherlands a consumer price index (CPI) is used to set multi-annual charges for the MAP. CPI measures changes in the price level of a sample of consumer goods whose prices are collected over a set period of time and predicts expected changes in price level in future years. The annual percentage change in a CPI is used to estimate inflation. For calculating the multi-annual charges of the minimum access package CPI is used to adjust for these effects of inflation. CPI is calculated by the Dutch statistical agency and it is considered to be the most reliable index available which predicts future changes in price level.

In GB the charges are set for a 5-year control period and are annually indexed using CPI.

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### 3. Correction mechanism

Setting multi-annual charges increases the risk of over- or undercharging since its cost allocation is based on a predicted level of costs in future years. To minimize this risk a correction mechanism could be put in place. When some costs (budgeted or actual) are considered to deviate too much from the original predicted costs, for example beyond a specified bandwidth, the level of charges can be adjusted.

For example, in France the manager of the passenger stations has introduced a correction mechanism for the cost of capital : for the major passenger stations with a total amount of investment over three years exceeding 5 M €, when the amount of the investments is lower than expected, a correction of the charges and the bills is made ex post. Moreover, a correction mechanism applies for all passenger stations when charging units (the number of stops in passenger stations) deviate from the expected charging units.

In the Netherlands, a correction mechanism is used to minimize the risk of over- or undercharging.. When the costs are expected to deviate more than 5 percent below or above the original budgeted costs the costs are adjusted.

## V. Productivity and performance objectives

According to recital (3) of the Directive 2012/34/EU (“Recast”), *“the efficiency of the railway system should be improved, in order to integrate it into a competitive market, whilst taking account of the special features of the railways”*.

Although they are not mandatory, productivity and performance objectives for service facility operators may contribute to enhance the railway system efficiency. Both are complementary: productivity goals aim at controlling the costs of the service and relate therefore to the economic management of the service facility operator. Performance objectives refer to the quality of the rail related services provided in a service facility and relate to the operational performance of the service facility operator.

According to recital (71) of the Directive “Recast”, *“Railway infrastructure is a natural monopoly and it is necessary to provide infrastructure managers with incentives to reduce costs and to manage their infrastructure efficiently.”* Recital (71) is in line with the economic theory which underlines the inefficiencies of a monopoly (higher prices, lower production, a lack of incentives to reduce costs and to innovate [...]).

In Member countries, some service facilities or services are not operated or provided in a competitive market environment with a variety of competitors providing comparable services. Moreover, some service facilities are “essential facilities”, which implies that they are in a natural monopoly market situation. According to recital (17) of Commission Implementing Regulation (EU) 2017/2177 *“Building a service facility requires significant investments and the network character of railways implies that there are limitations on where facilities can be constructed; as a result, many service facilities cannot easily be duplicated”*.

The principle of a cost-based approach should not be interpreted as the recognition of a model exempting the service facility operator from any effort to control or even reduce its costs. According to article 31(7) of the Directive 2012/34/EU, operators of service facilities should set prices such that *“the charge imposed for track access within service facilities referred to in point 2 of Annex II, and the supply of services in such facilities, shall not exceed the cost of providing it, plus a reasonable profit”*. The Directive does not require that the charge covers the cost of providing a service but sets a ceiling for the charge. As a result, the

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estimated expenses taken into account for the calculation of the charge can include a level of productivity, reducing therefore the *estimated* costs of the SFO.

### *Productivity and performance objectives*

The productivity objectives proposed by the service facility operators should be calculated on the basis of operating expenses for which they consider to have levers for action, that is upon which they can influence the level of the expenses concerned (recurrent expenses, personnel expenses in particular).

In line with the price cap theory, taking into account a productivity goal for the calculation of the charge would incentivize the service facility operator to exceed its productivity objective, without degrading performance. Any additional cost would be borne entirely by the service facility operator. Symmetrically, the additional productivity gains that could be achieved beyond the productivity objective may be kept by the operator.

