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THE ECONOMICS OF THE SINGLE-TICKETING REGULATION IN EUROPE

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Executive Summary

The European Commission is preparing a new regulatory framework on digital ticketing aimed at strengthening passenger rights and enhancing competition in rail transport. This framework consists of three pillars: Multimodal Digital Mobility Services (MDMS), the Single Digital Booking and Ticketing Regulation (SDBTR), and a targeted review of the Passenger Mobility Rights (RPRR). This issue paper focuses on the first two pillars, examining how single-ticketing regulation should be implemented and how the relationship between operators and other ticket distributors should be regulated.

The regulation will address long-standing structural issues in European rail markets, where ticketing has traditionally been vertically integrated within national incumbents, limiting visibility and making access for new entrants and new digital distribution platforms more difficult. Despite the growing presence of independent platforms, incumbents' channels remain dominant. The MDMS proposal would require all vertically integrated incumbents to *sell*, and all ticketing platforms, including those operated by dominant rail companies, to neutrally *display* competitors' services. In parallel, the SDBTR aims to broaden the range of rail ticketing options available by imposing obligations on operators to enter into contracts with platforms under fair and transparent conditions.

However, ticketing platforms themselves may suffer new forms of market failure, particularly when a single platform is already the default point of access for journey planning and ticket sales, making the penetration of alternative platforms more difficult. When this occurs, it can reinforce incumbents' structural advantages in the rail market, restrict the growth of independent ticketing services, and weaken incentives for innovation among both operators and intermediaries. One of our aims is to point out that even well-intentioned regulatory obligations may inadvertently worsen concentration if they strengthen the role of already-powerful platforms.

From a regulatory perspective, key elements to guarantee a level playing field between all actors of this three-sided market are: on one side, vertically integrated railways incumbents and, on the other, new train operators and digital platforms independently distributing tickets. To do so, the SDBTR is expected to define economic criteria to set the commercial remuneration for ticketing by independent providers and the fees that platforms may pay to access the offers of rail operators. In this perspective, the policy discussion on the definition of the remuneration for ticket selling is based on the application of a well-known regulatory mechanism, i.e. the Fair, Reasonable and Non-Discriminatory (FRAND) method. While FRAND is widely used in several regulatory cases, and more recently even on data sharing within the Data Act framework, the FRAND principle remains extremely generic to be applied predictably. For this reason, it is essential that the European Commission – particularly DG MOVE – provides a concrete interpretation of FRAND for the rail and ticketing context, along with methodological guidance for determining the cost of ticket selling and assessing their competitive impact.

Because these risks vary across national markets, the regulation calls for a flexible and graduated approach rather than a uniform model. Voluntary cooperation agreements, graduated obligations, or even the structural unbundling of ticketing platforms may be required depending on market size, incumbent strength, or the role of Public Service Obligation (PSO) services. In the domain of RPRR, ensuring that operators retain liability only for their own journey segments is also a trade-off regulators should consider carefully, to avoid legal friction and support wider adoption of single-

ticketing. In particular, FRAND principles and allowing intermediaries to sell competitors' tickets should not impact the approach to passenger rights and liability.

In conclusion, while the primary goal remains the opening and improvement of the rail market, ticketing regulation should minimise new market failures within the ticketing sector itself. It is important to anticipate and address dominant positions in ticketing already at the regulatory stage – for example, through forms of graduated regulation and the active involvement of sectoral national regulators – and to provide a clear and usable framework to ensure that FRAND principles are applied effectively in ticketing-related pricing.

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1. Introduction

After the public consultation that took place from July to September 2025, the European Commission started assessing the introduction of new packages of interventions aimed at reinforcing railway passenger rights and enhancing market competition. The new legislative body is characterised by three different pillars: the Multimodal Digital Mobility Services (MDMS), the Single Digital Booking and Ticketing Regulation (SDBTR) and a targeted review of the Passenger Mobility Rights (RPRR).

In a nutshell, the first pillar is aimed at supporting the development of multimodal ticketing services within and across passenger transport modes, with the intention of significantly improving multimodality, inclusiveness and sustainability in the EU, within Member States and across borders. It thus introduces mandatory rules for *ticketing platforms*[1] to show in a neutral way all services provided by any operator, with the additional obligation for the incumbents' integrated ones to sell any of them. The second pillar focuses on broadening the range of rail ticket options available through the obligation for operators to enter into contracts with platforms. While the SDBTR concentrates specifically on rail transport, the MDMS proposal aims to improve the overall online multimodal ticketing market by enhancing transparency, promoting fair competition, and avoiding market distortion. Overall, the regulation tackles the issue of ticketing fragmentation, enabling passengers to book multi-operator rail journeys in a single transaction while preserving their full rights across the entire journey. Achieving this level of integration requires continuous, secure, and standardised data exchange between railway operators, infrastructure managers, digital platforms, and regulatory authorities, in a way that is also economically sustainable. The third pillar ensures that individuals can travel without discrimination and receive appropriate assistance. These rights include the right to travel by various modes of transport, receive accessible information, and get free assistance at terminals and on-board vehicles.

