

**Multi-polarization in the 9th term of the European Parliament**

A network analysis of voting communities

Sebastião Manuel Inácio Rosalino

Master Thesis

presented as partial requirement for obtaining a Master’s Degree in Data Science and Advanced Analytics

**NOVA Information Management School**

**Instituto Superior de Estatística e Gestão de Informação**

Universidade Nova de Lisboa

**NOVA Information Management School**

**Instituto Superior de Estatística e Gestão de Informação**  
Universidade Nova de Lisboa

**Multi-polarization in the 9th term of the European Parliament**

A network analysis of voting communities

by

Sebastião Manuel Inácio Rosalino

Master Thesis presented as partial requirement for obtaining the Master’s degree in Data Science and Advanced Analytics, with a specialization in Data Science

**Supervised by**

Flávio Luís Portas Pinheiro, PhD, NOVA Information Management School

António Bernardo Curado Estevão, MSc, NOVA Information Management School

July, 2025

**STATEMENT OF INTEGRITY**

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism, any form of undue use of information or falsification of results along the process leading to its elaboration. I further declare that I have fully acknowledged the Rules of Conduct and Code of Honor from the NOVA Information Management School.

*Lisbon, 30th of April*

*Sebastião Rosalino*

**DEDICATION**

I dedicate this thesis to my parents, whose unwavering encouragement and steadfast support have been the cornerstone of my academic journey. Your belief in my potential has been a constant source of inspiration, and for that, I am profoundly grateful.

**ACKNOWLEDGEMENTS**

I would like to express my deepest gratitude to my supervisors, Professor Flávio Pinheiro and António Curado, for their invaluable guidance and support throughout this journey. Their encouragement and the opportunity to work on such an impactful and meaningful topic have been truly transformative for my academic growth.

I am profoundly thankful to my parents for their unwavering support, motivation, and care. Their belief in my abilities, along with the conditions they created to help me succeed, have been fundamental in completing this thesis. I am especially grateful for their constant encouragement and for always checking in on my progress, reminding me of the importance of perseverance and dedication.

I also want to acknowledge the pivotal role that IMS has played in shaping me as a data scientist. The competence, intelligence, and dedication of the teachers I have had the privilege to learn from have left a lasting impact, and I am certain that I would not be the data scientist I am today without their guidance and inspiration.

Finally, I wish to extend my sincere appreciation to the HowTheyVote.eu platform and its entire team. Their provision of high-quality data, as well as their swift support, played an essential role in enabling the analysis and insights that underpin this thesis. Their efficiency exemplifies the collaborative spirit needed to advance open data initiatives in research.

**ABSTRACT**

Brexit, a global pandemic, the Russian invasion of Ukraine, and record inflation – few legislative bodies have faced such a cascade of shocks as the European Parliament did during its 9th term (2019-2024). Using the Bipartite Configuration Model and a set of network statistics, this dissertation explores how multi-polarization was characterized during this term by constructing and analyzing co-voting networks across all legislative subjects and within specific legislative subjects. The results contest binary polarization narratives inherited from US/UK scholarship by uncovering a multi-polar landscape. In many legislative subjects, including “Community policies”, “Internal market, single market”, and “External relations of the Union”, coalitions realign fluidly, forming several voting communities rather than a single left-right divide. Ideological affinity and group memberships, not nationality, emerge as the primary forces that bind or separate Members of the European Parliament, reaffirming the chamber’s transnational character. Two quantitative patterns stand out. First, the Greens/EFA and The Left display the highest intragroup cohesion, while governing groups – EPP, S&D, and Renew – often fracture into multiple, issue-driven alliances, suggesting declining centrist disciplines. Second, a distinct Eurosceptic versus Euroenthusiastic cleavage crystallizes in matters concerning the “State and evolution of the Union” subject, cutting across economic and social ideologies and hinting at a budding second dimension of parliamentary conflict. Beyond advancing methodological practice, this dissertation warns that legislative consensus in the European Parliament will hinge on navigating a fluid, multi-polar, issue-driven alliance landscape rather than building stable grand coalitions.

Keywords

Political polarization; European Parliament; Co-voting networks; backbone; Community detection

**Sustainable Development Goals (SDG):**

Uma imagem com texto

Descrição gerada automaticamente

Table of Contents

[1. Introduction 1](#_Toc197792127)

[2. Political polarization 3](#_Toc197792128)

[3. Data & Methods 12](#_Toc197792129)

[3.1 Co-voting network inference 16](#_Toc197792130)

[4. Results and discussion 21](#_Toc197792131)

[4.1 Results 21](#_Toc197792132)

[4.2 Discussion 28](#_Toc197792133)

[5. Conclusions and Future Research 30](#_Toc197792134)

[Bibliographical References 32](#_Toc197792135)

[Appendix A 37](#_Toc197792136)

[Appendix B 40](#_Toc197792137)

[Appendix C 41](#_Toc197792138)

[Appendix D 54](#_Toc197792139)

[Appendix E 60](#_Toc197792140)

**LIST OF FIGURES**

[Figure 1 – Distribution of bills by primary subjects 13](#_Toc197792141)

[Figure 2 – Data preprocessing steps 14](#_Toc197792142)

[Figure 3 – Distribution of voting positions 14](#_Toc197792143)

[Figure 4 – MEP affiliation change 15](#_Toc197792144)

[Figure 5 – Methodology to obtain the relevant voting communities 18](#_Toc197792145)

[Figure 6 – Relevant voting communities for all subjects and primary subjects 21](#_Toc197792146)

[Figure 7 – Co-voting networks for all subjects and primary subjects 22](#_Toc197792147)

[Figure 8 – Relevant voting communities for the selected secondary subjects 25](#_Toc197792148)

[Figure 9 – Co-voting networks for the selected secondary subjects 26](#_Toc197792149)

**LIST OF TABLES**

Table 1 – Data before and after the preprocessing steps 15

Table 2 – Modularities and assortativities for the primary subjects 23

Table 3 – Structural statistics for the primary subjects 24

Table 4 – Modularities and assortativities differences between all subjects and each primary subject 24

Table 5 – Modularities and assortativities for the secondary subjects 27

Table 6 – Structural statistics for the secondary subjects 27

Table 7 – Modularities and assortativities differences between all subjects and the secondary subjects 28

**LIST OF ABBREVIATIONS AND ACRONYMS**

**BiCM** Bipartite Configuration Model

**ECR** European Conservatives and Reformists Group

**EP** European Parliament

**EPP** European People’s Party Group

**EU** European Union

**Greens/EFA** The Greens/European Free Alliance

**ID** Identity and Democracy

**MEP** Member of the European Parliament

**NI** Non-attached

**Renew** Renew Europe

**S&D** Progressive Alliance of Socialists and Democrats

**The Left** The Left in the European Parliament

**UK** United Kingdom

**USA** United States of America

# Introduction

Political and social polarization are among the most pressing challenges faced by liberal democracies nowadays. Polarized societies become entrenched in ideological silos and governance becomes a battleground where collaboration is sacrificed for partisanship. Indeed, while polarization can be a catalyst for political engagement and spur public discourse (Rogowski & Sutherland, 2016), it frequently creates irreconcilable divisions that impede decision-making and erode trust in democratic institutions (McCarty et al., 2016). This phenomenon is now a defining feature of the political landscape, influencing electoral dynamics, legislative processes, and public policy outcomes across the globe (McCarty et al., 2016; Iyengar & Westwood, 2015).

In Germany, France, and Italy, political polarization led to the emergence of new parties and the fragmentation of traditional parliamentary structures and coalitions. In the United States of America (USA), political polarization is marked by a stark ideological bifurcation within established parties, with Democrats gravitating toward more progressivism and Republicans embracing heightened conservatism (Canen et al., 2020; Patkós, 2023). Along the same line, the European Union (EU) combines both features at the European Parliament (EP) level, with the proliferation of Eurosceptic and populist parties (Servent, 2019) and the widening ideological rifts within traditional political groups (Börzel et al., 2023) – contributing to the forces straining coalition-building and consensus-driven policymaking efforts within the EU and challenging legislative cohesion. The EP’s structure, marked by a balance of ideological alignment and national interests, provides a valuable case study for examining polarization within a multi-national legislative framework (Hix et al., 2009; Lo, 2018).

While substantial research has explored polarization in national parliaments, such as in the USA (Canen et al., 2020) and the United Kingdom (UK) (Peterson & Spirling, 2018; Evans & Menon, 2017), a gap remains in our understanding of how these phenomena unfold in a transnational legislative body like the EP (Hix et al., 2009; Börzel et al., 2023). Empirical evidence on the evolution of polarization in the EP, especially related to voting behavior across distinct legislative subjects, remains limited, underscoring the need for a deeper investigation into these dynamics. In particular, the patterns of synergy and antagonism formed between the participant actors and how they contrast with different subjects.

Here, we use roll-call data on Members of the European Parliament (MEPs) to analyze the co-voting network for the 9th term of the EP (2019-2024). Moreover, we explore the alliances and divisions between political groups among the major legislative subjects. By mapping patterns of co-voting behavior, we show that ideological alliances in the EP are highly contingent on legislative subject matter, often transcending group boundaries and giving rise to dynamic, multi-polar voting communities that challenge conventional notions of stable group alliances.

The remainder of this dissertation is organized as follows: Chapter 2 reviews the literature on political polarization and describes voting behaviors within and outside the EU, along with the principal methodologies for measuring polarization; Chapter 3 details the data and the methods employed to infer the co-voting networks and obtain the voting communities; Chapter 4 presents the results and discusses the empirical findings; and Chapter 5 concludes with key findings and suggestions for future research, emphasizing the importance of addressing polarization within the EP to promote more effective and collaborative governance.

# Political polarization

Political polarization is associated with a growing ideological divide in modern societies, marked by shifts towards extremes among the general population and political elites, especially parties. The historical trajectory of polarization reveals a growing trend that began in the 1970s and has been driven by social and economic transformation and changes in social media (McCarty et al., 2016). In this trajectory, polarization has been mostly associated with income inequality, socioeconomic changes, and political fragmentation (Autor et al., 2020; Grechyna, 2016).

Rising political polarization poses serious challenges to democratic institutions, as growing ideological divisions hinder cross-party cooperation, promote legislative deadlock, and erode public trust (McCarty et al., 2016; Gestefeld et al., 2022). Polarization is observed as a structural phenomenon that reflects the fragmentation of public opinion into opposing poles (two rigid ideological camps), gradually eliminating the space for consensus (McCarty et al., 2016; Pew Research Center, 2014; Gentzkow, 2016). As this divide deepens, the risk of democratic backsliding intensifies, especially when populist leaders exploit polarization by portraying political conflicts as existential struggles, thereby undermining institutional legitimacy (Arbatli & Rosenberg, 2021). Ultimately, polarization destabilizes democratic governance and fragments the social fabric, with far-reaching implications for economic stability and societal cohesion (McCarty et al., 2016).

Affective polarization, defined as emotional and social hostility between opposing political groups, intensifies divisions as political groups increasingly see opponents not merely as ideological opposites but as social adversaries (Iyengar & Westwood, 2015). The durability of this polarization is evident in the USA, where partisan divides have widened on topics ranging from social policy to national security (Canen et al., 2020). Studies (Bor et al., 2022; Larkin & Lendler, 2019) suggest that even non-extremist individuals can experience affective polarization, particularly when exposed to highly polarized media.

Polarization is further amplified by populist rhetoric, which frames politics as a struggle between “the people” and “the elite”. This idea strengthens in-group solidarity while deepening hostility toward opposing groups (Mudde & Kaltwasser, 2017). In this sense, elite and mass behaviors heighten affective divides, with contemporary political movements using emotive issues to consolidate support and reinforce group identity (Iyengar & Westwood, 2015). Populism contributes to growing affective polarization by aligning party identities with ideological beliefs, curtailing the cross-party exchanges that traditionally mitigated partisan divides (Iyengar & Westwood, 2015; Levendusky, 2009; Levendusky & Druckman, 2019).

Political polarization is driven by diverse structural forces: technological advancements, globalization, and demographic transformations. These factors interact in ways that reinforce ideological and emotional divides through feedback loops. This chapter investigates each structural driver, drawing from recent empirical and theoretical findings across various social science fields, including labor economics, political communication, demographic studies, and advanced statistical modeling approaches.

Technological advancements contribute significantly to polarization through their effects on the labor market and media dynamics. The impacts of technological advances have fundamentally transformed labor markets, primarily by expanding wage disparities between high-skilled and low-skilled workers. As demand grows for highly educated workers, those with lower skills often face stagnating wages and reduced job security. Research by Grechyna (2016) indicates a direct correlation between income inequality, a byproduct of skill-based wage gaps, and heightened political polarization. However, this causality is more complex: Duca & Saving (2016) posit that political polarization also influences public policy, thus indirectly affecting inequality. They argue that heightened partisan divides can obstruct redistributive policies, exacerbating inequality and fueling further polarization in a cyclical pattern, which is particularly evident in the USA. The advent of digital media has transformed political communication, contributing to ideological silos and amplifying affective polarization. Fragmented media landscapes, characterized by selective access to ideologically aligned information, foster echo chambers and ideological rigidity, intensifying the “silo effect” (Iyengar & Hahn, 2009; Iyengar et al., 2012). Additionally, the shift towards entertainment-driven political content dilutes substantive policy discussions, creating an environment where extreme viewpoints can flourish unchallenged, further dividing audiences along ideological lines (Prior, 2007).

Globalization’s impact on political preferences, particularly in Western economies, is complex and multifaceted. Rising international trade, exemplified by the “China trade shock”, has led to economic dislocation in specific regions, fueling ideological shifts. Autor et al. (2020) found that areas in the USA with increased exposure to Chinese imports saw a political shift toward ideological extremes, dependent on regional demographics. Similarly, in Europe, Colantone & Stanig (2017) link rising nationalism and anti-globalization sentiments to the economic disruptions caused by globalization. Rodrik (2018) argues that globalization sharpens the divide between “mobile” professionals who benefit from global integration and “local” workers facing job insecurity. This divide is further politicized, reinforcing ideological distinctions between globalist and protectionist viewpoints, which have come to dominate the political landscapes in the USA and Europe alike. These trends highlight the polarization in political responses to globalization, as economic changes feed into broader social and ideological divides (Autor et al., 2020; Rodrik, 2018; Fuks & Marques, 2022).

