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# Fourth Annual Report to the Parliament

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# Part one - Competition by comparison in transport

Competition by comparison (or yardstick competition) stimulates regulated firms to undertake competitive behaviours even in the case of markets where actual competition is hindered (Baumol, 1997). This situation often occurs in the transport sector, where relevant markets are often characterized by a small number of firms operating under natural monopoly conditions on, for example, specific market segments or geographic areas. This regulatory method, which is increasingly analysed in the economic literature, has been applied in the transport sector in Italy, too. In particular, the Authority applied it for the definition of optimal management areas in the highway sector and is currently carrying out inquiries in other areas, starting from regional rail transport. The characteristics of the method together with a review of the relevant economic literature and a description of the areas of application by the Authority are summarized in what follows.

# 1. Why competition by comparison is relevant?

The structural absence of competitive mechanisms within a market does not necessarily create a welfare loss for the society as a whole. The possibility that a firm - operating, for example, in different segments of an industry or in different geographic areas - competes on that market with the incumbent monopolist allows, in fact, to achieve results similar to those of the so-called competition "in the market". This is the case of the so called "competition for the market" which is used, for example, for the tendering of local public road transport services or railway services and for motorway concessions. A well-structured tender ensures the participation of potential competitors and avoids that excessive profit levels be achieved by the winning bidder.

On the other hand, even in the absence of both forms of competition, the "structural" one in the market and the one triggered by competitive mechanisms "for the market", economic regulation may step in to correct distortions and induce undertakings to adopt behaviours in line with a competitive approach even in those markets where no conditions for the development of competition are actually in place (Baumol, 1997). These goals can be pursued through the "competition by comparison" (or yardstick competition).

In general, regulation can pursue various goals, inter alia ensuring the unfolding of competitive dynamics through equitable and non-discriminatory access to existing infrastructures, promoting productive efficiency, improving service quality and containing costs for end users. Where legislation imposes that the economic and financial equilibrium of the regulated firms must be ensured, the regulator should make sure that firms provide the required level of service at a tariff, including any public subsidies, which is in line with this cost.

Actually, natural monopolies are generally, but not always, subject to "cost-of-service" regulation. In these cases, the regulatory body defines the pricing criteria so as to allow that the revenue stream (including public subsidies, if any) be in line with that of the costs actually incurred in providing



services to consumers. In this way, the action by the regulatory body limits what the economic theory identifies as a welfare loss due to the generation of extra profits, for example.

However, such "cost-of-service" charging scheme involves critical issues that make its implementation difficult and sometimes ineffective. In the first place, the actual costs incurred by the regulated entity may be not fully assessed by the regulatory body due to information asymmetries, thus giving to the firm an information advantage. Secondly, cost-of-service regulation does not adequately address the issue of an efficient cost reduction by the regulated entity. Actually, if prices are determined so as to reflect costs, the firm has little incentive to contain costs, especially where cost functions and their reduction potential are not known or may not be examined by a public decision maker.

Therefore, where public policy objectives integrate the targets of cost containment and promotion of innovation, cost-based regulation may be inadequate and the regulatory body needs an additional "benchmark" to evaluate business performance compared with present and past performance levels. The benchmark should allow to determine the entity's efficient costs and set a tariff, or a "tariff dynamics", accordingly. Based on appropriate and robust quantitative methods the regulatory body may identify this benchmark by comparing performances of the entities operating in a specified sector.

# 2. The functioning of competition by comparison

According to the previous considerations, competition by comparison or yardstick competition is a tool to introduce incentive mechanisms in the markets where such incentives are lacking due to the absence of direct competition. This constitutes a third form of competition, i.e. indirect or simulated competition, on top of the competition in and for the market.

As mentioned above, yardstick competition is achieved by comparing the performance of regulated firms operating in the same industry, with the ultimate aim of improving the productive efficiency of all firms operating in a market. As for the policies of competition for the market, this virtual or indirect form of competition does not introduce competition in the market, but serves as an incentive mechanism to improve firm efficiency.

By applying this method, regulatory bodies identify, for example, a tariff or subsidy for a certain firm that does not directly depend on its costs, but on the estimated efficient costs for the entire sector and/or for similar firms operating in the same sector. These efficient costs are determined by a quantitative analysis of the costs of all firms operating in the same industry, which not only are likely to use the same production technology, but also provide similar services to those of other firms operating in the same industry. The efficiency targets defined by the regulatory body for an operator are thus related to the performance of the firm itself compared with the performance of other firms which the first is compared with. It follows that the performance of a regulated firm is correlated with its position with respect to the efficient cost level evaluated by the regulatory body.



It should be emphasised that firms involved in the benchmarking do not necessarily have to be in direct competition with each other. Indeed, it is sufficient that they carry on the same activity for the purpose of a significant comparison. Consequently, competitive comparisons can be made both domestically, i.e. across firms operating in the same territory and in the same industrial sector, and internationally, i.e. across firms which, while operating in geographically different markets, are similar from a strictly product perspective, i.e. they provide similar goods or services. Of course, in the latter case, the comparison shall be made with due consideration, taking into account the institutional, market and structure peculiarities (such as the different degree of public contribution or the specific regulatory constraints which the firms are subject to). In the rail sector, for example, EU countries differ significantly in terms of degree of infrastructure expansion and vertical integration, level of public contribution, market share of the main operator, development of high-speed network, passenger and freight traffic volumes and their distribution, and so on. Nonetheless, as further illustrated below, competition by comparison can be still carried out, provided that such structural, geographical or institutional differences are appropriately taken into account.

A major advantage of yardstick competition is that its implementation does not require the regulatory body to be acquainted with the technical arrangements by which an operator intends to pursue cost-cutting policies. Technical and economic data provided by the enterprises operating in the sector, covering accounting, regulatory accounting and technical data for the sector at issue, are sufficient for this purpose.

Actually, the most significant benefits of yardstick competition arise in presence of strong information asymmetry, where a correct ("truthful") measurement of current costs is difficult. In these cases, it is difficult to apply a cost-reflective pricing scheme, since real costs cannot be exactly allocated to tariffs, nor can internal efficiency targets be achieved as the regulatory body finds it difficult to determine the exact level of efficient costs. Yardstick competition allows to overcome these critical issues as the regulated tariff would not depend on its actual cost level, but only on that of other firms operating in the same industry; hence, the regulated firm will thus be urged to reduce its costs so as to achieve costs in line with the efficient costs of the sector.

Competition by comparison has an additional and not negligible advantage, which is linked to its ability to neutralize the effects of so-called "idiosyncratic" errors, i.e. the impact of cost variations due to events that cannot be controlled by a firm, such as a sudden increase in oil prices or a downturn in national GDP which leads to a drastic reduction in the demand for services by end-users. In fact, if external events have a horizontal impact on the entire industry and result in increased costs of all firms, or in decreased demand, comparison tariff scheme implemented through yardstick competition will provide firms with a kind of insurance as it would recognize a charge increase equal to the increase in the efficient cost of the industry. Hence, any regulated firm would not be penalised for events that do not depend on its performance. In this respect, yardstick competition reduces the risk of regulated firms by limiting their vulnerability to such measurement errors.



## 3. Policy goals and objectives

Policy objectives that can be achieved by the application of the competition by comparison are considerable and cover incentive targets for increasing the productive efficiency, the acquisition of relevant information to public decision-makers, the definition of the optimal dimension of a service area and the analysis of the productivity change. A more detailed analysis of these issues follows below.

Yardstick competition is characterized by being a powerful incentive method for regulated firms to adopt cost efficient behaviours. Indeed, by relating the tariffs or subsidies of a firm with the costs of similar ones, the regulatory body may induce firms serving geographically different markets, but operating in the same sector, to be subject to a kind of indirect competition: actually, if an operator is able to reduce its costs to a greater extent than other operators, it will derive immediate benefits because the tariffs or subsidies received will reflect the higher costs of the latter.

Thus this regulatory scheme provides the firm with the incentive to reduce its costs below a certain threshold taken as reference (such as the industry average), in order to achieve a higher profit margin. Since this target is shared by all operators in the sector, the collective effort to seek greater efficiency than comparable firms ultimately leads to the reduction of the average cost over the long term. If firms are very similar, or if any differences are taken correctly into consideration, competition by comparison proves to be more effective than cost-of-service regulation thanks to the strong incentive to enhance productive efficiency.

In addition to the incentive objective, comparing firms' performance can also bring considerable benefits in terms of information acquisition both from a regulatory and public decision-maker viewpoint. In particular, a direct consequence of the incentive to increase efficiency under the yardstick competition is the evaluation of the efficiency gains of a firm compared to the average efficiency of the industry. Indeed, the comparison over time of a firm performance with those of other firms provides a measure of the ability of the regulated firm to reduce its costs. This information is not only an important tool for setting up regulatory actions and enhancing their effectiveness, but is of particular significance for public-decision makers: information can then be used to appropriately set public subsidies aligned to the efficient cost to provide a subsidized service. This information is of great value to all companies as well, as it provides each of them with an industry benchmark and an indication of its ranking with respect to such benchmark, while also allowing to identify best practices in the industry.