These new initiatives are relevant, especially within the current EU goal of enlarging high-speed connections across European countries and facilitating consumers' travel experiences (European Commission, 2025). While all aspects previously described would deserve an ad hoc analysis, in this Issue Paper, we focus on the first two pillars, offering an assessment of how regulation on single ticketing should be implemented and how the ticket distribution system should be accessed across players and under what commercial conditions.

In the remainder of the Paper, Section 0 will discuss first the regulatory aspects of the MDMS, focusing on some specific aspects that might introduce new market failures and thus require further measures to face them. Section 0 instead deals with an analysis of how to regulate access to ticketing distribution systems within the FRAND approach foreseen in the SDBTR.

[1] Ticketing platforms are digital tools that streamline the selling, distribution, and management of access (tickets) for events, services, or support requests.

2. Regulating Ticketing Platform Access

2.1 The Regulatory Problem

Open and neutral access to ticketing platforms, which is at the core of MDMS regulation, arises from the need to ensure that competition in the rail market functions as an effective driver of development. Competition, in general, can foster innovation and efficiency, but only when a level playing field is ensured for all operators, **whether they are rail operators or ticketing platforms**. However, when such a level playing field is not guaranteed, new rules may unintentionally lead to more concentrated markets and, in turn, less innovation (Aghion et al., 2005).

In the rail sector, ticketing has traditionally been a vertically integrated feature of national incumbent operators. Unlike the air market – where interlining is common and third-party ticketing agents such as Global Distribution Systems (GDS) have long been established – the rail market has very limited forms of co-issuing, typically only among partner rail companies in neighbouring countries. Moreover, the rail market has no comparable history of independent ticketing intermediaries. At the same time, ticketing is a key component of an open and contestable market, giving access to the broadest range of customers. Hence, the need for newcomers to establish their own sales channels (and especially give visibility through marketing campaigns, CRM, etc.), duplicating existing ones, may constitute a financial barrier.

In recent years, digital ticketing has expanded rapidly and has become the standard for most travellers. However, national incumbents' sales channels remain the preferred option even in the digital domain. Some incumbents have developed sophisticated travel planners that integrate local public transport, although these tools do not necessarily ensure integrated ticketing. As a result, rail companies' websites have been further reinforced as the main reference for national door-to-door routing. Among the most open markets, no country has developed a significant public travel planner independent from the national rail operator, covering long-distance traffic, with the partial exception of Czechia (see Table 1).

Open-access (OA) rail operators have emerged across Europe since the 2010s, particularly in Italy, Sweden, Czechia and neighbouring countries, as well as Austria. More recently, incumbents in Germany, Spain and France have also faced strong competitive entry, while in the United Kingdom (UK) the market remains structurally fragmented due to the division into multiple franchises. Across these countries, OA operators have adopted different strategies to reach potential customers and sell tickets. In Sweden and Germany, competitors' services are displayed on incumbent railways' sales channels, but not sold. By contrast, in Italy, Czechia and Austria, newcomers have had to rely since the beginning on their own digital and physical sales platforms (de Rose & Jørgensen, 2024), while the possibility of renting physical spaces in stations has been guaranteed after some initial struggle (AGCM, 2014).

Table 1. Overview of openness of sales channels across a sample of liberalised rail markets.

	Shops and machines at stations	Show in the incumbent's navigator	Sales through the incumbent's digital platforms	Sales through national digital platforms	Third-party ticketing platforms
Sweden		Yes	Yes[2]		Yes
Germany		Yes			Yes
Italy	Yes				Yes
Czechia	Yes			yes (idos.cz)	Yes
Austria	Yes	Yes (Scotty)			Yes
France	Yes				Yes
Spain	Yes				Yes

Source: elaborated by the authors.

The absence or difficulty of access to incumbents' physical and/or digital sales channels represents a substantial barrier for smaller operators (de Rose & Jørgensen, 2024). Building independent sales platforms from scratch – and communicating their presence to potential travellers – entails significant costs that weigh heavily on new entrants. Current regulation of the ticketing sector is at the national level and generally does not guarantee a level playing field, thereby representing a significant source of market failure that impedes seamless competition among train operating companies. For this reason, the EU, through the MDMS initiative, is introducing obligations requiring dominant rail operators to display and sell competing carriers' services in a neutral and non-discriminatory manner.

In parallel, independent ticketing platforms have expanded, particularly in markets with more active competition. The UK has been a pioneer in this area, owing to its structural fragmentation and the absence of a nationwide operator. Today, however, the presence of such players is also significant in Italy, Central Europe, Spain and France. These platforms are currently the only ones capable of providing visibility, comparison and even purchase options across potentially all available travel services, although they do so exclusively based on bilateral agreements.

