Autorità di Regolazione dei Trasporti

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The economic regulation of motorways in Italy 2014-2019

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The Italian Transport Regulation Authority (ART)

A snapshot

The most recently established of 3 utilities regulators in Italy, ART became operational in **January 2014**

ART's **competencies span across all transport modes** and cover the **r**egulation of access to infrastructures and services and passengers' rights

ART is fully **independent from government** and **accountable to Parliament**.

It decides autonomously on recruitment at all levels, organisation and operation and is funded with contributions from regulated companies

Motorway concessions have been among the first dossiers dealt with by ART.

In this area the Authority provides the **regulatory framework for the «concession contract»** between the grantor and the concessionaire

Governance, functions & structure

Decisions are adopted by a **Board** composed of the President and two Members acting as a collegiate body. Majority voting applies.

A **staff** of up to 120 permanent civil servants is coordinated by a Secretary general appointed by the Board.

Services and units are organised according to functions (not by transport modes)

ART's **proceedings are participatory** in nature.

The consultation of stakeholders and interested parties precedes the adoption of all regulatory decisions

ART's regulatory decisions may be **challenged** by interested parties before the regional administrative courts and, on appeal, before the Council of State

In some areas, including that of motorway concessions, ART's main function of *ex ante* regulation is **complemented** by an advisory role

Objectives of economic regulation

Ensure **transparent tariff-setting** and **transparent tariff dynamics**

Create a **favourable environment for long-term investment** by adopting balanced and predictable regulation

Pursue the **efficiency** and **productivity** of the concessionaires for the benefit of users and stakeholders

Ensure **fair and non-discriminatory access** to infrastructure and services

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The economic regulation of motorways in Italy

The road to ART

Before the establishment of ART, the economic regulation of motorways was entrusted to the **Interministerial Committee for Economic Policy (ICEP) operating w**ithin the Presidency of the Council of Ministers.

Over time, **six different tariff methods have been applied;** as a result, different methods of investment remuneration also applied.

Based on the law establishing ART, a **uniform tariff-setting methodology** would have to be developed that would replace the six methods applied before.

Thereby the market would become more easily **understandable** and its operating conditions would become more **transparent**.

The law establishing the Authority also provided that such a methodology would be based on **price-cap**, with determination of a five-year "X productivity factor" for each concession.

In addition, «**optimal management areas**», to be identified with the aim of «*fostering competition by comparison*», would be set. ART defined the optimal management area as the length section of a motorway above and below which there are no significant economies of scale and scope.

In 2016 and 2017, upon carrying out consultation proceedings, ART framed the relevant regulation. It defined «the optimal management area» and the criteria for evaluating the «X productvity factor» based on the Stochastic Frontier Analysis (SFA) methodology

ART's regulation

Based on its statutory provisions, the regulatory framework set by ART was to be applied to concessions awarded after its establishment («**new concessions**»).

ART developed charging systems (all based on the same methodology and framework) for **each new concession** submitted to it by the grantor (the Ministry of Infrastructure and Transport)

Upon the adoption of the so-called «**Genoa decree**» in 2018, ART was also entrusted with the economic regulation of «**existing concessions**».

Thereupon, the regulatory framework developed by ART in 2016 and 2017 would apply to **all concessions**.

The application of ART's regulation to existing concessions

In order to enact the 2018 legislation, ART launched a consultation and adopted general provisions concerning the **application of its regulatory framework to existing concessions** (decision n. 16/2019).

Insofar as it concerned concessions which were under way, the decision provided for an *ad hoc* **safeguard system** (see below).

Based on the general provisions enshrined in decision n. 16/2019, ART adopted a number of **individual decisions** applicable as of 1 January 2020 to regulate:

- concessions for which the 5-year regulatory period has expired **after** the adoption of the Genoa decree;

- concessions for which the 5-year regulatory period has expired **before** the adoption of Genoa decree **but** the relevant «price-setting procedure» had not been finalized.

