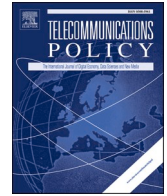




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# State aid for broadband network deployment: National and subnational governance mechanisms, 2003–2023

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## ABSTRACT

This paper examines the governance models of State aid measures for broadband network deployment in European Union Member States. The research is based on 199 decision letters collected from the European Commission's competition cases database, published between 2003 and 2023. Deploying a theory-driven content analysis approach, the analysis reveals and categorises a variety of governance models. These models vary regarding the authority responsible for the decision-making and, in the case of national schemes, the authority responsible for the implementation, including centralised and decentralised arrangements. Different legacies and institutional set-ups explain the governance models, including the typology of state structures, the constitutional powers, the traditions of participation in the telecommunication sector, policy diffusion and regional development. There are several possible pathways to a gradual transition from one model to another. The design of flexible national schemes, which offer subnational authorities the option to implement them in their regions or to rely on central management agencies for specific tasks adapted to their interests, resources and capacities, could be the optimal solution to prevent the launch of ad hoc measures by subnational authorities and to adapt to different institutional arrangements.

## 1. Introduction

This paper contributes to disclosing the governance black box of broadband in Europe. High-speed internet access is acknowledged for its role in enhancing economic prospects, especially in rural areas, where it stimulates business activity, broader economic development and employment (for a review of the literature on this topic, see [Mack et al., 2023](#)). Despite the European Commission's ambitious Digital Agenda for Europe (DAE) adopted in 2010, which aimed to ensure fast broadband availability (over 30 Mbps) for all European Union (EU) population by 2020, only Malta and Cyprus would eventually meet the target ([DESI, 2020](#)). In 2016, the Commission set more ambitious and long-term targets for network deployment by 2025. These targets include providing universal access to networks with download speeds of at least 100 Mbps (i.e., through Very High-Capacity Networks - VHCN) ([EC, 2016a](#)). Additional targets have also been proposed for 2030, with the aim of providing fixed gigabit network coverage to all European

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households (EC, 2021).

To achieve these objectives, most EU Member States have implemented broadband plans with similar coverage targets (OECD, 2018). Some have also foreseen the use of State aid, as private initiatives often fail to provide necessary infrastructure under normal market conditions in areas of low population density or remote regions. In 2003, the European Commission started to assess State aid measures for broadband deployment at the community level (Chirico & Gaál, 2014). The European Commission has encouraged the use of State aid to develop broadband networks, allocating, since 2007, funds through various financial support instruments. These funds, which can partly be used to support the rollout of broadband, come from the European Structural and Investment Funds (ESIF), including the Regional Development Fund (ERDF), the Agricultural Fund for Rural Development (EAFRD), the European Social Fund (ESF) and the Cohesion Fund (CF) (Bourreau et al., 2020). In addition, there are specific programs with smaller budgets that support broadband network deployment, such as the Connecting Europe Facility (CEF). Finally, the Recovery and Resilience Facility (RRF), which includes a digital component, serves as the primary recovery instrument within the Next Generation EU Multiannual Financial Framework (MFF). The RRF is intended to aid the EU in its recovery from the current crisis and is expected to improve broadband infrastructure and digital connectivity across Member States.

Since 2003, Member States have invested billions of euros to expand network coverage in areas where private investors find it unprofitable. State aid programs have been determined predominantly at national government levels and are typically channelled through the central government. However, central state authorities do not always decide on this, reflecting the diverse institutional settings across Member States (Briglaue & Grajek, 2023). In some countries, broadband interventions have been conducted at regional or local/municipal levels, while other nations have pursued a larger-scale national intervention strategy. Even when countries adopt a national plan, the practical implementation of the plan might be pursued either by central government agencies or by subnational authorities. To put it another way, there is a plethora of governance models associated with the process of decision-making and the implementation of the aforementioned measures.

There are multiple definitions of governance, which vary depending on the academic field and the narratives used. Governance can be broadly defined as encompassing all processes of governing (Bevir, 2013, p. 1). In this study, we define governance as the power relations between central and local authorities in this public policy process. By governance models, we mean the combination of decision-making schemes (national or subnational) and the respective implementing authorities. Specifically, this study examines governance models in the context of State aid policies for broadband network deployment. This study contributes to an agenda that advocates the introduction of new empirical approaches to the analysis of telecommunications policy (Mendonça et al., 2015).

The European Commission adopted guidelines on State aid rules for broadband network deployment in 2009, which were subsequently revised in 2013 and 2023. These guidelines primarily address technical aspects rather than governance models (EC, 2009). Governance models for State aid for broadband network deployment fall within the powers of each Member State, given the subsidiarity principle and their political-administrative institutions. Subnational authorities may promote their own State aid policies either explicitly by legislation or indirectly through broader economic development mandates or through a general power of competence (i.e., when subnational authorities have the power to do anything unless expressly prohibited). National governments may also play a role in coordinating and optimizing resource allocation at the national level, with subnational authorities often involved in policy implementation in a multilevel governance approach (Gerli et al., 2023). Although academic research exists on State aid to support the development of broadband networks, previous studies did not consider the governance component (see, for example, Bourreau et al., 2020; Chirico & Gaál, 2014). This dimension is a crucial aspect of public policies, and the present study aims to address this gap. Given the persistent deficit in network coverage within the European Union (EC, 2023a), policymakers will have to assess the need to maintain State aid for facilitating VHCN deployment in the forthcoming years. It is important to understand the political process and, specifically, the associated governance model in order to maximize the benefits of this policy. This research addresses the gap in the literature by focusing on the political processes and governmental actors involved in State aid measures for broadband networks. Through a systematic identification, categorisation, and comparative analysis of different governance models, this study aims to provide policymakers with key elements for designing effective measures and to offer scholars a foundation for further public policy research.

Against this background, the research has two objectives. First, it aims to examine and categorise the governance models found in State aid measures that have been notified by EU Member States for the deployment of broadband networks between 2003 and 2023. These governance models result from the decision-making (national plans versus individual measures) and the implementation of the national plans (centralised vs decentralised). Second, it aims to identify the national contexts that frame the different models.

This analysis aims to provide information to decision-makers at different territorial levels regarding the development of public policies, specifically State aid for high-tech network deployment. These measures are expected to become increasingly important, not only for broadband but also for advanced networks such as 5G, as they will be crucial in ensuring territorial cohesion in accessing essential infrastructure and advancing societal progress in the digital age. These networks will also enhance EU productivity and competitiveness (EC, 2016b, p. 588; Gilles & Toth, 2021; OECD, 2019). Our study improves understanding of EU competition law, public policy, administration, and territorial development by identifying the level of government responsible for making decisions on State aid measures in a specific sector and elucidating the governance model for their implementation.

The empirical data for the study was obtained from primary sources provided by the European Commission. It comprises 122 original cases directly related to broadband deployment out of a set of 199 notified cases, a grand total including non-substantive procedural decisions. The 122 original measures provide insight into the governance models for State aid measures related to broadband network deployment. No dominant State aid set-up is revealed; indeed, each country's historical legacies and institutional structure account for the choice between a centralised or decentralised implementation governance model.