On top of them, GoogleMaps or AppleMaps have entered the door-to-door routing and have rapidly become the standard also for public transport searches, although not yet heavily present in the ticketing. Their size and pervasiveness in the searches' market must be monitored to prevent the rise of excessive market power in ticketing.[3]

In conclusion, two interconnected markets exist in the rail sector:

[2] VR (formerly MTRx) is no more shown or sold via www.sj.se

[3] The Digital Market Act (DMA) already incorporates constraints in the behaviour of dominant tech firms in new submarkets.

- The **rail market**, in which ticketing platforms are essential for **market liberalisation**, as they enable fair and efficient access to the market for all operators, including smaller new entrants, without requiring costly duplication of sales channels.
- The **ticketing market**, in which ticketing platforms themselves require regulation to prevent or address potential market dominance, ensure neutrality and guarantee fair pricing, including general mapping platforms such as GoogleMaps.

Ultimately, **both the rail and ticketing markets need to be opened, and each opening must be supported by adequate and coherent regulatory frameworks**.

2.2 Pros and Cons of Proposed MDMS Regulation

Introducing pros and cons helps clarify the potential benefits and threats of a measure that is at the cross-point between two markets – the rail and the ticketing one.

Pros

- The promotion of a level playing field in searching and ticketing supports rail liberalisation by making rail newcomers visible to the full potential customer base, strengthening their financial sustainability and encouraging the introduction of innovative services. This is *expected* to contribute to limiting the distortive effects of today's vertically integrated ticketing systems in favour of rail newcomers.
- Centralised and multi-operator ticketing platforms promote intermodality and interlining, thereby offering users a wider range of travel solutions and making public transport more competitive.
- Open ticketing generates data-sharing opportunities that enhance market knowledge and provide valuable evidence for planners and regulators, without distorting the market.

Cons

- While addressing one of the rail market's key failures – the incumbents' control of sales channels – the MDMS must also avoid creating new dominant positions in the ticketing market. In fact, leveraging the dominant position of a vertically integrated railway operator from the service market to the ticketing platform is more than a possibility, especially where it is already the default searching or route-planning tool in a national market or the only one providing last-mile multimodal integration (e.g., with local public transport). Such concentration would *weaken* the position of independent platforms, which is the opposite of the aim of the regulation.
- Dominant positions in ticketing may create risks of asymmetric conditions in pricing (see Section 0 for a discussion on FRAND principles).
- Dominant positions in ticketing may also lead to imbalances in market data sharing, generating asymmetric access to information and difficulties in monitoring the incumbent's fair behaviour.

- Risk of concentration of power in distribution platforms, and implementation costs, which could penalise private operators without adequate support mechanisms by simply forcing them to appear primarily on their competitor's platform.

2.3 Possible Solutions

Regulation of ticketing platforms should be **designed to support the primary objective of opening and improving the rail market,** while **at the same time avoiding the creation of new market failures within the ticketing sector itself**.

Thus, single ticketing regulation must not be limited to correcting market distortions, as is the case with antitrust instruments, but must be proactive and aimed at fostering fair and competitive conditions. However, this is not an easy task as the market is not characterised simply by the presence of large operators versus small entrants, but its structure is much more complex, with a variety of players and business models (Figure 1). This requires **a flexible and graduated regulatory approach, capable of adapting to national specificities while maintaining a coherent European framework.**

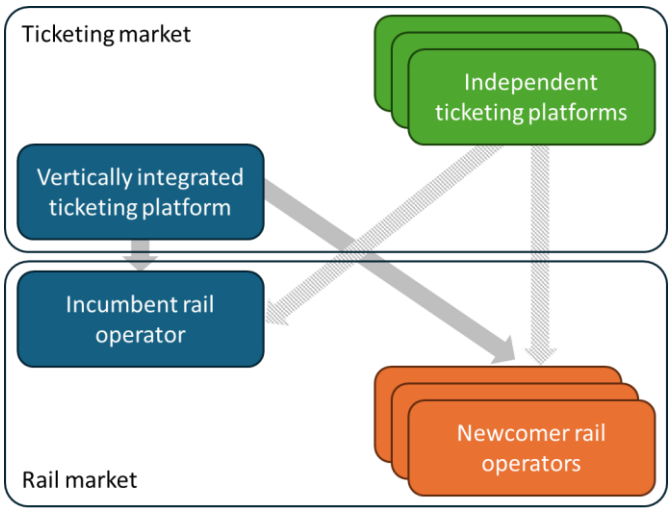

Figure 1. Multi-actor relationships in the two markets.

Source: elaborated from the authors.

The differentiated situations existing across Europe on both markets (e.g. already open vs. still closed rail markets, small vs. large new entrants, market shares of vertically integrated ticketing platforms) **do not justify a uniform approach across EU countries**. **NRAs have a fundamental role to play in this scenario** as challenges differ significantly between countries. In larger markets, for example, where incumbents tend to be particularly strong, imposing obligations to sell rival tickets may help liberalise rail services but could also result in an even more concentrated ticketing market, especially if competitors operate in niche segments. In smaller markets, where international traffic plays a more prominent role, interactions with PSO services are typically more intense.