Concessions regulated based on the 2018 law (annex A to decision n. 16/2019)

	Concession	Company name	End of the last regulatory period	End of Concession
1	Convenzione Unica ANAS S.p.A. - Raccordo Autostradale Valle d'Aosta S.p.A.	Raccordo Autostradale della Valle d'Aosta S.p.A. (RAV)	31/12/2013	31/12/2032
2	Convenzione Unica ANAS S.p.A. - Società Autostrada Tirrenica p.A.	Società Autostrada Tirrenica S.p.A. (SAT)	31/12/2013	31/12/2046
3	Convenzione Unica ANAS S.p.A. - Strada dei Parchi S.p.A.	Strada dei Parchi S.p.A.	31/12/2013	31/12/2030
4	Convenzione ANAS S.p.A. - Concessioni Autostradali Venete - CAV S.p.A.	Concessioni Autostradali Venete S.p.A. (CAV)	31/12/2014	31/12/2032
5	Convenzione Unica ANAS S.p.A. - Società SATAP Tronco A4	Società Autostrada Torino-Alessandria-Piacenza S.p.A. (SATAP) Tronco A4	31/12/2017	31/12/2026
6	Convenzione Unica ANAS S.p.A. - Società Milano Serravalle-Milano Tangenziali p.A.	Milano Serravalle S.p.A.	31/12/2017	31/10/2028
7	Convenzione Unica ANAS S.p.A. - Società Autostrada Brescia – Verona – Vicenza – Padova S.p.a.	Brescia - Verona - Vicenza - Padova S.p.A.	31/12/2017	31/12/2026
8	Convenzione Unica ANAS S.p.A. - Autostrade per l'Italia S.p.A.	Autostrade per l'Italia S.p.A.	31/12/2017	31/12/2038
9	Convenzione Unica ANAS S.p.A. - Società di Progetto Autostrada Asti - Cuneo p.A.	Società di progetto Autostrada Asti Cuneo S.p.A.	31/12/2017	11/08/2035
10	Convenzione Unica ANAS S.p.A. - Autocamionale della CISA S.p.A.	Società Autostrada Ligure Toscana S.p.A. (SALT) - Tronco Autocisa	31/12/2018	31/12/2031
11	Convenzione Unica ANAS S.p.A. - Autostrada dei Fiori S.p.a.	Autostrada dei Fiori S.p.A. (Tronco A10)	31/12/2018	30/11/2021
12	Convenzione Unica ANAS S.p.A. - Autostrada Torino Savona S.p.A.	Autostrada dei Fiori S.p.A. (Tronco A6)	31/12/2018	31/12/2038
13	Convenzione Unica ANAS S.p.A. - SALT S.p.A.	Società Autostrada Ligure Toscana S.p.A. (SALT) - Tronco Ligure-Toscano	31/12/2018	31/07/2019
14	Convenzione Unica ANAS S.p.A. - SAV Società Autostrade Valdostane S.p.A.	Società Autostrade Valdostane S.p.A. (SAV)	31/12/2018	31/12/2032
15	Convenzione Unica ANAS S.p.A. - SITAF S.p.A. Autostrada A32 Torino-Bardonecchia	Società Italiana Traforo Autostradale del Frejus S.p.A. (SITAF)	31/12/2018	31/12/2050
16	Convenzione Unica ANAS S.p.A. - Tangenziale di Napoli S.p.A.	Tangenziale di Napoli S.p.A.	31/12/2018	31/12/2037

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Selected features of ART's regulation as applied to new and existing concessions

Goals and main features

Preserving investment plans and incentives to invest, while providing a ROI at fair and market-oriented values

A uniform **tariff method** based **on a five-year regulatory period**

Separation between the **Capex for the investment already executed or in progress** and the **Capex for the new investment to be done** (even in terms of ROI; see below) → «**Safeguard mechanism»** for concessionaries

Incentives to enhance **efficiency (through price cap)**, **applied to Opex**

Penalties for **investment** planned but **not executed** & rewards/penalty tariff schemes for **quality targets**

Better focused **regulatory accounting**

The pricing method

The per unit-tariff for the generic year $_{t+1}$ is given by the sum of three building-blocks:

1. **"Construction charge" component**, aimed at allowing the recovery of capital costs (depreciation and cost of capital) related to those assets which are reversible upon expiry of the concession, including takeover value (i.e. Terminal Value) already paid to the previous outgoing concessionaire, and including capital costs for planned investments in extraordinary maintenance ($\boldsymbol{T_K}$); → **RAB**
2. **"Operational charge" component**, allowing the recovery of efficient operating costs, including those for ordinary maintenance and use of the provision for cyclical maintenance of the motorway infrastructure, as well as of incremental operating costs associated with new investments and new laws and regulations ($\boldsymbol{T_G}$); this component is evaluated with reference to the base year costs for each regulatory period and its yearly dynamic is regulated by a «price cap». → **PRICE CAP**
3. **Component for additional charges,** aimed at recovering specific other charges, by identifying an annual fee that is not subject to the price cap dynamics ($\boldsymbol{T_{OI,t}}$).

$$\boldsymbol{T_{t+1} \leq T_{K,t+1} + T_{G,t} \cdot \left(1 + \widehat{P}_{t+1} - X_{t+1}\right) + T_{OI,t+1}}$$

The evaluation of the construction component/1

The net invested capital (NIC) is given by the amounts of the following tangible and intangible fixed assets, net of depreciation, provided they are recognized by the grantor of the concession:

a) **non-reversible assets**, related to initial endowment or acquired during the concession, as quantified as at the 1st of January of the base year of each regulatory period, provided they are related and pertinent to motorway operations;
b) **reversible assets**, related to investments made in the concession period, quantified as at the 1st of January of each year of the regulatory period, including the takeover value that has been already paid.

The **NIC** related to the reversible assets is in turn **divided into two categories**:

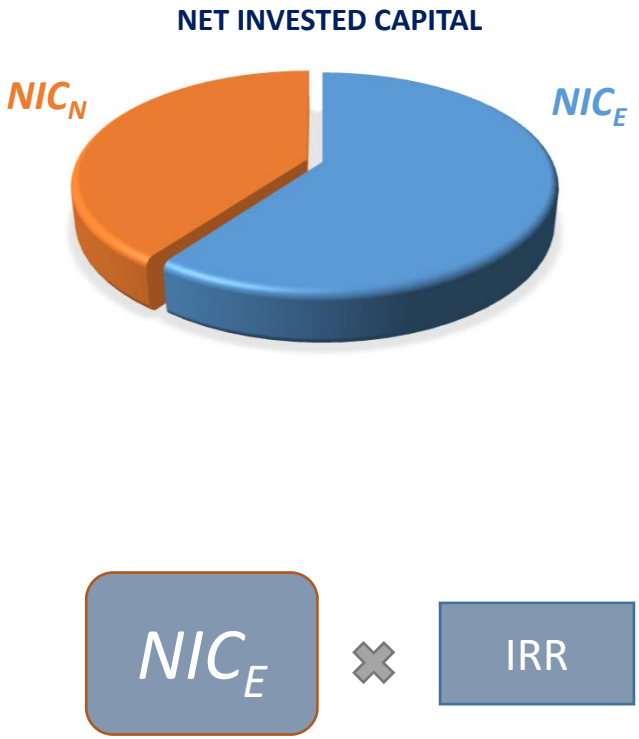
i. **NIC of the works executed or in progress**, to which the *"safeguard system"* applies, aimed at ensuring the same **IRR** provided for under the previous charging system;
ii. **NIC of the works to be executed**, to which the **WACC** defined by ART applies

The evaluation of the Construction component/2

Safeguard system **for "works executed or in progress" (NIC_E)**

Those works are defined as follows: «*the works approved by the grantor of the concession are considered to be executed or in progress where, on the date of publication of this charging system on the Authority's website, they are: (i) already executed, (ii) in progress, as the contract for awarding of the works has already been concluded or, if earlier, works have been already delivered*."

The capital remuneration due to the concessionaire on the Net Invested Capital (NIC) of the works executed or in progress is determined on the basis of the internal rate of return of motorway activities, arising from the application of the previous charging system, before financial charges and taxes (IRR).