The remainder of the article is structured as follows. Section 2 presents the framework of analysis, and Section 3 provides a review

of previous research on broadband deployment, State aid, and governance. Section 4 delivers a perspective of the institutional framework on State aid control. Section 5 describes the data collection method. Section 6 provides the analysis of the factors behind the governance models adopted by different countries and Section 7 the discussion of the main results from the data analysis. Section 8 concludes by summarising the main contributions of the article and their implications for policymaking, identifying the study's limitations and suggesting topics for further research.

## 2. Analytical framework

As the Commission's decision-making practice illustrates, public intervention in support of broadband networks may take place at state, regional or municipal level (EC, 2013, par. 40; Matteucci, 2019). The central government is typically the primary point of contact with the European Commission, even if the aid was granted by a subnational body such as federal states, regions, municipalities, or other state entities. This means that the central government is typically responsible for formally notifying the European Commission of any subnational measures while the subnational authority makes the decision to pursue the measure.<sup>1</sup> However, subnational authorities with access to the State Aid Notifications Interactive ("SANI") software could notify a State aid measure to the European Commission.<sup>2</sup> In this context, in addition to coordinating the various interventions to avoid duplication and incoherence in the application of the aid, the European Commission encourages Member States to, whenever possible and respecting institutional competencies and specificities, design national schemes that contain the most relevant principles underlying public initiatives (EC, 2013, par. 40–41). Based on these principles, analysis framework comprises two key dimensions for assessing the territorial aspects of the political decision-making process and the implementation of State aid measures.

The first dimension considers the territorial level of the *political decision-maker* responsible for the measure. According to the European Commission, national plans<sup>3</sup> should be encouraged whenever possible (EC, 2013, par. 41). National governments determine these plans, which may function as 'umbrella' aid schemes. These framework schemes typically operate similarly to block exemptions. Individual projects can be implemented without notifying the Commission as long as they comply with the rules and conditions of the general framework scheme (Chirico & Gaál, 2014, p. 36). However, in some cases, subnational authorities may choose to allocate State aid within their territorial areas and decide on their own subnational plans, creating specific plans tailored to local needs and conditions (Gerli et al., 2023; Matteucci, 2019; Nucciarelli et al., 2013).

The territorial level of the *entity responsible for implementing* the measure is considered in the second dimension. A national measure can either be implemented at the national level, centrally by the government or any of its agencies, or delegated to subnational authorities (Gerli et al., 2019; Matteucci, 2020). If subnational authorities decide on specific State aid measures for their territories, they may adopt a scheme, generally to be implemented by authorities at lower levels, or adopt an individual measure.

This study uses the term 'decentralisation' to refer to two types of measures. The first type consists of nationwide central government initiatives implemented by subnational authorities. The second type includes initiatives originating from subnational authorities, regardless of subsequent execution, even if it remains centralised within the same authority or within an entity controlled by it. It includes measures implemented by any public or private law body, including regional or local bodies, regional development bodies or non-governmental organisations, which acts under the responsibility of a national or regional managing authority or which carries out duties on behalf of such an authority. Table 1 presents the conceptual grammar used in this paper.

A specific feature of decentralised national governance models is the existence, or not, of a coordinator and the respective territorial tier of this coordinator. The coordinator can have an important role in ensuring that the subnational authorities implement the measures in a way compatible with the general lines defined in the national measure. This role is particularly important when the national measure leaves some options and flexibility open for the subnational authorities. Additionally, the coordinator can provide technical advice and harmonise technological options in network implementation. It can also verify spending and the allocation of public funds.

In the scope of the governance model of State aid measures for VHCN deployment, we also could potentially include the ownership of the subsidised network and the different actors, public and private, involved in the construction and/or management of the network. This aspect of the governance model has already captured the attention of academic research (e.g., Bourreau et al., 2020; Falch & Henten, 2010; Gómez-Barroso & Feijóo, 2010; Lattemann et al., 2009; Nucciarelli et al., 2010; Saleminck & Strijker, 2018; Troulos et al., 2010), being excluded of the scope of this research.

Fig. 1 clarifies what is under and out of the scope of this research, using the typical arrangement of national and subnational measures.

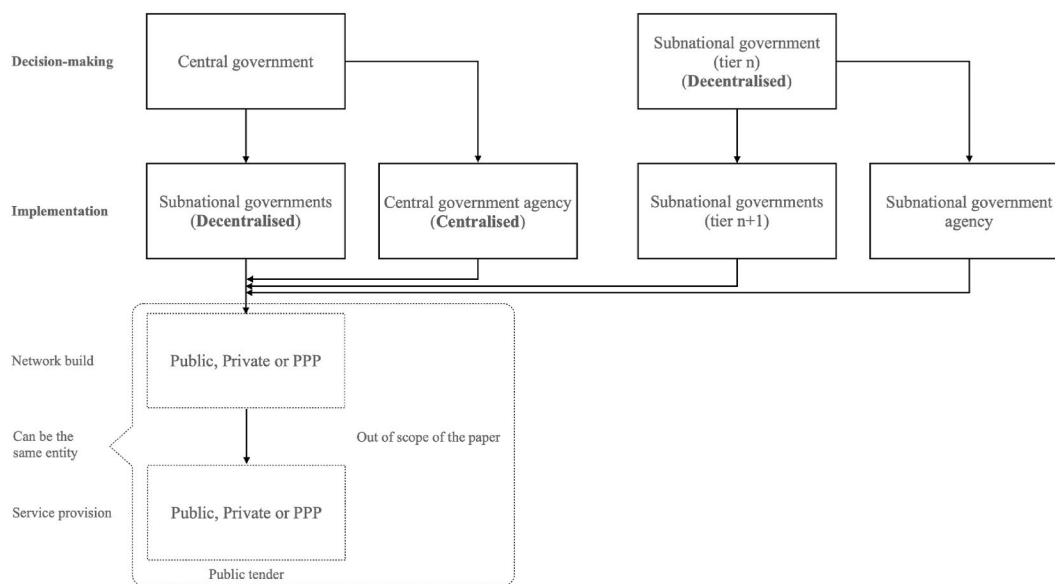
<sup>1</sup> For example, State aid for deploying optical fibre in Catalonia (Xarxa Oberta) was decided by the autonomous region of Catalonia, but the interlocutor with the European Commission was the central government, through the Ministry of Foreign Affairs (SA.28969). The same practice might be found in other municipal and regional funding cases (e.g., SA.33420 - Germany, Breitband Lohr am Main).

<sup>2</sup> The use of the SANI software became mandatory on January 1, 2014. Before that, any public entity could also notify an intended State aid measure to the European Commission. However, irrespective of the body that formally notifies the measure, the relevant aspect from the public policy perspective in this research is the level of government responsible for the decision (and with powers to assume that decision) and not the body responsible for the administrative notification.

<sup>3</sup> In this paper, we use the terms 'national measures', 'national plans', 'national programmes', or 'national schemes' to refer to these centrally decided policies that have a national scope.

**Table 1**  
Key concepts for analysis.

Decision-maker	Type of measure	Implementor	Governance model
Central government	<b>National measure</b>	Central government Subnational government tier 1 Subnational government tier n	<b>Centralised</b> <b>Decentralised</b>
Subnational government tier n	<b>Subnational measure</b>	Subnational government tier n Subnational government tier n+1	<b>Decentralised</b>



**Fig. 1.** Main stages of the political process regarding State aid measures for broadband deployment, the key dimensions and actors involved and the scope of the research.

