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Riviere Beleta, Julia; Camatarri, Stefano, dir. The effects of decentralization on EU climate laws implementation. 2024. (Grau en Ciència Política i Gestió Pública)

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UAB

Universitat Autònoma de Barcelona

Faculty of Political Sciences and Sociology

Bachelor's Final Project

The effects of decentralization on EU climate laws implementation

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17 May 2024

Political Sciences and Public Administration

Abstract

This study, "The Effects of Decentralization on EU Climate Laws Implementation," examines the impact of decentralization on the enforcement of EU climate change laws across the 27 member states. Divided into four parts, the research includes a theoretical framework on decentralization and the EU implementation process, a methodology using the Most Similar System Design (MSSD), data presentation and analysis, and a conclusion with recommendations.

Key findings indicate that decentralization does not universally affect the efficiency of climate law implementation when measured by infringements. Population size is a significant variable, accounting for about 80% of the variation. Medium-sized countries with higher levels of decentralization experience longer procedures and more administrative infringements, suggesting potential tensions among regional authorities. In small countries, delays in transposition lead to extended infringement durations, complicated by regional authority dynamics. Conversely, large countries exhibit shorter infringement durations and fewer formal communications, possibly influenced by selective enforcement practices of the Commission.

The study highlights the Commission's reliance on external notifications to identify legislative breaches due to limited internal resources, especially in medium and large countries with complex administrative structures. It underscores the need to consider additional variables such as public expenditure and political ideology to better understand the implementation dynamics. While infringement data provides useful insights, it may not capture the full extent of non-compliance. Future research should examine member states separately and incorporate broader variables to enhance the understanding of implementation complexities and mitigate limitations in the Commission's data collection.

Index

Index	3
1. Introduction	4
2. Theoretical framework	6
2.1.1 Decentralization in EU Member States	6
2.1.2 Decentralization in the EU policy-making	7
2.2 EU decision-making and implementation	8
2.2.1 Decision making and competences on climate change	8
2.2.2 Implementation Process in the EU and compliance mechanism.....	9
2.3 Expectations.....	10
3. Methodology.....	12
3.1 Implementation	12
3.2 Decentralization.....	14
4. Analysis	15
4.1 Implementation Reports	15
4.2 Analysis of database by case of Infringement	17
5. Conclusions	24
References	27
Annexes	32
Annex 1.....	32
Annex 2.....	33
Annex 3.....	34
Annex 4.....	35
Annex 5.....	36
Annex 6.....	38

1. Introduction

Climate change a multifaced issue that requires cooperation to accomplish adaptability and mitigation. This has been acknowledged and is one of the main strategies of climate change response, as article 7.2 on the Paris Agreement states:

“Parties recognize that adaptation is a global challenge faced by all with local, subnational, national, regional and international dimensions, and that it is a key component of and makes a contribution to the long-term global response to climate change (...)”

This treaty follows a *bottom-up* approach framework for nations to contribute to climate change solution (Chan, 2016). This approach focuses on smaller action that builds up on major goals; giving lower levels of government much more importance and decentralizing the decision-making and implementation process. It is a substantial change from the Kyoto Protocol (1997), which followed a *top-down* strategy. This approach defines policies at a high level of authority and implements them downwards on other levels of governance with hierarchical structure and standardization of the processes. It also implies some level decentralization with the actors involved in implementation process.

In this international sphere one of the most active actors is the European Union (EU). Acting as a supranational regional organization, it has very clear objectives on how to address climate change challenges:

- 1) To conserve, protect, and enhance the quality of the environment.
- 2) To safeguard human health.
- 3) To use natural resources prudently and rationally.
- 4) To promote the implementation of international measures aimed at addressing regional and/or global environmental issues, particularly in combating climate change, which is the most relevant for this study.

Understanding how the EU addresses these objectives is essential to comprehend its policymaking process and its impact on Member States (MS). Initially, the European

Community employed a bottom-up strategy resembling an intergovernmental organization (Eusepi & Wagner, 2017). However, as EU institutions expanded and gained more competences, with MS delegating greater sovereignty, the EU evolved into a supranational regional organization with substantial autonomy and authority (Idem 2017; Schmidt 2009). Consequently, the EU's influence on MS operates within a top-down system (Barbé et al., 2007, 36).

The duality of these systems has led to multi-level governance, blending horizontal and vertical cooperation among actors. However, in decision-making processes, subnational actors have limited influence, while implementation heavily relies on national administrations due to the EU's decentralized administration (Norgueira, 2020). This contrast creates friction when subnational actors attempt initiatives (Norgueira, 2020) and generates a drift on law implementation¹(Arregui, 2016).

The common component in all the approaches is decentralization; however, it is used differently in each of them. This research, tries to find to what extent the level of decentralization in MS's administration is affecting the process of implementing EU climate change legislation and accomplish the international compromises. The research question, therefore, is:

“How might decentralization of EU Member States affect the implementation of EU climate legislation?”

The goal is to find which types of errors the MS are making when it comes to applying Climate change legislation ruled by the EU. The study will be divided in four main parts. In the first part, there will be a theoretical framework to put into place the main concepts of decentralization and EU implementation process. A second part will include the methodology used to find the relation between both variables and, in the third part, the data will be presented and analyzed. Lastly, a conclusion of the results with a revision of the study and recommendations.

¹ The gap between the policy on paper and the policy in action.

2. Theoretical framework

2.1 Decentralization

As a general definition, it is the allocation of decision-making power in various levels of government or, in other words, the transfer of powers from the central authority to the local, regional, subnational actors (Biela et al., 2013; Hooghe et al., 2020). Political scientists have studied decentralization from many perspectives². Generally, decentralization has been studied as a process that can be identified in *polity* (institutions/structure), *policy* (decisions/actions) and *politics* (activity/participation). In this study, given that research will be done in implementation (which is a part of policy making); decentralization will be looked at from a *policy* perspective taking into account the structure, *polity*, of EU Member States and the EU itself.

2.1.1 Decentralization in EU Member States

One common way to conceptualize the territorial organization of authority is by considering federal or unitary system of governance (Elazar 1991; Watts 1998). The key distinction lies in the fact that under federalism, changes to the structure cannot be made unilaterally by the central authority, whereas in a unitary state, the central authority holds the power. Federal systems are characterized by the division of governance into regional units, while unitary systems may or may not incorporate regional divisions (Hooghe et al., 2020). Consequently, in a federal system, governmental responsibilities are divided and sometimes shared between the central and regional authorities, inherently embrace decentralization, and this dual sovereignty is constitutionally safeguarded against alterations initiated solely by either the central or regional entities (Riker, 1964).

This dichotomy has been seen as a black or white categories. However, when considering decentralization as process or system, as Arjan Schakel (2019) explains, it is a continuous

² From territorial organization, political system, policy making, to its effects on participation, territorial integration, regional development and political accountability, among many others (e.g. Biela et al. (2013); Ениколопов and Zhuravskaya (2007); Mathieu et al. (2020); Lago (2021); Oubiña (2022); Dandoy (2017); Maza et al. (2022); Mookherjee (2015))

dimension. Schakel focused on the multidimensional nature of *authority* within regional governments, and developed the Regional Authority Index (RAI) to measure it.