Among possible solutions, the softer one is to **enhance and actively promote cooperation among operators** through voluntary agreements, supported by appropriate data-sharing obligations, with National Authorities appointed to settle disputes between parties (see Section 0). On the opposite range, a more radical approach, applicable when an incumbent's platform holds a dominant position,

would be to **separate the ticketing platform from the incumbent operator rather than merely requiring neutrality**. While this measure could limit the rail incumbent's advantages, it would not necessarily address ticketing market concentration and could even exacerbate it.

Where ticketing markets are already highly concentrated, a **graduated regulatory approach** may be appropriate to facilitate the entry and growth of independent or new ticketing providers. Such asymmetry could take several forms, to be evaluated case by case:

- a temporal one, for example, delaying or anticipating specific obligations for incumbent platforms with respect to newcomer ones to prevent excessive market concentration in ticketing;
- a scope-based one, for example, imposing obligations on incumbents only for specific services such as regional PSO routes or international connectivity while leaving pure open-access services to voluntary agreements;
- a size-based one, prioritising access to incumbent platforms for smaller competitors.

Facilitating the integration of last-mile local transport could also be particularly effective in supporting independent platforms. Failing to ensure full and effective coverage of local transport options and focusing only on long-distance services – which are those where voluntary symmetric agreements work better – could inadvertently reinforce the advantages of incumbent platforms. At the same time, digital platforms should not interfere with operators' pricing policies, as this would undermine the competitiveness and economic sustainability of the sector.

Finally, an outcome-based approach to regulation remains essential. Penalty and reward schemes for demand-side targets such as punctuality should be preserved, but liability must remain separate for each operator responsible for its own segment of a journey. Introducing segmented responsibility across operators could generate legal friction and should be assessed carefully to avoid hindering the adoption of single-ticketing solutions. Thus, in short, each operator must remain responsible for its own travel segment, avoiding forms of joint liability that would generate legal and financial risks.

All in all, **regulation must be seen as a tool to foster competition and prevent the formation of new dominant positions**, both among railway operators and distribution platforms. The process is only just at its beginning, and more studies are needed to define effective and sustainable rules capable of ensuring an integrated, competitive, and passenger-oriented mobility system.

3. Instruments for Implementing Single Ticketing Regulation

The European Commission has identified a structural and persistent problem in the digital ticketing market. Independent distributors play an essential role in fostering consumer choice, transparency, and innovation; however, their ability to operate effectively is increasingly constrained by dominant transport operators.

Ensuring effective market access is therefore a prerequisite for a well-functioning and competitive digital ticketing ecosystem. The SDBTR proposal responds to these challenges in a targeted and proportionate manner by introducing clear obligations aimed at preventing foreclosure and guaranteeing fair access to the market. In particular, the obligation for dominant transport operators to negotiate with independent vendors on FRAND terms constitutes a key safeguard against discriminatory conduct and self-preferencing.

Meaningful and enforceable market access conditions, especially with regard to access to the offers of rail operators and fair remuneration for independent digital platforms, are indispensable to enable independent distributors to compete effectively and to deliver tangible benefits to consumers. In this respect, the proposal represents an important step towards correcting existing market failures and promoting an open, competitive, and consumer-centric digital ticketing ecosystem.

The FRAND regime is a principle requiring that access to essential inputs — in this case, access to the ticketing distribution system and the remuneration of commercial activities — be granted on fair, reasonable, and non-discriminatory terms, in order to prevent abuses of market power and ensure a level playing field for competition.

The concept of Fair and Reasonable Pricing (FRP for brevity) frequently appears in the regulation of network industries (see Section 3.3), as well as in the case of the regulation of Standard Essential Patents (SEP) (Meniere, 2015) and, more recently, in the regulation of digital services (Kramer et al., 2023).

As reported by Heim and Nikolic (2019), the FRAND framework is inherently adaptable, promoting a level playing field among participants based on established commercial principles. While the appropriate form of an access remedy depends on the nature of the input – both its physical characteristics (here, non-tangible) and its legal attributes – the FRAND system helps overcome many regulatory challenges by offering a comprehensive model. Although public policy may define certain boundaries for the relevant sector input, the detailed terms and conditions of access are generally determined through bilateral, market-driven negotiations between parties, supported by mechanisms for dispute resolution or judicial oversight.

In antitrust enforcement, there are multiple cases examining fair and reasonable pricing practices that lead to the exploitation of a dominant position, a behaviour prohibited under Article 102 of the Treaty on the Functioning of the European Union.