Demographic shifts, especially those involving generational divides and immigration, contribute to the intensification of polarization in significant ways. Generational gaps are widening, with younger cohorts, such as Millennials, often gravitating toward more radical positions compared to older generations. This trend is evidenced by Murillo & Ruiz (2018), who observed that Millennials populate ideological extremes more than previous generations. Such generational divides are reshaping political alignments as younger voters embrace distinct radical ideologies compared to their Generation X and Baby Boomer counterparts. This shift also aligns with findings on increased ideological consistency among younger cohorts, suggesting a growing intergenerational cleavage that reshapes party dynamics and electoral strategies (Murillo & Ruiz, 2018). Immigration has become a contentious topic that aligns along partisan lines, especially in the USA and Europe, where attitudes toward immigration significantly vary between right- and left-wing voters. In the USA, Republicans increasingly view immigration as a burden, while Democrats adopt more favorable stances. In Europe, these trends are evident as right-wing nationalist groups capitalize on anti-immigration sentiments, further polarizing the electorate. These attitudes contribute to identity-based cleavages that compound ideological divides, fostering affective polarization across both regions (Patkós, 2023; Halla et al., 2017; Iyengar et al., 2012).

Besides long-term structural factors, specific events have intensified political polarization in recent years.

Funke et al. (2016) showed that financial crises worldwide often shift voter support away from centrist positions, significantly boosting radical parties on both the right and left. To confirm this idea, there is broad agreement that the 2008 global financial crisis and recent waves of migration in Europe have been central in this regard. Concerning Europe, Funke & Trebesch (2017) demonstrate that the 2008 financial crisis played a pivotal role in the rise of right-wing populist parties across several countries. A historical parallel can be drawn from Germany in the 1930s, where, as Doerr et al. (2019) show, the country’s financial collapse decisively facilitated the ascent of the National Socialist Party. In the USA, Mian et al. (2014) illustrate how heightened polarization has prevented effective policy responses to global economic crises. These situations point up a recurrent pattern: financial crises act as catalysts for political polarization by eroding public trust in institutions, exacerbating inequalities, and imposing fiscal constraints (Duca & Saving, 2016; Rodrik, 2018). When crises are perceived as the result of regulatory or political failure, they tend to delegitimize mainstream parties and empower anti-establishment alternatives (Funke & Trebesch, 2017). Moreover, efforts to manage sovereign debt, often involving austerity measures, can disproportionately impact the most vulnerable, fueling resentment and electoral radicalization. The surge in social inequality that accompanies most financial downturns deepens ideological divides, reinforcing the appeal of more extreme political movements.

Immigration has also proven to be a significant catalyst for political polarization, particularly in Europe. The increase in immigration during the 2000s corresponded with a notable rise in support for parties opposed to immigration. Otto & Steinhardt (2014), in an in-depth study of the city of Hamburg, demonstrate a causal relationship between increased immigration and the growth of far-right support. Between 1987 and 1998, the city received large numbers of immigrants, including refugees and asylum seekers. By examining electoral outcomes across different city areas, the researchers showed that regions with higher immigrant populations experienced a corresponding increase in far-right votes, illustrating the political tensions generated by immigration at the local level.

Migration impacts polarization through multiple channels, such as labor market competition, redistribution of social benefits, shifts in cultural identity, and political influence. Card et al. (2012) found that immigration can affect wages and labor competition, especially for lower-wage native workers, potentially fostering economic insecurity and resentment, which can fuel divisive political responses. Dustmann & Frattini (2014) further observed that, while immigrant populations may contribute positively to public finances, they also influence perceptions around the distribution of social benefits, particularly when welfare systems are perceived as strained. These dynamics, coupled with cultural shifts associated with immigration, create conditions ripe for polarization, often mirroring the social and economic dislocations observed in post-crisis societies.

Beyond financial crises and migration, other contemporary challenges, such as environmental and health crises, are increasingly contributing to political polarization in unique ways. For instance, the COVID-19 pandemic polarized political responses in many countries, driven by conflicting views on public health measures, personal freedoms, and economic priorities. Much like financial crises and migration, events such as pandemics strain economic resources, intensify social inequalities, and challenge public trust in institutions. Including these additional factors in future analyses could yield valuable insights, revealing whether polarization is becoming a persistent feature of modern democracies.

Looking now at political polarization from a geopolitical perspective, we focus the analysis on some geographies where it has registered greater significance: the USA, the UK, Canada, Australia, and Brazil.

In the USA, polarization has intensified over several decades, with distinct divides emerging between Democrats and Republicans, particularly in Congress. Since the 1970s, researchers such as McCarty et al. (2016) and Canen et al. (2020) have documented how partisan division and ideological alignment have pushed both parties to ideological extremes, significantly restricting bipartisan cooperation. This trend is exacerbated by media dynamics, which Gentzkow (2016) describes as creating “echo chambers” that reinforce ideological silos. The impacts are evident in Congress, where legislative gridlock on key issues like healthcare and immigration reflects this rigid partisan division and affective polarization, with limited avenues for compromise.

In the UK, polarization has sharply increased in recent years, especially around Brexit, which fractured both major parties, notably the Conservatives. Peterson & Spirling (2018) employed machine learning to reveal long-term trends of growing rhetorical division in the House of Commons, while studies by Evans & Menon (2017) and Hobolt (2016) documented how Brexit debates marked a shift toward more intense partisan and factional conflicts. This period saw a departure from traditional parliamentary cooperation, as intra-party divisions and ideological rifts disrupted norms of party unity and cross-party collaboration. Issues of sovereignty, immigration, and economic policy remain deeply divisive, limiting the scope for cross-party consensus and complicating legislative processes. This shift reflects broader European trends discussed by Patkós (2023), who found that nationalism and anti-immigration rhetoric are often central to legislative polarization in modern democracies.

In Canada, polarization has gradually deepened, particularly around energy policies, environmental issues, and regional disparities. Canadian western provinces frequently oppose federal policies on environmental regulation and carbon taxes, creating a form of “regional polarization” that influences Canadian parliamentary dynamics (Huijsmans & Rodden, 2024). This trend reveals a growing ideological divide rooted in geographic and economic differences, affecting discussions on climate policy and inter-provincial relations. Local media coverage has further amplified these regional grievances, as McGrane & Berdahl (2013) observe in their analysis of how media outlets reinforce provincial identities, shaping public opinion along provincial lines.

Australia presents another case of rising polarization, particularly on issues of climate policy and immigration. The 2020 bushfire crisis, widely attributed to climate change, intensified ideological divisions between the Labor and Liberal-National parties regarding climate action. McDonald (2021) highlights that climate policy has become a central source of polarization, with significant disagreements on addressing environmental challenges. Similarly, Markus et al. (2019) highlight how attitudes toward immigration contribute to ideological divides, with public opinion increasingly polarized on the best approaches to social cohesion and immigration policy. Marr (2017) examines the role of national security and race-related policies in intensifying partisan divides and shaping polarizing narratives within Australia’s political discourse. Both Markus et al. (2019) and Marr (2017) observe that each party uses contentious issues like immigration and national security to mobilize their political bases, adding to the divisiveness of public debate.

Brazil exemplifies a case of deepening polarization linked to corruption scandals and populist governance. The impeachment of President Dilma Rousseff and the election of Jair Bolsonaro intensified divisions between left- and right-wing factions, with Bolsonaro’s administration adopting polarizing rhetoric on issues like public health and economic reform. Fuks & Marques (2022) emphasize the growth of affective polarization, especially with the rise of right-wing radicalization, which has influenced Brazil’s political landscape since 2018 and fueled discord across Brazilian society and within its institutions. This polarization is visible in Congress, where deepening divides impede cooperation on urgent issues, including Amazon conservation efforts. Social media has also played a significant role in amplifying polarization, as it allows political figures to engage and galvanize their bases, enhancing affective polarization directly.

These examples illustrate how economic strains, regional divides, and identity-based rhetoric shape democracies, influencing legislative gridlock and reducing policy adaptability. The ideological sorting in the United States Congress, regional and climate divides in Canada and Australia, and the social and cultural rifts in Brazil reveal the complex ways polarization disrupts parliamentary function, highlighting the implications of an increasingly divided political landscape.

Turning now to the EU, where the EP plays a central role in shaping the European project, characterized by its transnational structure and the intricate dynamics between MEPs of different political affiliations. Research from Hix et al. (2009) provides critical insights into how MEPs’ voting behaviors and alliance formations can reveal distinct trends of political polarization within the EP. Their study shows that MEPs tend to align mainly along ideological rather than national lines, highlighting broader ideological divisions that shape the EU’s legislative framework.

Furthermore, Hix et al. (2009) found that political groups in the EP facilitate MEPs’ political objectives through a strategic division of labor in policy expertise and agenda-setting. This internal organization enables MEPs to follow group voting instructions that align with their broader political aims. The EP’s political dynamics are thus defined by a balance of ideological alignment and strategic considerations, which collectively drive voting behavior and alliance formation. This complex interplay highlights the EP’s distinctive role as a transnational body, where cohesion and cooperation are achieved through shared political priorities rather than traditional national loyalties.

Political group cohesion in the EP is positively correlated with centrality, meaning that groups exhibit stronger internal unity when their votes are pivotal. This effect has intensified as the EP’s legislative powers have expanded, particularly following the Treaty of Lisbon. This treaty enhanced the EP’s authority across various policy domains, including trade, immigration, and justice, making cohesive voting increasingly essential for groups aiming to influence key legislative outcomes (Servent, 2019).

Political groups within the EP, such as the EPP (European People’s Party Group) and the S&D (Progressive Alliance of Socialists and Democrats), embody distinct ideological perspectives and play pivotal roles in shaping legislative negotiations. Although these groups lack the direct national implementation powers that parties wield in domestic settings, they maintain high levels of internal cohesion through structured voting guidelines that reinforce ideological alignment. Consequently, MEPs are inclined to follow group voting patterns that resonate with their broader political identities, particularly on major issues, thereby ensuring ideological consistency within the EP (Cherepnalkoski et al., 2016).

Spatial voting analysis reveals that the EP dominant voting alignment follows a primary left-right ideological dimension, mirroring the diverse political ideologies of member states. A secondary, cross-cutting dimension based on attitudes toward European integration also significantly shapes voting patterns, although its influence varies with the degree of Euroscepticism or pro-European sentiment among MEPs’ national parties (Börzel et al., 2023). Eurosceptic factions tend to exhibit higher cohesion in opposing integrationist policies, while centrist and pro-European groups often display greater internal divergence on these issues. This dynamic adds a layer of complexity to coalition building, as the increasing prominence of Eurosceptic voices amplifies polarization within the EP, further challenging consensus-driven policymaking (Börzel et al., 2023).

The dual allegiance of MEPs to both their EP political groups and their national parties introduces a self-regulatory element to polarization. MEPs must balance the benefits of group cohesion with the need to align with national party interests, especially during high-stakes ideological votes, such as those involving socio-economic policies and anti-corruption measures. This balancing act is particularly evident in votes requiring an absolute majority, where the incentive to maintain group cohesion is paramount for achieving legislative outcomes (Hix et al., 2009; see also Apergis & Pinar, 2023 on polarization factors).

Since the late 1980s, political group cohesion within the EP has grown, often surpassing cohesion within national delegations. This trend reflects the EP’s increased legislative centrality, as cohesion has risen in parallel with the expansion of the EP’s powers and the EU’s enlargements. Enhanced political group cohesion supports the EP’s internal stability, reinforcing its effectiveness as a central legislative body within the EU (Lo, 2018).

The increased polarization (possibly also within the EP) would reflect broader European trends where economic inequality and low trust levels deepen ideological divides (Grechyna, 2016). The rise of populist elements within mainstream groups has further strained the traditional “cordon sanitaire” approach used to contain extremist factions, complicating coalition-building and potentially impacting legislative cohesion. This development raises concerns about the EP’s ability to effectively negotiate with other EU institutions amidst growing ideological fragmentation.

Voting behavior in the EP reflects a complex interplay of ideological alignment, strategic voting, and group cohesion, driven by MEPs’ dual allegiances to both transnational and national interests. This intricate balance, intensified by growing Eurosceptic factions and ideological divides, underscores the EP’s central role in shaping EU legislation amidst evolving challenges to unity and consensus.

As political polarization is an increasingly striking reality in our societies, its identification and measurement become increasingly important. The measurement of political polarization has generated a diverse body of research, reflecting its multidimensional nature.

One of the most established techniques is the analysis of roll-call votes, which measures polarization by assessing how consistently legislators vote along party lines, revealing ideological alignment, partisan cohesion, and inter-group divergence within legislative bodies. This method is particularly suitable for institutional settings such as parliaments, where formal votes are systematically recorded. Hix & Noury (2009), for example, demonstrate how MEPs predominantly vote along partisan rather than national lines, offering evidence of party-based polarization in a transnational setting. More recent studies have extended this framework by incorporating spatial and dynamic modeling: Lo (2018) applies a dynamic ideal point estimation model to capture ideological shifts across legislative terms, while Canen et al. (2020) introduced a multi-dimensional voting model to assess the historical evolution of party discipline in the United States Congress, attributing a significant share of polarization (65%) by 2018 to increasing leadership influence over legislative behavior.

Beyond roll-call analysis, social network analysis has become a powerful tool for capturing structural features of political polarization. This approach conceptualizes political actors as nodes connected through ideological proximity, co-voting behavior, or digital interactions. Maoz & Somer-Topcu (2010) use ideological clustering to identify fragmentation within legislative bodies, while Hohmann et al. (2023) refine network-based metrics by introducing generalized Euclidean distance measures that reveal ideological clustering and echo chambers. Furthermore, Cherepnalkoski et al. (2016) merged Twitter and roll-call data to identify informal alliances among MEPs, illustrating how online behavior complements formal legislative activity. In addition, Domagalski et al. (2021) enhanced the interpretability of co-voting networks through their backbone extraction, reducing statistical noise and isolating significant ideological alignments.

Another methodological approach is probabilistic and Bayesian models, which estimate ideological distributions, model attitudinal shifts over time, and identify key structural drivers influencing divergence across political parties. Guevara et al. (2022) employ Markov Chain models to estimate the probability of populations reaching polarized states over time, providing a dynamic counterpart to traditional polarization indices. Grechyna (2016), using Bayesian Model Averaging, identifies socioeconomic determinants of polarization, such as trust and income inequality. Mehlhaff (2023) introduces the Cluster Polarization Coefficient, a group-based metric capturing both intra-group cohesion and inter-group divergence, which is particularly applicable in multiparty systems and multidimensional ideological landscapes.