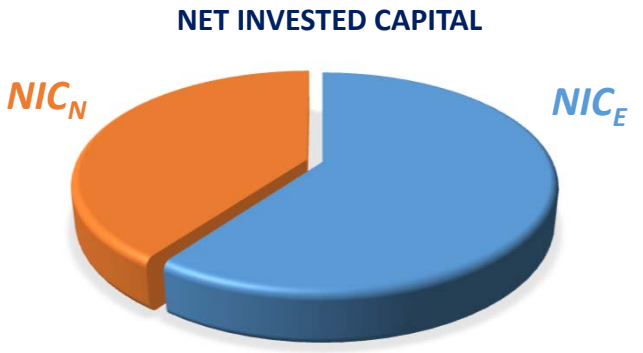


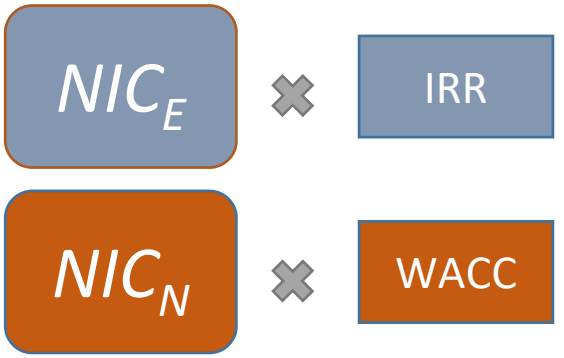
The evaluation of the Construction component/3

Works yet to be executed (NIC_N)

Those works are defined as follows: « *the works approved by the grantor of the concession are considered to be executed where, on the date of publication of this charging System on the Authority's website, they are: (i) works to be carried out, for which no awarding contract has been concluded yet or, if earlier, works have not been delivered yet, or (ii) subject to new agreements* ”

The rate of return on the NIC of works yet to be executed as well as on non-reversible assets, is determined according to the method based on the weighted average cost of the capital (equity and debt capital) (see below)





The evaluation of the Construction component/4

The **NIC economic value** remunerated under the per-unit tariff (T_K) in a year $_{t+1}$ is calculated as follows:

$$NIC\ econ\ value_{t+1} = NIC_{E,\ t+1} * IRR + NIC_{N,\ t+1} * WACC$$

The WACC/1

The methodology applied to determine the WACC is used extensively by NRAs, including in Italy. The formula is:

$$R = g \cdot \frac{R_d\,(1 - t)}{1 - T} + (1 - g) \cdot \frac{R_e}{1 - T}$$

where:

- R_d cost of debt
- R_e cost of equity
- g *gearing*
- *(1-g)* share of equity
- t tax shield (24%)
- T income tax rate resulting from the corporate income tax (IRES) and the regional tax on productive activities (IRAP) (28.82%)

The WACC/2

The cost of **equity** is determined according to the Capital Asset Pricing Model (CAPM) formula, that is:

$$R_e = rfr + \beta_e \cdot erp$$

- R_e cost of equity;
- *rfr* risk-free rate given by the arithmetic mean of daily gross returns of the ten-year BTP (long-term Italian Treasury bond), as collected by the Bank of Italy with reference, for each regulatory period, to the last twelve months available (2.87% as the time of adoption of ART's decisions implementing decision n. 16/2019);
- β_e beta equity
- *erp* *equity risk premium*, estimated equal to 5.5%

The cost of **debt** is determined as follows:

$$R_d = rfr + dp$$

- R_d cost of debt;
- dp debt premium, now 2%

The WACC/3

The **beta equity** is estimated using an international benchmarking:

- The **comparables** presently applied are ATLANTIA, SIAS, VINCI, Ferrovial (we used also Abertis before its acquisition by ATLANTIA)
- In case of a concession not awarded through a bidding process, the comparables SNAM and TERNA (Italian monopolistic transmission operators in the energy markets) are added to account for lower levels of competition

Finally, the **gearing** (*g*), i.e. the ratio of financial debt to total financing sources is defined using a «notional» approach applied by several NRAs worldwide.