However, while largely applied in several antitrust and regulatory cases, the FRAND regime has also been largely criticised for being sometimes too generic and undetermined. Contreras et al. (2022), for

example, points out that "*as demonstrated by two decades of intensive litigation around the world, FRAND royalties have given rise to intractable disputes regarding the manner in which such royalties should be calculated and adjudicated*." A preliminary review of the literature shows that **textbooks in economics, industrial economics, and regulation do not devote much space to methodologies used to set fair and reasonable prices in markets subject to ex-ante intervention**. Academic research also appears to have paid limited attention to the issue of setting these particular prices.[4]

3.1 The FRAND Approach in the EU Data Act Framework

Before revising potential pricing methods for commercial fees in the railways market, we consider insightful to briefly review the specific prescriptions on FRAND included within the EU Data Act.

As pointed out in Tombal and Graef (2025), **the Data Act's framework applies only in situations where a data holder is required to share data with a data recipient**. Data holders are entities that possess de facto or de jure control over data generated by products or services and are legally obligated under EU law to make certain data accessible. This implies that the framework covers only those businesses that gather data through their control over products or services.

At the heart of this framework lies the requirement for data holders to share data with recipients transparently and on FRAND terms, formalised through a data-sharing agreement (Kramer et al., 2023). The Data Act also stipulates reduced compensation when the data recipient is a Micro, Small, or Medium-sized Enterprise (SME), aiming to shield such entities from disproportionate financial burdens that could hinder the growth of innovative business models.

According to the Data Act, the concept of "reasonable compensation" payable by a data recipient that is not an SME, must cover the direct costs of sharing the data, as well as a fee that reflects – at least partially – any investments made in collecting or producing the data, taking into account contributions from other parties involved in obtaining or generating it.[5] Furthermore, the amount of compensation may vary depending on factors such as the volume, format, and nature of the data.[6] The reasonableness of this compensation will therefore depend on market conditions and may include a profit margin, except in the case of SMEs and not-for-profit research organisations. This approach aligns with the Open Data Directive, which defines a "reasonable return on investment"[7] as a percentage added to the cost-recovery charge, capped at 5 percentage points above the European Central Bank's fixed interest rate.[8]

While the Data Act could in principle be a starting point for analysing data access for single ticketing, it remains largely generic, generating significant uncertainty about the very meaning of the FRAND paradigm. As such, it may not, on its own, be sufficient to prevent a new wave of litigation (as also reported in Kramer et al., 2023, CERRE). **Therefore, this Section aims to examine how the FRAND**

[4] An exception is Layne-Farrar (2017).
[5] Article 9.2.b) of the Data Act.
[6] Article 9.3 of the Data Act.
[7] Article 6.4 of Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the reuse of public sector information, OJ L 172/56, 26 June 2019.
[8] Article 2(16) of Directive (EU) 2019/1024.

paradigm could be applied within the specific characteristics of the railway market. The FRAND regime is also mentioned in the French Legislation (*Loi de la mobilité*, 2019) as the method to fix the access conditions to train operators' data by digital platforms. In this law, the French Transport Authority (*Autorité de Regulation des Transports*) has been in charge of resolving disputes and initiating investigations on specific cases.

To this aim, we will first review possible pricing methods and then practical experiences in the transport sector and beyond. The analysis will not address the regulation of economic conditions for patents; rather, it focuses on a review of economic literature and jurisprudence (mainly of a regulatory nature) concerning FRP.

3.2 Methods for FRAND Implementation

FRP serves as a price control mechanism used by regulatory authorities when defining obligations (price-related) for entities holding significant market power (SMP), i.e., when the authority exercises its market regulatory powers. This involves adopting a "pricing setting" mechanism. Regulatory authorities could also resort to the concept of FRP in disputes between operators, representing another important function of market regulatory authorities.

What are the main methods for pricing data within the FRP paradigm? We now provide a taxonomy of alternative mechanisms, pointing out both the pros and cons.

Pricing approach could be divided into two classes, output-based and input-based measures.

Output-Based Measures

The FRAND regime is ideally implemented to share the benefit of a transaction (e.g. of a ticket sale in our case) between the parties involved in it. The most widely adopted models in this perspective are:

Revenue-sharing model: Revenue sharing ensures that all parties contributing to the transaction are fairly compensated when that data is commercialised. This, in principle, should align incentives and promote participation in the market, where the ticketing service can be seen as a shared asset rather than the exclusive property of one entity. Different mechanisms can be used depending on the market structure and regulatory context, as reported in **Error! Reference source not found.**:

Table 2: Alternative mechanism for implementing a Revenue-sharing model.

Model Type	Description
Fixed percentage split	Revenue is divided according to agreed percentages (*output-based mechanism*).
Usage-based model	Sharing depends on how often or how intensively the service is used (*e.g. how many tickets have been sold).*
Value-based model	Compensation reflects the value added by the transaction to the final product or service.

Source: elaborated by the authors.