Decentralization, in this sense, varies along three key dimensions: territorial scope, depth of authority, and spheres of action. Territorial scope ranges from *self-rule* to *shared rule*, where regional governments either govern independently within their jurisdiction or participate in decision-making processes beyond their boundaries. Depth of authority assesses the extent of a government's legislative, fiscal, and executive capacities, with higher decentralization granting more autonomy to regional governments. Spheres of action determine the policies over which regional governments have authority, with some having broad jurisdiction over areas like taxation and constitutional reform, indicating a high level of decentralization, while others may have more limited authority, especially in traditionally national government-dominated domains.

Hence, as more decentralized is the country, the regional governments have more participation in the policy and polity of the state. This can offer some benefits in decision-making as more focus on specific demands, incrementation on participation and more flexibility on implementation (e.g. Di Gropello, E. & Cominetti, 1998; Cardona, 2010, p.182). Nonetheless, it also presents challenges on horizontal cooperation between government levels and can bring competences issues (e.g. Nogueira, 2020).

2.1.2 Decentralization in the EU policy-making

The European integration theories have usually used the *top-down* and *bottom-up* approaches to explain the policy making process of the EU. Bottom-up approach is the "The attempt by MS to elevate their priorities and concerns to the European scale" (Barbé et al., 2007, 36) while the top-down approach "The adoption by a MS of EU policies and priorities" (Idem, 2007). Given this two-way process, many scholars have shifted towards understanding EU system through *multilevel governance*, which integrates different levels of government (e.g. Hooghe et al. (2020); Massetti and Schakel (2020); Börzel, (1998)). This approach recognizes the complexities of governance in an interconnected and decentralized world, combining elements of both *top-down* and *bottom-up* to address political and governance issues effectively. Regarding policy-making, each of these methods focus decentralization differently.

Policy-making has various steps, being decision-making and implementation two of them. In the case of *top-down*, the focus of the decentralization lays in the implementation of policies; while in the *bottom-up* view, the decision-making process is decentralized as well. In the EU decision-making process subnational actors and interest groups do have access to it and can influence but they do not have, in any case, a systematical and direct practice (Börzel, 1998). Simultaneously, implementation process happens with a decentralized administration, which are the 27 different MS that apply EU law. Therefore, this process follows a *top-down* approach with great level of decentralization in the implementation due to the lack of administrative capacities of the EU.

2.2 EU decision-making and implementation

2.2.1 Decision making and competences on climate change

Climate change legislation encompasses everything from air and water pollution to resource management, land use, and forest protection. Due to its extensive nature, it is essential to define the framework within which the EU operates, as taking action in these areas may challenge the principle of subsidiarity and proportionality³. The key is for the EU to act only when its function is much more effective than what national or local authorities of the MS can achieve. Thus, it is a shared competence, meaning both the EU and the MS can enact climate-related laws, but always if the EU has not already proposed legislation.

The process for enacting EU climate laws is the ordinary legislative procedure. It entails the European Commission proposing the legislative text, and both the European Parliament⁴ and the Council of the EU⁵ negotiate to refine or amend the proposal.

³ Competencies are governed by attribution, proportionality, and subsidiarity principles, which set limits on EU actions based on Member States' treaty-granted powers.

⁴ The work groups for climate decisions in the European Parliament are: the Committee on the Environment, Public Health and Food Safety responsible for discussing the European Parliament's position.

⁵ The Council of the European Union, composed of political representatives from Member States, decides unanimously on crucial national matters: environmental fiscal policies, land management (excluding waste), and energy source decisions.

The authorities within the Commission in charge of climate change legislation are the Directorate-General for Climate Action, Directorate-General for Environment and Directorate-General for Energy. Upon approval by the Council of the EU and the Parliament, the Commission can pass the law, becoming part of European legislation and subjecting to compliance mechanisms.

2.2.2 Implementation Process in the EU and compliance mechanism.

Pressman and Wildavsky, founding fathers of implementation studies, describe the *implementation* as a set of organized activities and systems used to carry out public policies (Arregui, 2016; Pressman and Wildavsky, 1973). In their approach, they highlight the complex interactions among different actors⁶, which influence policy implementation and how planned actions unfold. This complex interaction leads to a substantial gap between how the policies are aimed to function and how they actually work in the practice (Versluis, 2004). This is the *bureaucratic drift*, which is the difference between the policy passed as legislation and the implementation by the administration (Shepsle, 1992).

In the case of the European Union, the implementation process is very complex, yet the EU does not have an actual common administration that implements policies, which always take the form of legislation. There are different types of EU legislation, differed by the binding effects of it. On his study Javier Arregui (2016) differentiates them by bindingness, type of implementation (mandatory or not), and the political areas the different kind of laws cover (see Annex 1). Climate and environmental laws (Directives, Regulations and Decisions) are binding and have direct impact and mandatory implementation for MS.

Even though implementation varies in each country's responsibility of the national administrations, the general normative process for legislation after being approved, goes as follows (Idem, 2016):

⁶ Such as government officials, agencies, interest groups and citizens.

- 1) Transposition: terms on how and when the law has to be included in national legislation.
- 2) Implementation in administration: changes or adaptations needs in the administration to make effective the law.
- 3) Practice of the law: actions taken by the administrations, enforcement methods and compliance mechanisms.

This whole process can be divided as normative implementation (transposition) and administrative implementation (implementation in the administration and enforcement of law). This are the two process the Commission requests to make the legislation effective, where the methods, strategies and the level of change in each step varies depending on type of legislation.

To ensure MS compliance, the Commission operates a two-step system: monitoring and formal procedures. Monitoring identifies potential EU law infringements. Formal procedures begin with a Formal Notice, signaling concerns to the MS. The MS must respond within about 2 months. If non-compliance persists, a Reasoned Opinion is issued, requiring corrective action and updates to the Commission. Failure to comply may lead to the case being referred to the Court of Justice of the EU (TJUE). If the MS fails to adhere even after a court ruling favoring the Commission, economic or other penalties may follow. (European Commission, 2022).

2.3 Expectations

The exploration will be using all the information about infringement cases open by the Commission on MS and crossing it with the decentralization measurements⁷. As MS increasingly decentralize their governance structures, several hypotheses emerge regarding the implications for handling infringement cases within the European Union framework. Firstly, heightened decentralization may introduce horizontal coordination

⁷ This research considers all the processes from a utilitarian and consequentialist approach where actors act rational. It will not be taken into account the motivations of emotion of social norms and human motivations as Étienne (2011) and Lindernberg (2000) argue also take a big role on compliance with implementation.

challenges among regional authorities, potentially amplifying the frequency of infringements across different policy areas (Borghetto & Franchino, 2010).

Secondly, the decentralization process itself could elongate the time required to address infringement cases, prolonging the resolution of regulatory issues (Nogueira, 2020). This delay may stem from the need to navigate complex jurisdictional boundaries and varying administrative procedures within decentralized frameworks.

Thirdly, greater decentralization often correlates with reduced stakeholder complaints, reflecting a perceived effectiveness of locally tailored policies (Arregui, 2016). This phenomenon suggests that highly decentralized MS may experience fewer infringements during Step 3 of transposition, where specific measures are implemented to comply with EU legislation.