### 3. The experience of public interventions in the EU

Several studies have demonstrated a link between broadband penetration and national development variables, such as income, economic growth, human capital, and labour productivity (Baker et al., 2020; Briglauer et al., 2021; de Clercq et al., 2023; Gruber et al., 2014; Gruber & Koutroumpis, 2011; Koutroumpis, 2009; Vu, 2019). Marcus et al. (2024) provide guidance to policymakers on promoting broadband deployment, adoption and usage in the context of crises such as the Covid-19 pandemic and the Russo-Ukrainian war. Expanding broadband coverage is crucial, but it may not be profitable in rural areas due to high deployment costs and a small potential subscriber base (Cambini & Jiang, 2009; Sadowski et al., 2009; Salemink et al., 2015). Several articles have examined the supply-side aspects of broadband. However, few studies have analysed the cost of broadband networks in rural areas in detail. Frias et al. (2015) compared the costs of providing 30 Mbps through FTTH (“Fiber To The Home”) and LTE (“Long Term Evolution” or 4G) networks in rural areas in Spain. They concluded that in municipalities with more than 10,000 inhabitants, deploying FTTH networks is economically feasible. In municipalities with between 1,000 and 10,000 inhabitants, deploying LTE networks is more viable in most cases. Deploying either FTTH or LTE networks is not feasible for most municipalities with fewer than 1,000 inhabitants. According to Schneir and Xiong (2016), the cost of deploying a network outside a town or village in a rural area is, on average, 80% higher than deploying the network in the town or village. Ioannou et al. (2020) calculated the net present value of each access technology to ascertain the viability of LTE-based fixed wireless access (FWA) as an alternative to the existing fixed access technology for providing broadband at 30 Mbps in Europe. In light of the aforementioned estimates, it was posited that FWA could serve as a viable solution for the provision of broadband at 30 Mbps in rural areas. However, 30 Mbps is far from the new full Gigabit coverage target proposed by the European Commission. Feijóo et al. (2018) estimated that around €50 billion would be required to achieve the DAE targets by 2020 in the EU-28, in addition to expected public and private funding. More than 90% of these investments are needed in rural areas. Ferrandis et al. (2021) conducted a similar analysis with updated data up to 2019 and confirmed a significant investment gap of €260 billion between 2020 and 2025 for the EU to meet its 2025 broadband targets. However, private operators are projected to cover only about one-third of this gap. It is concluded that extensive public interventions are needed, particularly to address investment gaps in rural areas, in order to achieve the DAE targets. A subsequent update, based on data from 2021, revealed an investment gap of €174.8 million (Ferrandis et al., 2023).

Several studies have examined the effects of State aid policies on broadband deployment in various EU Member States and regions.

Specifically, research has been conducted in Germany (Duso et al., 2021), the German state of Bavaria (Briglaue et al., 2019), Italy (Matteucci, 2019), the Italian province of Trento (Canzian et al., 2019), and France (Bourreau et al., 2023).

Chirico and Gaál (2014) reported that the European Commission had examined State aid notifications for broadband network deployment, involving a total of €13 billion in subsidies across Europe as of October 2013. Bourreau et al. (2020) quantitatively assessed fifteen years of State aid for broadband in the EU based on notified measures. However, these studies did not analyse the governance models of the measures.

The concept of governance, which is crucial for comprehending policy implementation dynamics, encompasses the various ways of organizing collective action and delivering policies (Teles, 2023, p. 1). In the 1980s, political scientists distinguished the term from government and included civil-society actors. Based on Marks' (1993) research on multilevel governance in the EU, scholars have explored the distribution of authority across different levels of government and sectors, emphasising both horizontal and vertical power-sharing arrangements (Touati et al., 2019). Ansell and Torfing (2022, p. 1) highlight the multifaceted nature of governance theories and definitions, emphasising their evolution beyond traditional government-centric paradigms. Howlett and Ramesh (2014, p. 318) define 'governing' as the actions of governments, while 'governance' refers to establishing, promoting, and supporting a specific relationship between governmental and non-governmental actors in the governing process.

The governance landscape for State aid in broadband deployment involves multiple stakeholders at various levels. These stakeholders include the European Commission, central governments, subnational authorities, and national regulatory bodies. Interactions between these stakeholders occur during the decision-making process or when implementing measures. Matteucci (2020) and Gerli et al. (2019) offer insights into governance structures and practices through case studies of broadband initiatives in Italy and the United Kingdom (UK), respectively. Gerli et al. (2023) also analyse the influence of governance frameworks on the effectiveness and efficiency of State aid programs, emphasising the significance of coordination and collaboration across different administrative levels.

#### 4. Institutional background on state aid control

State aid provisions are a fundamental principle of EU law. They were included in the Treaty of Rome, signed in 1957, and are now codified in Articles 107 and 108 of the Treaty on the Functioning of the EU (TFEU). These provisions establish a general prohibition on State aid. However, Article 107 (2) deems certain categories of aid compatible with the internal market, while Article 107 (3) identifies additional categories that may also be considered compatible. Under Article 108 TFEU, the European Commission has the authority to monitor, control, and enforce State aid regulations. Member States must notify the European Commission of any plans to grant or alter aid, allowing for thorough assessment and approval procedures. The Commission has a considerable amount of discretion in interpreting the Treaty. However, it has guided soft law instruments and sector-specific guidelines to ensure transparency and consistency in evaluating State aid (Cini, 2001). This is the case, for example, of the guidelines on State aid rules for broadband network deployment adopted in 2009.

In 1992, the European Commission introduced a *de minimis* rule that exempts smaller amounts of aid from notification obligations (EC, 1992; Ehlermann, 1994). According to the *de minimis* regulation, aid amounts below a certain threshold are exempt from State aid rules. The ceiling for *de minimis* aid has been set at €100,000 per undertaking over a three-year period in 2002. This ceiling has been regularly updated, and as of 2023, it stands at €275,000. Subsequently, after signing the Single European Act, the Commission proposed the Enabling Regulation in the application of Article 109 TFEU. The Council approved the Enabling Regulation in 1998 (Council Regulation 994/98). This regulation enables the European Commission to adopt regulations that identify specific categories of aid as compatible and exempt them from ex-ante notification by Member States, provided that they meet certain criteria. These measures only require ex-post notification to the European Commission, reducing information requirements. In 2008, the General Block Exemption Regulation (GBER) was introduced. The European Commission's 2008 regulation excludes certain aid categories that aim to promote specific policy objectives while reducing administrative burdens on Member States (EC, 2008). In 2014, the Commission adopted an enlarged GBER that extends block exemptions to new categories of aid, including certain broadband infrastructure (EC, 2014). Simultaneously, the Commission introduced a requirement that the Member States should conduct evaluations of all aid measures over €150 million that the GBER covers.