The gearing of the sector is evaluated on the basis of the average of the last five years of Italian motorway concessionaires

The approach for the X productivity factor/1

The efficiency model is based on a quantitative, objective **cost function** as follows:

$$C_{i,t} = f\left(V_{i,t}\ , L_{km_{i,t}}\ , P_{j,i,t}, H_{i,t}\right)$$

where

- i is the i concession (i = 1, … , 24);
- t is the time variable (t = 2005, … 2017);
- Pj are the input prices (j = 1, … ,4): labor, capital, maintainance and other costs;
- $C_{i,t}$ is the total cost of the i firm in time t. They include labor costs, maintainance costs, other costs, amotization and financial costs (to proxy capital costs);
- $V_{i,t}$ is the number of km travelled in the concession i in year t;
- $L\_Km_{i,t}$ is the network extension of concession i in year t;
- $H_{i,t}$ are additional firm-level and structural control variables.

The model closely follows the main economic literature (Benfratello et al., 2009 JRE). We use a dataset tracking the data of 24 concessionaries for the years 2005 to 2018

The approach for the X productivity factor/2

Based on economic literature and upon a protracted process of consultation, that begun in 2014, a set of *Control variables (H*) was defined as follows*:*

Structural control

- ***Stoneworks /Km*** = Length of viaducts, bridges, tunnels in Km/Network Length
- ***High lanes/Km*** = (3-lanes and 4 lanes km) / Network Length
- ***Quality*** = IPAV index – quality pavement indicator

Firm-level control

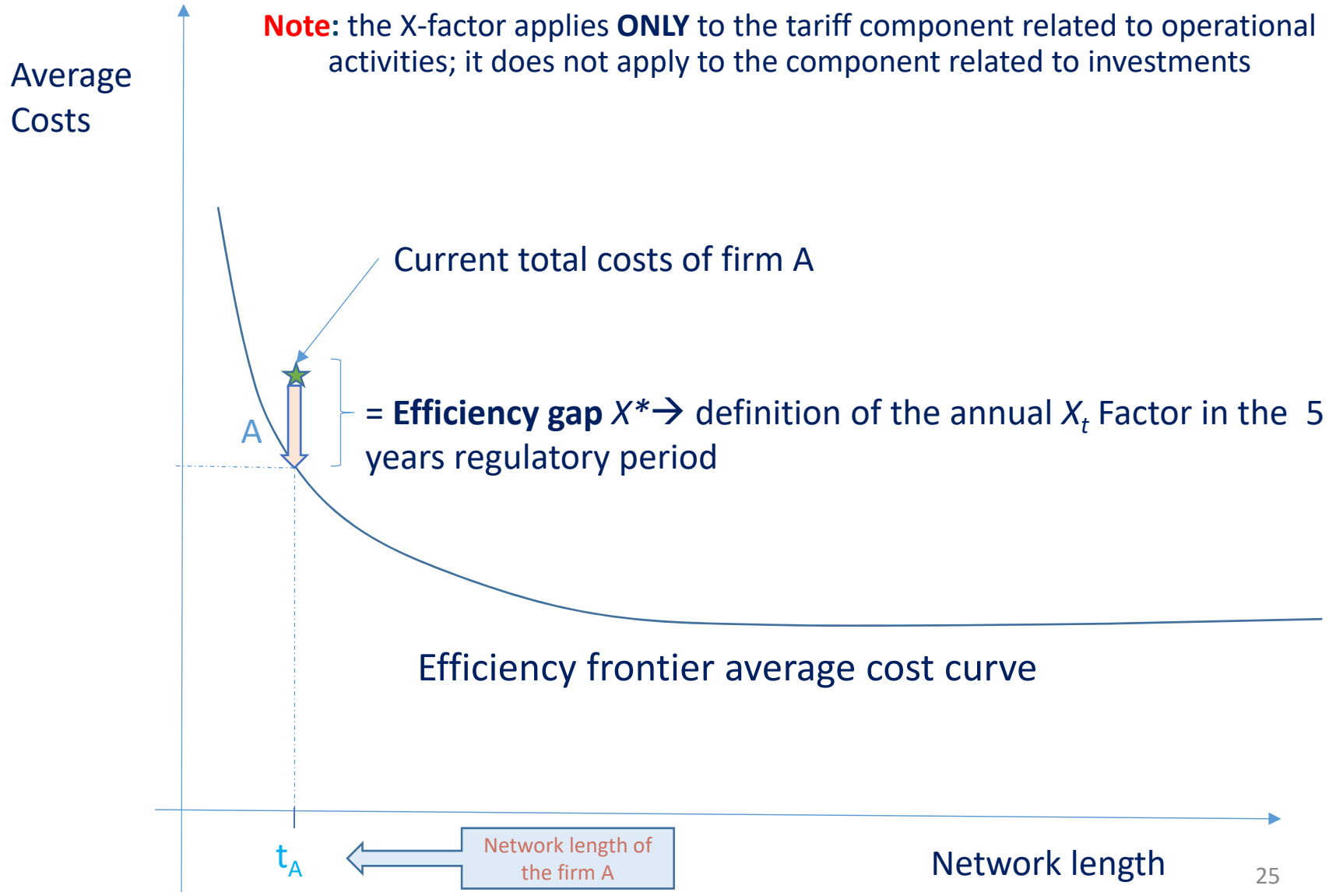
- ***Residual period/length of concession*** = Years at the end of the concession/Duration of the concession
- ***Debt/Equity***= Debt to Equity ratio