Lastly, an increase in case duration is likely to prompt a rise in formal communications issued by the European Commission. In decentralized systems, where communication and coordination between national and regional authorities can be intricate (Borghetto & Franchino, 2010), prolonged case durations may necessitate more frequent and detailed formal notices from the Commission.

3. Methodology

To conduct the exploration, based on a comparative study, the method used is Most Similar System Design (MSSD). The rationale behind this approach lies in the belief that analyzing similar cases with disparate outcomes facilitates the control of extraneous factors, allowing the researcher to identify the independent variable responsible for the presence or absence of the dependent variable (Anckar, 2008).

In this study, the 27 EU Member States share similarities in terms of regulatory framework, objectives in climate change, and involvement in EU decision-making processes. They are all bound by EU treaties and institutions, adhering to fundamental principles like democracy and the Welfare State. Despite differences in political systems, all Member States participate in EU decision-making through Parliament and the Council, playing significant roles in policy formulation and implementation.

Consideration must be given to a key limitation of MSSD for cross-country studies: case similarity can vary from precise to approximate, influencing research outcomes accordingly (Idem, 2008). In this study, the differing sizes of countries pose a challenge; however, despite these differences, MS share similarities in many respects but vary significantly in population. Therefore, to address this issue, after conducting a preliminary study, the population variable will be categorized into groups of Big, Medium, and Small countries.

3.1 Implementation

Implementation is analyzed by examining new infringement cases opened by the European Commission annually from 2018 to 2022, based on data from the latest Annual Report on monitoring EU law application. The study focuses solely on open infringement cases within this timeframe. Additionally, a complementary analysis breaks down each infringement procedure initiated by the EU Commission during this period to gather the following details:

- Country characteristics: name and abbreviation of the country and population (Eurostat 2024).

- Formal communications: whether the case included a Formal Letter, Additional Formal Letter, Reasoned Opinion, Additional Reasoned Opinion and/or the case was referred to The Court of Justice of the EU.
- Type of infringement (find examples in Annex 2):
 - Type 1: this type refers to the cases where the infringement case was open because of the complete lack of transposition; partial transposition regarding to general changes in the law of the MS or incorrect transposition of the general Directive, Regulations or Decisions.
 - Type 2: refers to infringement cases where the transposition was lacking or incorrect in areas specifically regarding the changes needed in the national administrations to transpose and implement the EU law.
 - Type 3: infringement cases where the problem in transposition was found in the specific application and/or action needed to be carried out by the administrations with the objective to enforce and enact the law.
 - Type 4: direct infringement by the MS regarding the compliance with the obligations and requirements by the EU law.
- Duration of the procedure: time taken for each case from the date it was opened to the closing or withdraw date⁸.

With all of this information stored under a data base of individual development, the variables to explore implementation are the following:

Concept of the variables:

- Country name
- Population
- Formal Notice
- Additional Formal Notice
- Reasoned Opinion
- Additional Reasoned Opinion
- Referral to Court of Justice of EU

Name of the variable in data base:

- *country_name*
- *Population*
- *frml_ntice*
- *add_frml_ntice*
- *rsd_opin*
- *add_rsd_opin*
- *ref_tjue*

⁸ In this case there are two categories: open cases and closed cases. The closed cases category is the only one that is relevant to calculate duration.

- | | |
|--|----------------------|
| ▪ Total number of formal communications per case | ▪ <i>total_infri</i> |
| ▪ Type of infringement | ▪ <i>type_infri</i> |
| ▪ Duration | ▪ <i>duration</i> |

3.2 Decentralization

The Regional Authority Index (RAI) is used to identify and measure the level of decentralization of the MS. The RAI is measured following Arjan Schakel (2019): it consists of two dimensions, each comprising five sub-dimensions.

The first dimension, *self-rule*, pertains to the authority wielded by a regional government within its territory. It is evaluated based on five sub-dimensions: institutional depth, policy scope, fiscal autonomy, borrowing autonomy, and representation. The second dimension, *shared rule*, focuses on the authority exerted by a regional government or its representatives at the national level. It encompasses five sub-dimensions: law making, executive control, fiscal control, borrowing control, and constitutional reform. Scores are assigned to each sub-dimension, with higher scores indicating greater authority of regional governments⁹.

Yet the data goes from 1950-2018; the variable of decentralization is an average of the values that each EU country has been attributed from the entrance of Bulgaria and Romania: 2007-2018¹⁰. It can be found in the analysis as *avg_RAI*.

⁹ For further details on the measurement methodology of the RAI, see Arjan Schakel (2019) and Hooghe et al. (2016).

¹⁰ Even though Croatia entered in 2013, this study did not consider 5 years was representative enough and, therefore, the Lisbon Treaty in 2007 is chosen for better understanding of the RAI.

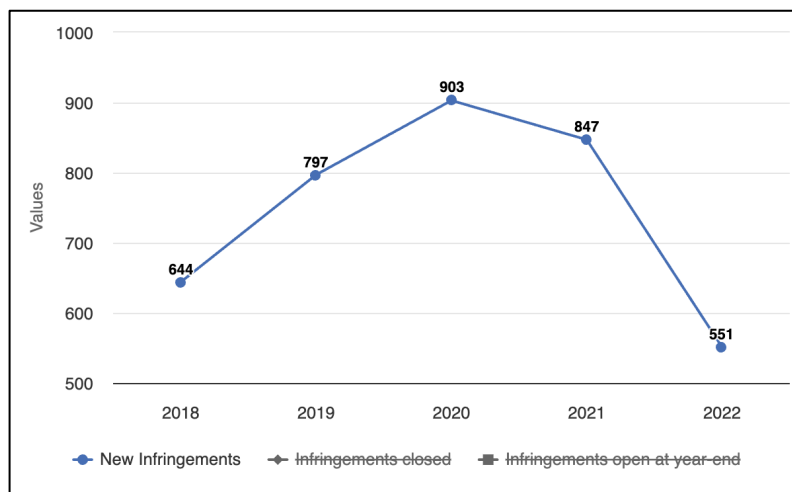
4. Analysis

4.1 Implementation Reports

The preliminary study data from the 2022 Annual Report on monitoring the application of EU law comprehensively collects information on infringements across all MS and policy areas. It categorizes cases into new transposition cases¹¹, and tracks average handling times and received complaints. An overview of the timeframe reveals a decline in overall infringements since 2020, reaching its lowest point since 2018 (Figure 1). However, when specifically examining environmental policies, it has consistently experienced the highest level of infringements (see Annex 3, Graphs 1 to 5).

Figure 1

Evolution of new infringement cases 2018-2022



Note: Adapted from *Evolution of infringement cases*, Annual Reports on monitoring the Application of EU law, July 14 2023, European Commission.