A more exploratory but increasingly influential approach involves simulation-based models, particularly agent-based models and techniques drawn from statistical mechanics, which measure polarization by simulating opinion dynamics, modeling group interactions, and analyzing environment responses to political shocks. These allow researchers to simulate hypothetical scenarios and assess the impact of systemic shocks on polarization dynamics. For example, Diep et al. (2023) use Monte Carlo simulations to examine how public opinion responds to policy shocks, while Kaufman et al. (2022) employ the concept of “social temperature” to model how social and political pressures shift opinion distributions. Such models are especially useful for exploring counterfactuals and testing the effectiveness of potential depolarization strategies.

In parallel, advances in supervised machine learning and natural language processing have opened new opportunities for analyzing polarization at scale. These methodologies measure polarization by classifying alignment from textual data, analyzing rhetorical patterns, and detecting partisan clusters or thematic divergence. Peterson & Spirling (2018) show that high accuracy in classifying party affiliation based on parliamentary speeches signals increased ideological polarization. Similarly, Bor et al. (2023) leverage sentiment analysis on Twitter to map partisan divides in the United States Congress, revealing polarized discourses on issues such as gun control and immigration, alongside areas of cross-party convergence such as Taiwan independence, LGBTQ rights, and views on the Chinese Communist Party. These techniques are particularly well-suited for analyzing large, unstructured datasets and tracking evolving patterns of political communication.

Additionally, survey-based methods remain central to the study of affective and perceptual polarization. These methodologies measure polarization by gauging attitudes and biases through questionnaires, tracking ideological distances, and assessing intergroup hostility, yielding insights into mass-level partisan divergences. Through these methodologies, researchers have captured the emotional and interpersonal dimensions of ideological division. Rogowski & Sutherland (2016) demonstrate how ideological distance influences affective responses toward political outgroups, while Patkós (2023) introduces a Partisan Polarization Index based on differential satisfaction with government, enabling cross-national comparisons. These indices are particularly valuable for gauging polarization at the mass level across time and space.

Finally, comparative indices and socio-demographic analyses measure polarization by capturing ideological and affective differences within geographical and demographic factors (such as urban-rural divides), which shape electoral outcomes and foster distinct partisan alignments. Van der Veen (2023) constructs a Comparative Political Polarization Index that captures ideological and affective dimensions across countries over 25 years, facilitating longitudinal and cross-national analyses. Huijsmans & Rodden (2024), focusing on electoral geography, show that urban-rural divides are more pronounced in the USA, UK, and Canada but are also emerging in European multiparty systems, where smaller parties increasingly draw support from either urban or rural areas.

# Data & Methods

We use roll-call data on MEPs’ votes in the 9th term (2019-2024) of the EP. Appendix A presents an explanation of the functioning and powers of the EP, as well as its composition during the 9th term. This roll-call voting data was retrieved from the HowTheyVote.eu platform[[1]](#footnote-2) and supplemented with legislative subject information from the *Legislative Observatory of the European Parliament[[2]](#footnote-3)*. Appendix B presents these two data sources.

A bill in the EP refers to a legislative proposal, motion, or report for debate and a formal roll-call vote. Each bill is assigned to one or more legislative subjects, following a three-level hierarchical classification from the *Legislative Observatory of the European Parliament*.

The top level, referred to as primary subjects, consists of eight broad policy areas.

1. European citizenship: Covers matters of citizenship, migration, and asylum.
2. Internal market, single market: Internal market regulations, competition, and consumer rights. It also covers standards for products, public subsidies, and the mutual recognition of degrees and qualifications.
3. Community policies: European political parties and the EP’s interaction with other institutions, on the European and national levels. It also covers the implementation of European treaties and all general issues regarding the EU institutions.
4. Economic, social and territorial cohesion**:** Employment, social, and infrastructural policies, all of which aim to promote the EU’s economic, social, and territorial cohesion.
5. Economic and monetary system: The economic and monetary system of the EU and regulations regarding the financial system, taxation, competition, and the free movement of capital and payments. It also comprises the relationship with the European Central Bank (which is accountable to the EP).
6. External relations of the Union: Relationship of the EU with third countries. Decisions concerning the accession process to the EU, associations, and the European neighborhood policy fall in this category. Security, defense, development policy, and human rights matters are also part of this policy area.
7. Area of freedom, security and justice: Home affairs and policies regarding justice and the freedom of movement within the EU. It also covers the harmonization of legal systems and cooperation at the level of police and justice between member states. The Schengen Area, the European Arrest Warrant, and Frontex patrols are well-known projects attributed to this policy area.
8. State and evolution of the Union: European integration process and concerns the power balance between the EU institutions on the one side and the member states on the other side.

Each primary subject groups a set of secondary subjects. For example, the secondary subject “4.10” under the primary subject “4” refers to “Social policy, social charter and protocol”. Similarly, “6.10” under the primary subject “6” represents “Common foreign and security policy (CFSP)”. In total, this intermediate level contains 47 secondary subjects. The lowest level of the classification concerns the tertiary subjects. These are the most detailed levels of granularity, specifying the particular focus within the secondary subject. For example, “4.10.03” refers to “Child protection, children’s rights”, a subset of the secondary subject “4.10”. Similarly, “6.10.09” refers to “Human rights situation in the world”, a specific area within the secondary subject “6.10”. In total, 252 legislative dossiers are mapped into tertiary subjects. Appendix C includes a complete list of all primary, secondary, and tertiary subjects.

Figure 1 illustrates the distribution of bills by primary subject.

Uma imagem com texto, captura de ecrã, número, Tipo de letra

Os conteúdos gerados por IA poderão estar incorretos.

Figure 1 – Distribution of bills by primary subjects

The bills are voted on by nationally elected MEPs from the 28 EU member states (including the UK until January 31, 2020). MEPs have three possible voting positions: “FOR”, “AGAINST”, or “ABSTAIN”. However, if an MEP was not serving during the vote or was not present in the voting session, their position is recorded as “DID\_NOT\_VOTE”.

MEPs join one of several transnational parliamentary groups based on ideological alignment rather than nationality. During the 9th term of the EP, there were seven recognized political groups: **EPP**, **S&D**, Renew Europe (**Renew**), The Greens/European Free Alliance (**Greens/EFA**), European Conservatives and Reformists Group (**ECR**), Identity and Democracy (**ID**), and The Left in the European Parliament (**The Left**). In addition, some MEPs remained non-attached (**NI**), meaning they did not affiliate with any political group. A description of the seven political groups, the NI set of MEPs, their political positions, and their number of seats at the beginning and end of the 9th term, is presented in Appendix D.

Several preprocessing steps are employed to reduce data noise before inferring the co-voting networks. Figure 2 summarizes the steps that will be described below.

Uma imagem com texto, Tipo de letra, captura de ecrã, file

Os conteúdos gerados por IA poderão estar incorretos.

Figure 2 – Data preprocessing steps

Approximately 32.6% of MEPs did not serve the entire term, indicating a substantial portion with limited legislative activity. Hence, to ensure our study is based on MEPs with significant voting activity and reduce distortions from MEPs who served for too little time, we follow the approach of Schoch & Brandes (2020) and exclude MEPs who participated in fewer than 50% of all roll-call votes.

Figure 3 shows that the dataset exhibits a strong imbalance in voting positions, with “FOR” comprising most of the votes (approximately 72%). Hence, we reclassified voting positions into a binary format by considering two classes: “supporting” that includes the “FOR” votes, and “not\_supporting” that groups the votes “AGAINST”, “ABSENTION”, and “DID\_NOT\_VOTE”. Grouping the remaining three positions into “not\_supporting” partially mitigates this data imbalance but, more importantly, ensures that the data is suitable for the co-voting analysis in the next steps.

Uma imagem com texto, captura de ecrã, diagrama, file

Os conteúdos gerados por IA poderão estar incorretos.

Figure 3 – Distribution of voting positions

Next, following the steps from NOMINATE (Poole & Rosenthal, 1985), we removed high-consensus bills. We excluded any bill where fewer than 2.5% of MEPs opposed the majority position. For example, if 98% of MEPs voted in support of a bill and only 2% did not, we would consider the bill too consensual. This step ensures that our study focuses only on bills with minimum group divisiveness, reducing the noise introduced by too-consensual bills.

Furthermore, as illustrated in Figure 4, some MEPs appear in multiple groups or as NI at different times. Although NI is not a recognized group, we treat it as one for the sake of a single membership assignment. This means that each MEP will be assigned to only one group (or NI) throughout the study, even if they held multiple affiliations during the term. To determine this single “most representative” affiliation, we examine all group (or NI) memberships every MEP held and the time spent in each. Whichever affiliation occupied most of the MEP’s term is chosen. If there happens to be a draw in terms of time, we select the first affiliation that the MEP held. This approach avoids representing the same MEP multiple times with different groups (or as NI). Consequently, each MEP is allocated exactly one affiliation, whether a recognized political group or NI, ensuring a streamlined yet accurate depiction of each MEP’s predominant membership in the term.

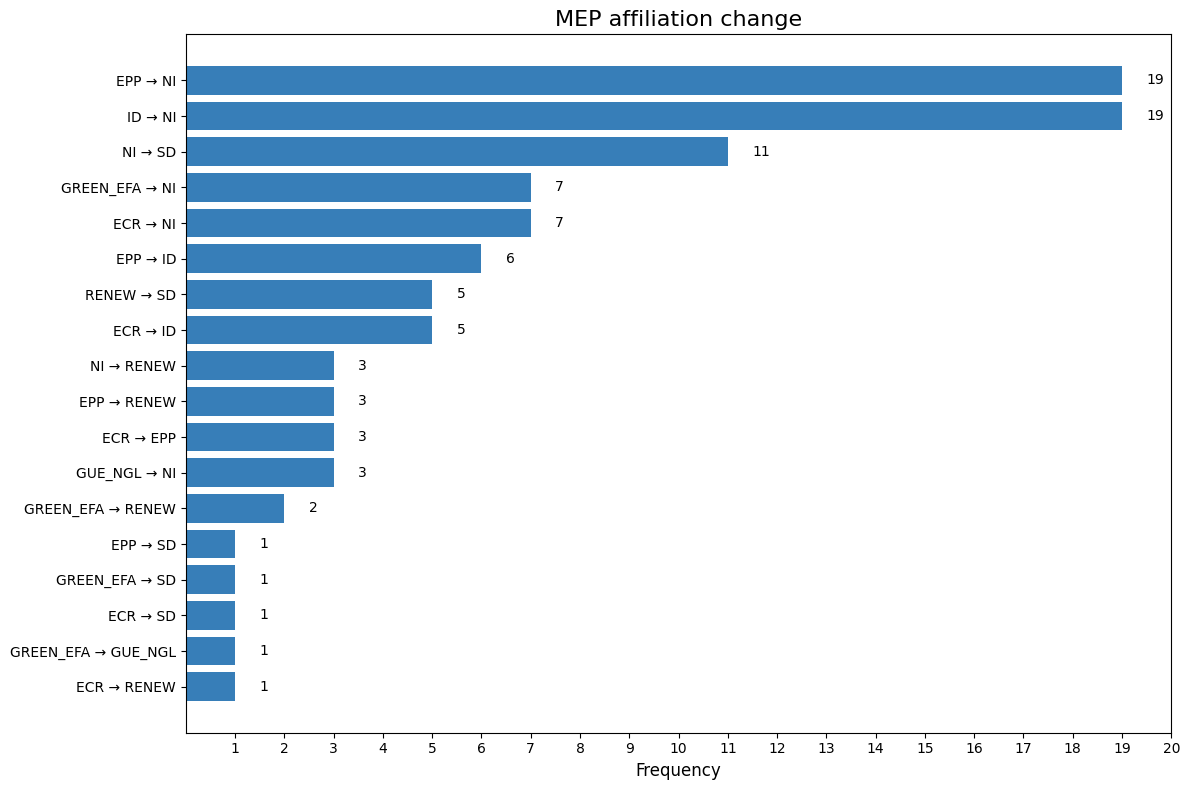


Figure 4 – MEP affiliation change

Finally, we excluded all MEPs who spent more time as NI than as affiliated with any group. Since those MEPs lack significant group affiliation, their voting behavior does not contribute meaningfully to our study.

Table 1 summarizes the data before and after the preprocessing steps.

Table 1 – Data before and after the preprocessing steps

|  |  |
| --- | --- |
| Before data preprocessing | After data preprocessing |
| 7 groups + NI set of MEPs | 7 groups |
| 871 MEPs | 695 MEPs |
| 1903 bills | 1890 bills |
| 1345674 roll-call votes | 1273626 roll-call votes |

## Co-voting network inference

The next step involves the inference of the co-voting networks. In such networks, nodes represent MEPs and edges connect pairs of MEPs who exhibit statistically significant co-voting behavior. To that end, following the steps from Domagalski et al. (2021) and Saracco et al. (2015), we used the *Bipartite Configuration Model* (**BiCM**) to extract statistically validated backbone networks from co-voting data. We begin by encoding the roll-call data as a biadjacency matrix , where is the number of MEPs and is the number of bills. Each element if MEP supported bill ; otherwise . For example, if MEP 9 supported bill 2 then . On the contrary, if MEP 9 did not support bill 2 then . This defines a bipartite network between MEPs and bills, capturing which MEPs supported which bills. From this, we compute the weighted unipartite projection , where each entry reflects the number of bills co-supported by MEPs and , while the diagonal gives the total number of bills supported by MEP .

To extract only the statistically meaningful co-supporting ties, we compare the observed values with the expectations under a null model that preserves the observed support frequencies of each MEP (row sums of ) and the popularity of each bill (column sums of ). The BiCM formalizes this null model using the principle of maximum entropy: it generates an ensemble of random bipartite matrices, where the probability of an edge between MEP and bill is:

(1)

Here and are positive real-valued parameters associated with MEP and bill , respectively. These parameters are not directly observed but fitted numerically to ensure that the expected degrees in the model match the observed ones:

(2)

where is the total number of bills supported by MEP and is the number of MEPs who supported bill . Thus, while and are empirical quantities derived from the observed data (i.e., row and column sums of ), the fitted parameters and are latent factors that encode each MEP’s support tendency and the overall popularity of each bill. For example, suppose the data shows that MEP 12 supported 42 bills, so . The model must then assign a value of such that, when combined with the fitted popularity values of all bills, the expected number of edges from MEP 12 equals 42:

(3)

Similarly, if bill 49 was supported by 100 MEPs, i.e., , the model must determine a value for such that, when combined with all fitted values of the MEPs, the expected number of edges connecting to bill 49 equals 100:

(4)

In both cases, these parameters are fitted iteratively to satisfy the expected degrees. The resulting values and do not directly equal or , but instead serve as internal weights that produce probabilities reproducing the empirical support behavior.