In principle, this mechanism encourages new operators to enter the market while providing the incumbents with economic incentives to keep their investments. By reducing the entry barriers to new entities and platforms, it also fosters innovation and competition. However, the main con is the relative bargaining power between the parties: when negotiating the economic compensation for commercial fees, in the presence of SMP operators, the bargaining power might not be equally distributed and this may lead to an "unfair" price for the less-powerful party in the negotiation, typically the smaller players or new entrants. Hence, the adoption of this method in a largely asymmetric market share scenario might lead to inadequate fees.

The retail minus approach: This method consists of a bottom-up approach, where the commercial fee or the fee paid for accessing rail operators' offers is given by the difference between the "retail" price applied by a SMP firm for the service sold, minus the costs (a percentage reduction) that the SMP firm itself would not incur if it reduced its production of final services. This method basically allows the commercial fee to be equal to the per unit the profit SMP would not earn by allowing a third party to offer the service it can provide. This approach is the one, for example, suggested in a recent paper by Bisceglia and Tirole (2024) for FRAND access to third-party data within the regulatory framework of the Digital Markets Act (DMA).

Input-Based Measures

Alternative methods are based on the cost for the provision of the service, in this case, the cost for ticket commercialisation and distribution. The main instruments are:

Benchmarking: this technique has been widely used in the past in the experience of national regulators in network industries, in the absence of regulatory accounting – that is, an accounting system providing the regulatory authority with detailed information on costs, revenues, and invested capital for the services subject to regulation. In short, it consists of a comparison (benchmark) between the price applied by the SMP firms and the prices applied by any competitors in the national market or by other regulated operators in the same sector in other countries. The main positive aspect of this method is its simplicity and transparency; however, its primary drawback is that commercial agreements among firms – if already in place – are difficult to monitor, and public sources are often insufficient, making benchmarking extremely challenging in this context.

Cost-Based Approach: This method aims to ensure that prices cover costs and include a reasonable profit margin (mark-up). The costs to be covered should include all direct costs of ticket distribution, as well as a fee that compensates any investments made in managing and maintaining the ticket platform. Costs must be evaluated in terms of the so-called *Equally Efficient Operator* principle[9] so as to ensure that access conditions do not disadvantage rivals who could otherwise compete effectively. To this aim, existing regulatory approaches already provide criteria of cost evaluation to be

[9] The principle aims at verifying whether a competitor that is equally efficient as the dominant firm might be able to compete under the same conditions.

implemented in such circumstances, such as the long-run average incremental cost (LRAIC) approach, commonly used in communication markets and in several other applications in Antitrust.[10]

A possible alternative to this method is the so-called *Cost plus mechanism*, according to which the final prices should also incorporate not only direct and partially indirect costs, but also a remuneration of the capital invested by the SMP firm to collect and produce the data. This remuneration is typically evaluated using the so-called Weighted Average Cost of Capital (WACC).

3.3 Other Applications of Fair and Reasonable Prices in the Experience of Network Industry Regulators

Although it has not been directly referred to in regulatory decisions, we report here some "*experiences*" involving the use of FRP criteria for verifying offers or prices in the context of regulated markets.

In the transport sectors, some national regulators have not explicitly defined a single, univocal criterion for "*fairness and reasonableness*." Instead, it has articulated the criteria of "*fairness*" and "reasonableness" separately, depending on the type of sector and context. With reference to the Italian Regulatory Authority of Transport (ART), we provide some examples below.

- ***Railway toll system (network access services provided by the incumbent firm)***[11]

  The "*criterion of fairness*" is defined in the definition of a specific component of the regulated tariff:

  > *"The distribution of traffic into classes of total train mass, carried out through the selection of appropriate threshold values, is implemented by the Infrastructure Manager (i.e., Italian Railway Network - Rete Ferroviaria Italiana – RFI) according to criteria of fairness and non-discrimination based on the different incidence of Direct Costs, as well as oriented to reflect the technical and operational characteristics of the rolling stock, rewarding in particular its efficiency in terms of lower infrastructure wear, separately for passenger and freight services." (Measure 28.1 - p.39).*

  In essence, this requires taking into account direct costs plus the costs generated on the network by the use of third parties (that is, by the rolling stocks operated by railway companies).

  The "*criterion of reasonableness*", on the other hand, is generally associated with the concept of "reasonable profit" (Measure 6 - p.11). Therefore, this example points toward the application of a sort of "cost-plus" mechanism.

[10] See, for example, the 2009 Communication from the Commission — Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2009_045_R_0007_01)

[11] https://www.autorita-trasporti.it/wp-content/uploads/2023/05/All.-A-delibera-n.-95_2023.pdf

- ***Regulatory models for highway tolls***[12]

  The concept of "*fairness*" is applied only to tariff modulation – that is, to the articulation of toll rates left to the operator when setting the individual tolls by vehicle type (cars, motorcycles, heavy vehicles):

  "Tariff modulation, while respecting the relationship described in section 5.4 with reference to the integrated average unit tariff, is guided by the principles of transparency, fairness, and non-discrimination among users." (Measure 6.3)

  The "*criterion of reasonableness*" is present in relation to the concept of "*reasonable profit*," particularly in the evaluation of investments (Measure 14.1). Thus, again within the transport sectors, the implementation of FRP appears to be in line with the "cost plus" approach.