Within yardstick competition, two additional policy objectives may be identified. First, the comparison of firms operating within the same sector allows to estimate the optimal dimension of the service, as well as to identify the existence of economies of scale and assess their size. The results of these analyses allow to identify the potential savings that could be achieved by redefining the level of integration in the industry. For example, the existence of economies of scale which are not fully exploited could lead the public decision-maker to increase the dimension of firms operating in a sector (i.e. the area served and/or the volume of the service provided), by encouraging



expansion of activities (through mergers of firms or concessions) aimed at achieving further cost savings.

Secondly, the intertemporal analysis of firms' performance provides accurate information on the evolution of the historic productive efficiency. In this respect, yardstick competition is a useful tool for monitoring the performance levels achieved by the industry as a whole. Moreover, firm efficiency is not the only tool to be focused on, and cost considerations are increasingly being associated with others which are more focused on the provision of service quality. Analyses by comparison that take due account of the service quality, amongst other more economic variables, allow to define a level of efficient cost that includes the service quality level. This is clearly a priority when the competition by comparison is applied to areas where the quality of service is significant and at the same time considerably affects the costs of delivery of the final service.

# 4. Potential limits in its application

As for its implementation, yardstick competition may face some critical issues. One of the main problems is the possibility that firms are largely heterogeneous, in terms of size and cost or in relation to demand or institutional or geographical contexts in which they operate. Firms may have peculiarities with respect to geographic location, demographic, economic and social characteristics of their reference markets (e.g. in terms of households density, income level of citizens, unemployment rate, infrastructures development and so on) or as for the political and regulatory institutions that may directly or indirectly influence the performance of the business activity.

Of course, these environmental, political and regulatory factors have an impact on costs so that firms operating in different situations, despite operating in the same industry and being equally efficient, may have a significantly different cost structure. Consequently, as already noted in the literature (Shleifer, 1985), a simple comparison based on unit costs might be insufficient and inadequate as it would attribute the high variance observed to the inefficiencies of some firms rather than to the intrinsic different context. Therefore it appears necessary to ensure that the implementation of regulation-by-comparison schemes provides for mechanisms to correct differences due to those external factors. In other words, these (institutional, geographic or structural) peculiarities need to be taken into account in the analysis of the regulated firm's cost structure so as to define an efficient cost that is appropriately evaluated also on the basis of such exogenous factors. Failing this, heterogeneity would cause distortion in the results of the comparison, making the implementation of such regulatory mechanism ineffective. Hence, a policy issue for the regulatory body is to ensure an appropriate degree of significance within the comparative procedures, both with respect to variables to be considered as direct sources of costs and with respect to indirect ("controlling") variables.

A second issue concerns the possibility that regulated companies establish collusive agreements aimed at providing incorrect information so that firm comparisons are performed on cost levels that are much higher than the actually efficient ones (Tangeras, 2000). A collusive agreement is generally referred to as a cooperative behaviour among firms that exchange information and



coordinate their actions instead of competing against each other. For a yardstick competition scheme to be effective, it is necessary that firms act in a non-cooperative manner and determine their performance independently. Should they agree on a low level of effort, yardstick competition would be ineffective for the purpose of stimulating greater productive efficiency. From this perspective, the importance of monitoring any exchanges of information among firms is self-evident. The monitoring activity is all the more important because yardstick competition generates a strong incentive to collusion: by anticipating that the comparison of their performance will impact on their profits, firms may in fact be motivated to coordinate in order to counteract regulatory effects.

With respect to other forms of regulation, yardstick competition is highly effective even in contexts affected by information asymmetry and allows to achieve better results in terms of social welfare thanks to its high ability to encourage investment. However, it should be pointed out that the size of the incentive to invest actually depends on the nature of the investment itself. Indeed, in the case of yardstick competition, regulated firms would focus their efforts mainly on those investments aimed at increasing efficiency and productivity, the benefits of which can be therefore fully appropriated (Guthrie, 2006).

On the other hand, competition by comparison is less effective with respect to investments characterised by positive externalities on other businesses of the industry. In particular, regulated firms might have lower incentive to make investments which are beneficial to the entire industry and have a positive impact on the technologies adopted by all firms, such as investment in research and development. The reason is that these investments, when directed to reducing the average costs of the sector in the medium and long term, may not be adequately remunerated if the regulatory body sets a regulatory intervention discouraging their implementation. From this point of view, the transport sector is characterized by an interesting technological development, although it is apparently less marked than that of other network industries, such as telecommunications and energy.

#### 5. Methodological issues

The main purpose of yardstick competition, or benchmarking is to compare the performance of firms operating in the same industry, namely to identify the most efficient operators and provide a firm ranking. Therefore, performance benchmarking is used to check whether a firm is efficient in comparison with its market peers.

Several methods are used in the literature to analyse performance and efficiency of public utilities in general (e.g. Coelli and Lawrence, 2006). They include non-parametric methods, mainly based on Data Envelopment Analysis (DEA) and parametric methods, which apply, among the other methods, the so-called Stochastic Frontier Analysis (SFA).

The DEA method compares the performance of different firms through different input/output ratios which are not linked one another by a specific functional form. The advantage of this scheme is that



it is more flexible than parametric methods, which use predefined functional forms, but its effectiveness strictly depends on the correct choice of the combination of input/output variables. Further, the method does not allow to directly consider any (institutional, geographic or structural) variables that have a significant impact on the cost structure of a regulated entity, nor to determine the estimation of sectoral efficient costs.

The performance and efficiency of public utilities is also studied with parametric methods, an example of which is the stochastic frontier analysis. Although the key assumption of this method is a specific technology structure, which is always difficult to define at functional level, it is the most used in the economic and regulatory practice and realistically allows to take into account any exogenous shocks (i.e. outside the firm control) that may originate over a specified period of time.

At an operational level, an analysis of the efficiency of a regulated entity is conducted by estimating a total or operating cost function, depending on the context under analysis. These methods may also be used in parallel so as to test the robustness of the analysis and the results of the application of a specified method.

In order to perform such a study, some procedural steps are essential to ensure the robustness of the analysis.

First, parametric frontier estimation requires detailed data with respect to both the cost items of the production factors and the physical units referred to these factors. These data are typically derived from the accounts of the operators or from regulatory accounting data, as for economic variables. Regulatory accounting data by their nature are obviously more disaggregated and, therefore, more suitable to perform benchmarking analyses; nevertheless, if they are not available, accounting data are still a useful benchmark. These economic data need to be accompanied by technical and production data to better take into account the technological issues of the provision of services in the specific industry considered. Collecting detailed data, such as regulatory accounting, is particularly important when benchmarking is conducted in contexts with a very different firm sample, where, for example, a firm alone represents a substantial share of the entire reference market. In this case, data disaggregated by territorial areas or by type of contract may still allow meaningful analyses.

The second step is the identification of all factors - "control variables"- that affect the costs of a regulated entity and may be exogenous to its behaviour. For example, in case of an analysis of the rail infrastructure management in an international sample, the policy maker should take into account the different degree of vertical integration and subsidization of firms. In the analysis of rail transport or bus services, it is important to consider the territorial morphology and density of the population served. For the highway concessionaries, it is necessary to consider the existence of major works whose maintenance generates additional costs for the concessionaire. For this reason it is essential to identify ex ante the main economic and non-economic factors that tend to influence the costs of a regulated firm, measure each of these factors and include them into the cost analysis so as to take into due account the sample heterogeneity and, at the same time, determine an



efficient cost level representing this heterogeneity. At the same time, it is necessary to avoid the duplication of variables to measure the same effect.

The third step is the definition of the functional form that is intended to be used to study firm's costs. Two functional forms are commonly used in the regulatory practice. By using the Cobb-Douglas function it is assumed that the production factors can be combined with a constant elasticity of substitution. This is the simplest and most intuitive functional form for interpreting coefficients, while imposing more restrictions on their values. On the other hand, the translogarithmic function represents the most flexible functional form, especially with respect to economies of scale that may vary with output level, but requires a large number of observations. Further, the former is typically used when it comes to studying productivity developments over time and comparing the performance of several firms, while the latter is more appropriate in evaluating the optimal dimension of a service, i.e. the existence of economies of scale in the provision of a service.

The final step is the definition of the methods of estimation. Quantitative analyses, based on a large database including firms observed over several years (so-called panel data), can be performed with different methods depending on the assumptions that are made on the cost function and, in particular, on those concerning the statistical distribution of the measurement error. The main methods are Fixed Effects Estimations (Lee and Smith, 1993), Generalized Least Squares (GLS), Maximum Likelihoods Estimations (MLE) (Pitt and Lee, 191, Battese and Coelli, 1988 And 1995) and True Random Effects estimation (Greene, 2005). In practice, however, different methods are used and their results are compared in order to check their robustness.

### 6. The applications of Yardstick competition in transport industries

This section provides a summary of the economic studies on yardstick competition applied to different transport systems and, in particular, to rail and local public road services, as well as to highway concessions and airport management. Recent works based on the stochastic frontier method both at international and, wherever possible, national level are taken into consideration. The aim is not to provide a detailed description of each of these works, but to describe the results of those studies and, above all, present the variables used in the quantitative estimations. The purpose is to analyse theoretically how to define the set of variables to be used in a cost function analysis.