Each synthetic matrix is a realization of the null model, where the entries are independent. We then project onto the MEP space via , analogous to the observed projection . For each MEP pair , the entry counts the number of bills that and support jointly in a single draw from the null model. Because and the pairs are independent across , the product . Therefore:

(5)

i.e., follows a Poisson Binomial distribution with parameters , which models the sum of independent (but not identically distributed) Bernoulli trials.

We then perform a right-tailed hypothesis test for each MEP pair to determine whether their observed co-support count is significantly higher than expected under the null model. Formally, we compute the p-value:

(6)

which measures the probability that two MEPs would co-support at least bills purely by chance. The null hypothesis posits that the co-support between MEPs and arises entirely from random alignment, given their marginal support levels and the overall popularity of each bill. That is, and appear to vote similarly only because they each support many bills and not because of any ideological proximity. Rejecting the null hypothesis implies that the observed co-support between MEPs and is too frequent to be explained solely by these marginal effects.

We retain an edge in the backbone network if . We set the significance level to 0.01 to curb false-positives without letting the backbone become overly sparse. This results in an unweighted backbone network , which includes only co-support relationships that are statistically stronger than expected under the BiCM null model.

All computations concerning the BiCM were done using the R package *backbone* (Neal, 2022).

We began by applying the co-voting network construction method to all subjects as well as to each primary subject. In this procedure, any bill covering multiple subjects was assigned to each corresponding subject’s network. Following this, we assessed the connectivity of the obtained subgraph . If the subgraph was connected, we applied the Louvain community detection algorithm (with a resolution parameter of 0.5) and retained only communities with at least 30 nodes, as smaller communities were considered too noisy for meaningful analysis. If the subgraph was disconnected, we removed all connected components with fewer than 30 nodes and then applied the Louvain community detection algorithm (with a resolution parameter of 0.5) to the remaining network, again retaining only communities with at least 30 nodes, therefore obtaining the relevant voting communities.

Figure 5 depicts the steps for obtaining the relevant voting communities.

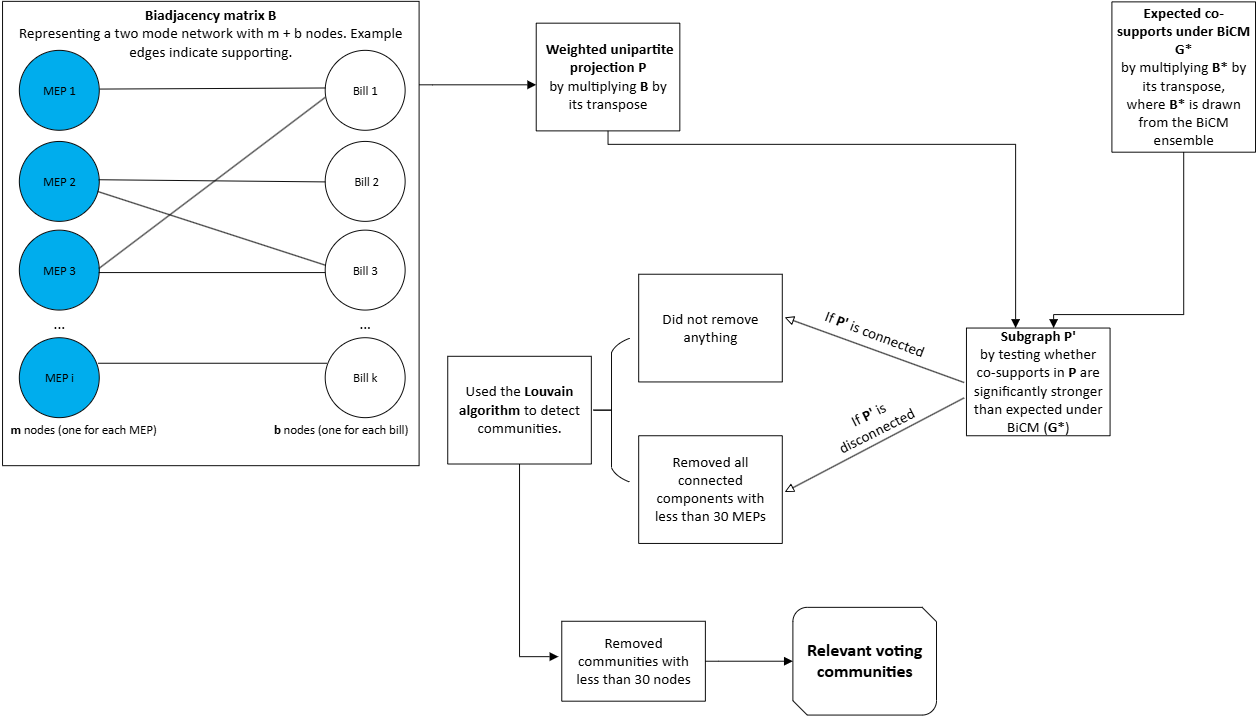


Figure 5 – Methodology to obtain the relevant voting communities

We chose a threshold of 30 because the least represented group in the EP’s 9th term began with 41 MEPs, so a threshold of 30 would still realistically capture that group in a separate component or community if most of them remained in the network.

During this process, we observed that the primary subject “Economic and monetary system”, which contained only 31 bills, did not yield any relevant communities that met the size threshold. To establish a meaningful threshold for analyzing secondary subjects, we selected the number of bills of the least represented primary subject with at least one relevant community, which was “European citizenship”, with 98 bills. As a result, in addition to retrieving the relevant voting communities for all primary subjects (except for “Economic and monetary system”, where no relevant communities were formed), we also retrieved relevant voting communities for all secondary subjects with at least 98 bills. The rationale behind this threshold is that secondary subjects with at least 98 bills have as much representation in the EP as the least represented primary subject that still produced relevant voting communities.

For all subjects, each primary subject and each selected secondary subject, we conducted a network analysis on the undirected and unweighted subgraph , computing 10 network statistics: optimal modularity, group modularity, nationality modularity, group assortativity, nationality assortativity, average clustering coefficient, network density, percentage of remaining nodes, total detected communities, and total relevant communities.

The optimal, group, and nationality modularities were computed using formula (7), where is the adjacency matrix (1 if there is an edge, 0 otherwise); is the degree of node ; is the degree of node ; is the sum of all degrees in the graph and is 1 if nodes and belong to the same community, 0 otherwise.

(7)

The group and nationality assortativities were computed using formula (8), where is the fraction of edges connecting MEPs with attribute to MEPs with attribute . Depending on the context, “attribute” can be group or nationality. , meaning that all the fractions sum to unity, since every edge must connect attribute to some attribute ; is the fraction of edges in the entire network attached to MEPs with attribute . By summing over all , we gather all edges that touch any MEP of attribute , irrespective of what the other MEP’s attribute is and describes the fraction of edges connecting attributes and if all edges were randomly distributed proportional to the presence of attributes and in the network. Comparing to shows how much (or less) often attributes and co-occur than expected by chance.

(8)

The average clustering coefficient was computed according to formula (9), where is the number of triangles (fully connected triplets) that node is part of; is the degree of node ; is the maximum possible number of triangles node could form and is the number of nodes in the network.

(9)

The network density measures the proportion of possible connections (co-voting relationships) that exist in the network, according to formula (10), where is the total number of edges in the network and is the total number of nodes in the network.

(10)

The percentage of remaining nodes measures what fraction of all possible MEPs (i.e., those that could appear in the final network after the data preprocessing) are present in each network, according to formula (11).

(11)

The total detected communities measures the total number of communities found by the Louvain community detection algorithm (with the resolution parameter set to 0.5) applied to the full network. We chose the same resolution parameter of 0.5 used for identifying the relevant communities so that the comparison remains consistent with the methodology.

The total relevant communities represents the network’s total number of relevant communities following the methodology.

# Results and discussion

## Results

We begin this chapter by presenting the obtained voting communities, which can be seen in Figure 6 (matrices) and Figure 7 (co-voting networks).

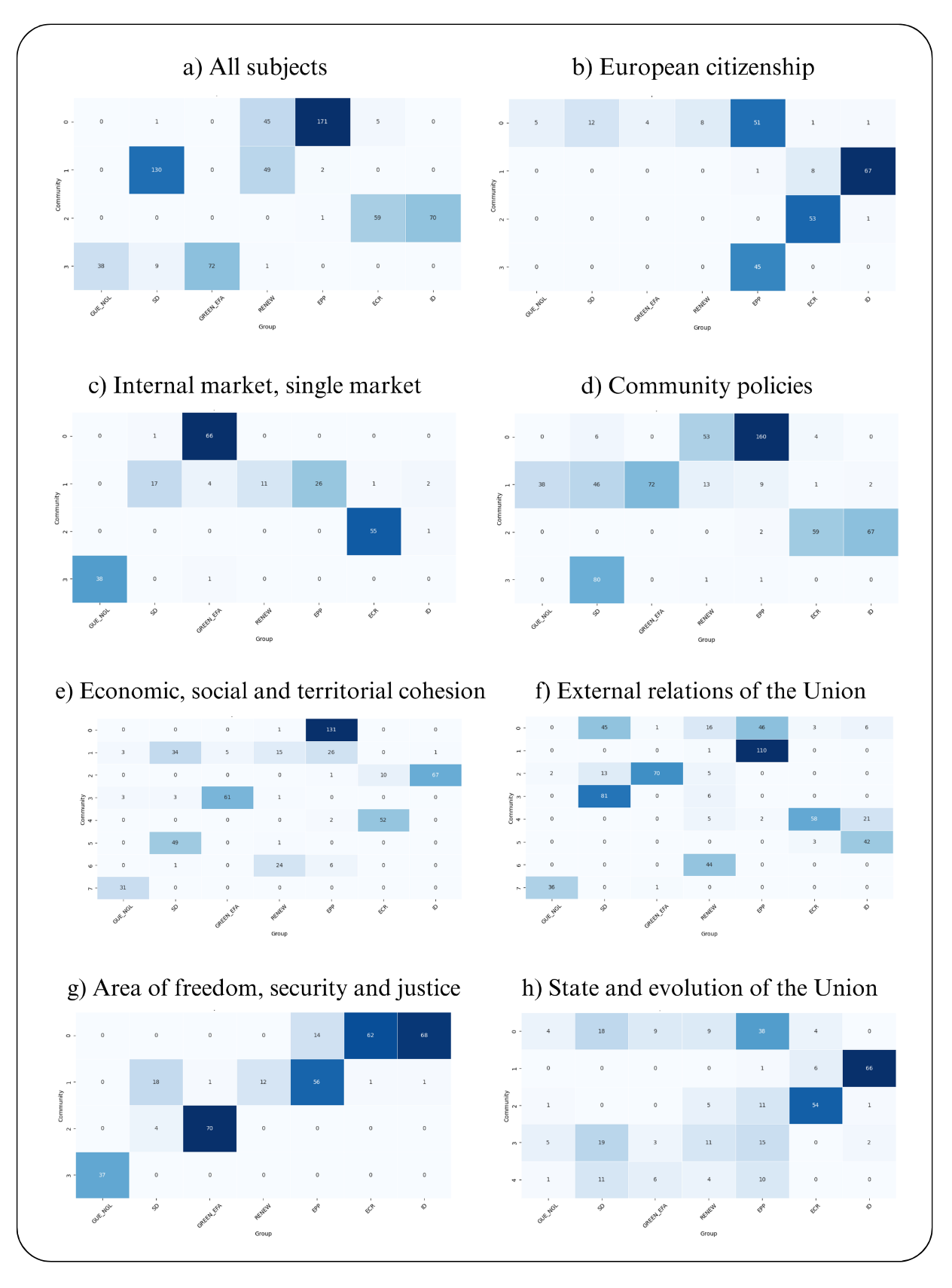


Figure 6 – Relevant voting communities for all subjects and primary subjects

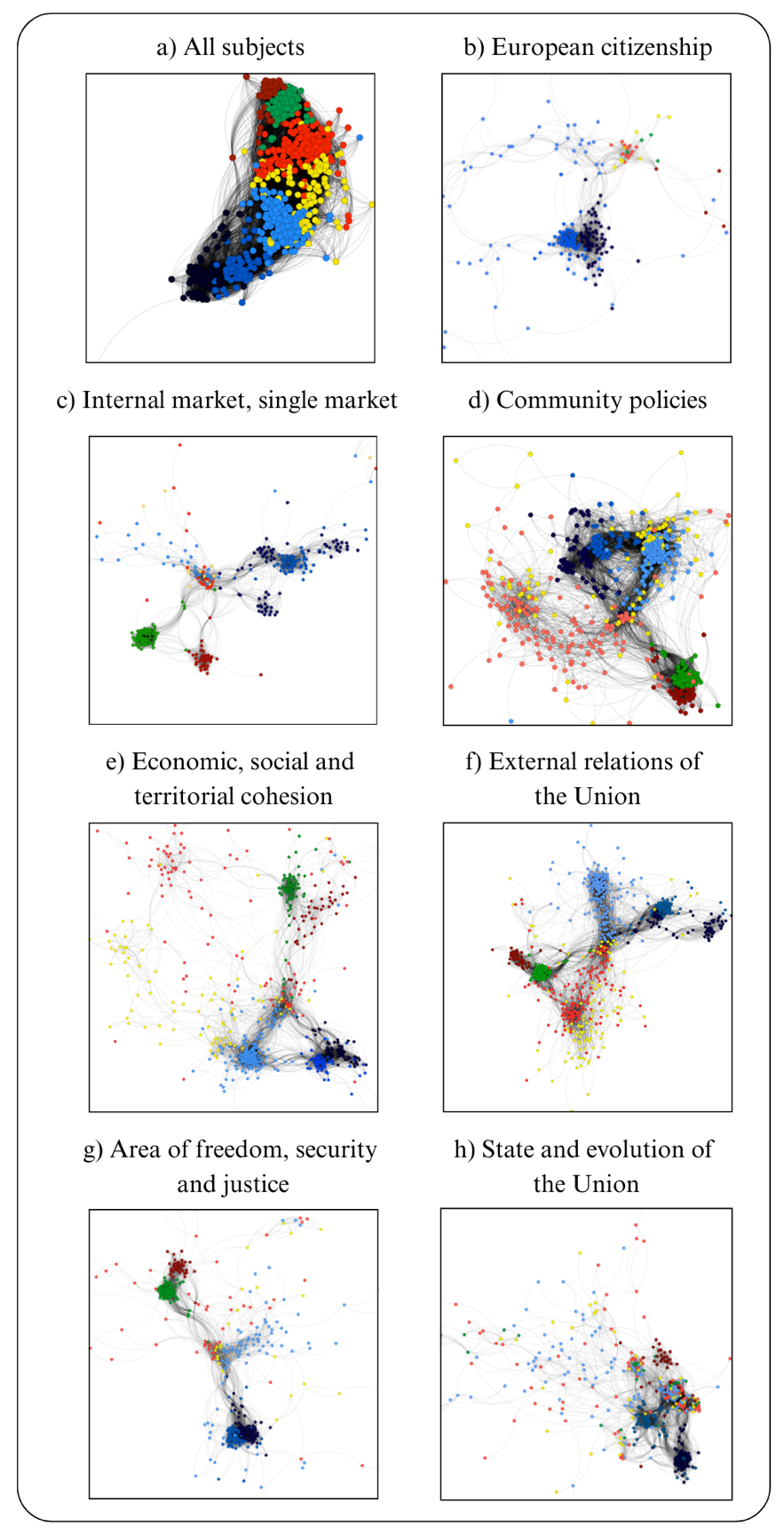


Figure 7 – Co-voting networks for all subjects and primary subjects

The group assortativity measures the likelihood that MEPs vote with MEPs of their group rather than forming cross-group alliances. A value near +1 means they overwhelmingly vote with group colleagues, a value near 0 means group membership matters little, and a negative value means they often team up with other groups instead. In turn, the nationality assortativity measures the likelihood that MEPs vote with MEPs from the same country rather than forming cross-country alliances. A value near +1 shows that MEPs mostly vote with fellow nationals, around 0 means that nationality has little effect, and a negative value indicates they more often side with MEPs from other countries.