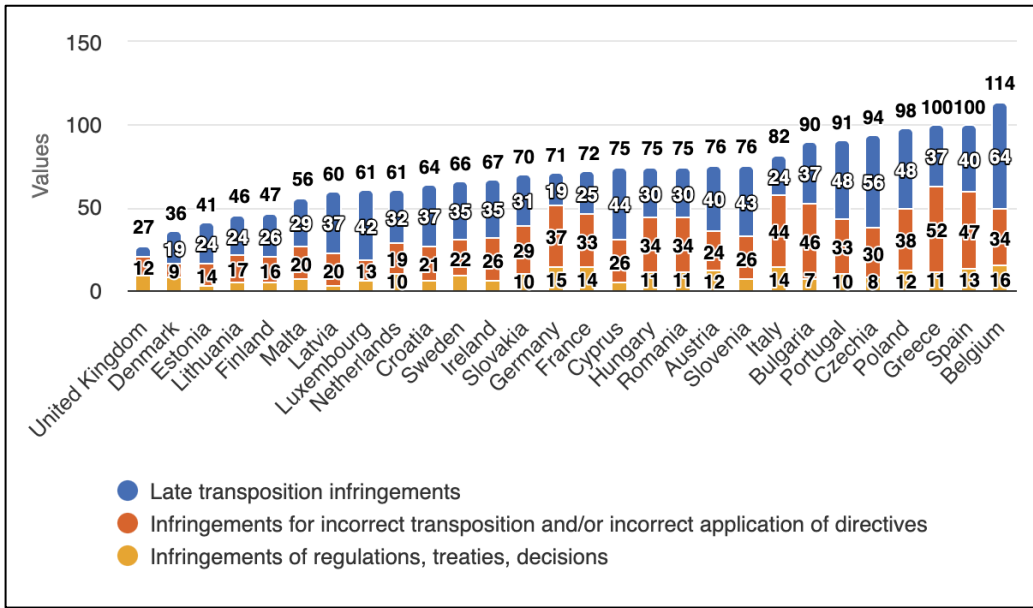
Furthermore, the data on the Report reveals that, concerning new transposition cases, the primary issues with infringements annually consist of either late or incorrect transposition of Directives (Figure 2). Specifically, the Environment and Energy policy areas represent

¹¹ Cases where the procedure of infringement started during the year studied.

a significant percentage of late transpositions in 2022 (20.96%), 2020 (37.40%), and 2019 (22.17%) (see Annex 4, Graphs 6 to 10). The data strengthens the understanding of total new infringements opened annually, emphasizing the significance of addressing late or incorrect transpositions for effective enforcement of EU law.

Figure 2

Type of open infringements accumulated at the end of 2022 by MS and the UK



Note: The figure shows the amount of incorrect and late transposition in comparison of infringements on regulations treaties and decisions. Adapted from *Type of infringement cases open at year-end per Member State and the UK*, Annual reports on monitoring the application of EU law, July 14 2023, European Commission.

The reports offer well-organized data for an initial examination of infringement issues. For instance, this study managed to quantify the total number of new infringement cases opened by Member States within the analyzed timeframe and correlate it with the average Regional Authority Index (see Annex 5, Graphs 11 and 12). However, the data is not statistically significant, and the reports do not provide detailed insights into the types of infringements by policy area and state.

4.2 Analysis of database by case of Infringement

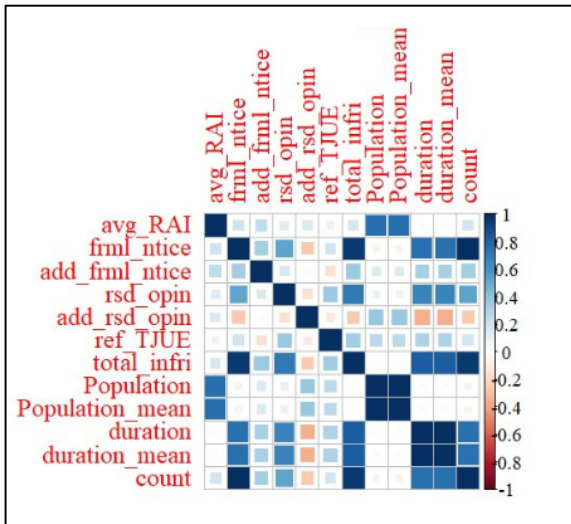
To gather all the information of laws related to Climate change, this study looks at all the infringement cases open by the three directorates in charge of Climate change legislation within the Commission: Directorate-General for Climate Action, Directorate-General for Environment and Directorate-General for Energy. The total amount of cases between 1st of January of 2018 and 31st of December of 2022 are 924.

The initial correlation matrix analysis in Figure 3 yielded unsatisfactory results. It reveals that the only variable significantly correlated with the independent variable of interest (average RAI) was Population, which accounts for approximately 80% of the variation between variables (Figure 4).

However, duration is directly tied to the total number of formal communications (*total_infri*). Each procedure starts with a Formal Notice, which increases both the total number of cases and their duration. Additionally, the analysis shows that Reasoned Opinion and the number of formal communications per case are correlated, further impacting procedure duration. Thus, all cases begin with a Formal Notice, and approximately 60% of the duration variability can be attributed to the Commission's decision to issue a Reasoned Opinion, influencing the total number of formal communications per case.

Figure 3

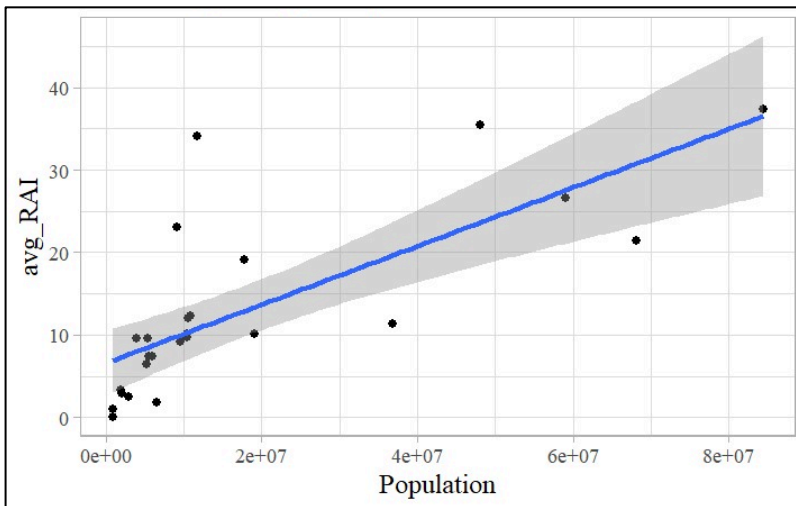
Matrix Correlation of general variables



Note: this matrix correlation is used to understand which variables are correlated with the independent variable of the study (average RAI). When referring to count it refers to total amount of cases. *Source:* own creation

Figure 4

Relation between Population of the Country and the average RAI



Note: Positive correlation of Population and RAI. (see Annex 5, Graph 13 for more detailed information on countries). *Source:* own elaboration

Given the strong correlation between Population and RAI, the study proceeds by examining the quartiles of Population to ascertain if grouping by size reveals any effects of RAI that may have been faded in the general analysis. This phenomenon, known as the

Simpson Paradox, can occur in probability and statistics when a trend or pattern appears in different data groups but disappears or reverses when the groups are combined. This paradox may arise due to significant differences in sample sizes among subgroups, as in this exploration. To mitigate this issue, grouping is conducted based on quartiles of 33% and 66% to establish three distinct population groups: *Big* (greater than 10.570.512 population) *Medium* (between 5.362.685 and 10.570.512), and *Small* (less than 5.362.685 population). Figures 5, 6, and 7 depict the correlation of all variables within these groups.