#### **Railways**

With reference to rail transport, the main literature is summarised in Table 1. Many of the existing studies have a purpose other than the analysis of the comparative efficiency of railway undertakings. Typically these works are aimed at comparing the performance of railway undertakings (vertically integrated or not) at international level and to assess the expediency of specified policies, in particular whether vertical integration or separation should be preferred for cost efficiency.



In particular, the study by Mizutani and Uranishi (2013) presents an estimation of a total cost function to assess whether a vertical separation (infrastructure manager and railway undertaking) or horizontal separation (passenger and freight services) reduces costs or not, therefore generating greater or lesser efficiency. Similar studies have also been carried out by Oum and Yu (1994). Other international studies which have used parametric cost function estimations have been conducted by Sanchez and Villarroya (2000), Cantos Sánchez (2001), Jensen and Stelling (2007), Friebel et al. (2010), Smith and Wheat (2011) and Smith (2012). Mizutani and Uranishi (2013) use a sample of 30 "railway organisations" operating in 23 OECD countries (both in Europe and East Asia) over a period of 14 years (1994-2007). The above-mentioned analysis is particularly interesting because it is one of the few international studies that apply a considerable number of control variables in the cost function estimation. The results show that a horizontal separation of different transport businesses generates cost savings, while vertical separation can generate greater efficiency in relation to train density, i.e. the ratio of train\*km/total km per day. Vertical separation appears to be socially preferable in case of low density levels, while vertical integration is desirable in case of high density levels.

On the other hand, studies focusing on the costs of firms providing rail passenger services are quite limited (Leveque, 2004; Farsi, Filippini and Greene, 2005; Wheat and Smith, 2015; Boitani, 2016 and Thiebaud, 2016).

Leveque's research (2004) is the first study producing a cost-frontier function estimation for the purpose of implementing a sort of yardstick competition among regional units managed by the same railway operator, the French company SNCF. The data relate only to the 1997-1998 two-year period for 22 regions. The study shows a strong heterogeneity in the performances across the regions, therefore demonstrating, from a policy perspective, that the implementation of competition by comparison may lead to further improvements in terms of lower operating costs.

The study by Farsi, Filippini and Greene (2005) considers 50 Swiss transport undertakings from 1985 to 1997. It should be noted that the study involves operators providing passenger services and freight services, whereas those providing local transport services are excluded. Further, some of these operators are integrated also in road transport, but, as cost data are not regulatory accounting data, these costs have not been deducted. The study highlights the existence of large economies of density and substantial economies of scale.

The research by Wheat and Smith (2015) focuses on the Anglo-Saxon market and, in particular, on the performance of the British railway undertakings, the so-called Train Operating Companies (TOCs). The purpose of the study is to verify that the analysis of scale performances is not sufficient to define the optimal size of a service, whereas it is necessary to integrate the scale measures with measures that take into account the heterogeneity of the final services provided. It should be noted that sometimes British TOCs operate very different services, some of them focusing only on interregional lines or with specific trains (mid-high speed intercity). The authors perform a cost function estimation by using data of 28 TOCs over a period of 11 years (2000-2010) for a total amount of 244 observations. The results show that service heterogeneity (in particular, service



differentiation in the London area, Intercities and in the North and West) leads to different levels of economies of density and of scale.

The study by Boitani (2016) performs a cost function (not a cost-frontier) estimation by seat-kilometre using data on 95% of the services included in access contracts in Italy. The purpose of the research is to determine a standard cost of the service and its optimal size, by analysing existing economies of scale in Italy. The study shows that economies of scale appear to be significant and that the optimal service areas seem to be sometimes better than existing regional areas.

Thiebaud (2016) analyses the situation in France and, in particular, the effectiveness of the mechanism for the award of regional services in 20 French regions in the 2009-2012 period. The results show that the French historical operator seems to adopt opportunistic behaviours by shifting some cost categories towards the end of the concession, and that the higher the share of costs that cannot be subjected to the regulatory body's efficiency policies, the greater the cost inefficiency of the undertaking.

#### Local public transport

Unlike rail transport, studies on local public road transport are quite a number and so are those on the Italian situation. In this report we shall only review the latter which are summarised in Table 2. For a detailed summary of international studies, see Cambini et al. (2007). In this respect, some research (Fazioli et al., 1993; Levaggi, 1994) highlights the existence of economies of scale and density in the service provision, but their significance decreases as the size of the undertakings increases. More recent studies have been carried out by Fraquelli et al. (2001, 2004) on a sample of 45 public transport firms operating in urban and suburban areas from 1996 to 1998. The authors point out that the business operating scale, measured in terms of average number of employees, is a significant variable in the evaluation of existing economies of scale in this sector. The study by Fraquelli et al. (2001) highlights a cost advantage for medium-sized operators, with a ∪-shaped curve of the average unit cost. This would reflect the initial existence of economies of scale and following diseconomies of scale. In fact, the average unit cost decreases from about 0.43 euro for small operators to 0.38 euro for medium-sized operators and increases up to approximately 0.51 euro for large operators. The minimum optimal scale corresponding to this trend seems to be identified within the range of 638 to 1,500 million seat-kilometres offered.

On the other hand, Cambini, Paniccia, Piacenza and Vannoni (2007) and Cambini et al. (2007) focus on the factors that affect the cost structure of operators providing local public transport services in large urban and metropolitan areas and find economies of scale and of density regardless of the type of service supplied (whether urban or mixed).

Other studies compare Italian and foreign operators supplying local transport services in Europe. Cambini and Filippini (2003) and Fazioli et al. (2003) carry out a study on the evaluation of efficiency of Italian and Swiss bus operators. The results point to cost inefficiencies for all types of operators, but also to the existence of economies of density and of scale for all the size classes taken into account. More recently, Boitani et al. (2013) compare the productivity (hence not the costs) of 77



local public transport firm operating in large cities in the EU15 (including 14 Italian companies) and find that not only the average unit costs are lower where competitive procedures are used for the award of services, but also that, above a certain threshold, disparities of scale in the provision of services are in place.

#### Toll road and highway concessionaires

The number of EU and Italian studies on the cost structure of road and highway concessionaires is more limited. The following studies - summarized in Table 3 - relate to the Italian or Norwegian context. Amdal et al. (2007) study a cost function of twenty-six toll road operators over the 1998-2004 period. The analysis is aimed at the estimation of an average cost function and, therefore, not at determining the efficient average cost of the service which can be analysed only by using efficiency frontiers. The purpose of the research is to check whether there are untapped economies of scale and whether there are potential efficiency gains that can be achieved through the adoption by the public decision-maker of competitive procedures for awarding the management of toll road sections. The results show that average operating costs reach their minimum value around 190 million paying vehicles per year levelling off thereafter. Unit operating costs drop by approximately 24% in case of award by competitive procedures. As for the Norway, Welde and Odeck (2011) perform a cost-frontier estimation on a sample of 20 toll road operators observed from 2003 to 2008. In line with the previous results, the authors show that significant efficiency gains are possible and that such gains are more than proportional to the managed traffic.

Massiani and Ragazzi (2008) and Benfratello et al. (2009) have conducted two interesting studies in Italy. The former carries out an efficiency frontier estimation by using data from 18 Italian motorway concessionaires observed in 2006. The reference variable is represented by the operating costs of these concessionaires. The results show that a strong heterogeneity in the productivity levels of concessionaires is in place and that the application of the competition by comparison can be effectively implemented to increase the overall efficiency of the system.

The study by Benfratello et al. (2009) carries out a panel-based analysis with a sample of 20 motorway concessionaires observed from 1992 to 2004. The authors estimate an average cost function (rather than a frontier estimation) with the purpose of verifying whether the sector is characterized by economies of scale or not. In particular, it is shown that economies of scale seem to be exhausted for concessions with length (km) above 300 km.

## **Airport management**

With respect to airport management, the economic literature carrying out benchmarking on several operators focuses more on the comparison of airport efficiency rather than on cost efficiency. These studies are summarised in Table 4.

Based on a sample of 34 European airports observed between 1995 and 1997, Pels et al. (2003) estimate a number of production (rather than cost) stochastic frontiers with reference to both air traffic and passenger movements. The study shows that European airports present more or less high levels of production inefficiency and there are increasing incremental scales for airports with at least



12.5 million/year in terms of passenger traffic, whereas the returns to scale are constant for freight movements.

Oum, Yan and Yu (2008) investigate the effects of the type of ownership on airport cost efficiency with a sample of major airports in the world showing that airports controlled and operated by privately owned companies reach greater efficiency levels than those operated by mixed companies whose majority is owned by the Government. Barros (2008a and 2008b) carries out frontier analyses on the operating costs of British and Portuguese airports, respectively, finding in both cases an airport ranking in the analysed countries and substantial levels of cost inefficiency.

Martín et al. (2009) analyse the efficiency of Spanish airports operated by a single operator (AENA). The authors make a long-term total cost frontier estimation. The sample includes 37 airports over the period from 1991 to 1997. The results show that cost inefficiencies range from 15% to 26% on average and that larger airports are typically the most efficient as for costs.