The average clustering coefficient measures the degree to which MEPs form tightly interconnected voting clusters. A high network density suggests that MEPs often align in votes across the EP. In contrast, a low network density suggests that the network is more fragmented, suggesting greater ideological distance. On the one hand, a higher percentage of remaining nodes signifies that a large fraction of MEPs are included in the network, which, in turn, ensures a broader representation and more robust results. On the other hand, a small percentage of remaining nodes, limits coverage and calls for caution in interpreting the results. By comparing the total detected communities (how many communities emerged from the entire network without removing any components or communities of smaller size) to the total number of relevant communities, we gain insight into whether the community filtering process (which excludes connected components and communities below the defined threshold) leads to only a modest or substantial reduction in community count.

The results of these statistics for the primary subjects are presented in Tables 2 and 3.

Table 2 – Modularities and assortativities for the primary subjects

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Subject | Optimal modularity | Group modularity | Nationality modularity | Group assortativity | Nationality assortativity |
| All subjects | **0.520** | **0.406** | **0.041** | **0.512** | **0.044** |
| European citizenship | 0.483 | 0.412 | 0.179 | 0.625 | 0.211 |
| Internal market, single market | 0.718 | 0.609 | 0.188 | 0.787 | 0.210 |
| Community policies | 0.553 | 0.413 | 0.067 | 0.553 | 0.073 |
| Economic, social and territorial cohesion | 0.662 | 0.549 | 0.124 | 0.740 | 0.137 |
| Economic and monetary system | 0.803 | 0.484 | 0.549 | 0.991 | 0.717 |
| External relations of the Union | 0.715 | 0.605 | 0.127 | 0.736 | 0.138 |
| Area of freedom, security and justice | 0.607 | 0.522 | 0.108 | 0.663 | 0.121 |
| State and evolution of the Union | 0.586 | 0.350 | 0.080 | 0.423 | 0.087 |

Table 3 – Structural statistics for the primary subjects

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Subject | Average clustering coefficient | Network density | Percentage remaining nodes | Total detected communities | Total relevant communities | Number of bills |
| All subjects | **0.654** | **0.190** | **94.964%** | **5** | **4** | **1890** |
| European citizenship | 0.485 | 0.062 | 46.619% | 14 | 4 | 98 |
| Internal market, single market | 0.659 | 0.066 | 57.410% | 39 | 4 | 191 |
| Community policies | 0.671 | 0.117 | 93.957% | 8 | 4 | 595 |
| Economic, social and territorial cohesion | 0.607 | 0.060 | 88.345% | 25 | 8 | 386 |
| Economic and monetary system | 0.715 | 0.059 | 12.374% | 20 | 0 | 31 |
| External relations of the Union | 0.620 | 0.063 | 93.957% | 11 | 8 | 444 |
| Area of freedom, security and justice | 0.577 | 0.065 | 73.237% | 49 | 4 | 176 |
| State and evolution of the Union | 0.621 | 0.073 | 77.554% | 40 | 5 | 567 |

In Table 4 we compare the differences between all subjects and each primary subject.

Table 4 – Modularities and assortativities differences between all subjects and each primary subject

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Subject | Optimal modularity | Group modularity | Nationality modularity | Group assortativity | Nationality assortativity |
| European citizenship | -0.037 | 0.006 | 0.138 | 0.113 | 0.167 |
| Internal market, single market | 0.198 | 0.203 | 0.147 | 0.275 | 0.166 |
| Community policies | 0.033 | 0.007 | 0.026 | 0.041 | 0.029 |
| Economic, social and territorial cohesion | 0.142 | 0.143 | 0.083 | 0.228 | 0.093 |
| Economic and monetary system | 0.283 | 0.078 | 0.508 | 0.479 | 0.673 |
| External relations of the Union | 0.195 | 0.199 | 0.086 | 0.224 | 0.094 |
| Area of freedom, security and justice | 0.087 | 0.116 | 0.067 | 0.151 | 0.077 |
| State and evolution of the Union | 0.066 | -0.056 | 0.039 | -0.089 | 0.043 |

The relevant voting communities for the selected secondary subjects can be seen in Figure 8 (matrices) and Figure 9 (co-voting networks).

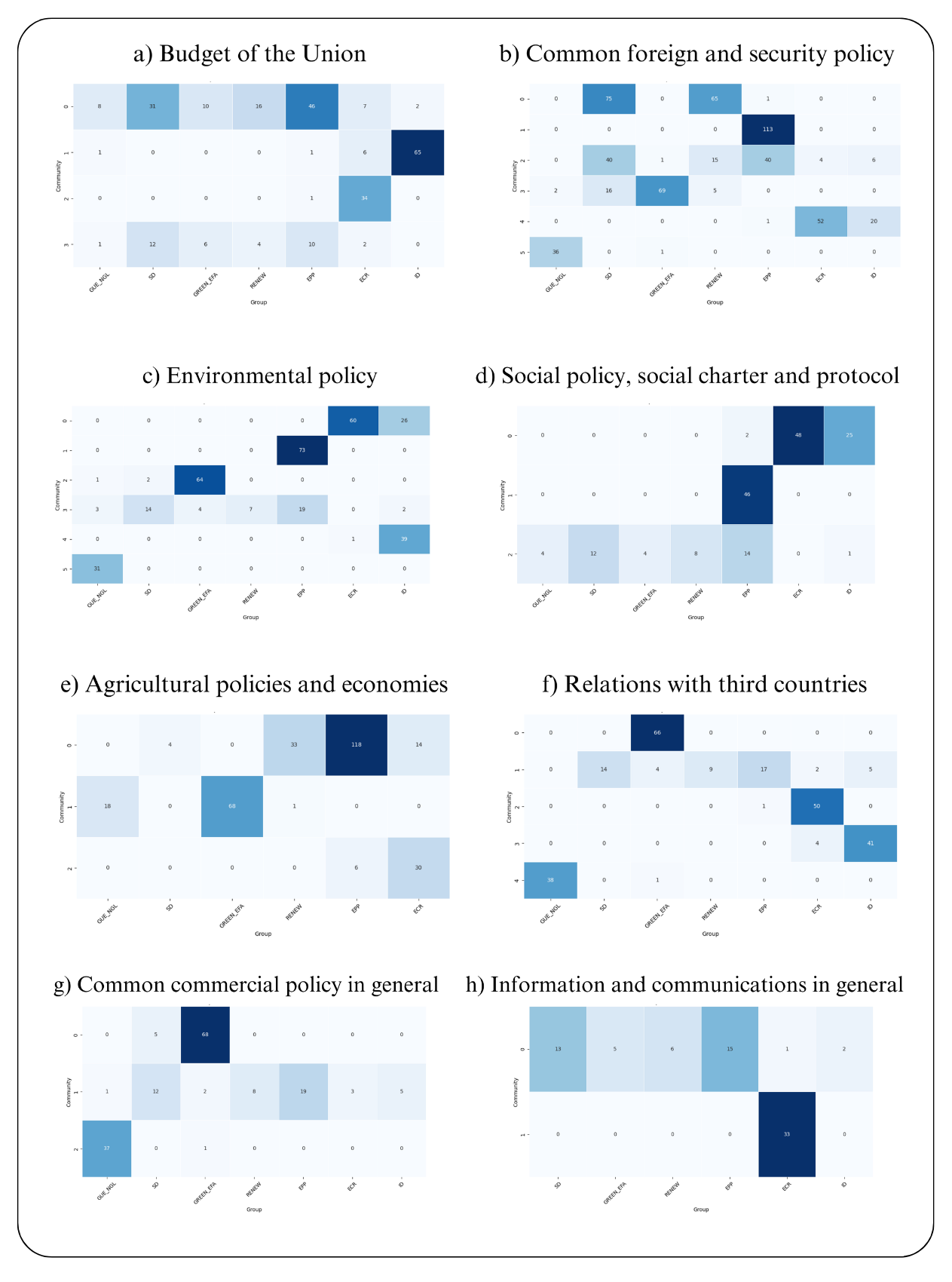


Figure 8 – Relevant voting communities for the selected secondary subjects

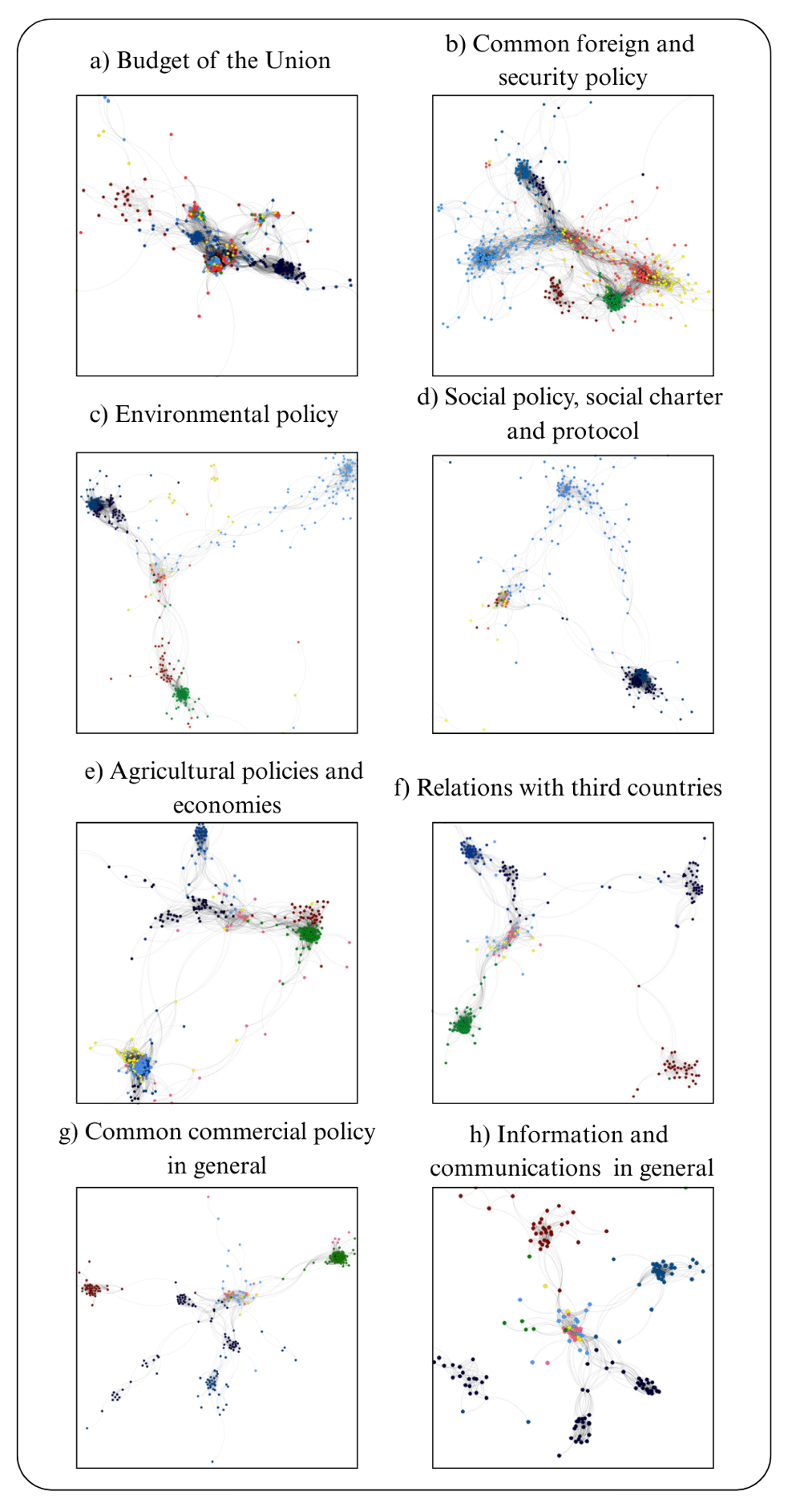


Figure 9 – Co-voting networks for the selected secondary subjects

Then, we applied the same statistics to the secondary subjects, starting with computing modularity and assortativity statistics (Table 5) to evaluate the degree of group and national alignment within each secondary subject. Additionally, structural statistics (Table 6) will provide further insight into the density, clustering tendencies, number of voting communities, and reliability of the results.