Time and firm dummies

The methodology

- **The methodology adopted is the *Stochastic frontier analysis*** (see Aigner et al., 1977; Schmidt, C. A. Knox Lovell, 1979; Kumbhakar & Knox Lovell, 2003).
- **It is aimed at identifying the «*efficiency frontier cost curve*»**
- The methodology used is **standard in the economic literature**.
- It has been also **adopted by several NRAs around Europe** for regulatory benchmarking in railways, electricy, gas, water and so on.
- The analysis uses alternative **functional forms** (Cobb-Douglas and Translog)
- To implement such analysis we use an **econometric software** (STATA) and we elaborate an ad hoc code to run different estimations.

The frontier cost curve, the efficiency gap and the X factor



The flexibility of the grantor

With no prejudice for the value of the overall recovery percentage $X*$, in the early application of ART's regulatory framework, the **grantor may define a different allocation of the productivity factor** (instead of the standard allocation on a five-year basis), when at least one of the following conditions is met:

- **structural inefficiency** deriving from a total length*km of the motorway sections covered by the concession below the 180 km minimum threshold of the optimal management area (as defined in decision n. 70/2016);
- **existing constraints to efficiency measures** based on clear, objective and documented evidence, that prevent the achievement of the targeted recovery of production efficiency:
- **impairment**, despite the adoption of objective and documented efficiency measures, of the requirements of "financial soundness" (as per article 11 (5) of Italian Law No 498 of 23 December 1992).

The grantor submits the decision to operate the safeguard mechanism to ART for an assessment of its impact on the charging system

The terminal value of the concession

The **terminal value of a concession (takeover value)** is the compensation borne by the incoming concessionaire for investments related to approved works that have been already executed by the previous concessionaire and have not been yet amortized upon expiry of the concession.

The compensation shall be **equal to the cost actually borne, net of depreciation, of the reversible assets** as resulting from the financial statements on the date of the year in which the concession expires, and net of necessary changes made for regulatory purposes.

The terminal value is set by the grantor when the concession or the new regulatory period starts. ART's regulatory framework assumes that value as an input.