As regards performance, it is important to notice that the level of operational performance and quality of service is related to the level of the estimated expenses. Therefore, it is essential to specify the performance objectives justifying the amount of the charges. The quality of service, however, is not as such a quantifiable element, which makes it complicated to measure. To evaluate the quality of service, it would be necessary to define specific indicators. The definition of indicators and performance objectives could be accompanied by a bonus / malus incentive mechanism to make credible commitments in terms of quality of service. When using productivity and performance objectives the RB should verify that the incentive mechanisms are sufficiently ambitious, so the service facility operator optimizes the operation of its service facility. However, the RB should also ensure that the incentives are not set too strict which would result in it having a decreasing effect on the quality of service. It should be noted that the powers of the RB to set performance and productivity objectives is strongly dependent on national charging schemes and national legislation.

According to IRG-Rail's knowledge, actual decisions regarding performance and productivity objectives for service facilities have only been made in France and Great Britain. In France, two decisions<sup>18</sup> (settlement of disputes) deal with productivity and performance, both for the operators of passenger stations. In 2017, the French RB asked SNCF Gares & Connexions to define (after consulting stakeholders (RUs...)) performance objectives, indicators to measure them and a financial incentive mechanism to make them be credible to achieve. Since 2018, the managers of passenger stations have introduced several quality of service indicators (for cleaning, availability of elevators and escalators, passenger information, satisfaction...) with annual objectives and a financial incentive scheme. In GB, the station long term charge (LTC) is set at the level that the RB considers to reflect the IM's efficient operational target.

## VI. Conclusions

This paper is a first report based on RBs experiences and ways of setting charges for service facilities. The charging principle of Article 31(7) of Directive 2012/34/EU on setting charges for service facilities is discussed, as well as problems and decisions of regulatory bodies when investigating the charges of service facility operators.

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<sup>18</sup> [www.arafer.fr/wp-content/uploads/2017/03/Décision-2017-008-du-1er-février-2017-RDD-Nouvelle-Aquitaine-c-SNCF-Gares-et-Connexions-VERSION-PUBLIQUE-3.pdf](http://www.arafer.fr/wp-content/uploads/2017/03/Décision-2017-008-du-1er-février-2017-RDD-Nouvelle-Aquitaine-c-SNCF-Gares-et-Connexions-VERSION-PUBLIQUE-3.pdf) and [www.arafer.fr/wp-content/uploads/2017/03/Décision-2017-018-du-22-février-2017-RDD-Nouvelle-Aquitaine-c-SNCF-Réseau-VERSION-PUBLIQUE.pdf](http://www.arafer.fr/wp-content/uploads/2017/03/Décision-2017-018-du-22-février-2017-RDD-Nouvelle-Aquitaine-c-SNCF-Réseau-VERSION-PUBLIQUE.pdf)

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**Appendix**

The following list contains the service facilities, and additional- and ancillary services listed in in Annex II of Directive 2012/34/EU.

*"2. Access, including track access, shall be given to the following services facilities, when they exist, and to the services supplied in these facilities:*

- (a) passenger stations, their buildings and other facilities, including travel information display and suitable location for ticketing services;*
- (b) freight terminals;*
- (c) marshalling yards and train formation facilities, including shunting facilities;*
- (d) storage sidings;*
- (e) maintenance facilities, with the exception of heavy maintenance facilities dedicated to high-speed trains or to other types of rolling stock requiring specific facilities;*
- (f) other technical facilities, including cleaning and washing facilities;*
- (g) maritime and inland port facilities which are linked to rail activities;*
- (h) relief facilities;*
- (i) refuelling facilities and supply of fuel in these facilities, charges for which shall be shown on the invoices separately.*

*3. Additional services may comprise:*

- (a) traction current, charges for which shall be shown on the invoices separately from charges for using the electrical supply equipment, without prejudice to the application of Directive 2009/72/EC;*
- (b) pre-heating of passenger trains;*
- (c) tailor-made contracts for: — control of transport of dangerous goods, — assistance in running abnormal trains.*

*4. Ancillary services may comprise:*

- (a) access to telecommunication networks;*
- (b) provision of supplementary information;*
- (c) technical inspection of rolling stock;*
- (d) ticketing services in passenger stations;*
- (e) heavy maintenance services supplied in maintenance facilities dedicated to high-speed trains or to other types of rolling stock requiring specific facilities."*