Table 5 – Modularities and assortativities for the secondary subjects

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Subject | Optimal modularity | Group modularity | Nationality modularity | Group assortativity | Nationality assortativity |
| All subjects | **0.520** | **0.406** | **0.041** | **0.512** | **0.044** |
| Budget of the Union | 0.504 | 0.255 | 0.075 | 0.310 | 0.081 |
| Common foreign and security policy | 0.742 | 0.636 | 0.163 | 0.773 | 0.178 |
| Environmental policy | 0.662 | 0.580 | 0.203 | 0.741 | 0.231 |
| Social policy, social charter and protocol | 0.421 | 0.324 | 0.175 | 0.479 | 0.209 |
| Agricultural policies and economies | 0.396 | 0.290 | 0.072 | 0.442 | 0.080 |
| Relations with third countries | 0.750 | 0.636 | 0.239 | 0.836 | 0.269 |
| Common commercial policy in general | 0.700 | 0.590 | 0.238 | 0.827 | 0.269 |
| Information and communications in general | 0.789 | 0.594 | 0.447 | 0.770 | 0.528 |

Table 6 – Structural statistics for the secondary subjects

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Subject | Average clustering coefficient | Network density | Percentage remaining nodes | Total detected communities | Total relevant communities | Number of bills |
| All subjects | **0.654** | **0.190** | **94.964%** | **5** | **4** | **1890** |
| Budget of the Union | 0.682 | 0.103 | 62.590% | 41 | 4 | 394 |
| Common foreign and security policy | 0.603 | 0.044 | 91.942% | 18 | 6 | 247 |
| Environmental policy | 0.618 | 0.054 | 63.022% | 28 | 6 | 155 |
| Social policy, social charter and protocol | 0.595 | 0.074 | 49.640% | 79 | 3 | 124 |
| Agricultural policies and economies | 0.725 | 0.126 | 69.928% | 55 | 3 | 120 |
| Relations with third countries | 0.705 | 0.069 | 44.317% | 16 | 5 | 116 |
| Common commercial policy in general | 0.735 | 0.070 | 43.741% | 14 | 3 | 112 |
| Information and communications in general | 0.726 | 0.056 | 34.101% | 27 | 2 | 102 |

Additionally, we compared the network statistics by secondary subject with those obtained for all subjects, assessing the differences, which are presented in Table 7.

Table 7 – Modularities and assortativities differences between all subjects and the secondary subjects

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Subject | Optimal modularity | Group modularity | Nationality modularity | Group assortativity | Nationality assortativity |
| Budget of the Union | -0.016 | -0.151 | 0.034 | -0.202 | 0.037 |
| Common foreign and security policy | 0.222 | 0.230 | 0.122 | 0.261 | 0.134 |
| Environmental policy | 0.142 | 0.174 | 0.162 | 0.229 | 0.187 |
| Social policy, social charter and protocol | -0.099 | -0.082 | 0.134 | -0.033 | 0.165 |
| Agricultural policies and economies | -0.124 | -0.116 | 0.031 | -0.070 | 0.036 |
| Relations with third countries | 0.230 | 0.230 | 0.198 | 0.324 | 0.225 |
| Common commercial policy in general | 0.180 | 0.184 | 0.197 | 0.315 | 0.225 |
| Information and communications in general | 0.269 | 0.188 | 0.406 | 0.258 | 0.484 |

## Discussion

The analysis of co-voting behavior in the 9th term of the EP reveals a legislative landscape marked not by binary ideological bifurcation, but by multi-polarization. This reality emerges across the entire legislative agenda and more sharply within specific legislative subjects. These findings challenge prevailing assumptions derived from two-party systems, such as those of the USA or the UK, where polarization is predominantly conceptualized along a single left-right axis.

When considering all subjects together, the optimal modularity of 0.520 and group modularity of 0.406 suggest that MEPs generally form cohesive voting blocs along ideological lines, though not rigidly. The small gap between optimal and group modularity indicates that group affiliation is the main, but not exclusive, driver of voting behavior. Cross-group coalitions and issue-specific preferences introduce meaningful variation, as reflected in the moderate group assortativity of 0.512. In contrast, national affiliations play a marginal role: the low nationality modularity (0.041) and assortativity (0.044) confirm that MEPs rarely vote in nationally cohesive blocs, underscoring the EP’s transnational nature.

Structural network statistics confirm a cohesive yet multi-polar EP. A high clustering coefficient (0.654) shows strong within-group ties, while low density (0.190) indicates sparse links across groups. Four sizeable communities emerge, not just two, and the backbone still contains approximately 95 % of MEPs across 1,890 bills, evidence that these patterns are both clear and robust.

The voting communities reflect identifiable patterns. The EPP and S&D remain consistently separated, confirming an ideological divide between center-right and center-left forces. Renew demonstrates a bifurcated alignment pattern, affiliating at times with S&D and at other times with EPP, mirroring its centrist position and ideological flexibility. The Eurosceptic and far-right groups, ECR and ID, form an isolated voting bloc. On the opposite pole, Greens/EFA and The Left coalesce.

These dynamics are accentuated when legislative activity is disaggregated by primary subject. In nearly every primary subject, the optimal modularity surpasses the value for all subjects, indicating that multi-polarization tends to deepen when policy specificity increases. For instance, “Internal market, single market” and “External relations of the Union” show optimal modularities of 0.718 and 0.715, respectively, revealing the emergence of sharply defined voting blocs within those subjects. This trend is mirrored by increases in group modularity and assortativity across most primary subjects, suggesting that group affiliations become more determinative when MEPs are engaged in focused policy deliberation.

An exception is the primary subject “State and Evolution of the Union”, where group modularity and assortativity drop significantly. This suggests that traditional ideological cleavages lose explanatory power, giving way to a new axis of conflict: Eurosceptics versus Euroenthusiasts. Voting communities reflect this shift, with ECR, ID, and a few EPP dissenters forming distinct Eurosceptic blocs, while Euroenthusiastic groups (EPP, S&D, and Renew) cluster separately. However, the fact that these pro-integration groups form distinct communities reveals underlying factionalism. These patterns reinforce the view that attitudes toward European integration now constitute a second dimension of conflict in the EP

The role of nationality, though limited overall, gains slightly more salience within primary subjects. In every primary subject, nationality modularity and assortativity exceed the baseline observed across all subjects. This suggests that while nationality is not a primary driver of voting behavior, it gains a higher relevance in context-specific legislative matters, particularly where domestic political considerations may become more acute.

This pattern continues within secondary subjects. Here too, voting communities diverge from those found in the all-subjects network, though many of the primary subject alliances persist. However, some coalitions disappear entirely at the secondary level, most notably, the triple synergy between The Left, Greens/EFA, and S&D; the alliance between S&D and Greens/EFA; and the EPP–S&D–Renew synergy.

On nationality, every secondary subject surpasses the baseline values from the all-subjects network. This implies again that nationality becomes a slightly more relevant factor in shaping voting communities within certain issue-specific contexts.

These findings reinforce the idea that the EP’s polarization is not merely a function of increasing ideological distance between stable partisan camps but a reflection of complex, policy-contingent multipolarity. Legislative consensus in the EP thus depends not on fixed grand coalitions but on navigating a fluid, multipolar alliance space.

# Conclusions and Future Research

This thesis set out to investigate the structure of political multi-polarization within the EP during its 9th term (2019-2024), a period marked by profound social, economic, and geopolitical disruptions. Drawing on co-voting networks derived from roll-call data and constructed through the BiCM, this dissertation examined how MEPs aligned or diverged across all subjects and within specific legislative subjects. The findings challenge narratives of polarization in supranational institutions and contribute several novel insights to the political science and network analysis literature.

The most salient contribution of this dissertation is the empirical evidence of multi-polarization within the EP. Contrary to the dominant literature, largely rooted in the binary political systems of the USA and UK, this dissertation demonstrates that the ideological structure of the EP is not reducible to a single left-right dimension. Many legislative subjects exhibit three or more distinct voting communities. In subjects such as “Community policies”, “Internal market, single market”, and “External relations of the Union”, ideological alliances shift significantly, reflecting fluid coalitions rather than static group blocs.

This dissertation also reaffirms that national origin, often presumed to be a latent source of division in transnational legislatures, plays a negligible role in shaping the voting communities. Instead, ideological affinity and group membership are the predominant shaping factors. These findings reaffirm the view of the EP as a transnational legislature in practice, not merely in structure.

A particularly striking result is that some of the most cohesive voting behavior is observed within the Greens/EFA and The Left, while traditional governing groups – EPP, S&D, and Renew – exhibit lower internal cohesion and participate in multiple, sometimes conflicting, voting alliances. This suggests an erosion of uniform group discipline within centrist groups and highlights a shift toward more flexible, issue-driven alignments.

Moreover, the subject “State and evolution of the Union” reveals a novel axis of multi-polarization – Euroscepticism versus Euroenthusiasm – that cuts across traditional left-right divides. This cleavage represents a redefinition of political conflict within the EP and may presage the emergence of a second ideological dimension dominating future EU policymaking.

Taken together, these findings redefine our understanding of polarization in supranational governance. The EP, far from being a static or derivative arena of national political conflict, emerges instead as a dynamic and uniquely structured legislative body, where polarization manifests not as a fixed binary but as a multidimensional and fluid network of issue-driven alliances and cleavages.

However, several limitations might constrain these conclusions. First, the number of bills per subject varies widely, potentially reducing the reliability of results for subjects with fewer bills. Second, by focusing on only one legislative term, our dataset yields sparser communities for the subjects that are less represented, so the interpretation of their communities must be treated with caution. Third, for detecting relevant communities and computing optimal modularities, we relied on the Louvain community detection algorithm alone. A more robust approach would combine multiple community detection algorithms and aggregate the results. Fourth, the choice of a 30-MEP threshold, although justified by considerations of group size, may bias the configuration of relevant communities. Experimenting with alternative thresholds and aggregating the results could yield more comprehensive insights. Finally, when obtaining the relevant communities, our use of the Louvain resolution parameter fixed at 0.5 favored broad communities. Different resolution values might produce divergent relevant communities, warranting future experimentation with different resolution values.

Looking ahead, future research should replicate and extend this analysis as more legislative terms become available, particularly the forthcoming 10th term. HowTheyVote.eu continues to collect roll-call voting data, thereby enabling a longitudinal perspective on how multi-polarization in the EP might evolve. Conducting the same study in a multi-term context would help clarify whether the patterns observed here reflect short-term political circumstances or represent more stable, ongoing realignments within the EP. By deepening our understanding of these dynamics, policymakers and scholars can better anticipate legislative coalitions, manage potential polarization, and foster more effective, inclusive governance across the EU.

# Bibliographical References

Apergis, N., & Pinar, M. (2023). Corruption and partisan polarization: evidence from the European Union. *Empirical Economics*, *64*(1), 277–301. <https://doi.org/10.1007/s00181-022-02247-z>

Arbatli, E., & Rosenberg, D. (2021). United we stand, divided we rule: how political polarization erodes democracy. *Democratization*, *28*(2), 285–307. <https://doi.org/10.1080/13510347.2020.1818068>

Autor, D., Dorn, D., Hanson, G., & Majlesi, K. (2020). Importing Political Polarization? The Electoral Consequences of Rising Trade Exposure. *American Economic Review*, *110*(10), 3139–3183. <https://doi.org/10.1257/aer.20170011>

Bor, D., Lee, B. S., & Oughton, E. J. (2023). *Quantifying polarization across political groups on key policy issues using sentiment analysis*. <https://arxiv.org/abs/2302.07775>

Börzel, T. A., Broniecki, P., Hartlapp, M., & Obholzer, L. (2023). Contesting Europe: Eurosceptic Dissent and Integration Polarization in the European Parliament. *JCMS: Journal of Common Market Studies*, *61*(4), 1100–1118. <https://doi.org/10.1111/jcms.13448>

Canen, N., Kendall, C., & Trebbi, F. (2020). *Political Parties as Drivers of U.S. Polarization: 1927-2018*. <https://doi.org/10.3386/w28296>

Card, D., Dustmann, C., & Preston, I. (2012). IMMIGRATION, WAGES, AND COMPOSITIONAL AMENITIES. *Journal of the European Economic Association*, *10*(1), 78–119. <https://doi.org/10.1111/j.1542-4774.2011.01051.x>

Cherepnalkoski, D., Karpf, A., Mozetič, I., & Grčar, M. (2016). Cohesion and Coalition Formation in the European Parliament: Roll-Call Votes and Twitter Activities. *PLOS ONE*, *11*(11), e0166586. <https://doi.org/10.1371/journal.pone.0166586>

Colantone, I., & Stanig, P. (2017). *The Trade Origins of Economic Nationalism: Import Competition and Voting Behavior in Western Europe*. <https://ssrn.com/abstract=2904105>

Diep, H. T., Kaufman, M., & Kaufman, S. (2023). An Agent-Based Statistical Physics Model for Political Polarization: A Monte Carlo Study. *Entropy*, *25*(7), 981. <https://doi.org/10.3390/e25070981>

Doerr, S., Gissler, S., Peydró, J.-L., & Voth, H.-J. (2019). *From Finance to Fascism: The Real Effect of Germany’s 1931 Banking Crisis*. <https://pseweb.eu/ydepot/seance/513027_Peydro_Fascism.pdf>

Domagalski, R., Neal, Z. P., & Sagan, B. (2021). Backbone: An R package for extracting the backbone of bipartite projections. *PLOS ONE*, *16*(1), e0244363. <https://doi.org/10.1371/journal.pone.0244363>

Druckman, J. N., & Levendusky, M. S. (2019). What Do We Measure When We Measure Affective Polarization? *Public Opinion Quarterly*, *83*(1), 114–122. <https://doi.org/10.1093/poq/nfz003>

Duca, J. V., & Saving, J. L. (2016). Income Inequality and Political Polarization: Time Series Evidence Over Nine Decades. *Review of Income and Wealth*, *62*(3), 445–466. <https://doi.org/10.1111/roiw.12162>

Dustmann, C., & Frattini, T. (2014). The Fiscal Effects of Immigration to the UK. *The Economic Journal*, *124*(580), F593–F643. <https://doi.org/10.1111/ecoj.12181>

Evans, G., & Menon, A. (2017). Brexit and British Politics. In *Polity Press*. <https://www.wiley.com/en-au/Brexit+and+British+Politics-p-9781509523856>

Fuks, M., & Marques, P. H. (2022). Polarização e contexto: medindo e explicando a polarização política no Brasil. *Opinião Pública*, *28*(3), 560–593. <https://doi.org/10.1590/1807-01912022283560>

Funke, M., Schularick, M., & Trebesch, C. (2016). Going to extremes: Politics after financial crises, 1870–2014. *European Economic Review*, *88*, 227–260. <https://doi.org/10.1016/j.euroecorev.2016.03.006>

Funke, M., & Trebesch, C. (2017). *Financial Crises and the Populist Right*. <https://www.ifo.de/DocDL/dice-report-2017-4-funke-trebesch-december.pdf>

Gentzkow, M. (2016). *Polarization in 2016*. <https://web.stanford.edu/~gentzkow/research/PolarizationIn2016.pdf>

Gestefeld, M., Lorenz, J., Henschel, N. T., & Boehnke, K. (2022). Decomposing attitude distributions to characterize attitude polarization in Europe. *SN Social Sciences*, *2*(7). <https://doi.org/10.1007/s43545-022-00342-7>

Grechyna, D. (2016). On the determinants of political polarization. *Economics Letters*, *144*, 10–14. <https://doi.org/10.1016/j.econlet.2016.04.018>