Figure 5

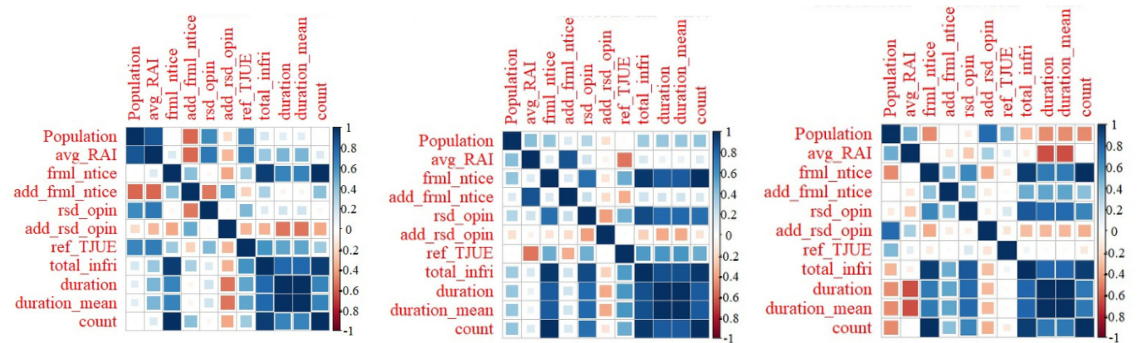
Matrix of Correlation for Small Countries

Figure 6

Matrix of Correlation for Medium Countries

Figure 7

Matrix of Correlation for Big Countries



Note: these three matrices of correlation show which are the variables that are the most influenced and/or correlated to the RAI. *Source:* own creation

As expected, we find that again the duration is related to the count, and to total number of formal communications by case, hence, more notifications is equal to extended duration. The difference in this case is that in Small Countries we find that if an Additional Reasoned Opinion is sent, duration decreases (roughly 50% of variation explained).

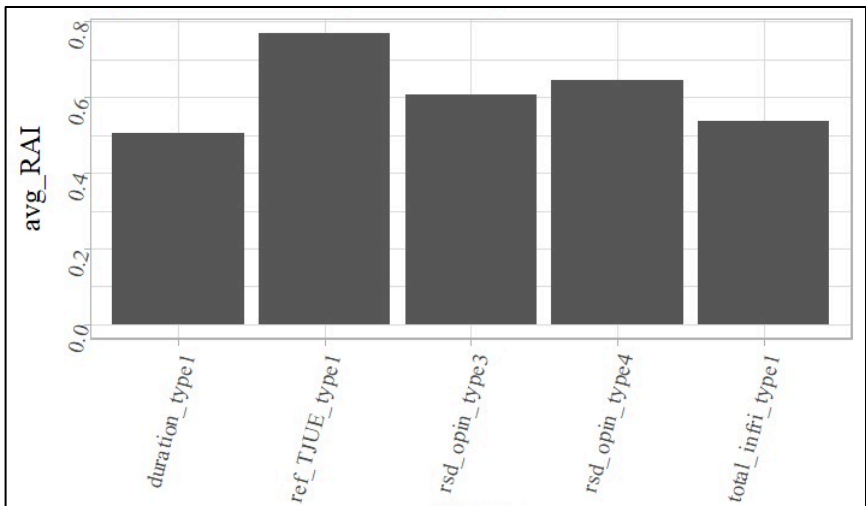
Regarding decentralization, we observe distinct correlations within different country sizes. In *Small Countries*, a positive correlation exists between RAI and Reasoned Opinion, as well as Referral to TJUE, suggesting that greater decentralization increases the likelihood of receiving a Reasoned Opinion or being referred to court. Conversely, an additional formal notice has a negative impact. In *Medium Countries*, the most correlated variables are Additional Formal Notice (positively) and Referral to TJUE (negatively),

indicating that, more decentralized countries receive additional formal letters but fewer referrals to TJUE. In the final group, *Big Countries*, the only noteworthy correlation between decentralization and implementation variables is the duration of cases, which is negative. This suggests that higher RAI values result in shorter periods for each opened case.

To understand how these relations in each country group work, this study filtrated each one of the variables by Infringement Type¹². Yet the matrix shows about 32 differentiations, the top 5 variables filtered by type are displayed for better understanding.

Figure 8

Top 5 variables that correlate with the Average RAI on Small Countries



Note: the correlation of each variable by type that are most affected by the average RAI on Small Countries. All correlations are positive and statistically significant. *Source:* own creation.

Figure 9

Top 5 variables that correlate with the Average RAI on Medium Countries

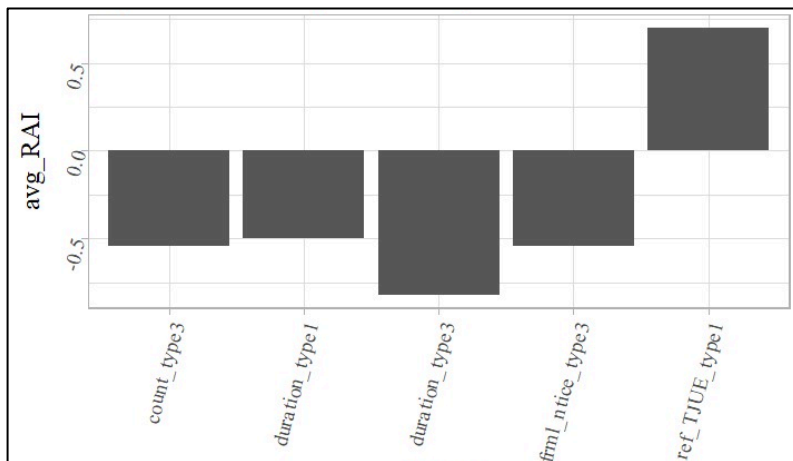
¹² An example of the correlation matrix is provided in the Annex 6 for Small Countries



Note: the correlation of each variable by type that are most affected by the average RAI on Medium Countries. All correlations are positive and statistically significant. *Source:* own creation.

Figure 10

Top 5 variables that correlate with the Average RAI on Big Countries



Note: the correlation of each variable by type that are most affected by the average RAI on Medium Countries. All statistically significant but not all are positive, only Referral to TJUE on type 1 infringements. *Source:* own creation.

This differentiation on the types by variable allows to see that there is a big difference on how RAI effects on implementation in different country groups. The analysis of ***Small Countries*** reveals a significant positive influence of RAI on Reasoned Opinions,

particularly in Type 3 and 4 cases. Moreover, there is a correlation between RAI and the Referral TJUE in Type 1 cases, as well as with the duration and total infringements in each Type 1 case. This suggests that higher decentralization lengthens infringement process for closing Type 1 cases, with an increased likelihood of receiving multiple procedural notices¹³ and high chance of being referred to the TJUE. Additionally, infringements of Type 3 and 4 also experience longer procedures in countries with higher RAI, increasing the likelihood of receiving a Reasoned Opinion. Overall, the study indicates that as decentralization increases in *Small Countries*, the time taken to resolve cases lengthens, particularly for general transposition infringements (Type 1), and the likelihood of complications in addressing specific application and compliance (Type 3 and Type 4).