In the early 2020s, the European Commission adopted two temporary frameworks. The first was to address the COVID-19 outbreak in March 2020 and the containment measures taken by all Member States (EC, 2020). The second was to address the crisis caused by the Russo-Ukrainian war (EC, 2022). These temporary frameworks aimed to support the economy by enabling Member States to use the full flexibility under State aid rules to keep otherwise viable companies afloat and to help EU companies cope with problems such as disruptions in supply chains, blockages in the supply of energy and raw materials, and surges in energy prices. In 2023, the European Commission amended and partially extended the Temporary Crisis Framework to support key sectors in transitioning to a net-zero economy, in line with the Green Deal Industrial Plan (EC, 2023b).

#### 5. Data

##### 5.1. Data source

To develop a typology of governance models for State aid measures in broadband network deployment, we gathered data from the European Commission's competition cases database, which can be accessed at <https://competition-cases.ec.europa.eu/search>. We searched for the term 'broadband' under the State aid policy area and collected data on January 31, 2024. The information was verified by comparing it with the published summary of European Commission decisions on State aid to broadband and mobile, last updated in

January 2024 (EC, 2024). The evidence consists of State aid measures scrutinized by DG-COMP for compliance with EU legislation on State aid. Measures granted under GBER or *de minimis* were defined from the outset to be outside the research perimeter and were excluded from the corpus collection.

### 5.2. Data acquisition

Between 2003 and 2023, DG-COMP assessed a total of 199 State aid measures in broadband, including VHCN deployment. This dataset of 199 decision letters, comprising 3141 pages of content, was collected from the European Commission's website as of January 2024. These letters are issued in response to each Member State notification and contain information on various aspects, including case type, target area, granting authority, tender procedure, notification and decision dates, and detailed procedural information. The dataset was compiled through manual review due to the non-standardised format of the letters.

The decision letters' corpus was comprehensively combed, analysed, and appraised using conventional qualitative content analysis methodology. The supplementary material to this paper contains the data used.

### 5.3. Data validation

The 199 decision letters include 122 original cases directly concerning broadband deployment. These 122 letters, averaging 17 pages each, are our focus and constitute the main body of data. Of the remaining 77 measures, 38 cases involved extensions, prolongations, amendments, or modifications to previous notifications without changes in the governance model. Furthermore, the European Commission identified 27 cases that were not directly related to broadband deployment. These cases included mobile, submarine cables, and demand promotion (vouchers) measures. Additionally, six cases were found not to involve State aid. The remaining cases consisted of two formal investigations, two evaluation plans, one negative decision, and one withdrawn case. The final 122 measures cover 23 Member States.

### 5.4. State aid measures for broadband deployment: Key descriptive

Between 2003 and 2010, the number of annual notifications of original measures increased and reached a peak of 15 notifications. This number was maintained in 2011 and 2012, but it has significantly decreased since then. On the other hand, the number of measures involving extensions, prolongations, amendments, or modifications of previously notified measures increased between 2008 and 2012, remained constant between 2012 and 2014 and decreased thereafter.

Germany, the UK, Italy, and Spain are the countries with the highest number of original measures notified, in descending order. All of these countries notified ten or more original measures. All Member States except for Belgium, Denmark, Malta, and Luxembourg have notified this type of measure. The European Commission concluded that the single notification from Czechia did not constitute State aid. Although Belgium, Czechia, and Denmark did not notify any measures, they utilized GBER. Malta, a small country with high population density and virtually no rural areas, did not require State aid measures, including GBER. Notwithstanding, Malta was the first Member State to achieve the Digital Agenda for Europe target of 100% broadband coverage with at least 30 Mbps by 2020. Luxembourg also achieved extensive broadband deployment without relying on any form of aid.

The remainder of this section presents the analysis results of 122 original State aid cases for broadband network deployment that were notified to the European Commission between 2003 and January 2024.

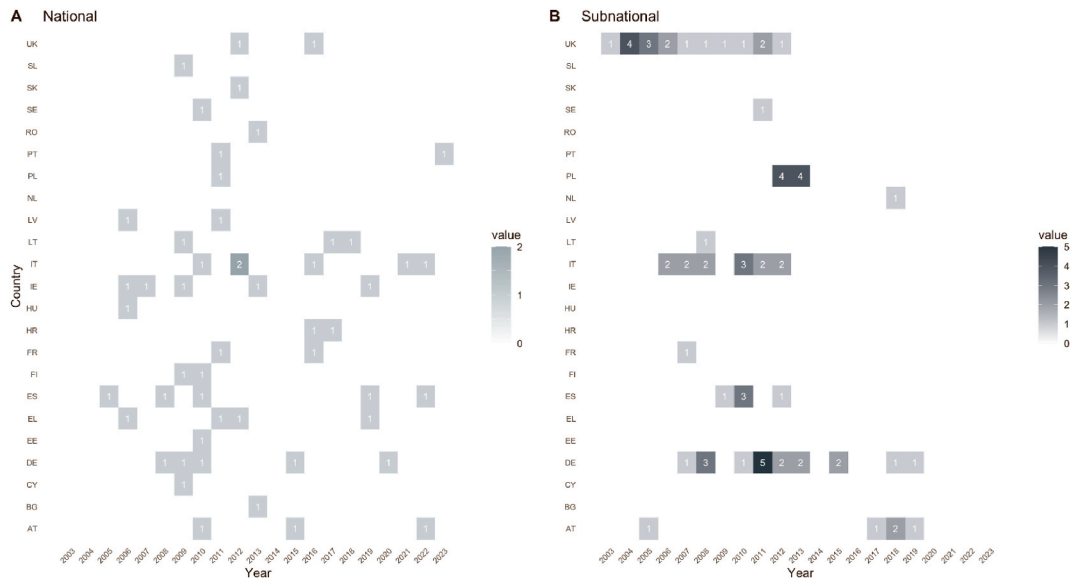
### 5.5. Models of governance

During the analysed period, the implementation of State aid for broadband networks varied significantly across the EU. This resulted in a plurality of governance models despite the general trend towards multilevel governance and a common European framework applicable to State aid for deploying these networks. In some Member States, State aid measures were exclusively pursued through national plans decided by central governments, in some cases implemented centrally and in other instances implemented by subnational authorities. Subnational authorities also decide on measures for their specific territories that run concurrently with national State aid programs. The subnational measures may adopt the same design as the national plans. However, at lower territorial levels, notifications tend to take the form of individual measures rather than umbrella schemes.

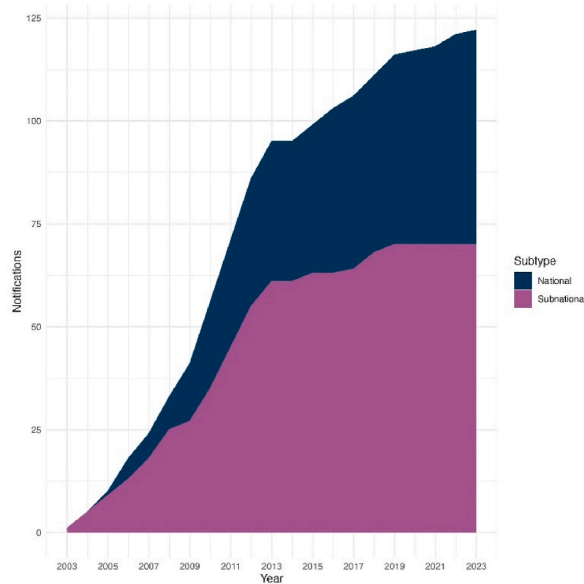
Fig. 2 displays the number of notifications categorized by country, year, and type of measure (national or subnational), providing an overview of the dynamics of the national and subnational measures. Fig. 3 shows the cumulative evolution of the number of notifications per year and per type of measure (national or subnational). It is important to note that during the analysis period from 2003 to 2023, all countries in the sample, except for the Netherlands, submitted at least one national plan to the European Commission. Additionally, around half of the countries, including Austria, France, Germany, Italy, Lithuania, Poland, Spain, Sweden, and the UK, also submitted subnational measures.