The study by Scotti et al. (2012) analyses a production (rather than cost) frontier for Italian airports with a sample of 38 airports observed between 2005 and 2008. In particular, the research examines the efficiency level in the airport management with respect to the level of airport competition, which is measured by an index based on the ratio between the number of seats available for each route at an airport and the total number of seats available at the same airport, i.e. an indicator of potential demand in the airport under consideration.

### 7. Initial applications by the Authority

The Authority applied the method of competition by comparison in order to "(...) define optimal management areas of toll motorway sections so as to promote plural management and foster competition by comparison", pursuant to the law establishing the Authority (article 37 (2) (a) of decree law no 201 of 6 December 2011, converted with amendments into law no 214 of 22 December 2011). For this purpose, since the beginning of 2014, the Authority started an analysis of the development of the production costs of (both small and medium-sized) motorway concessionaires so as to determine the so-called "efficient cost frontier". This "frontier" is the set of points that identify the minimum cost of production for each output level (e.g. traffic volumes or length of the section under concession), given the prices of production factors and the qualitative and quantitative characteristics of existing technology. The curve formed by these points has been used to determine the minimum optimal size of production (i.e. the size below which significant "diseconomies of scale" are clearly observed.)

In particular, the analysis of economies of scale allows to verify whether the total cost increases to a proportionally greater or lesser extent than the increase of both output (traffic volumes) and geographic size of the network. Therefore, economies of scale are useful to check whether the total cost of production decreases by expanding the production activity both in terms of traffic volumes and network kilometres. In a motorway industry that has been characterized by a large variety in



terms of size of the concessions granted, these results are of considerable interest from the regulatory viewpoint as they provide guidance on the optimal size of a network concession.

Drawing on the a.m. studies, and in particular on the analysis by Benfratello et al. (2009), the Authority defined a method to study the costs of Italian motorway concessionaires by introducing some innovations in the existing studies. In particular, the Authority examined both variable cost functions (including only the operating costs of concessionaires) and total cost functions (including also an estimation of capital costs). Further, a greater number of control variables have been introduced in order to better capture the concessionaire heterogeneity, such as that related to the different depreciation policies with respect to remaining life of the concession, quality of service (in relation to the road surface) and structure of the concessionaire. The Authority applied both the Cobb-Douglas and Translog functions, as mentioned above, as well as different estimation methods (both frontiers and cost functions) to test the validity and robustness of the results.

The results of the analysis, transposed into Decision no. 70/2016, show that, irrespective of the method used (frontier or cost function estimation) and the type of (total or variable) estimated cost, the value of 180 km (corresponding to the 75th percentile of distribution in the sample examined) is the minimum threshold value for the optimal length (km) of the motorway infrastructure subject to a concession. The maximum threshold, despite varying according to model and sample used, was estimated at approximately 315 km, whereas for lengths exceeding 315 km no additional efficiency gains related to industrial and structural aspects of motorway concessionaires seem to be generated. These results are without prejudice to any further policy evaluations.

Thereafter the Authority initiated to investigate the possible application of the competition by comparison to other areas of economic regulation falling within its remit. In particular, by Decision no 69 of 18 May 2017, a proceeding was started to identify methods and criteria for defining efficiency objectives for the operation of regional rail passenger services subject to public service obligations.



Table 1. Empirical analysis for cost estimation of railway operators

Author	Data	Dependent variable	Output	Input	Environmental or context variables	Functional form
Leveque (2004)	22 Regions 1997-1998	Operating costs	Total train-km	- Length (km) of regional network - Price of inputs (assumed as constant and therefore not included)	- Delinquency rate - Average load factor - Train average speed - # rolling stock	Cobb-Douglas
Farsi, Filippini, Greene (2005)	50 operators 1985-1997	Total costs	passenger-km ton-km	<ul> <li>Price of labour: labour cost / # of total employees</li> <li>energy price: energy cost/power consumption (kWh)</li> <li>Cost of capital (total costs - labour costs - energy costs) / total number of seats offered</li> </ul>	- Network length (Km) - Time dummies	Cobb-Douglas
Wheat & Smith (2015)	28 operators 2000-2010	Total costs – charge costs	- length (km) of lines - total train hours - # stations served	<ul> <li>Price of labour: labour cost / # of total employees</li> <li>Non-payroll price: (Rental costs of rolling stock, maintenance costs, energy costs and other costs)/ # rolling stock</li> </ul>	- Train average length: vehicles-km/train-km - Average speed (train-km/train hours) - Load factor: passenger-km/train-km - # operated rolling stock - # operated stations - Dummy for Intercity TOC - Dummy for trains operating in London & South Eastern	Translog (with hedonic variables)
Boitani (2016)	29 service agreements 2014	Total costs	- Seat-km - Train-km	- Price of inputs (assumed as constant and therefore not included) - Commercial speed	- Train service productivity = train- km/number of trains used - Hours of operation - Seats per travel	Cobb-Douglas
Thiebaud (2016)	20 regions 2009-2012	Net costs = total costs – revenue from charges = fees payable under the Agreement	Vehicles-total km	- Load factor - Price of inputs (assumed as constant and therefore not included)	- average # of stopping points per line; - Network complexity/existence of important nodes - # stations per area served - # stations per network length - # remaining years to end of concession	Cobb-Douglas



Table 2. Empirical analysis for cost estimation of local public transport operators

Author	Data	Dependent variable	Output	Input	Environmental or context variables	Functional form
Fazioli et al. (1993)	40 transport operators in Emilia Romagna 1986-1990	Total costs	Bus-km	- Price of labour: labour cost / # employees - Price of capital: bus cost/# vehicles	Network length	Translog
Levaggi (1994)	55 operators 1989	Variable costs	Passenger-km	<ul><li>- Price of labour: labour cost / # employees</li><li>- Price of capital: bus cost/# vehicles</li></ul>	- Network length - Commercial speed	Translog
Fazioli et al. (2003).	58 operators 1991-1997	Total costs	Bus-km	- Price of labour: labour cost / # employees - Price of capital: bus cost/# vehicles	- Network length - Temporal trend	Translog
Fraquelli et al. (2001, 2004)	45 operators 1996-1998	Variable costs	Seat-km	<ul> <li>- Price of labour: labour cost / #         employees         - Price of capital: bus cost/# vehicles         - Petrol price = petrol cost /# litres of         fuel</li> </ul>	Commercial speed	Translog
Cambini, Paniccia, Piacenza & Vannoni (2007)	33 operators 1993-2002	Variable costs	Seat-km Bus-km Total seat-km	- Price of capital: bus cost/# vehicles - Petrol price = petrol cost /# litres of fuel - Price of materials and other services - Physical measurement of employed capital (including average age of vehicle fleet)	- Network length - Commercial speed - Temporal trend - urban/extra-urban dummy	Translog
Cambini, Piacenza & Vannoni (2007)	33 operators 1993-1999	Variable costs	Seat-km	<ul> <li>- Price of capital: bus cost/# vehicles</li> <li>- Petrol price = petrol cost /# litres of fuel</li> <li>- Price of materials and other services</li> <li>- Physical measurement of employed capital (including average age of vehicle fleet)</li> </ul>	- Network length - Commercial speed - Temporal trend	Translog



Table 3. Empirical analysis for cost estimation of motorway concessionaires

Author	Data	Dependent variable	Output	Input	Environmental or context variables	Functional form
Amdal, Bardsen, Johansen & Welde (2007)	26 road operators 1998-2004	Operating costs	# total paying vehicles	- Price of inputs (assumed as constant and therefore not included) - # lines at toll stations	- Financial debts of the operator - Type of payment system (electronic, manual) - Vehicles equipped with electronic toll systems - Dummy for award with competitive procedures	Cobb-Douglas
Massiani & Ragazzi (2009)	18 concessionaires 2006	Operating costs	Vehicles-km	Network average capacity indicator		Cobb-Douglas and Translog
Benfratello, lozzi & Valbonesi (2009)	20 concessionaires 1992-2004	Operating costs (long-term)	Traffic volumes	- Price of labour: labour cost/annual average number of employees - Maintenance Price: maintenance costs / traffic volumes - Price of other costs (total operating costs - labour costs - maintenance costs) / network km	- Network length (km) - # major works (bridges, viaducts) - % of network with three or more lanes - public/private ownership dummy - Regulatory regime dummy (Price cap/rate of return) - Temporal trend	Translog (with hedonic variables)
Odecke & Welde (2011)	20 road operators 2003-2008	Operating costs + administrative costs	Total # of paying vehicles/ # of sections	- Price of inputs (assumed as constant and therefore not included)	- Years of activity of the operator  - Type of payment system (electronic, manual)  - Vehicles equipped with electronic toll systems  - Dummy for award with competitive procedures	Translog



Table 4. Empirical analysis for cost and production frontier estimation of airport managing bodies