In the *Medium Countries* the type of infringement with relevance is Type 2 regarding changes on administration. In particular, it increments its general count, therefore, the Formal Notices, the Additional Formal Notices and the total infringements do as well. What it can be extracted from the information is that greater decentralization, greater are the chances being called out by infringements of Type 2. In other words when there is more decentralization, the Commission sees more problems in the changes needed in national administrations to implement legislation. At the same time, we find a positive relation between Additional Formal Notices and RAI in Type 3. This could be due to the Commission's difficulty to find reliable information hence they do not have enough reasons to ascend from a Formal Notice to a Reasoned Opinion. It also could be explained by the way *Medium Countries* handle Type 3 infringements; which due to the specificity of them, might be easier to defend or fix in front of the Commission and therefore don't give enough reasons to be handed a Reasoned Opinion.

Regarding *Big Countries*, the findings are very different. First off, the correlations are not as high as the other two groups, meaning that the explanation on variation of RAI is lower on the variables presented. On top of that, three out of the top five variables have a negative relation with RAI and types 2 and 4 do not seem to be relevant in this group of countries. Instead, Type 3 is the most correlated negatively. The sense of the chart shows

¹³ Formal notice, Additional Formal Notice, Reasoned Opinion, Additional Reasoned Opinion and/or Referral to TJUE.

that as the RAI increases the total amount of infringements Type 3 decrease and the Formal Notice checks the same way. One interesting thing is that besides reducing the number of infringements of this type, the duration of this same type tends to be shorter when the RAI increases. This implies that the procedures on transposition infringements about specific actions on enactment of the legislation get closed faster when decentralization increases. Thus, an plausible explanation as in *Medium Countries*, could be that these cases are harder for the Commission to notice and/or easier for the MS to fix them or defend.

Differently, for Type 1 cases it seems the duration also gets reduced in more decentralized countries even though the chances to get referred to court increase. This, on one side, does not go in accordance with the trends on duration and number of total formal communications seen before in the other groups and the general analysis (which was parallel). On the other side, the variable of Type 1 Referral to the TJUE explains more the correlation with RAI than does the duration of Type. A possible explanation could be that because of the percentage of population being affected by these infringements, the Commission puts more pressure and gets stricter in *Big Countries*, thus shortening the timings but at the same time ascending to Referral to TJUE faster.

5. Conclusions

The analysis provided insightful information on the implementation process of the EU, which, according to the data of the Commission, improved since 2018. Even so, implementation regarding climate change is still one of the main areas of conflict regarding the data; transposition being the main issue for deficient implementation. This deficiency generates a bureaucratic drift that presents differently in all 27 MS, which each of them present different administration systems and differ in decentralization levels.

As a general trend, there is no effects of decentralization to the efficiency of implementation in EU Climate change legislation when using infringement as a measurement. Even so, the findings demonstrate that when dividing the countries by population sizes, there are certain trends that arise and showcase influence of decentralization in the type of errors MS make when implementing EU climate legislation and meet mostly all the expectations suspected.

Commonly, the duration of the procedures is related to the total number of formal communications by case. Even so, this relation behaves differently regarding the type, when decentralization arises in each group. In *Medium Countries*, an increase in decentralization is associated with prolonged durations and heightened frequencies of infringements related to administration. This suggests that greater decentralization may exacerbate tensions between regional authorities, adversely affecting implementation efforts (Nogueira, 2020; Borghetto & Franchino, 2010).

In *Small Countries*, infringements pertaining to the general transposition of laws into national legislation lengthen, reflecting the problem of implementation on late completion of transposition with higher power on the regional authorities. This could be explained by the difficulties that horizontal organization presents in multi-governance systems which usually requires greater communication, negotiation between subnational actors and time to materialize a coordinated and coherent implementation (Borghetto & Franchino, 2010)

In contrast, in *Big Countries*, the duration of such infringements decreases overall, along with the frequency of formal communications. This disparity may be attributed to

Thomson et al.'s (2007) suggestion that the Commission's actions are not always neutral and may be influenced by various factors, including the perceived importance of specific laws. Consequently, the Commission may exert more pressure on MS to rectify transposition issues, resulting in an uptick in procedural notices. Conversely, in the case of larger states, the Commission may expedite response times or show leniency due to their larger population shares.

Regarding cases where the problem on implementation resides on the specific actions, methods, resources' concrete display to enact and enforce the law (Type 3), *Medium and Big* countries share a similarity. In *Medium Countries*, there is a notable increase in Additional Formal Notices alongside the level of decentralization. This trend implies that Type 3 cases in these countries may exhibit a broader scope, posing challenges for the Commission to gather sufficient evidence for escalation to Reasoned Opinions. Moreover, the handling of Type 3 infringements in *Medium Countries* may involve specific measures that are readily defensible or correctable, reducing the likelihood of escalation to Reasoned Opinions.

In *Big Countries* a similar trend displays, but it is showcased differently. Type 3 infringements display the strongest negative correlation with decentralization. As the RAI increases, there is a concurrent decrease in the total number of Type 3 infringements and Formal Notices, while the duration of Type 3 cases tends to be shorter. This pattern indicates that procedures related to transposition infringements regarding specific legislative actions are resolved more expeditiously in this group, possibly suggesting that they are more difficult for the Commission to detect or easier for Member States to rectify or defend, mirroring trends observed in *Medium Countries*.

The absence of dedicated technicians within the Commission to identify breaches of European legislation, as well as its limited capacity to enforce legislation in most cases, relies on third-party actors to notify such breaches. This dependency on external notifications underscores the significance of nuanced patterns observed in the handling of infringement types across different country groups (Arregui, 2016). In *Medium* and *Big* countries, where decentralized structures may pose administrative challenges for implementation, the reliance on external notifications becomes particularly relevant. The observed trends in the handling of specific infringement types reflect not only the

Commission's capacity limitations but also the dynamics of Member States' responses to infringement cases.

It is relevant to mention that the usage of infringements as a method of calculating implementation success is limited to the Commission data and capacity to identify infringements. In many cases where transpositions are flawed, the Commission may lack adequate mechanisms to pinpoint these issues. Indeed, some experts argue that the infringement data collected by the Commission merely scratches the surface of the true extent of non-compliance (Falkner, 2005, 204).

For a better understanding of the implementation procedure, I suggest to look at these group of countries separately and introduce independent variables which can account for other rational and consequential theories such as the public expenses and also agency variables such as political ideology of MS. At the same time, I suggest that to look more in depth on the implementation complex variables, using complaints and achievement on climate goals of MS. As a whole this could be useful to understand better the implementation drift and the account of limitations would be less noteworthy.