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Expected outcomes

Expected outcomes

Stability and predictability of regulation

Long-term investment strategy and vision

Remuneration of invested capital at fair and market-oriented value

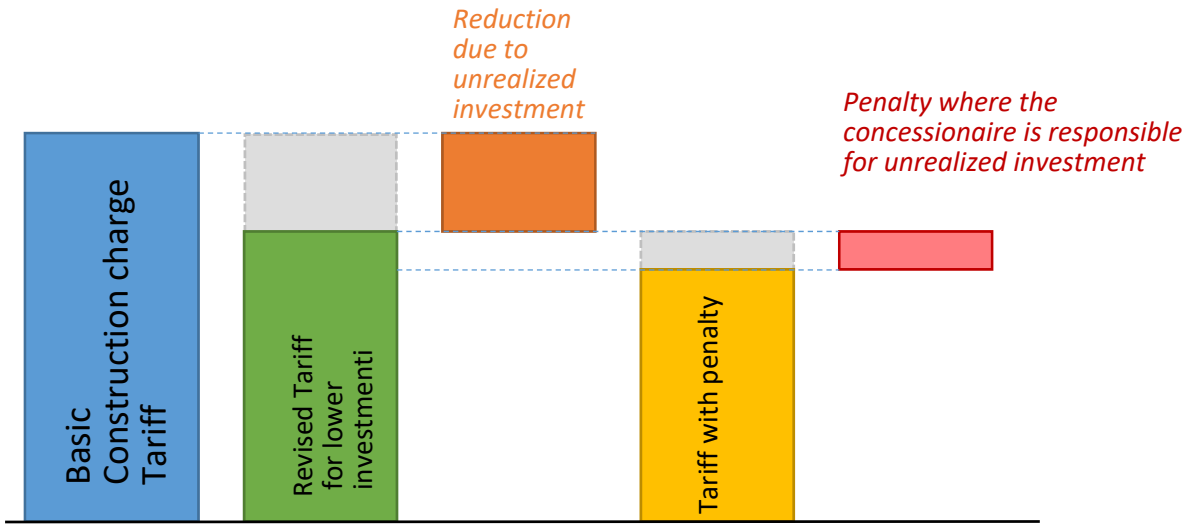
Economic sustainability of concessions

Benefits for the end-users

Back up

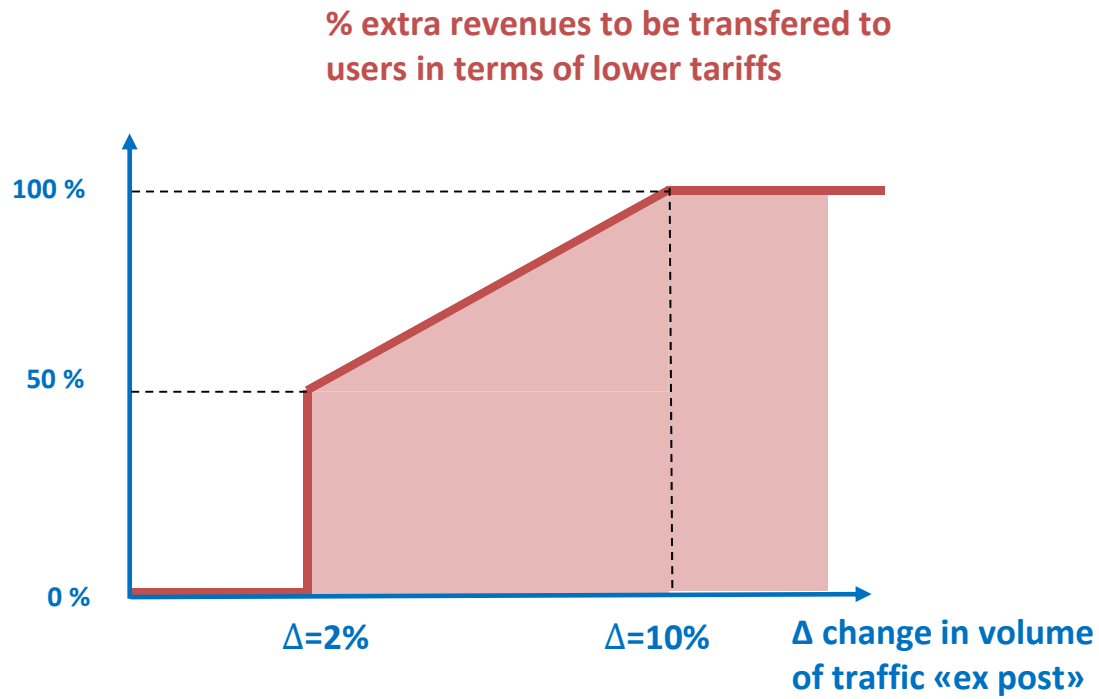
Investment dynamics and penalty system

- ART has defined a mechanism to account for the difference between realized investment with respect to planned ones.
- In case of **unrealized investments**, the **tariff** will be reduced taking in to account the % of unrealized investments on the total planned investments.
- Moreover, a **penalty is applied** in case the delay in making the investments is attributable to the concessionaire.