Author	Data	Dependent variable	Output	Input	Environmental or context variables	Functional form
Pels et al. (2003)	33 EU airports 1995-1997	Production functions, 2 models: (i) Air Transport Movements - total # of movements (ii) Air Passenger Movements - total passenger #		Air Transport Movements - # of runways - # of terminals (size) - # of aircraft parking areas  Air Passenger Movements - # of baggage carousels - # of terminals (size) - # of gates - # of check-in counters		Translog
Oum et al. (2007)	109 airports in Asia, Australia, New Zealand, Europe, North America 2001-2004	Total costs	- # of passengers - # of movements - revenues from non- aviation activities (divided by purchasing power)	- Price of labour: labour cost / # of employees - Price of other factors	- # of runways - Terminal size - % of international passengers - % of cargo - Ownership variables	Translog
Barros (2008a)	27 airports in the United Kingdom 2000-2005	Total costs	- # of passengers - # of movements	- Price of labour: labour cost / # of employees - Price of capital (premises): depreciation /total value of fixed assets - Price of capital (investment): investment value/ medium-long term debts		Translog
Martin et al. (2009)	37 airports 1991-1997	Total costs	# of movements WLU	- Price of labour - Price of capital - Price of other inputs	Temporal trend	Translog
Malighetti et al. (2012)	38 Italian airports 2005-2008	Distance function to production frontier	- # of annual flights - passenger movements - freight movements	- Runway capacity - Terminal area - # of check-in counters - # of baggage carousels - # of aircraft parking areas - # of full-time employees	- existing hub - Seasonal dummy - Competition Index: # of available seats for each route / # of available seats for all airport routes - Ownership dummy (50% and 25%) - Dominance index of a carrier:% of seats supplied by the carrier with the largest market share at an airport	Translog



# **Abstract**

# Part two - Activities

#### 1. The context

The fourth year of the Authority's activity is characterised by a context where the industrial strategies of operators and the mobility needs of citizens are increasingly affected by inter-modality and integration (including technological and infrastructural) of the transport system.

This development, which is taking place in Italy, too, together with the concurrent needs for modal balance due to prevailing public interests (sustainability and environmental protection, in particular), poses major challenges both for the purpose of defining public policies and for the *ex ante* economic regulation. Notably, economic regulation operates in ways which vary depending on the nature of the industries involved and require a broader and consistent view, despite any necessary differences, especially in consideration of the evolution described above.

This framework shows the soundness of the approach adopted in 2011 by the Italian legislator with the establishment of the Transport Regulatory Authority, which was intended to be characterised by functions pertaining to the transport sector as a whole. As already indicated in last year's Annual Report, the choice of the Italian legislator anticipated by some years similar approaches to the economic regulation in the transport industry implemented in other EU countries, e.g. United Kingdom, France, Spain, Portugal, Belgium and the Netherlands.

In the EU context, the Commission has dedicated the year 2018 to multimodality. Multi-modality is also the goal of the most recent policy initiatives of the Community executive, such as that on passenger mobility contained in the Communication of 31 May 2017 [COM (2017) 283 final], "Europe on the move". In this respect, in the "agenda for a socially fair transition towards clean, competitive and connected mobility for all", the Commission highlights, inter alia, the interaction and simultaneous evolution of new mobility needs and of what is defined as the "digital mobility revolution", setting out the multimodality-digitalisation pair pertaining to this agenda in the years to come.

At multilateral level, too, within the network of regulatory bodies IRG-Rail (Independent Regulators' Group), the multimodality-digitalisation pair has been integrated into the next three-year strategy among the main challenges and opportunities for regulatory bodies. In particular, IRG-Rail brings together the rail regulatory bodies of 30 EU and non-EU countries: since the network establishment in 2011, a number of IRG-Rail members have been attributed responsibilities in other areas in addition to rail transport.

For these regulatory bodies, too, the a.m. developments are of particular interest and the experience gained in transport regulation as a whole will be reflected in IRG-Rail, too, where the Authority will serve as Vice Chair in 2017 and Chair in 2018. This experience will be fuelling and contributing to a better and more competitive functioning of the EU reference markets for the benefit of both operators and citizens.

Last but not least, at national level, the attribution of horizontal competences to the Authority has been further enhanced in the period under review with two additional elements in the field of port



economic regulation (in particular, by Legislative Decree No 169 of 6 July 2016) and local public transport (in particular, by Article 48 of Decree-Law No 50 of 24 April 2017), which will be further explained. These have been supplemented to the statutory Law establishing the Authority, namely art. 37 of Decree Law No 201 of 6 December 2011, converted into Law No 214 of 22 December 2011, and following modifications and additions (an updated list of the relevant legislation is included in Table 5).

As it has already been described in past Annual Reports, from the very beginning the Authority shaped the structure of its internal organisation based on the main areas of expertise and activity, i.e. access to infrastructures, regulation of services and protection of passengers' and users' rights, rather than on the basis of transport modes. The following Table 6 included in a Decision adopted by the Authority on 31 May 2017 (No 75/2017) lists these areas in detail.



#### **Table 5. Relevant legislation**

#### Law establishing the Authority

Article 37 of Decree Law No. 201 of 6 December 2011 on "Urgent measures for growth, equity and consolidation of public accounts", converted, with amendments, into Law No. 214 of 22 December 2011, as amended.

#### Other sources (in chronological order and as amended after the entry into force of the law establishing the Authority)

Legislative Decree No. 285 of 30 April 1992 on "New road traffic code".

Law No. 84 of 28 January 1994 on "Reorganisation of port legislation", as amended by Article 10 (3) (n) of legislative decree No. 169 of 4 August 2016 on "Reorganisation, rationalisation and simplification of regulations concerning port authorities under Law No. 84 of 28 January 1994, implementing Article 8 (1) (f) of Law No. 124 of 7 August 2015".

Law 14 No. 481 of 14 November 1995 on "Rules on competition and public utilities regulation. Establishment of the regulatory Authorities for public utilities".

Decree Law No. 138 of 13 August 2011 on "Further urgent measures for financial stabilisation and development", converted, with amendments, into Law No. 148 of 14 September 2011.

Decree Law No. 124 of 24 January 2012 on "Urgent measures for competition, infrastructure development and competitiveness", converted, with amendments, into Law n. 27 of 24 March 2012.

Decree Law No. 145 of 23 December 2013 on "Urgent measures for "Destination Italy plan", aimed at the containment of electricity and gas tariffs, internationalisation, development and digitalisation of businesses, as well as measures for public works construction and EXPO 2015", converted, with amendments, into Law No. 9 of 21 February 2014.

Legislative Decree No. 70 of 17 April 2014 on "Rules on penalty proceedings for infringements of the provisions of Regulation (EC) No 1371/2007 on rail passengers' rights and obligations".

Decree Law No. 91 of 24 June 2014 on "Urgent measures for agricultural sector, environmental protection and energy efficiency of school and university buildings, business relaunch and development, cost containment of electricity tariffs and for the immediate compliance with the obligations arising under EU Law", converted, with amendments, into Law No. 116 of 11 August 2014.

Decree Law no 133 of 12 September 2014 on "Urgent measures for start-up of construction works, realisation of public works, country digitalisation, red tape reduction, prevention of hydrogeological hazards and recovery of productive activities", converted, with amendments, into Law No. 164 of

Legislative decree No. 169 of 4 November 2014 on "Rules on penalty proceedings for infringements of the provisions of Regulation (EU) No 181/2011, amending Regulation (EC) No 2006/2004, concerning the rights of passengers in bus and coach transport".

Legislative decree No. 112 of 15 July 2015 on "Implementation of Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area (Recast)".

Legislative decree No. 120 of 29 July 2015 on "Rules on penalty proceedings for infringements of the provisions of Regulation (EU) No 1177/2010 amending Regulation (EC) No 2006/2004 concerning the rights of passengers when travelling by sea and inland waterway".

Legislative decree No. 175 of 19 August 2016 on "Consolidated act on publicly-owned companies".

Decree law No. 50 of 24 April 2017 on "Urgent financial measures, initiatives in support of local entities, further measures for earthquake-hit areas and development measures".

Regulation (EC) No 1371/2007 of the European Parliament and of the Council of 23 October 2007 on rail passengers' rights and obligations.

Directive 2009/12/EC of the European Parliament and of the Council of 11 March 2009 on airport charges.

Regulation (EU) No 913/2010 of the European Parliament and of the Council of 22 September 2010 concerning a European rail network for competitive freight.

Regulation (EU) No 1177/2010 of the European Parliament and of the Council of 24 November 2010 concerning the rights of passengers when travelling by sea and inland waterway and amending Regulation (EC) No 2006/2004.

Regulation (EU) No 181/2011 of the European Parliament and of the Council of 16 February 2011 concerning the rights of passengers in bus and coach transport and amending Regulation (EC) No 2006/2004.

Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area (Recast).

Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU.

Commission implementing Regulation (EU) No 869/2014 of 11 August 2014 on new rail passenger services.