During the period, subnational measures were mainly reported in the first half, with a decrease observed in the latter half. The timing and sequencing of national and subnational measures varied among countries. No subnational measures were reported after the first national measure in France, Italy, Lithuania, and the UK. Furthermore, subnational measures consistently preceded national ones, except in Spain, Poland, and Sweden.

Subsection 5.5.1 provides a detailed analysis of national measures, while section 5.5.2 covers subnational measures.



**Fig. 2.** Number of notifications per year, per Member State and per type of measure (national or subnational)  
 Key: AT-Austria; BG-Bulgaria; CY-Cyprus; DE-Germany; EE-Estonia; EL-Greece; ES-Spain; FI-Finland; FR-France; HR-Croatia; HU-Hungary; IE-Ireland; IT-Italy; LT-Lithuania; LV-Latvia; NL-Netherlands; PL-Poland; PT-Portugal; RO-Romania; SE-Sweden; SK-Slovakia; SL-Slovenia; UK-United Kingdom.



**Fig. 3.** Cumulative evolution of the number of notifications per year and per type of measure (national or subnational).

5.5.1. National measures

Central governments primarily determine State aid measures for broadband deployment. Among the Member States reporting such measures, all except the Netherlands have had at least one national plan. However, there are variations in the governance models used to implement these plans across different countries, which can be categorized as either centralised or decentralised.

A slight majority of countries have adopted a centralised governance model. A generally consistent governance model was observed in countries with multiple national plans, with a few exceptions. For instance, Austria initially followed a decentralised model for its national plan but later shifted to a centralised approach. Similarly, Italy’s initial measures were decentralised, but subsequent plans, particularly under the RRF, tended to be centralised. Table 2 provides an overview of the governance models of national State aid plans for broadband networks in countries that have notified the European Commission of such plans.

**5.5.1.1. Centralised models.** In the most common centralised model, the central government initiates a public tender for a limited number of lots. The tender is usually administratively processed by a ministerial cabinet or a state agency supporting the government in this task. This model has been adopted in Bulgaria, Cyprus, Greece, Ireland,<sup>4</sup> Portugal, Romania, and Spain. Austria initially embraced a decentralised approach for its first national measure (N 336/2010) but later transitioned to a centralised model. Despite the shift, municipalities have actively participated as bidders and had projects subsidised under this measure, creating a hybrid model with municipal involvement.

State aid was directly granted to a state-owned company in Slovakia, Latvia, and Lithuania, while in Estonia, it was allocated to a non-profit organisation. The measure took an atypical form in Hungary, consisting of a tax benefit for broadband network deployment.

In Italy, the central government implemented its most recent measure (SA.63170) through Infratel Italia (Infratel), a state-owned enterprise. Infratel initiated a single tender split into lots with regional or multi-regional dimensions. The previous measure (SA.41647) involved a framework agreement between the central government and regions, which was operationalized through bilateral agreements with each region. Infratel manages the allocation of funds and serves as the sole contracting authority.

In a centralised model, the tender process can occur periodically, such as once a year, as is the case in Austria and Spain or consist of a single call in the remaining countries.

**5.5.1.2. Decentralised models.** Several Member States have implemented decentralised governance models in their national plans, following a multilevel governance approach. However, civil society actors have not been involved in these models. The role of subnational authorities as implementing actors may entail varying degrees of flexibility and autonomy. The subnational authorities responsible for implementation can be found at various territorial levels, ranging from regions, predominantly in federal states, to municipalities or equivalent authorities. This reflects the unique context and priorities of the respective Member State.

The design of these national measures with decentralised implementation involves three key dimensions.

The first dimension concerns the presence of a coordinating or supervising body for individual projects (refer to Table 3). There is no such body in Federal States like Austria, Germany, Poland, Slovenia, and Sweden. However, in other countries such as Croatia, France, Italy, and the UK, this body is typically part of the central state administration and reports to a specific minister. These coordinating or supervising bodies may also be newly created specifically for managing national measures. For example, the Mission Très Haut Débit was established in France, while Broadband Delivery UK was created in the UK. In Sweden, the county administrative boards, which are at an intermediate territorial level, are responsible for coordinating and supervising the individual measures under the national scheme. In the cases of central or regional coordination or supervision, subnational authorities must submit their projects to the agency for approval before proceeding with the tender. In the UK, subnational authorities can request Broadband Delivery UK to carry out the tender on their behalf.

The second dimension relates to the territorial level of the authorities responsible for implementing individual measures (refer to Table 4). Central government-defined programmes may be implemented in a decentralised manner at various territorial levels. In many cases, implementation is the responsibility of authorities at the intermediate territorial level, either exclusively or in conjunction with lower territorial levels. For example, intermediate territorial authorities in Austria (länder), Finland (county), Italy (region and province), and Poland (voivodship) have exclusive responsibility. In contrast, authorities at different levels in Croatia, France, and the UK share responsibility. In Croatia, it includes counties and municipalities. In France, it covers regions, departments, and communes, including groupings and associations of these authorities. In the UK, it includes devolved administrations of Northern Ireland, Scotland, and Wales, as well as local authorities and community bodies. In Germany, Slovenia, and Sweden, the authorities at the lowest territorial level, such as municipalities, local communities, or associations of municipalities, are responsible for this competence.

The third dimension is linked to the functions assigned and the level of delegation and autonomy granted to the implementing entities. In all cases, these entities define project specifications. They are responsible for processing them in compliance with the minimum set of guidelines defined in the national programme approved and notified to the European Commission. Several European countries, including Croatia, France, Germany, Italy, Slovenia, and the UK, offer various options for the investment or ownership model of the network to be built. These options include public, private, or public-private partnerships (PPPs). The implementing authority has the discretion to select the most suitable model. In countries such as Germany, Sweden, and the UK, implementing authorities must conduct a market analysis to justify the specific project they intend to pursue. The market analysis presents a detailed map of the area covered by the measure and provides information on future private investment plans.

### 5.5.2. Subnational schemes or individual measures

Some notifications provide justifications for measures initiated by subnational authorities after national plans have been approved. For instance, a national scheme may not fully accommodate the differences and specificities of subnational territories in terms of target areas (such as the cases of, for example, SA.28665 and SA.30705) or maximum aid amount per project authorized under the scheme (e. g., SA.32037, SA.32203, SA.33420, and SA.33869).

<sup>4</sup> In one of the measures, the tender was not divided in lots.



**Table 2**

Member States that have a national programme and type of governance model used for each programme.