We now revise two different applications of the concept of FRAND in cases in which the National Regulatory Authority defines criteria to evaluate the fairness and reasonableness of SMPs' offers.

In the energy sector, an interesting case is the one recently conducted by the Italian Regulatory Authority for Energy, Networks and Environment (*'Autorità di Regolazione per Energia Reti e Ambiente' - ARERA*) to verify the strategic behaviour of energy producers in the wholesale electricity market. More specifically, ARERA carried out a fact-finding investigation on the economic withholding of capacity in the so-called Day-Ahead Market (MGP) in the years 2023–2024. This investigation represents the first systematic analysis of such magnitude conducted by a European energy regulator.

Launched with Resolution 401/2024/R/eel of 8 October 2024, the investigation was published on 2 July 2025, and examined the bidding behaviour of operators in the day-ahead electricity market, with particular regard to significant production units offered by all Italian energy producers in relation to gas, wind, and solar photovoltaic technologies.

Although the context of reference is obviously largely different from that of railway transportation, it is interesting to observe that the objective of this investigation was to analyse possible anti-competitive behaviour carried out by energy producers – in this specific case, aimed at increasing the unit prices offered in the market in order to raise the mark-ups obtained.

The investigation, particularly complex due to the functioning of the wholesale electricity market (merit-order auctions) and the various possible energy production technologies, proves to be highly informative.

Indeed, in order to assess whether the bids made by producers were actually excessive, i.e., to verify whether producers had artificially declared that they would not interrupt the production in specific plants so as to maintain higher prices in the wholesale market, the Authority reconstructed a benchmark for each production technology based on *the average variable production costs*, thereby determining a standard unit cost for each type of offer, which was then compared with the actual bids.

[12] https://www.autorita-trasporti.it/wp-content/uploads/2019/06/delibera-n.-77_All.-A.pdf

Similar investigations, with the same approach in terms of cost references to evaluate possible misbehaviour by energy generators, have been applied in France[13], Spain[14] and in the UK[15].

In the electronic communications, the current EU regulatory framework (the European Electronic Communications Code) contains FRAND-based access regimes to networks, infrastructure and content. The application of this FRAND regime is primarily managed by NRAs, who are best placed to assess the situation on the ground, given the nature of the markets. These access regimes are imposed in order to satisfy various public policy objectives, including ensuring full end-user connectivity, resolving infrastructure bottlenecks or safeguarding ex ante competition, as an adjunct to ad hoc competition enforcement. The EU framework thus shows that European legislation does not shy away from mandating access to critical infrastructure in order to satisfy broader policy objectives. Within this overall framework, it is interesting to briefly review the recent decision by Ofcom (Office of Communications). More specifically, the UK regulatory authority defined its own analytical methodology, which led it to intervene in evaluating two commercial offers by the wholesale SMP operator, Openreach, competing with alternative network firms in the provision of wholesale access. In detail, in its *Wholesale Fixed Telecoms Market Review Statement* of December 2020, Ofcom set out the analytical framework to be applied in cases where commercial conditions are notified in which the price or other contractual aspects are conditioned by the volume and/or range of services purchased. Ofcom emphasised that the creation of any barrier to the use of alternative operators would be justified only when:

a) a significant impact on competitors is unlikely; and

b) the agreements generate clear and demonstrable benefits, as in cases where:

   i. the agreements are essential to Openreach's business case for promoting investments; and

   ii. the agreements are necessary to offer more efficient prices, leading to benefits for consumers.

Ofcom's methodology, therefore, involves a step-by-step evaluation process, beginning with the impact on competitors at the wholesale level and including a kind of market test regarding the impact on final consumers. In its most recent market review, titled "*Promoting competition and investment in fibre networks: Telecoms Access Review 2026–31*", published in March 2025, Ofcom confirms its regulatory approach. In particular, in Volume I (page 23) of the document, Ofcom proposed a general network access obligation supplemented by additional requirements on transparency, non-discrimination or equivalence of inputs (EOI), financial reporting requirements, along with price controls and quality of service.

In the same document (point 1.90), Ofcom recognises the importance of competition among operators as a driver of robust infrastructure-based competition, but also highlights the risk that

[13] CoRDiS, Décision n° 08-40-23, January, 20, 2025, published on the Journal Officiel on February, 13, 2025.
[14] CNMC, Resolución SNC/DE/175/17, May, 14, 2019.
[15] Ofgem, Final Notice, 25 March 2020, regarding the imposition of a financial penalty under Regulation 38(1) and 38(5) of the Electricity and Gas Market Integrity and Transparency (Enforcement etc.) Regulations 2.