Table 6. Functions and powers of the Authority (Attachment A to Decision No. 75/2017)

	Description	Scope	Art. 37 of legislative decree No. 201/11	Other legislation
1.	Regulates the rights to equitable and non-discriminatory access to rail, port, airport and toll motorway infrastructures, as well as in relation to national, local and urban mobility of passengers and freight, including that related to stations, airports and ports	Listed infrastructures <sup>1</sup> and freight and passenger mobility	37(2)(a)	
2.	Sets the criteria to determine tariffs, charges, fees and tolls	All markets of transport services	37(2)(b)	
•	Checks the correct application of the criteria set out for setting tariffs, charges, fees and tolls	All markets of transport services	37(2)(c)	
	Sets the minimum quality standards of transport services subject to public service obligations	All transport modes	37(2)(d)	
i.	Defines the minimum rights and entitlements (including compensation) that may be claimed by users from infrastructure managers and service providers	All infrastructures and transport modes	37(2)(e)	
ō.	Defines tendering schemes for the award of transport services on an exclusive basis and model agreements to be included in the tender specifications, and sets the criteria for the appointment of the awarding authorities	All transport modes <sup>2</sup>	37(2)(f)	
<i>'</i> .	Defines the criteria for determining the exceptions to the principle of the lesser territorial extent of geographical franchising areas compared to mobility planning areas	All transport modes	37(2)(f)	legislative decree No. 50 of 24 April 2017, art. 48
3.	Defines service agreement schemes for in-house services provided by public companies or companies with a majority public shareholding, as well as for those directly awarded	All transport modes	37(2)(f)	legislative decree No. 50 of 24 April 2017, art. 48
).	Determines efficiency and performance objectives as well as financial equilibrium objectives to be complied with by the infrastructure manager (IM) both for in-house service agreements and for those awarded either directly or by tender	All transport modes	37(2)(f)	legislative decree No. 50 of 24 April 2017, art. 48
0.	Establishes general rules on the conduct of procedures implying the direct collection of tariffs and charges by the undertaking concerned	All transport modes	37(2)(f)	legislative decree No. 50 of 24 April 2017, art. 48
1.	Regulates the mandatory possession of suitable economic and financial requirements by those who intend to participate in the tender procedures, as well as of the requirements referred to in art. 18 of legislative decree No. 422 of 19 November 1997	All transport modes	37(2)(f)	legislative decree No. 50 of 24 April 2017, art. 48
2.	Adopts measures to ensure to successful tenderers access to infrastructure facilities and instrumental goods which are necessary for the provision of the service	All transport modes	37(2)(f)	legislative decree No. 50 of 24 April 2017, art. 48
3.	Provides for general rules concerning the power of the awarding authority and the outgoing operator to sell the property of essential infrastructure facilities and instrumental goods to private equity companies or public private equity companies specialised in the purchase and lease of these assets to local and regional public transport operators	Rail transport	37(2)(f)	legislative decree No. 50 of 24 April 2017, art. 48
4.	Provides for general rules concerning the provision in the invitations to tenders on the transfer of employees from the outgoing to the incoming operator in case of replacement of the operator as a result	All transport modes	37(2)(f)	legislative decree No. 50 of 24 April 2017, art. 48

 $<sup>^1\,\</sup>rm Rail$ , port, airport infrastructures, motorway networks.  $^2\,\rm Including$  road transport and logistics (logistic platforms, inland terminals, etc.)



	of the tender, with the exception of executives and in compliance with the relevant EU legislation		
15.	Invites and assists competent public authorities to identify the scope of the public service and the most efficient ways for its financing	All transport modes³	37(3)(a)
16.	Determines the criteria for the financial reporting of regulated entities	All infrastructures and transport modes	37(3)(b)
17.	Assesses complaints, requests and reports concerning the compliance with quality and tariff levels by the parties operating the regulated services	All infrastructures and transport modes	37(3)(g)
18.	Encourages the establishment of procedures for conciliation and dispute settlement between operators and users	All infrastructures and transport modes	37(3)(h)
19.	Reports annually to the Parliament on the state of the liberalisation rules adopted and to be adopted.	All infrastructures and transport modes	37(5)
	Releases the regulatory measures adopted		
20.	Imposes administrative fines in case of non-compliance with its measures, in the case of non-compliance by the operators providing the service with the requests for information or with those related to controls, or in the case of untrue information and documents.	All infrastructures and transport modes	37(2)(1)
21.	Proposes to the Ministry of Infrastructure and Transport (MIT) that the amount resulting from the imposition of the fines is used to finance projects for the benefit of consumers	All infrastructures and transport modes	37(2)(1)
22.	May impose the accounting and corporate separation of integrated businesses	All infrastructures and transport modes	37(3)(b)
23.	Proposes to the competent authority the suspension, revocation or withdrawal of concessions, agreements, public service contracts, contractual agreements ('contratti di programma') and any other equivalent deeds, however they may be described	All infrastructures and transport modes	37(3)(c)
24.	Requests information and documents and takes statements for the exercise of its functions	All infrastructures and transport modes	37(3)(d)
25.	Carries out inspections, also in collaboration with other Government bodies, may seal any business premises, books or records	All infrastructures and transport modes	37(3)(e)
26.	May accept and make binding the commitments made by regulated businesses; may re-initiate proceedings in case of changed circumstances upon which the commitments were made.	All infrastructures and transport modes	37(3)(f)
	May order to cease conducts contrary to its regulatory measures and to the commitments made by regulated businesses and provide for restoration.		
	May take precautionary measures		
27.	Imposes fines of up to 10 per cent of the turnover in case of  a. non-compliance with the criteria	All infrastructures and transport modes	37(3)(i)
	<ul> <li>for tariffs, charges and tolls</li> <li>for accounting separation</li> <li>for unbundling of costs and revenues pertaining to public service activities</li> </ul>		
	b. infringement of the rules governing the access to networks and infrastructures or of the conditions imposed by the Authority c. non-compliance with the Authority's requirements and measures		
28.	Imposes administrative fines of up to 1 per cent of the turnover of the business concerned in case of provision of incorrect, misleading or incomplete information or failure to provide the information within the specified time-limit	All infrastructures and transport modes	37(3)(I)

 $<sup>^{\</sup>rm 3}\,\mbox{See}$  below special provisions for regional rail transport.



29.	Imposes fines of up to 10 per cent of the turnover in case of non- compliance with the commitments made by the business concerned	All infrastructures and transport modes	37(3)(m)	
30.	Provides for airport charges models⁴	Air transport	37(2)(h)	artt. 71(2), 76 and 80 of legislative decree No. 1/2012 <sup>5</sup>
31.	Approves the compliance of charging systems and level of charges with the models developed	Air transport	37(2)(h)	arts. 71(2), 71(3) and 80 of legislative decree No. 1/2012
32.	As for airport charges, it monitors the correct application of the principles concerning: a) correlation to costs, transparency, relevance, reasonableness; b) consultation of airport users; (c) non-discrimination; (d) in accordance with the principles referred to in (a), steering towards the European average airport charges applied in airports with similar infrastructure, traffic and service standards. In case of infringement of the principles and non-compliance with economic policy and charging guidelines, it may suspend the charging system	Air transport	37(2)(h)	art. 80 of legislative decree No. 1/2012
33.	Handles the consultation proceeding between air carriers and airport managing bodies	Air transport	37(2)(h)	arts. 76(2) and 77 of legislative decree No. 1/2012
34.	May authorise the managing body of an airport network to introduce a common and transparent airport charging system to be applied to the entire network	Air transport	37(2)(h)	art. 74(2) of legislative decree No. 1/2012
35.	May allow the airport managing body to apply a common and transparent charging system to airports serving the same city or urban area by informing European Commission, Ministry of Infrastructure and Transport (MIT) and Ministry of Economy and Finance (MEF).	Air transport	37(2)(h)	art. 74(3) of legislative decree No. 1/2012
36.	Modulates airport charges among the airport users for reasons of public and general interest, including those related to environment protection	Air transport	37(2)(h)	art. 75 of legislative decree No. 1/2012
37.	Takes any necessary measures to enable the airport managing body and the airport users concerned to negotiate with a view to concluding an agreement on the level of service	Air transport	37(2)(h)	art. 78 of legislative decree No. 1/2012
38.	Authorises the airport managing body to differentiate services and level of airport charges	Air transport	37(2)(h)	art. 79 of legislative decree No. 1/2012
39.	Publishes annual reports on the activities performed on airport charges	Air transport	37(2)(h)	art. 76(5) of legislative decree No. 1/2012
40.	Conducts preliminary activities - and informs MIT accordingly - for the annual report to the EU Commission on the state of implementation of airport charges legislation	Air transport	37(2)(h)	art. 71(4) of legislative decree No. 1/2012
41.	Assesses the appeals submitted by the parties in case of disagreement on a decision on airport charges taken by the airport managing body, settling the dispute by taking the final decision	Air transport	37(2)(h)	art. 71(2) of legislative decree No. 1/2012; art. 6 of Directive 2009/12/EC
42.	Acts as the body responsible for the enforcement of Regulation (EC) No. 1371/2007	Rail transport		art. 3(1) of legislative decree No. 70/2014; art.

<sup>&</sup>lt;sup>4</sup> Art. 22 of legislative decree No. 5 of 9 February 2012 is without prejudice to the proceedings in progress at that time for the conclusion of contractual agreements with the airport managing bodies. Consequently, with reference to existing contractual agreements, the Italian Civil Aviation Agency (ENAC) is responsible for the airports of Rome Fiumicino and Ciampino, Milan Linate and Malpensa, Venice.

<sup>&</sup>lt;sup>5</sup> Decree Law No.1 of 2012 was adopted for the purpose of implementing Directive 2009/12/EC of the European Parliament and of the Council of 11 March 2009 on airport charges.