Guevara, J. A., Gómez, D., Castro, J., Gutiérrez, I., & Robles, J. M. (2022). *A New Approach to Polarization Modeling Using Markov Chains* (pp. 151–162). <https://doi.org/10.1007/978-3-031-08974-9_12>

Halla, M., Wagner, A. F., & Zweimüller, J. (2017). Immigration and Voting for the Far Right. *Journal of the European Economic Association*, *15*(6), 1341–1385. <https://doi.org/10.1093/jeea/jvx003>

HIX, S., & NOURY, A. (2009). After Enlargement: Voting Patterns in the Sixth European Parliament. *Legislative Studies Quarterly*, *34*(2), 159–174. <https://doi.org/10.3162/036298009788314282>

Hix, S., Noury, A., & Roland, G. (2009). Voting patterns and alliance formation in the European Parliament. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *364*(1518), 821–831. <https://doi.org/10.1098/rstb.2008.0263>

Hobolt, S. B. (2016). The Brexit vote: a divided nation, a divided continent. *Journal of European Public Policy*, *23*(9), 1259–1277. <https://doi.org/10.1080/13501763.2016.1225785>

Hohmann, M., Devriendt, K., & Coscia, M. (2023). Quantifying ideological polarization on a network using generalized Euclidean distance. *Science Advances*, *9*(9). <https://doi.org/10.1126/sciadv.abq2044>

*HowTheyVote.eu*. Retrieved July 31, 2024, from <https://howtheyvote.eu/>

Huijsmans, T., & Rodden, J. (2025). The Great Global Divider? A Comparison of Urban-Rural Partisan Polarization in Western Democracies. *Comparative Political Studies*, *58*(2), 261–290. <https://doi.org/10.1177/00104140241237458>

Iyengar, S., & Hahn, K. S. (2009). Red Media, Blue Media: Evidence of Ideological Selectivity in Media Use. *Journal of Communication*, *59*(1), 19–39. <https://doi.org/10.1111/j.1460-2466.2008.01402.x>

Iyengar, S., Lelkes, Y., Levendusky, M., Malhotra, N., & Westwood, S. J. (2019). The Origins and Consequences of Affective Polarization in the United States. *Annual Review of Political Science*, *22*(1), 129–146. <https://doi.org/10.1146/annurev-polisci-051117-073034>

Iyengar, S., Sood, G., & Lelkes, Y. (2012). Affect, Not Ideology. *Public Opinion Quarterly*, *76*(3), 405–431. <https://doi.org/10.1093/poq/nfs038>

Iyengar, S., & Westwood, S. J. (2015). Fear and Loathing across Party Lines: New Evidence on Group Polarization. *American Journal of Political Science*, *59*(3), 690–707. <https://doi.org/10.1111/ajps.12152>

Kaufman, M., Kaufman, S., & Diep, H. T. (2022). Statistical Mechanics of Political Polarization. *Entropy*, *24*(9), 1262. <https://doi.org/10.3390/e24091262>

Larkin, P., & Lendler, M. (2019). *United & Divided: Distinctions in Polarization between Political Elites and the Public*. <https://ssrn.com/abstract=3399568>

*Legislative Observatory.* Retrieved July 31, 2024, from <https://oeil.secure.europarl.europa.eu/oeil/en>

Levendusky, M. (2009). *The Partisan Sort How Liberals Became Democrats and Conservatives Became Republicans*. <https://press.uchicago.edu/ucp/books/book/chicago/P/bo8212972.html>

Lo, J. (2018). Dynamic ideal point estimation for the European Parliament, 1980–2009. *Public Choice*, *176*(1–2), 229–246. <https://doi.org/10.1007/s11127-018-0551-3>

Maoz, Z., & Somer-Topcu, Z. (2010). Political Polarization and Cabinet Stability in Multiparty Systems: A Social Networks Analysis of European Parliaments, 1945–98. *British Journal of Political Science*, *40*(4), 805–833. <https://doi.org/10.1017/S0007123410000220>

Markus, A., Smith, B., & Hancocks, A. (2019). Mapping Social Cohesion Survey. In *Monash University Publishing*. <https://doi.org/10.26193/IMUXSD>

Marr, D. (2017). *One Nation and the Politics of Race*. THE WHITE QUEEN. <https://www.quarterlyessay.com.au/essay/2017/03/the-white-queen/extract>

McCarty, N., Poole, K. T., & Rosenthal, H. (2016). *Polarized America The Dance of Ideology and Unequal Riches*. <https://mitpress.mit.edu/9780262528627/polarized-america/>

McDonald, M. (2021). After the fires? Climate change and security in Australia. *Australian Journal of Political Science*, *56*(1), 1–18. <https://doi.org/10.1080/10361146.2020.1776680>

McGrane, D., & Berdahl, L. (2013). ‘Small Worlds’ No More: Reconsidering Provincial Political Cultures in Canada. *Regional & Federal Studies*, *23*(4), 479–493. <https://doi.org/10.1080/13597566.2013.794415>

MEHLHAFF, I. D. (2024). A Group-Based Approach to Measuring Polarization. *American Political Science Review*, *118*(3), 1518–1526. <https://doi.org/10.1017/S0003055423001041>

Mian, A., Sufi, A., & Trebbi, F. (2014). Resolving Debt Overhang: Political Constraints in the Aftermath of Financial Crises. *American Economic Journal: Macroeconomics*, *6*(2), 1–28. <https://doi.org/10.1257/mac.6.2.1>

Mudde, C., & Rovira Kaltwasser, C. (2017). *Populism: A Very Short Introduction*. Oxford University Press. <https://doi.org/10.1093/actrade/9780190234874.001.0001>

Murillo, R., & Ruiz, À. (2018, April 16). *Millennials and politics: mind the gap!* <https://www.caixabankresearch.com/en/economics-markets/labour-market-demographics/millennials-and-politics-mind-gap>

Neal, Z. P. (2022). backbone: An R package to extract network backbones. *PLOS ONE*, *17*(5), e0269137. <https://doi.org/10.1371/journal.pone.0269137>

Patkós, V. (2023). Measuring partisan polarization with partisan differences in satisfaction with the government: the introduction of a new comparative approach. *Quality & Quantity*, *57*(1), 39–57. <https://doi.org/10.1007/s11135-022-01350-8>

Peterson, A., & Spirling, A. (2018). Classification Accuracy as a Substantive Quantity of Interest: Measuring Polarization in Westminster Systems. *Political Analysis*, *26*(1), 120–128. <https://doi.org/10.1017/pan.2017.39>

Pew Research Center. (2014). *Political polarization in the American public*. <https://www.pewresearch.org/politics/2014/06/12/political-polarization-in-the-american-public/>

Poole, K. T., & Rosenthal, H. (1985). A Spatial Model for Legislative Roll Call Analysis. *American Journal of Political Science*, *29*(2), 357. <https://doi.org/10.2307/2111172>

Prior, M. (2007). *Post-Broadcast Democracy*. Cambridge University Press. <https://doi.org/10.1017/CBO9781139878425>

Ripoll Servent, A. (2019). The European Parliament after the 2019 Elections: Testing the Boundaries of the “Cordon Sanitaire.” *Journal of Contemporary European Research*, *15*(4), 331–342. <https://doi.org/10.30950/jcer.v15i4.1121>

Rodrik, D. (2018). Populism and the economics of globalization. *Journal of International Business Policy*, *1*(1–2), 12–33. <https://doi.org/10.1057/s42214-018-0001-4>

Rogowski, J. C., & Sutherland, J. L. (2016). How Ideology Fuels Affective Polarization. *Political Behavior*, *38*(2), 485–508. <https://doi.org/10.1007/s11109-015-9323-7>

Saracco, F., di Clemente, R., Gabrielli, A., & Squartini, T. (2015). Randomizing bipartite networks: the case of the World Trade Web. *Scientific Reports*, *5*(1), 10595. <https://doi.org/10.1038/srep10595>

Schoch, D., & Brandes, U. (2020). Legislators’ roll-call voting behavior increasingly corresponds to intervals in the political spectrum. *Scientific Reports*, *10*(1), 1-9. <https://doi.org/10.1038/s41598-020-74175-w>

van der Veen, O. (2023). Political polarisation compared: creating the comparative political polarisation index. *European Political Science*, *22*(2), 260–280. <https://doi.org/10.1057/s41304-022-00400-x>

# Appendix A

**The composition and functioning of the EP**

Before delving into the data and methodologies employed in this study, it is essential to contextualize the institutional framework within which this study is situated, specifically the EP.

**The role and institutional framework of the EP**

The EP is the only directly elected supranational institution within the EU and serves as its legislative branch. It plays a central role in the EU’s political system, exercising law-making, budgetary, and oversight functions. Since 1979, it has been elected every five years through universal suffrage, granting every EU citizen voting rights, regardless of their country of residence.

Currently with 720 MEPs (10th term), representing approximately 450 million citizens and an electorate of roughly 375 million, the EP constitutes the world’s largest supranational parliamentary body. Regarding voter base, it ranks second only to India in size. Over the years, the EP has undergone significant institutional evolution, transforming from a consultative assembly into a fully-fledged legislative authority whose influence extends across virtually all policy areas of the EU.

**Legislative powers and functions**

The powers of the EP can be broadly categorized into six domains.

Legislation: The EP, alongside the Council of the EU, co-legislates on a wide array of policies, primarily through the Ordinary Legislative Procedure, formerly known as the co-decision process. Budgetary Authority: The EP shares responsibility with the Council over the approval and oversight of the EU budget, playing a critical role in financial governance. Executive Oversight: The EP exercises democratic control over the European Commission, including the power to approve or dismiss the Commission through a vote of confidence. External Relations: The EP engages in foreign policy discussions, participates in trade agreement ratifications, and upholds human rights and democracy in global affairs. Constitutional Affairs: It contributes to treaty revisions, institutional reforms, and the broader shaping of EU governance. Agenda-Setting: Although the European Commission holds the formal right of initiative in legislative proposals, the EP influences policy priorities through resolutions and political debates.

**Election process and political organization**

Elections to the EP are organized at the national level, with each member state electing MEPs through a proportional representation system. The number of seats allocated to each country is roughly proportional to its population, though smaller states benefit from degressive proportionality, ensuring that they are overrepresented relative to their population size.

For instance, Germany, the EU’s most populous country, elects 96 MEPs, while smaller states like Cyprus, Luxembourg, and Malta each have 6 MEPs. This system ensures that even the smallest member states maintain a significant voice in the legislative process.

Despite the elections being held at the national level, once elected, MEPs do not sit according to their nationality but instead organize themselves into transnational political groups based on ideological affiliation. These groups are composed of MEPs from different national parties across the EU.

The nomination process for European elections remains controlled by national parties, meaning that candidates must secure the backing of their domestic political parties. This link between national and European politics ensures that MEPs maintain a degree of accountability to their domestic political landscapes, particularly if they intend to transition back into national-level politics in the future.

The EP’s institutional structure is unique in the way it blends national electoral dynamics with supranational legislative cooperation. It has evolved into a pivotal decision-making body within the EU, exerting significant influence over law-making, budgetary allocations, and democratic oversight. As this study examines legislative behavior within the EP, understanding its composition and functioning provides a necessary backdrop for the analysis that follows.

**The EP in the 9th parliamentary term**

This study focuses on the 9th term of the EP (2019–2024), a period marked by profound institutional and geopolitical transformations within the EU.

One of the most defining events of this term was Brexit, which led to the withdrawal of the UK from the EU on January 31, 2020. This altered the EP's composition and had far-reaching implications for the European political landscape.

Additionally, this parliamentary term coincided with two major global crises that significantly shaped the EU’s legislative priorities and economic policies:

The COVID-19 pandemic (2020–2022): The outbreak of the coronavirus pandemic triggered an unprecedented public health and economic crisis, leading the EP to adopt emergency measures, including the NextGenerationEU recovery fund, to support member states in mitigating the economic fallout.

The global inflation crisis (2021–2023): The post-pandemic recovery, coupled with supply chain disruptions and the geopolitical consequences of the Russian invasion of Ukraine (2022), led to record-high inflation levels across the EU, forcing the EP to play a central role in shaping fiscal and monetary policy responses.

**Institutional changes and Brexit’s impact on the composition of the EP**

At the start of the 9th parliamentary term on July 2, 2019, the EP was composed of 751 MEPs, following the provisions of the Treaty of Lisbon. However, with the withdrawal of the UK from the EU on January 31, 2020, the EP underwent a structural reconfiguration, reducing its total number of seats to 705 MEPs.

The redistribution of seats following Brexit was based on two key principles:

* Abolition of the UK’s 73 seats: The departure of UK MEPs resulted in a significant political realignment within the EP, affecting the balance of power among the political groups.
* Partial reallocation of 27 seats to other EU member states: To improve proportional representation, 14 EU member states received additional seats, while the remaining 46 seats were left vacant, ensuring flexibility for potential future enlargements of the EU.

As a result, the composition of the EP before and after Brexit was as follows:

Uma imagem com texto, captura de ecrã, Tipo de letra, número

Os conteúdos gerados por IA poderão estar incorretos.

# Appendix B

**HowTheyVote.eu**

HowTheyVote.eu is a platform dedicated to enhancing the transparency and accessibility of the EP’s voting records. It serves citizens, journalists, researchers, and activists by providing detailed insights into how MEPs cast their votes.

The platform focuses on roll-call votes, where individual MEPs’ votes are recorded and published. Not all parliamentary votes are roll-call: some are conducted via a show of hands or are secret and thus are not included in the platform’s database. HowTheyVote.eu collects data in an automated manner, updating multiple times per day during plenary sessions. We collected data on each roll-call vote in the 9th term of the EP.

**Legislative Observatory of the European Parliament**

The *Legislative Observatory of the European Parliament* is an official online platform that tracks the legislative process within the EU. It is managed by the EP’s Directorate for Legislative Acts and provides detailed, real-time information on legislative proposals, their progress, and related documents.

It provides detailed documentation, compiling references to legislative texts, proposed amendments, committee reports, plenary votes, and interinstitutional negotiations. Moreover, the *Legislative Observatory of the European Parliament* classifies legislation into policy areas such as the economy, environment, foreign affairs, and social policy, allowing for subject analysis of legislative activity. It also incorporates an interinstitutional perspective, mapping the interactions between the European Commission, the EP, and the Council of the EU to offer insights into how EU institutions collaborate and negotiate legislative outcomes. Additionally, the platform provides access to historical data, enabling users to explore legislative archives and analyze voting trends over time.

We used the *Legislative Observatory of the European Parliament* to extract each bill's legislative subject(s), an essential step in developing this study.