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Annexes

Annex 1

Table 1:

Typology of Laws in the EU and Their Relationship with the Implementation Process in Member States

Types of Laws	Type of implementation (level of bindingness)	Political areas
Binding Laws: Directives, Regulations and Decisions	Mandatory implementation	The majority of policies in the construction of the market: internal market, agriculture, trade, industry, fisheries, monetary union, competition, regional policy, R&D, social policy, environment, consumers, development, (since Amsterdam); fundamental rights (since Lisbon), some aspects of fiscal surveillance and macroeconomic (since the reforms of 2011).
Weak laws	Mandatory implementation; weak enforcement	Fiscal and macroeconomic surveillance (prior to the reforms of 2011)
	Mandatory implementation; no enforcement	Some aspects of foreign and security policy.
	Non-binding; strong implementation/enforcement	Some aspects of fiscal and macroeconomic surveillance (since the reforms of 2011)
	Non-binding; weak implementation	Open Method of Coordination: employment, economic coordination, pensions, and social inclusion. Some aspects of competition: environment, energy, transportation, culture, education, regional policy, industry, development, and R&D.

Note: source from Javier Arregui (2016, p.169)

Annex 2

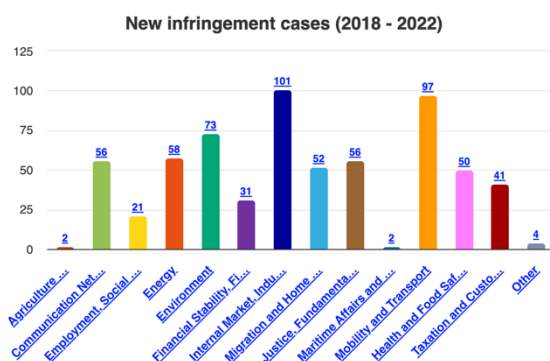
Examples of infringement types:

- Example type 1: INFR(2020)0150 Partial transposition by Bulgaria of Directive (EU) 2018/844 on the energy performance of buildings. Memo: https://ec.europa.eu/commission/presscorner/detail/EN/inf_22_3768
- Example type 2: INFR(2019)2221 by Denmark on unclear national rules for project adoption, improper public and authority consultation, and incorrect requirements for development consent decisions. Directive 2014/52/EU and EIA Directive 2011/92/EU. Memo: https://ec.europa.eu/commission/presscorner/detail/EN/INF_19_5950
- Example type 3: INFR(2021)2217 by Cyprus on the despair method of waste treatment by municipal authorities infringing the Landfill Directive (Directive 1999/31/EC) and the Waste Framework Directive (Directive 2008/98/EC). Memo: https://ec.europa.eu/commission/presscorner/detail/EN/INF_21_6201
- Example type 4: INFR(2019)2151 by France Poor implementation of the Birds Directive regarding traditional hunting conditions and the capture of certain birds. Memo: https://ec.europa.eu/commission/presscorner/detail/EN/inf_23_142

Annex 3

Graph 1:

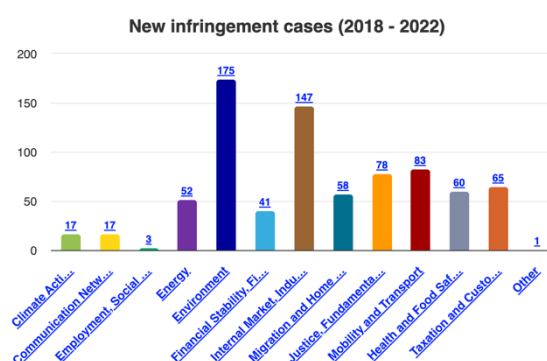
New infringement cases 2018 by policy



area

Graph 2:

New infringement cases 2019 by policy

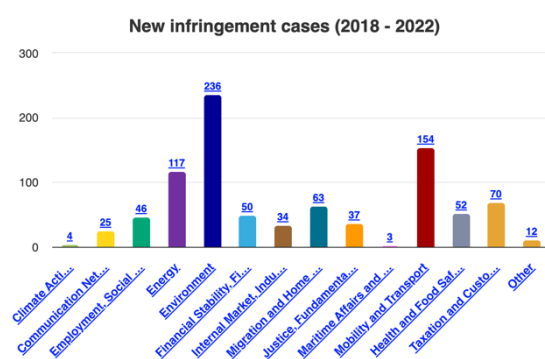


area

Graph 3:

New infringement cases 2020 by policy

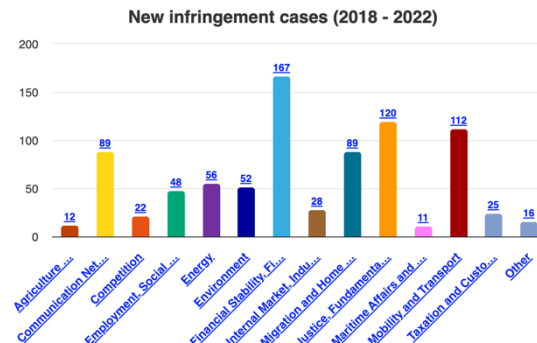
area



Graph 4:

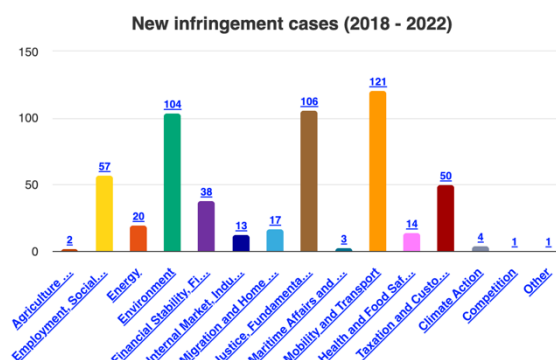
New infringement cases 2021 by policy

area



Graph 5:

New infringement cases 2022 by policy



area

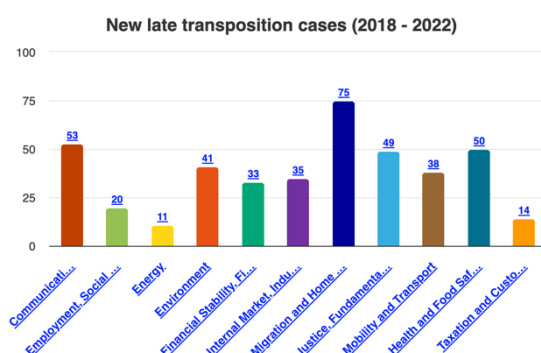
Note:

Source from *Annual reports on monitoring the application of EU law*. (2023, July 14). European Commission.