				30 of Regulation (EC) No. 1371/2007
43.	Supervises on the correct enforcement of Regulation (EC) No. 1371/2007 on rail passengers' rights and obligations	Rail transport		art. 4(1) of legislative decree No. 70/2014
44.	Carries out monitoring and surveys on the services referred to in Regulation (EC) 1371/2007	Rail transport		art. 4(1) of legislative decree No. 70/2014
45.	Assesses the infringement of the provisions of Regulation (EC) 1371/2007, including as a result of passengers' complaints.	Rail transport		arts. 4(1) and 4(4) of legislative decree No. 70/2014
46.	Reports annually to the Parliament on the application of Regulation (EC) No. 1371/2007 and on the activities performed and, where it is deemed appropriate, makes proposals of legislative amendments to the Parliament and the Government	Rail transport	37(5)	art. 4(3) of legislative decree No. 70/2014
47.	Makes proposals to MIT on the allocation of the fund resulting from the imposition of fines for financing projects for the benefit of consumers	Rail transport		art. 5(4) of legislative decree No. 70/2014
48.	Regulates the proceedings for the determination and imposition of penalties and the technical procedures for assessing complaints	Rail transport		arts. 5(1) and 4(4) of legislative decree No. 70/2014
49.	Informs other public authorities (such as National Safety Authority for Railways, Data Protection Authority) on issues falling within their remit	Rail transport		arts. 5(5) and 11(2) of legislative decree No. 70/2014
50.	Acts as the body responsible for the enforcement of Regulation (EC) No. 181/2011	Bus transport		art. 3(1) of legislative decree No. 169/2014; art. 28 of Regulation (EC) No. 181/2011
51.	Supervises on the correct enforcement of Regulation (EU) No. 181/2011 concerning the rights of passengers in bus and coach transport	Bus transport		art. 3(1)(a) of legislative decree No. 169/2014
52.	Carries out monitoring and surveys on the services referred to in Regulation (EC) 181/2011	Bus transport		art. 3(1)(a) of legislative decree No. 169/2014
53.	Assesses the infringement of the provisions of Regulation (EC) 181/2011, including as a result of passengers' complaints	Bus transport		art. 3(1)(b) and (c) of legislative decree No. 169/2014
54.	Reports annually to the Parliament on the application of Regulation (EC) No. 181/2011 and on the activities performed and, where it is deemed appropriate, makes proposals of legislative amendments to the Parliament and the Government	Bus transport	37(5)	art. 3(4) of legislative decree No. 169/2014
55.	Makes proposals to MIT on the allocation of the fund resulting from the imposition of fines for financing projects for the benefit of consumers	Bus transport		art. 4(5) of legislative decree No. 169/2014
56.	Regulates the proceedings for the determination and imposition of penalties and the technical procedures for assessing complaints	Bus transport		arts. 4(1) and 3(5) of legislative decree No. 169/2014
57.	Acts as the body responsible for the enforcement of Regulation (EC) No. 1177/2010	Maritime transport		art. 3(1) of legislative decree No. 129/2015; art. 25 of Regulation (EC) No. 1177/2010
58.	Supervises on the correct enforcement of Regulation (EU) No. 1177/2010 concerning the rights of passengers when travelling by sea and inland waterway	Maritime transport		art. 3(1)(a) of legislative decree No. 129/2015



59.	Carries out monitoring and surveys on the services referred to in Regulation (EC) No. 1177/2010	Maritime transport		art. 3(1)(a) of legislative decree No. 129/2015
60.	Assesses the infringement of the provisions of Regulation (EC) 1177/2010, including as a result of passengers' complaints	Maritime transport		arts. 3(1)(b) and (c) of legislative decree No. 129/2015
61.	Reports annually to the Parliament on the application of Regulation (EC) No. 1177/2010 and on the activities performed and, where it is deemed appropriate, makes proposals of legislative amendments to the Parliament and the Government	Maritime transport	37(5)	art. 3(4) of legislative decree No. 129/2015
62.	Makes proposals to MIT on the allocation of the fund resulting from the imposition of fines for financing projects for the benefit of consumers	Maritime transport		art. 4(5) of legislative decree No. 129/2015
63.	Regulates the proceedings for the determination and imposition of penalties and the technical procedures for assessing complaints	Maritime transport		arts. 4(1) and 3(5) of legislative decree No. 129/2015
64.	Applies Regulation (EC) No 2006/2004 on cooperation between national authorities responsible for the enforcement of consumer protection laws	Bus and maritime transport		art. 3(2) of legislative decree No. 169/2014, art. 3()2 of legislative decree No. 129/2015
65.	Provides an opinion to MIT on the Guidelines concerning the procedures for choosing the air carriers benefiting from contributions, subsidies or any other fees	Air transport	37(2)(h)	art. 13(14) of decree law No. 145/2013, converted with amendments into law No. 9/2014
66.	Provides an opinion to the Ministry of Economic Development on the definition of the methods to identify the relevant consumption for the implementation of the special electricity consumption tariff system of RFI - Rete Ferroviaria Italiana spa	Rail transport	37(2)(i)	art. 29(1) of decree law No. 91/2014, converted with amendments into law n. 116/2014
67.	Provides an opinion, at the request of MIT, in the context of the procedure for the adoption of the minimum insurance level required to railway undertakings	Rail transport	37(2)(i)	art. 8(14) of legislative decree No. 112/2015 <sup>6</sup>
68.	Provides an opinion, at the request of MIT, in the context of the procedure for assessing the compliance of any competitive guarantees on market terms held by railway undertakings with the minimum level of insurance coverage	Rail transport	37(2)i)	art. 9(4) of legislative decree No. 112/2015
69.	Determines whether the principal purpose of the service is to carry passengers between stations located in different Member States	Rail transport	37(2)i)	art. 12(4) of legislative decree No. 112/2015 and Commission Implementing Regulation (EU) No. 869/2014
70.	Determines whether a proposed new international rail passenger service would compromise the economic equilibrium of a public service contract.	Rail transport	37(2)(i)	Commission Implementing Regulation (EU) No. 869/2014
71.	With regard to national rail passenger services, it may impose restrictions on the right to pick up and set down passengers at any station located along the route, which are covered by one or more public service contracts, in cases where their operation compromises the economic equilibrium of the public service contract under review	Rail transport	37(2)(i)	art. 12(5) of legislative decree No. 112/2015
72.	Provides an opinion to the competent authority on the determination of appropriate, transparent and non-discriminatory fees to be paid by the railway undertaking when it is assessed that the economic equilibrium of the public service contract is compromised.	Rail transport	37(2)(i)	art. 12(10) of legislative decree No. 112/2015

<sup>&</sup>lt;sup>6</sup> Legislative decree No. 112 of 15 July 2015 transposes Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area.



73.	Sets reasonable time limits within which the operators of the service facilities referred to in art. 13 (2) of legislative decree No. 112/2015, reply to the requests for access to the facilities and provision of services submitted by railway undertakings	Rail transport	37(2)(i)	art. 13(6) of legislative decree No. 112/2015
74.	Examines the complaints of railway undertakings whose requests for access to service facilities pursuant to art. 13 (2) of legislative decree No. 112/2015 have not been satisfied. If appropriate, it takes action to ensure that an adequate part of the capacity be ensured to the applicant undertaking.	Rail transport	37(2)(i)	art. 13(7) of legislative decree No. 112/2015
75.	Defines procedures and criteria for access to service facilities referred to in art. 13 (2), to subsidiary services referred to in art. 13 (9) and auxiliary services referred to in art. 13 (11) of legislative decree No. 112/2015	Rail transport	37(2)(i)	art. 13(13) of legislative decree No. 112/2015
76.	Provides for requirements and guidelines to the IM on the Network Statement	Rail transport	37(2)(i)	art. 14(1) and art. 18(6) of legislative decree No. 112/2015
77.	Without prejudice to the independence of the IM and taking into account the need to ensure its economic equilibrium, the Authority defines the criteria for the determination of the charges for the use of the infrastructure by the IM and the fees for the services referred to in Article 13 of legislative decree No. 112/2015	Rail transport	37(2)(i)	art. 17(1) of legislative decree No. 112/2015
78.	Checks the criteria identified by the IM to determine the non-usage charge for capacity allocated to the railway undertaking but not used.	Rail transport	37(2)(i)	art. 17(9) of legislative decree No. 112/2015
79.	Verifies that: the market can bear the application of mark-ups; these mark-ups are applied on the basis of efficiency, transparent and non-discriminatory principles; these mark-ups are applied so as to guarantee optimal competitiveness of rail market segments; the charging system respects the productivity increases achieved by railway undertakings  Communicates the outcome of the verification to MIT and MEF	Rail transport	37(2)(i)	art. 18(4) of legislative decree No. 112/2015
	Verifies that the charge reductions comply with the provisions under paragraphs 11, 12 and 13 of art. 18 of legislative decree No. 112/2015.			
80.	At the request of MIT, the Authority delivers its opinion on the establishment of time-limited compensation systems, for the benefit of the rail transport mode, where it can be demonstrated that the following costs are not covered: environmental costs, costs incurred in connection with accidents, infrastructure costs not charged in competing modes of transport and within the limits of the difference between those costs and the equivalent costs attributable to the rail transport mode	Rail transport	37(2)(i)	art. 19(1) of legislative decree No. 112/2015
81.	Defines procedures and criteria for the conclusion of framework agreements between IM and applicants	Rail transport	37(2)(i)	art. 23(1) of legislative decree No. 112/2015
82.	Authorises the renewal of framework agreements signed as from 1 January 2010 for an initial period of five years	Rail transport	37(2)(i)	art. 23(8) of legislative decree No. 112/2015
83.	Sets the criteria for infrastructure capacity allocation to be published in the Network Statement	Rail transport	37(2)(i)	art. 26(1) of legislative decree No. 112/2015
84.	Approves the decision of the IM to continue to demand the payment of the charge component linked to the density of traffic on infrastructures and saturated infrastructure, in the cases provided for by law	Rail transport	37(2)(i)	art. 33(5) of legislative decree No. 112/2015
85.	Provides requirements concerning the measures necessary to restore the situation to normal in the event of disturbance to train movements caused by technical failure or accident	Rail transport	37(2)(i)	art. 36 (1) of legislative decree No. 112/2015
86.	Examines the disputes relating to infrastructure capacity allocation	Rail transport	37(2)(i)	art. 37(2) of legislative decree No. 112/2015