Decision-maker	Type of measure	Implementor	Governance model
Central government	<b>National measure</b>	Central government	Centralised AT BG CY EE ES EL HU IE IT LT LV PT RO SK
		Regional	<b>Decentralised</b> AT FI IT PL
		Regional/Municipal	FR UK HR
		Municipal	DE SE SL

**Table 3**

Existence of coordinator and respective territorial tier in national measures with decentralised governance models.

Coordinator		
	Central	FR UK HR IT
	Regional	SE
	No coordinator	AT DE FI PL SL

**Table 4**

Implementing authority in national measures with decentralised governance models.

Implementor		
	Regional	AT FI IT PL
	Regional/Municipal	FR UK HR
	Municipal	DE SE SL

In most cases, subnational authorities within a Member State adopt the same governance model, resulting in internal consistency. Additionally, in some cases, subnational measures align with the model of national plans to some extent. For example, in Germany, federal states design subnational measures<sup>5</sup> that are then implemented by municipalities or associations of municipalities, reflecting the same decentralised governance model observed in the national plans. Similarly, in Austria, subnational measures are typically designed by the federal states. However, in this case, the model is centralised, with the construction of networks and corresponding aid being delegated to a wholesale company controlled by the respective federal state. In Poland, subnational measures are the responsibility of the voivodships. There are two distinct approaches to implementing these measures: one replicates the national scheme, with implementation centralised within the voivodship, while the other follows a decentralised approach, with municipalities taking charge of implementation. In the latter scenario, municipal authorities organize an open tender procedure to select an infrastructure operator. In Italy, subnational measures have been implemented by regional and provincial authorities. The regional and provincial authorities implemented these measures through an open tender process, which was sometimes divided into lots. In Spain, subnational measures are the responsibility of autonomous communities, and these authorities implement the measures. In the UK, subnational measures were determined by various local authorities, including devolved authorities in Scotland, Wales, and Northern Ireland, regional development authorities, county councils, and city councils. The decision-making authorities or agencies centralised the projects. Only one subnational measure was implemented in the other four countries (France, Lithuania, Netherlands, and Sweden).

Fig. 4 provides an overview of the countries with national decentralised models and subnational measures. The result is a quite balanced profile, which underscores the sheer variety of governance mechanisms under the EU State aid set-up. Other observations emerge; for instance, there is a tendency for large countries to follow a scheme tying national decentralised *and* subnational measures, the exception being Spain (which is a Nation-state in which devolution occurs along significantly autonomous lines).

## 6. Factors behind the governance models adopted by different countries

The trend towards decentralisation in public policy processes, in line with the principles outlined in the European Charter of Local Self-Government, which was launched in the mid-1980s, has reshaped governance dynamics across the EU (Ladner et al., 2019, pp. 4–7). Decision-making and policy implementation functions are increasingly delegated to subnational authorities by central governments. However, State aid procedures for broadband deployment vary significantly among Member States due to differences in institutional design, reflecting diverse approaches to territorial power distribution. The stability of national State aid governance models is demonstrated in each country's dynamics. Apart from Austria and Italy, countries with multiple national measures maintained their respective governance models over time.

<sup>5</sup> Apart from the measures of the responsibility of federal states, there were two different kinds of subnational measures notified to the European Commission by Germany. One of the kinds refers to four cases (SA.32203, SA.33420, SA.33869, and SA.33869) of the responsibility of municipalities, the measure was needed because the aid amount for a particular project was higher than the maximum aid amount per single project authorized under the scheme (namely under the subnational measure of the federal state of Bayern). The other kind refers to two notifications of the responsibility of regions (SA.31729 and SA.39518).

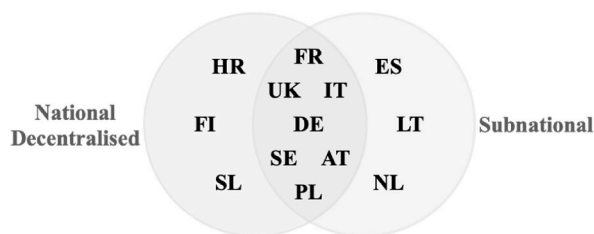


Fig. 4. Countries with national decentralised and subnational measures.

Several factors may explain why different countries adopt different models.

### 6.1. Typology of state structures

One potential justification for this phenomenon may be associated with the generic typology of state structures (ESPON, 2006; Giovannini et al., 2014). In federal states or regionalised states, the nature of the state structure is such that there are likely to be widespread and comprehensive decision-making mechanisms at the regional level. This is reflected in the case under discussion by the decentralised model for broadband State aid measures. These states usually have subnational authorities with fairly broad powers, which not only participate in the formulation of most federal legislation, but also are responsible for the implementation of most legislation, acting as the states' principal administrators (Thielemann, 1999). In contrast, in unitary states we would expect to see the opposite relationship, with most countries having a centralised governance model. Table 5 confirms this presupposition by linking the typology of state structures and the governance model of national State aid measures to the deployment of broadband networks.

These topologies are deeply entrenched in the politico-institutional frameworks of different countries, making it challenging to deviate from these contexts, in which actors are embedded, when designing public policies. Some countries might deviate from the expected outcome, as is the case with Spain, which, despite being a regionalised unitary state, has adopted a centralised governance model. In Spain, controversy and tensions have arisen regarding the powers to intervene in this process. As discussed in section 5, the autonomous regions in Spain have actively designed their own regional State aid measures for broadband network roll-out, despite the existence of national plans. This situation has inclusive led the European Commission to warn the Spanish authorities about the potential risk associated with the autonomous regions independently notifying their own State aid schemes for broadband, potentially resulting in numerous notifications from the same Member State (CMT, 2010). Gerli et al. (2023) captured these tensions, with a representative of a regional administration lamenting the residual role assigned to the regional government by the central government under the national measure (PEBA). This marginalisation may have driven these authorities to design their own programs. Since then, centralisation has increased, culminating in the Spanish Parliament's approval of a new Telecommunications Law in 2014, which defined broadband policy as the exclusive competence of the national government.

### 6.2. Constitutional powers

A second explanatory factor may be related to the specific competences or powers that have been explicitly granted to subnational authorities in relation to the telecommunications sector. Constitutional frameworks are the fundamental law in each country and can provide a starting point for understanding the territorial distribution of power in the telecommunications policy area. However, based on a survey conducted on March 10, 2024, using a repository of the Constitutions of each Member State of the European Union,<sup>6</sup> only four countries explicitly referred to the allocation of competencies in the field of telecommunications. In Austria and Germany, the federal government has exclusive jurisdiction over telecommunications policies (Erk, 2004, p. 17; Schneir & Batura, 2015, p. 163). A similar framework is also in place in Spain, which is a quasi-federal state (Romero Caro, 2022). Article 149.1.21. a of the Spanish Constitution grants exclusive jurisdiction over telecommunications policies to the central government. In Italy, according to Article 117 of the Constitution, the power regarding the area of communication<sup>7</sup> is a concurrent competence of the state and the regions. This data only provides information on the level of government that has competence for the decision-making process related to the telecommunication sector. It cannot be drawn from this data that the implementation of State aid measures in the sector cannot be delegated to territorial sublevels in countries where this power is not explicitly enshrined in the constitution.<sup>8</sup> Furthermore, it is possible that other powers may be in conflict with this one, such as the power to promote regional development, which can be exercised independently by subnational authorities.