Annex 4

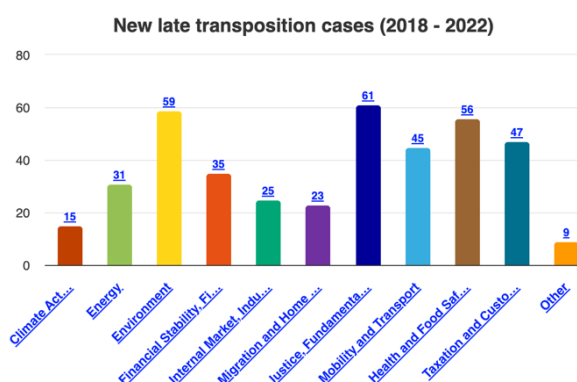
Graph 6:

New Late transposition cases by policy area 2018



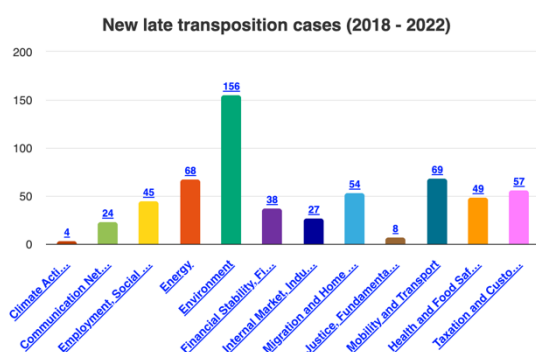
Graph 7:

New Late transposition cases by policy area 2019



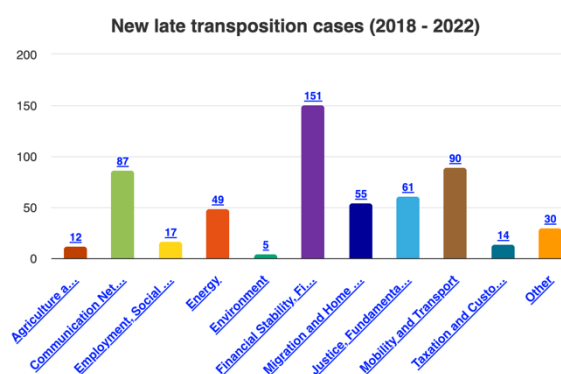
Graph 8:

New Late transposition cases by policy area 2020



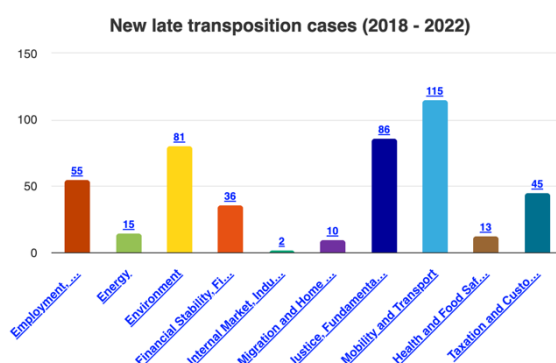
Graph 9:

New Late transposition cases by policy area 2021



Graph 10:

New Late transposition cases by policy area 2022



Note: The percentage that represents Environment and Energy policy areas by year are the following:

2022: 20,96%

2021: 9,46%

2020: 37,40%

2019: 22,17%

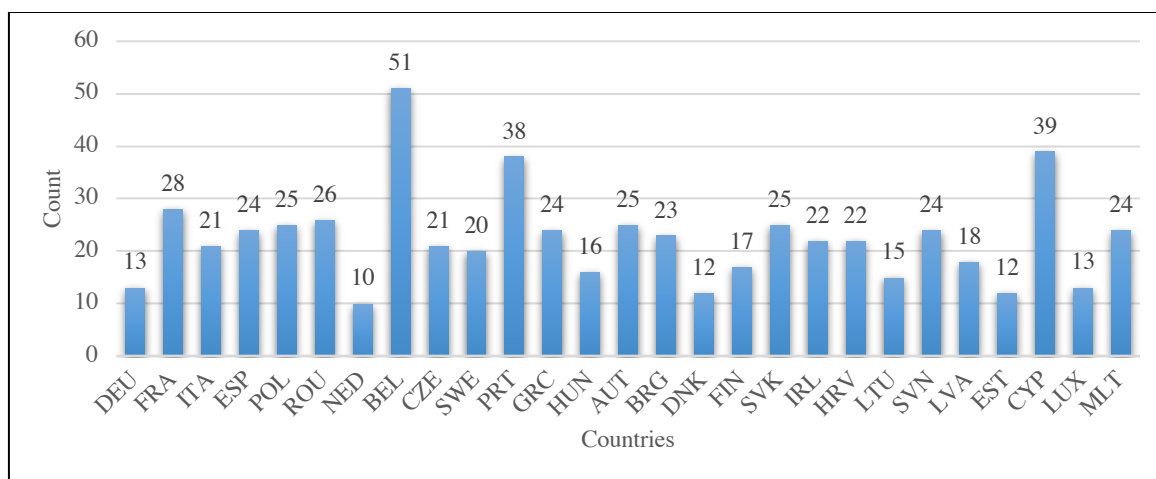
2018: 12,41%

Source: Annual reports on monitoring the application of EU law. (2023, July 14). European Commission.

Annex 5

Graph 11

Total number of new open cases of Environmental Infringements from 2018 to 2022



Note: this figure shows the total new infringement cases open in the environmental policy area from 2018 to 2022. The countries are in order of biggest to smallest population size. There is no tendency regarding population by number of new infringements on environmental laws. Source: own elaboration with data from the *Annual reports on monitoring the application of EU law*, July 14 2023, European Commission.

Graph 12

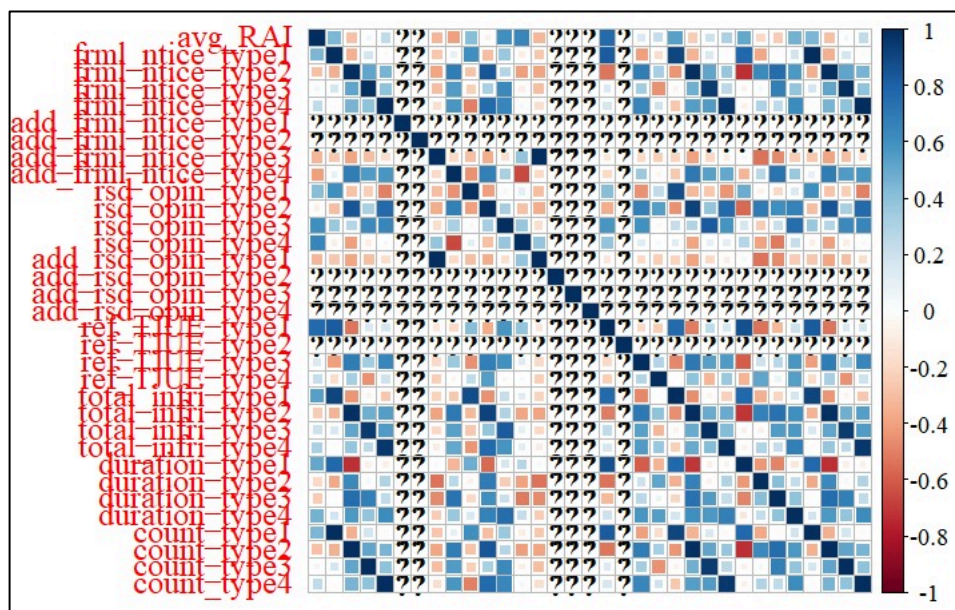
Total number of new infringements on environmental policy by the Regional Authority Index



Note: this scatter plot shows how the total count of infringements on environmental policies has a positive relation with the level of decentralization. Source: own elaboration with data from *Annual reports on monitoring the application of EU law*, July 14 2023, European Commission and *The Regional Authority Index*, Hooghe et al., 2016, Oxford University Press.

Graph 13

Correlation matrix with RAI and implementation variables filtered by type of infringement



Note: The graph shows all the variables of implementation divided by type of infringement with the goal to see the correlation with the average RAI. *Source:* own elaboration