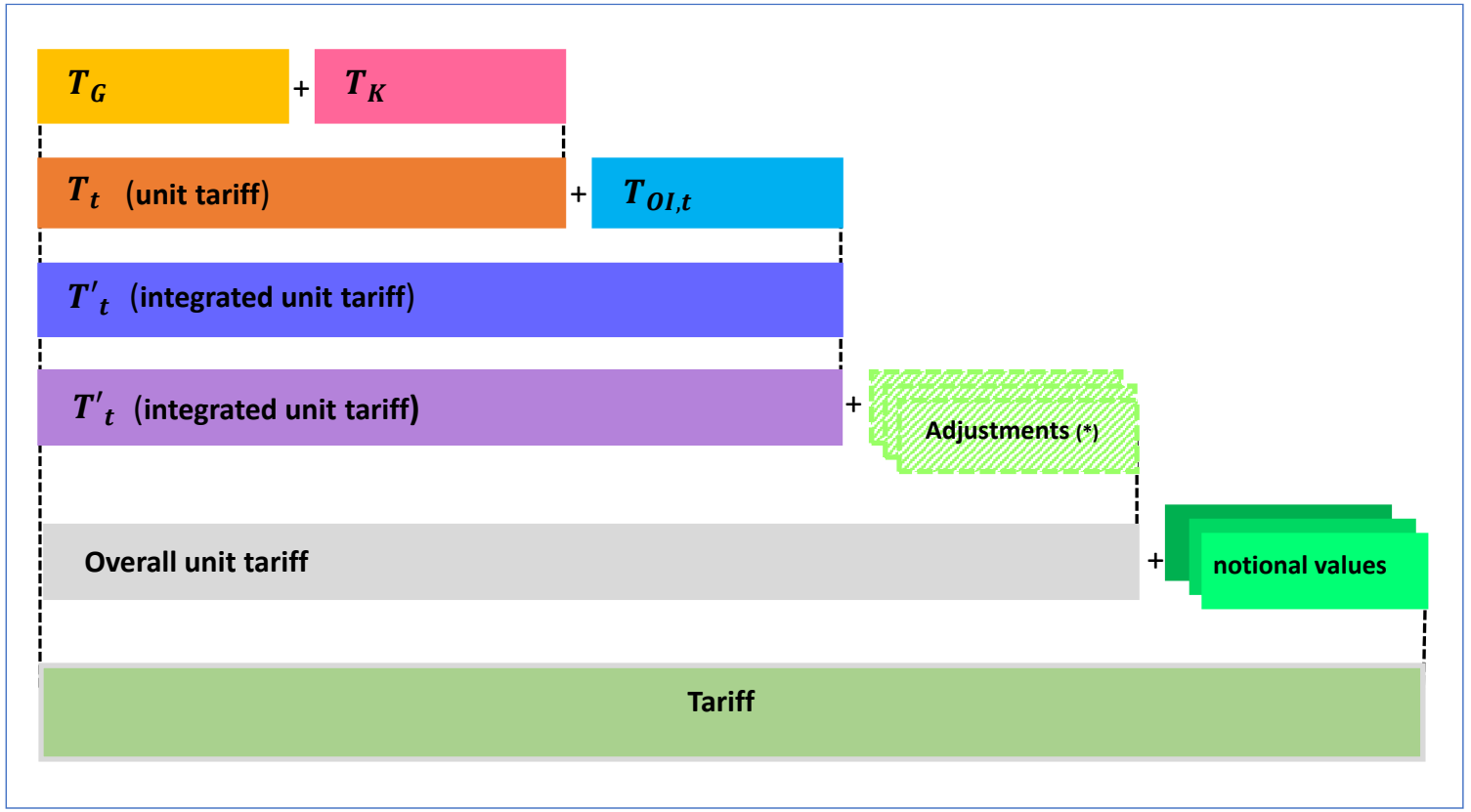


The Revenue-sharing system

- Revenue-sharing system in case the effective (ex post) volume of traffic differs from the (ex ante) one forecasted.
- The difference in value is then transferred to final users in terms of a lower tariff in the following regulatory period



Composing the tariff



(*) as conventionally agreed