Although constitutional provisions in Austria, Germany and Spain imply centralisation, regional governments or federal states have actively supported broadband network development since the late 1990s. In Spain, public operators or public-private partnerships

<sup>6</sup> Available at [https://www.venice.coe.int/WebForms/pages/?p=01\\_CODICES\\_constitutions&lang=EN](https://www.venice.coe.int/WebForms/pages/?p=01_CODICES_constitutions&lang=EN).

<sup>7</sup> We infer that telecommunication is included under the broader concept of communication.

<sup>8</sup> In Germany and Austria, there is, for example, the tradition of co-operative federalism (Benz, 2007; Faludi, 1998) or joint decision-making (Thielemann, 1999).

**Table 5**

Classification of the countries with national governance models using the typology of state structures.

Typology of state structures	National governance model of State aid for broadband deployment measures	
	Decentralised	Centralised
Federal states	AT, DE	–
Regionalised unitary states	IT, PL, UK	ES
Decentralised unitary states	FI, FR, SE	LV, SK
Unitary states	SL, HR	BG, CY, EE, EL, HU, IE, LT, PT, RO

Source: Author, based on [ESPON \(2006\)](#) and [Giovannini et al. \(2014\)](#).

have resulted from regional initiatives, including notable projects in regions such as Asturias, Catalonia, the Basque Country, Navarre, and Rioja ([Ganuza & Viecens, 2011](#); [Gerrand, 2006](#)). Similarly, in Germany, federal states and municipalities can adopt measures to promote the development of telecommunications infrastructure, complementing federal government initiatives ([Schneir & Batura, 2015](#), p. 163). These initiatives may result from other concurrent powers, such as the power to promote regional development, which is typically granted to subnational entities. For instance, in Spain, case law has confirmed that local authorities can intervene in the telecommunications sector based on economic or regional development grounds (Article 149.1.13).

Each of these three countries has chosen different solutions for national State aid measures. In Germany, significant powers have been delegated to subnational authorities to implement State aid policies for broadband network rollout, which have been decided centrally. Austria has established national measures with both centralised and decentralised implementation. In contrast, Spain has adopted a centralised model. The national government asserts that broadband policy falls under its exclusive jurisdiction, particularly since the 2014 legislation aimed at curbing autonomous measures by subnational authorities.

In Italy, regions kept the power to develop their own plans since, according to the Italian Constitution, the communication sector is subject to concurrent legislation. This means that the definition of fundamental principles is reserved for the State, while detailed legislation is left to the regions.

### 6.3. Traditions of subnational participation in the telecommunication sector

In some countries, subnational authorities have a legacy of increased powers to intervene in the telecommunications market. With this gradual reinforcing path, it is inevitable that those authorities will be involved in the implementation of national measures or even in the decision to proceed autonomously with regional aid measures. This is exemplified by the case of France. France, which has implemented decentralised national measures, has started to grant competencies to subnational governments in early 1980s, empowering them to participate in the telecommunications market long before adopting national plans. In France, the Defferre Law of 1982 initiated decentralisation, transferring competencies and resources from the state to local authorities for the purpose of facilitating the deployment of cable networks. Simultaneously, Law no. 82–652 liberalised the audio-visual communication sector, allowing local commercial cable companies with local authority majority ownership to operate cable networks. The Cable Plan, also adopted in 1982, gave local authorities the power to initiate cabling of their regions with national financing ([Thatcher, 1999](#), p. 243). This plan involved the collaboration between local authorities and central actors, such as DGT and ‘Mission Câble’, to ensure consistent infrastructure deployment in accordance with technical standards ([Humphreys, 1985](#), p. 16). These powers were progressively expanded and enhanced and in 2004 Law no. 2004-575 granted local authorities the power to deploy, operate, and provide any type of telecommunications network in the absence of private initiatives ([Laurie, 2011](#)). Eventually, in 2010, the national broadband plan, *France Très Haut Débit*, involved local authorities into the infrastructure deployment process.

### 6.4. Policy diffusion

Poland has implemented a telecommunications policy that is analogous to that of France, in what seems as part of a process of policy diffusion between countries. This legislative framework has been tailored to align with the country’s specific circumstances and institutions. Poland’s Act on Supporting the Development of Telecommunications Services and Networks, adopted on 7 May 2010, allowed local governments to construct and manage telecommunication networks using their own budgets to meet local needs when local entrepreneurs were unable to do so ([Windekilde & Ladny, 2015](#), pp. 304–305). As a regionalised unitary state, the introduction and adoption of this policy is facilitated, despite the absence of a prior tradition of subnational authorities’ intervention in the telecommunications market.

### 6.5. Regional development

The deployment of broadband networks can be viewed in a broader context as a regional development policy. This is an area of action that is best managed at the subnational level, rather than by central government. A paradigmatic example is the UK. Following almost two decades of Conservative government, during which the autonomy of the regions was diminished ([Graham, 1995](#)), both local and regional governments, the latter through the regional development agencies (RDAs), witnessed an expansion of their powers following the establishment of these agencies through the RDA Act in 1998 and the revision of the Local Government Act in 2000. The aforementioned acts bestow upon these authorities the requisite powers and responsibilities to foster economic growth within their

respective regions. These authorities, imbued with the powers and responsibilities conferred upon them by the aforementioned government initiatives and the favourable institutional environment at the time, interpreted these provisions in a broad manner and initiated State aid measures for broadband network deployment at the outset of the 2000s. RDAs recognized the importance of broadband access in addressing regional economic disparities with the Northwest Development Agency's notifying the first decision registered by the European Commission on broadband deployment in 2003 (Chirico & Gaál, 2014). Since then, the devolved territories of Northern Ireland, Scotland, and Wales, as well as local authorities, have taken initiatives to support broadband deployment since the early 2000s. Once again, these traditions could not be reverted in the design of the National Broadband Scheme for the UK in 2010.

Local government acts also justify decentralised national models in Sweden. Sweden's Local Government Act of 1991 delegates the competence for granting State aid to regional self-administrative agencies called *Länsstyrelserna*, which are responsible for monitoring local authorities' activities (Simonsson, 2006, p. 638).

### 6.6. Institutional lock-ins

The factors we have presented in the previous subsections explain the decentralised governance models. Centralised governance models are prevalent among the 13 nations that joined the EU since 2004, with eight adopting this model (Czechia and Malta have not notified any measure, and Croatia, Poland and Slovenia have adopted decentralised models).

Greece, Ireland, and Portugal have also adopted centralised national plans despite previous subnational involvement in telecommunication development policies (Healy et al., 2022; Nunes, 2009; Troulos & Maglaris, 2011). Subnational involvement in broadband expansion was promoted by central government in Ireland and Portugal, specifically with projects such as the County and Group Broadband scheme in Ireland or the Community Broadband Networks scheme in Portugal (Nunes, 2009; Palcic et al., 2023). The scheme in Portugal aimed to showcase covered regions as examples of nationwide broadband expansion. However, the national broadband plan, which was designed a few years later, failed to consider subnational authorities as relevant implementing actors. In Ireland, limited subnational involvement may result from central controls and financial constraints (Daemen & Schaap, 2000). Additionally, the impact of austerity policies and reforms made during the Great Recession in countries under financial assistance may have also contributed to greater central control in State aid policies. Despite the attempts to promote the participation of subnational authorities in Ireland and Portugal, the existing institutions appear to have undergone only a limited degree of reform. In fact, according to the theory of historical institutionalism, the historical legacies and institutional constraints limits change (Hall & Taylor, 1996). Policy change might occur, driven by critical junctures and exogenous shocks (Baumgartner & Jones, 1993), or by gradual institutional shifts, which involve drift, layering, conversion, and displacement (Streeck & Thelen, 2005).