87.	Monitors the competitive situation in rail services markets, in particular, checking whether the Network Statement contains discriminatory clauses or creates discretionary powers for the IM that may be used to discriminate against applicants	Rail transport	37(2)(i)	art. 37(3) of legislative decree No. 112/2015
88.	Cooperates with the national safety authority under Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the rail system within the Community and with the licensing authority	Rail transport	37(2)(i)	art. 37(4) of legislative decree No. 112/2015
39.	Guarantees that the charges for access to infrastructure and provision of services referred to under article 13 set by the operator of the service facility comply with the provisions of decree No. 112/2015 and are non-discriminatory.	Rail transport	37(2)(i)	art. 37(6) of legislative decree No. 112/2015
90.	Supervises negotiations between applicants and IM concerning the level of infrastructure charges	Rail transport	37(2)(i)	art. 37(6) of legislative decree No. 112/2015
91.	Considers and decides on complaints, taking action to remedy the situation	Rail transport	37(2)(i)	art. 37(9) of legislative decree No. 112/2015
12.	Informs the relevant parties of its reasoned decision  Publishes decisions taken on complaints	Rail transport	37(2)(i)	art. 37(12) of legislative
	, and account taken on complaints	nun transport		decree No. 112/2015
13.	Consults regularly the representatives of users of rail freight and passenger transport services, to take into account their views	Rail transport	37(2)(i)	art. 37(7) of legislative decree No. 112/2015
4.	In order to coordinate decision-making with its EU counterparts, the Authority exchanges information about its work and decision-making principles and practice, in particular on the problems of interpreting transposed Union railway law.	Rail transport	37(2)(i)	art. 38(1) of legislative decree No. 112/2015
15.	Cooperates with its EU counterparts for the purpose of mutual assistance in their market monitoring tasks and for handling complaints or investigations.	Rail transport	37(2)(i)	art. 38(2) of legislative decree No. 112/2015
16.	Reviews decisions and practices of associations of IMs as referred to in Article 37 and Article 40(1) that implement provisions of legislative decree No. 112/2015 or otherwise facilitate international rail transport.	Rail transport	37(2)(i)	art. 38(9) of legislative decree No. 112/2015
7.	After hearing the Ministry of Infrastructure and Transport, the Regions and local authorities concerned, the Authority defines the scope of public service on rail sections and their financing arrangements	Rail transport	37(2)(i)	art. 37(1) of decree-law No. 1/2012
18.	Analyses the efficiency of the different degrees of separation between IM and railway undertaking, also in relation to the experiences of other EU Member States and to the need to protect commuters in the regional rail service. As a result of the analysis, it prepares a report to be presented to the Government and the Parliament	Rail transport	37(2)(i)	art. 37(1) of decree-law No. 1/2012
9.	Is the body in charge of the assessment of complaints concerning path management/allocation with respect to the responsibilities provided for by Regulation (EC) No. 913/2010 on the Mediterranean Rail Freight	Rail transport	37(2)(i)	art. 20 Regulation (EC) N 913/2010 arts. 56 and 57
	Corridor			Directive 2012/34/EU  art. 3.2 "Cooperation agreement between the regulatory bodies competent for monitoring competition in the Mediterranean Corridor" entered into force on 22 November 2016
00.	Checks that tender notices do not contain conditions which are discriminatory or may prevent potential competitors from accessing the market	Regional rail transport	37(2)(f)	



101.	Regulates equitable and non-discriminatory access to service facilities as referred to in art. 13 (2) of legislative decree No. 112/2015, in particular: freight terminals, marshalling yards and train formation facilities, including shunting facilities; areas, facilities and buildings for parking and storage of rolling stock and freight; maritime and inland port facilities which are linked to rail activities	Logistic platforms, inland terminals, freight terminals <sup>7</sup>	37(2)(a)	arts. 13 and 37 of legislative decree No. 112/2015
102.	Ensures non-discriminatory access and application of transparent charges to logistic platforms and freight terminals falling within transport infrastructures <sup>8</sup>	Logistic platforms, inland terminals, freight terminals	37(2)(a)	Regulation (EU) No. 1315/2013
103.	Verifies the existence of the conditions required "pursuant to article 143 (8) of the Code referred to in legislative decree No. 163 of 12 April 2006, and following amendments"	Local and regional public passenger transport		art. 3a.2a of decree-law No. 138/2011, converted with amendments into law No. 148/2011
104.	Certifies management efficiency and service quality of IMs on the basis of parameters established by the Authority itself in order to allocate any funding from State resources pursuant to art. 119 (5) of the Constitution	Local and regional public passenger transport	37(2)(d) 37(2)(b)	art. 3a.2a of decree-law No. 138/2011, converted with amendments into law No. 148/2011
105.	Monitors and checks that the levels of supply, fares and performance quality of taxi services are aligned with the needs of different urban areas so as to ensure the users' right to mobility.	Taxi	37(2)(m)	
106.	Provides to Municipalities and Regions an advisory opinion on taxi services on the basis of the law	Тахі	37(2)(m)	
107.	With reference to the provisions under art. 37 (2) (m), the Authority may appeal to the Tribunale Amministrativo Regionale (Regional Administrative Court) of Lazio	Taxi	37(2)(n)	
108.	Establishes, for new concessions, toll charging systems based on the price-cap method	Road transport	37(2)(g)	
109.	Defines concession schemes to be included in tender notices for management or construction	Road transport	37(2)(g)	
110.	Defines tender schemes which motorway concessionaires are required to comply with for sub-concessions	Road transport	37(2)(g)	
111.	Defines optimal management areas of toll motorway sections	Road transport	37(2)(g)	
112.	Releases an opinion on motorway model contracts prior to their signature	Road transport	37(2)(g)	art. 178 (8) of legislative decree No. 50/2016
113.	Lays down procedures concerning the provision of motorway service areas for reasons of traffic safety related to project compliance	Road transport and haulage	37(2)(g)	art. 24(5a) of Traffic Code (legislative decree No. 285/1992)
114.	Provides an opinion to MIT on model agreements or addendums and related economic-financial plans submitted by concessionaires of national motorway sections	Road transport		art. 5(1) of law No. 164/2014

Pursuant to Article 61a of Law No. 27/2012 on "National logistic platform", the national logistic network includes inland terminals, freight centres, ports and logistic centres.

Regulation (EU) No. 1315/2013 of the European Parliament and of the Council of 11 December 2013 on the trans-European transport network crossing Italy with several "corridors", including the Mediterranean Corridor (RFC 6) which is coordinated by the Authority. Cf. arts 15 (2), 22 (1)(b) and 25 (1) which signify the need for regulatory oversight on access to freight terminals within (inland and maritime) ports and airports and provide that access is open to all operators in a non-discriminatory way and upon application of transparent charges, this function being ensured in our legal system by the Authority in the exercise of its responsibilities. "Logistic platforms" and "freight terminals", as defined by art. 3 (r) and (s) of the above Regulation, are specifically included in rail and road transport infrastructures, pursuant to arts. 11 (1) (b) and 17 (1) (e). A similar provision is contained in art. 21 (1) (b) of the Regulation with reference to the Motorways of the sea.



115.	Ensures equitable and non-discriminatory access to port infrastructures for port operations as referred to in art. 16 of law No. 84/1994 (loading, unloading, transhipment, storage, handling of cargos and any other material in the port area)	Port infrastructures Freight mobility	37(2)(a)	arts. 8 (3) (n) and 16 of law No. 84/1994
116.	Ensures equitable and non-discriminatory access to port infrastructures for the supply of temporary port labour as referred to in art. 17 of law No. 84/1994	Port infrastructures Freight mobility	37(2)(a)	arts. 8(3)(n) and 17 of law No. 84/1994
117.	Ensures equitable and non-discriminatory access to port infrastructures in relation to concessions of areas and docks as referred to in art. 18 of law No. 84/1994	Port infrastructures Freight mobility	37(2)(a)	arts. 8(3)(n) and 18 of law No. 84/1994
118.	Approves the recovery plan of loss-making publicly owned companies which involves achieving financial equilibrium within three years	All transport modes	37(2)	art. 14(5) of legislative decree No. 175/2016