Openreach could distort competition, particularly to the detriment of alternative non-SMP operators. To this end, Ofcom defines a criterion that is particularly relevant. Indeed, at point 1.91, it states:

> *"However, we would be concerned if Openreach set its prices at a level that undermines the opportunity for a reasonably efficient competitor to recover its costs. This would undermine the development of material and sustainable competition, which would be detrimental to consumers in the long term. In any consideration of whether the level of Openreach's prices raises prima facie concerns, one of the indicators we would look at is how Openreach's average Fibre to the Premises (FTTP) price compares against our estimate of a reasonably efficient operator's costs derived from the 2026 Fibre Cost Model."*

In sum, Ofcom commits to reviewing Openreach's offers ex ante, defining both a benchmarking criterion (that of an *equally efficient competitor* capable of covering its costs) and a tool for assessment (a bottom-up cost model).

All in all, the operational practice of some regulatory authorities operating in network industries is to apply the concept of FRAND based on a "*cost-based model*" with a "*reasonable profit*." In some contexts, however, cost reconstruction requires the definition of an underlying "bottom-up model" necessary to determine the cost level of the reference service.

4. Conclusion and Policy Recommendations

In conclusion, this issue paper aims to point out some aspects of the EU regulation on Ticketing that might deserve further attention.

Firstly, **while the primary goal remains the opening and improving of the rail market**, ticketing regulation should **minimise new market failures in the ticketing market itself**. The obligation of selling all operators, without contextually dismantling dominant positions in the ticketing market, reinforces them against smaller independent platforms. Therefore, it is recommended to address and anticipate the possible rise of dominant positions in the ticketing market already in the ticketing regulation, for example, by allowing some forms of **graduated regulation** or even the explicit unbundling of the function from national incumbents.

Secondly, Regulation must strike a balance between voluntary and mandatory measures, **avoiding excessive constraints that could stifle innovation**. For this reason, it is advisable to combine flexible market interventions, such as voluntary commercial agreements, with fairness principles to ensure non-discriminatory access to data and transparent conditions for all operators.

Thirdly, a key issue concerns the definition of a fair approach to third-party access to the incumbents' ticketing platform and commercial remuneration. Bringing together the insights from some regulatory experiences in network industries, it is clear that **the application of the FRAND principle appears economically reasonable**. At the same time, **however, the FRAND principle alone is too general and uncertain, and when the legal framework leaves its practical definition to private negotiation, it may lead to long disputes among players and, in turn, to competition concerns**. Thus, the recommendation to the European Commission is to provide its own interpretation of the principle of FRAND in the MDMS Regulation, as well as the methodological criteria for defining the commission levels granted to intermediaries for each ticket sold. An alternative is to delegate to national regulators the definition of the minimum regulatory framework (e.g. regulatory accounting and pricing methods) to guarantee a level playing field among operators.

Table 3: (Preliminary) policy recommendations.

Issue	Recommendation
Risk of dominant position in the ticketing market for newcomers	Do not apply the same regulation to all players; regulatory interventions should be graduated according to the specific degree of market power.
Overregulation of ticketing market solutions	Combine voluntary measures, ensuring non-discriminatory and transparent conditions.
Uncertain FRAND application	Provide an operable and univocal interpretation of FRAND principles, given the complexity of the market.

Source: Elaborated by the authors.

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6. List of Acronyms

API – Application Programming Interface

ARERA – Autorità di Regolazione per Energia Reti e Ambiente

ART– Autorité de Régulation des Transports/Autorità di Regolazione dei Trasporti

CERRE – Centre on Regulation in Europe

DG MOVE – Directorate-General for Mobility and Transport

DMA – Digital Markets Act

EOI – equivalence of inputs

EU – European Union

FRP – Fair and Reasonable Pricing report

FTTP – Fibre to the Premises

FRAND – Fair, Reasonable and Non-Discriminatory

GDS – Global Distribution Systems

MDMS – Multimodal Digital Mobility Services

OA – Open Access

Ofcom – Office of Communications (UK)

PSO – Public Service Obligation

RFI – Rete Ferroviaria Italiana

RPRR – Passenger Mobility Rights

SDBTR – Single Digital Booking and Ticketing Regulation

SEP – Standard Essential Patents

SMP – Significant Market Power

SME – Small and Medium-Sized Enterprise

UK – United Kingdom

WACC – Weighted Average Cost of Capital

About CERRE

Providing high quality studies and dissemination activities, the Centre on Regulation in Europe (CERRE) is a not-for-profit think tank. It promotes robust and consistent regulation in Europe's network, digital industry, and service sectors. CERRE's members are regulatory authorities and companies operating in these sectors, as well as universities.

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- the widely acknowledged academic credentials and policy experience of its research team and associated staff members;
- its scientific independence and impartiality; and,
- the direct relevance and timeliness of its contributions to the policy and regulatory development process impacting network industry players and the markets for their goods and services.

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