## 7. Discussion

When designing public policies, policymakers must take due account of the prevailing institutions. The unique context, culture, institutions, and historical legacies of a country play a crucial role in either facilitating or hindering the adoption of a specific governance model. Two significant anchors that restrict the range of potential governance models for public policy are the type of state structure and the constitutional framework in force. In countries where the constitutional framework explicitly defines the powers of different government levels, it is challenging to deviate from these established rules.

Despite the aforementioned constraints, change is possible. Within the existing framework, national and subnational policymakers can explore various paths and mechanisms. For example, in Spain, even though the constitution clearly states that telecommunications is under the exclusive jurisdiction of the national government, regional governments have found ways to autonomously manage regional aid measures for broadband deployment within their other granted powers. Similarly, subnational authorities in Italy and Spain have engaged in opportunistic behaviors to influence policy design, regardless of their formal involvement in governance (Gerli et al., 2023). This requires robust subnational governments with adequate resources. However, the willingness of subnational governments to participate and influence national measures has often been overlooked by highly centralised national governments.

This study does not advocate for a particular governance model, as assessing the most efficient model is beyond its scope. Scholars have conducted studies on the efficiency of public intervention through State aid policy (e.g., Bourreau et al., 2023; Briglauer & Grajek, 2023). There are also ex-post evaluations of State aid broadband projects (e.g., France Stratégie, 2023; Ipsos Mori, 2018). However, to our knowledge, there has been no comparative evaluation of the effectiveness and efficiency of centralised versus decentralised governance models. Such an assessment depends on numerous independent variables, including regulatory instruments, investment incentives, legislative measures, legacies, and the competitive context (Manica, 2024). Although this study does not evaluate these policies, it is noteworthy that countries with centralised national governance models have a VHCN median coverage rate that is 25 percentage points higher than those with decentralised models, while their median percentage of the population in rural areas is only 3 percentage points higher. One scenario could be the implementation of flexible national schemes, for example, with the option of national management agencies replacing subnational authorities in the tendering process, which could be a good match in order to support different subnational authorities' interest and capacities.

In the absence of comparative evaluations, it is nevertheless possible to identify, in general terms, the advantages and disadvantages of each model. Some studies indicate a trend toward the centralisation of public interventions, which can create efficiencies in State aid management, resulting from significant economies of scale (Gerli et al., 2023). Launching a single centralised call for tenders instead of multiple calls for tenders at the regional or local level, as well as centrally monitoring the implementation of the actual network, with the corresponding savings in resources, are examples of these economies of scale. Conversely, coordinating and steering multiple actors to implement policies of the central government may result in considerable transaction costs, potentially undermining

accountability and efficiency. Furthermore, ad hoc subnational measures lacking an overarching vision may prove even more disadvantageous.

In the absence of comparative evaluations between different models, one approach to be followed by policymakers could be to test smaller solutions aligned with the institutional context and evaluate their results. This strategy has been adopted in several countries, with successive national measures (as presented in Fig. 2). For example, France launched a €750 million program in 2010, which was subsequently superseded by a much more ambitious €13.3 billion program four years later. Policymakers should consider different governance models and adapt them to their country's specific institutions, as it is impractical to impose a model that does not fit their circumstances, resulting in an efficient outcome. Adopting national policies with a progressively increasing scale allows for a gradual alignment with institutional anchors and the testing of the model, considering factors such as the capacity and the resources of subnational authorities.

## 8. Conclusion

In this paper, we have examined the governance models of State aid measures to support the deployment of broadband infrastructure in Europe spanning two decades. This study provides a novel and exhaustive look into the governance of the State aid measures and the governmental actors engaged in implementing digital connectivity policies. It also analyses how these models fit within countries' legislative and institutional contexts.

Two governance models have been identified for State aid national broadband network deployment measures: the centralised and the decentralised models. In the centralised model, the central government implements the measure, usually through a central agency, which promotes a public tender and takes all necessary measures for the project to be carried out properly. In the decentralised model, the government decides on the general lines of the project, and the subnational authorities implement these measures in their territory, complying with those lines. Centralised models are slightly predominant, mainly due to the countries that joined the EU since 2004. Additionally, subnational authorities may promote individual measures that are autonomous from national plans. These measures stem from the powers and competencies of the authorities that feel national plans are insufficient for the needs of their populations. However, it is important to note that most of these autonomous subnational measures were published before the central government adopted the first national plan.

Within this framework there is at least two practical implications. First, political decision-makers can become aware of the existence of different models and assess their relevance for application to their realities, considering existing institutions and the demands of subnational authorities. Second, policymakers must take these institutional set-ups into account when designing State aid measures, being able to gradually deviate from legacies by including some aspects they consider to be more effective.

This study has two types of limitations. The first limitation is related to the scope of the cases collected. The analysis excludes measures adopted under GBER or falling under the *de minimis* Regulation, as well as other measures that may not have been notified to the European Commission. However, this limitation does not significantly impact the conclusions for two reasons. Firstly, GBER applies only to broadband projects decided after July 1, 2014, which covers less than half of the analysis period. Secondly, the ceiling for *de minimis* aid is low, at €275,000, which may exclude notifications for small and circumscribed individual measures. Furthermore, these small-scale projects have a limited impact in comparison with the measures subject to approval by the European Commission and included in the research. The inclusion of these measures would require a different research strategy regarding the data acquisition as there are no decision letters from the European Commission regarding GBER projects, and it would potentially distort the conclusions of the analysis. Another limitation concerns the interpretation of the collected data. The analysis mainly relies on information from the European Commission's decision letters. While these letters provide a general overview of the governance model and may contain limited information in some cases, the essential characteristics of the measures in each country were confirmed through complementary sources, including primary sources and scientific literature where available. Therefore, the impact of these limitations on the validity of the conclusions is expected to be minimal.

Regarding future research, three potential avenues have been identified. Firstly, reinforcing the conclusions through interviews with key stakeholders involved in these processes could provide valuable insights into implementing the measures in each governance model. Second, further research into the political decisions leading to the choice of the governance model for implementing the measure in each country would enhance understanding of the prevailing institutions behind these decisions. Lastly, assessing the efficiency and alignment with the initial objectives of measures implemented under centralised and decentralised governance models could provide valuable insights for policymaking and practice about the merits and disadvantages of each model.

## CRedit authorship contribution statement

**Luis Manica:** Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. **Bruno Damásio:** Writing – review & editing, Visualization, Validation, Supervision. **Sandro Mendonça:** Writing – review & editing, Validation, Supervision.

## Declaration of competing interest

None.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.telpol.2024.102837>.

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