Each legislative proposal, whether initiated by the European Commission, MEPs, or other EU institutions, is assigned to one or more predefined subjects. These subjects allowed us to organize and track the evolution of the legislation process across different domains, facilitating specialized analysis.

# Appendix C

|  |  |  |
| --- | --- | --- |
| **Primary Subject** | **Secondary Subject** | **Tertiary Subject** |
| 1. European citizenship | 1.10 Fundamental rights in the EU, Charter |  |
| 1. European citizenship | 1.20 Citizen’s rights | 1.20.01 Political rights, right to vote and to stand in elections |
| 1. European citizenship | 1.20 Citizen’s rights | 1.20.02 Social and economic rights |
| 1. European citizenship | 1.20 Citizen’s rights | 1.20.03 Right of petition |
| 1. European citizenship | 1.20 Citizen’s rights | 1.20.04 European Ombudsman |
| 1. European citizenship | 1.20 Citizen’s rights | 1.20.05 Public access to information and documents, administrative practice |
| 1. European citizenship | 1.20 Citizen’s rights | 1.20.09 Protection of privacy and data protection |
| 1. European citizenship | 1.20 Citizen’s rights | 1.20.20 Diplomatic and consular protection |
| 2. Internal market, single market | 2.10 Free movement of goods | 2.10.01 Customs union, tax and duty-free, Community transit |
| 2. Internal market, single market | 2.10 Free movement of goods | 2.10.02 Public procurement |
| 2. Internal market, single market | 2.10 Free movement of goods | 2.10.03 Standardisation, EC/EU standards and trade mark, certification, compliance |
| 2. Internal market, single market | 2.20 Free movement of persons | 2.20.01 Freedom of movement, right of residence, identity checks |
| 2. Internal market, single market | 2.30 Free movement of workers |  |
| 2. Internal market, single market | 2.40 Free movement of services, freedom to provide | 2.40.02 Public services, of general interest, universal service |
| 2. Internal market, single market | 2.50 Free movement of capital | 2.50.02 Savings |
| 2. Internal market, single market | 2.50 Free movement of capital | 2.50.03 Securities and financial markets, stock exchange, CIUTS, investments |
| 2. Internal market, single market | 2.50 Free movement of capital | 2.50.04 Banks and credit |
| 2. Internal market, single market | 2.50 Free movement of capital | 2.50.05 Insurance, pension funds |
| 2. Internal market, single market | 2.50 Free movement of capital | 2.50.08 Financial services, financial reporting and auditing |
| 2. Internal market, single market | 2.50 Free movement of capital | 2.50.10 Financial supervision |
| 2. Internal market, single market | 2.60 Competition | 2.60.01 Trade restrictions, concerted practices, dominant positions |
| 2. Internal market, single market | 2.60 Competition | 2.60.03 State aids and interventions |
| 2. Internal market, single market | 2.70 Taxation | 2.70.01 Direct taxation |
| 2. Internal market, single market | 2.70 Taxation | 2.70.02 Indirect taxation, VAT, excise duties |
| 2. Internal market, single market | 2.80 Cooperation between administrations |  |
| 3. Community policies | 3.10 Agricultural policy and economies | 3.10.01 Agricultural structures and holdings, farmers |
| 3. Community policies | 3.10 Agricultural policy and economies | 3.10.02 Processed products, agri-foodstuffs |
| 3. Community policies | 3.10 Agricultural policy and economies | 3.10.03 Marketing and trade of agricultural products and livestock |
| 3. Community policies | 3.10 Agricultural policy and economies | 3.10.04 Livestock farming |
| 3. Community policies | 3.10 Agricultural policy and economies | 3.10.05 Livestock products, in general |
| 3. Community policies | 3.10 Agricultural policy and economies | 3.10.06 Crop products in general, floriculture |
| 3. Community policies | 3.10 Agricultural policy and economies | 3.10.07 Animal and vegetable fats, oils |
| 3. Community policies | 3.10 Agricultural policy and economies | 3.10.08 Animal health requirements, veterinary legislation and pharmacy |
| 3. Community policies | 3.10 Agricultural policy and economies | 3.10.09 Plant health legislation, organic farming, agro-genetics in general |
| 3. Community policies | 3.10 Agricultural policy and economies | 3.10.10 Foodstuffs, foodstuffs legislation |
| 3. Community policies | 3.10 Agricultural policy and economies | 3.10.11 Forestry policy |
| 3. Community policies | 3.10 Agricultural policy and economies | 3.10.12 Agrimonetary policy, compensatory amounts |
| 3. Community policies | 3.10 Agricultural policy and economies | 3.10.13 European Agricultural Guidance and Guarantee Fund, EAGGF and EAGF |
| 3. Community policies | 3.10 Agricultural policy and economies | 3.10.14 Support for producers and premiums |
| 3. Community policies | 3.10 Agricultural policy and economies | 3.10.30 Agricultural statistics |
| 3. Community policies | 3.15 Fisheries policy | 3.15.01 Fish stocks, conservation of fishery resources |
| 3. Community policies | 3.15 Fisheries policy | 3.15.02 Aquaculture |
| 3. Community policies | 3.15 Fisheries policy | 3.15.04 Management of fisheries, fisheries, fishing grounds |
| 3. Community policies | 3.15 Fisheries policy | 3.15.05 Fish catches, import tariff quotas |
| 3. Community policies | 3.15 Fisheries policy | 3.15.06 Fishing industry and statistics, fishery products |
| 3. Community policies | 3.15 Fisheries policy | 3.15.07 Fisheries inspectorate, surveillance of fishing vessels and areas |
| 3. Community policies | 3.15 Fisheries policy | 3.15.08 Fishing enterprises, fishermen, working conditions on board |
| 3. Community policies | 3.15 Fisheries policy | 3.15.15 Fisheries agreements and cooperation |
| 3. Community policies | 3.15 Fisheries policy | 3.15.17 European Maritime and Fisheries Fund (EMFF) |
| 3. Community policies | 3.20 Transport policy in general | 3.20.01 Air transport and air freight |
| 3. Community policies | 3.20 Transport policy in general | 3.20.02 Rail transport: passengers and freight |
| 3. Community policies | 3.20 Transport policy in general | 3.20.03 Maritime transport: passengers and freight |
| 3. Community policies | 3.20 Transport policy in general | 3.20.04 Inland waterway transport |
| 3. Community policies | 3.20 Transport policy in general | 3.20.05 Road transport: passengers and freight |
| 3. Community policies | 3.20 Transport policy in general | 3.20.06 Transport regulations, road safety, roadworthiness tests, driving licence |
| 3. Community policies | 3.20 Transport policy in general | 3.20.07 Combined transport, multimodal transport |
| 3. Community policies | 3.20 Transport policy in general | 3.20.08 Urban transport |
| 3. Community policies | 3.20 Transport policy in general | 3.20.09 Ports policy |
| 3. Community policies | 3.20 Transport policy in general | 3.20.10 Transport undertakings, transport industry employees |
| 3. Community policies | 3.20 Transport policy in general | 3.20.11 Trans-European transport networks |
| 3. Community policies | 3.20 Transport policy in general | 3.20.15 Transport agreements and cooperation |
| 3. Community policies | 3.20 Transport policy in general | 3.20.20 Transport statistics |
| 3. Community policies | 3.30 Information and communications in general | 3.30.01 Audiovisual industry and services |
| 3. Community policies | 3.30 Information and communications in general | 3.30.02 Television, cable, digital, mobile |
| 3. Community policies | 3.30 Information and communications in general | 3.30.03 Telecommunications, data transmission, telephone |
| 3. Community policies | 3.30 Information and communications in general | 3.30.04 Radiocommunications, broadcasting |
| 3. Community policies | 3.30 Information and communications in general | 3.30.05 Electronic and mobile communications, personal communications |
| 3. Community policies | 3.30 Information and communications in general | 3.30.06 Information and communication technologies, digital technologies |
| 3. Community policies | 3.30 Information and communications in general | 3.30.07 Cybersecurity, cyberspace policy |
| 3. Community policies | 3.30 Information and communications in general | 3.30.08 Press, media freedom and pluralism |
| 3. Community policies | 3.30 Information and communications in general | 3.30.09 Postal services, parcel delivery services |
| 3. Community policies | 3.30 Information and communications in general | 3.30.16 Ethical information policy |
| 3. Community policies | 3.30 Information and communications in general | 3.30.20 Trans-European communications networks |
| 3. Community policies | 3.30 Information and communications in general | 3.30.25 International information networks and society, internet |
| 3. Community policies | 3.40 Industrial policy | 3.40.01 Chemical industry, fertilizers, plastics |
| 3. Community policies | 3.40 Industrial policy | 3.40.02 Iron and steel industry, metallurgical industry |
| 3. Community policies | 3.40 Industrial policy | 3.40.03 Motor industry, cycle and motorcycle, commercial and agricultural vehicles |
| 3. Community policies | 3.40 Industrial policy | 3.40.04 Shipbuilding, nautical industry |
| 3. Community policies | 3.40 Industrial policy | 3.40.05 Aeronautical industry, aerospace industry |
| 3. Community policies | 3.40 Industrial policy | 3.40.06 Electronics, electrotechnical industries, ICT, robotics |
| 3. Community policies | 3.40 Industrial policy | 3.40.07 Building industry |
| 3. Community policies | 3.40 Industrial policy | 3.40.08 Mechanical engineering, machine-tool industry |
| 3. Community policies | 3.40 Industrial policy | 3.40.09 Defence and arms industry |
| 3. Community policies | 3.40 Industrial policy | 3.40.10 Textile and clothing industry, leathers |
| 3. Community policies | 3.40 Industrial policy | 3.40.11 Precision engineering, optics, photography, medical |
| 3. Community policies | 3.40 Industrial policy | 3.40.12 Luxury products industry, cosmetics |
| 3. Community policies | 3.40 Industrial policy | 3.40.13 Food industry |
| 3. Community policies | 3.40 Industrial policy | 3.40.14 Industrial competitiveness |
| 3. Community policies | 3.40 Industrial policy | 3.40.16 Raw materials |
| 3. Community policies | 3.40 Industrial policy | 3.40.17 Manufactured goods |
| 3. Community policies | 3.40 Industrial policy | 3.40.18 Services sector |
| 3. Community policies | 3.45 Enterprise policy, inter-company cooperation | 3.45.01 Company law |
| 3. Community policies | 3.45 Enterprise policy, inter-company cooperation | 3.45.02 Small and medium-sized enterprises (SME), craft industries |
| 3. Community policies | 3.45 Enterprise policy, inter-company cooperation | 3.45.03 Financial management of undertakings, business loans, accounting |
| 3. Community policies | 3.45 Enterprise policy, inter-company cooperation | 3.45.04 Company taxation |
| 3. Community policies | 3.45 Enterprise policy, inter-company cooperation | 3.45.05 Business policy, e-commerce, after-sales service, commercial distribution |
| 3. Community policies | 3.45 Enterprise policy, inter-company cooperation | 3.45.06 Entrepreneurship, liberal professions |
| 3. Community policies | 3.45 Enterprise policy, inter-company cooperation | 3.45.07 Social economy, mutual societies, cooperatives, associations |
| 3. Community policies | 3.45 Enterprise policy, inter-company cooperation | 3.45.08 Business environment, reduction of administrative burdens |
| 3. Community policies | 3.45 Enterprise policy, inter-company cooperation | 3.45.20 Business statistics |
| 3. Community policies | 3.50 Research and technological development and space | 3.50.01 European research area and policy |
| 3. Community policies | 3.50 Research and technological development and space | 3.50.02 Framework programme and research programmes |
| 3. Community policies | 3.50 Research and technological development and space | 3.50.03 European space policy |
| 3. Community policies | 3.50 Research and technological development and space | 3.50.04 Innovation |
| 3. Community policies | 3.50 Research and technological development and space | 3.50.06 Research staff, researchers |
| 3. Community policies | 3.50 Research and technological development and space | 3.50.08 New technologies; biotechnology |
| 3. Community policies | 3.50 Research and technological development and space | 3.50.15 Intellectual property, copyright |
| 3. Community policies | 3.50 Research and technological development and space | 3.50.16 Industrial property, European patent, Community patent, design and pattern |
| 3. Community policies | 3.50 Research and technological development and space | 3.50.20 Scientific and technological cooperation and agreements |
| 3. Community policies | 3.60 Energy policy | 3.60.01 Solid fuels, coal mining, mining industry |
| 3. Community policies | 3.60 Energy policy | 3.60.02 Oil industry, motor fuels |
| 3. Community policies | 3.60 Energy policy | 3.60.03 Gas, electricity, natural gas, biogas |
| 3. Community policies | 3.60 Energy policy | 3.60.04 Nuclear energy, industry and safety |
| 3. Community policies | 3.60 Energy policy | 3.60.05 Alternative and renewable energies |
| 3. Community policies | 3.60 Energy policy | 3.60.06 Trans-European energy networks |
| 3. Community policies | 3.60 Energy policy | 3.60.08 Energy efficiency |
| 3. Community policies | 3.60 Energy policy | 3.60.10 Security of energy supply |
| 3. Community policies | 3.60 Energy policy | 3.60.15 Cooperation and agreements for energy |
| 3. Community policies | 3.70 Environmental policy | 3.70.01 Protection of natural resources: fauna, flora, nature, wildlife, countryside; biodiversity |
| 3. Community policies | 3.70 Environmental policy | 3.70.02 Atmospheric pollution, motor vehicle pollution |
| 3. Community policies | 3.70 Environmental policy | 3.70.03 Climate policy, climate change, ozone layer |
| 3. Community policies | 3.70 Environmental policy | 3.70.04 Water control and management, pollution of waterways, water pollution |
| 3. Community policies | 3.70 Environmental policy | 3.70.05 Marine and coastal pollution, pollution from ships, oil pollution |
| 3. Community policies | 3.70 Environmental policy | 3.70.06 Soil pollution, deterioration |
| 3. Community policies | 3.70 Environmental policy | 3.70.07 Noise pollution |
| 3. Community policies | 3.70 Environmental policy | 3.70.09 Transfrontier pollution |
| 3. Community policies | 3.70 Environmental policy | 3.70.10 Man-made disasters, industrial pollution and accidents |
| 3. Community policies | 3.70 Environmental policy | 3.70.11 Natural disasters, Solidarity Fund |
| 3. Community policies | 3.70 Environmental policy | 3.70.12 Waste management, domestic waste, packaging, light industrial waste |
| 3. Community policies | 3.70 Environmental policy | 3.70.13 Dangerous substances, toxic and radioactive wastes (storage, transport) |
| 3. Community policies | 3.70 Environmental policy | 3.70.15 Environmental taxation |
| 3. Community policies | 3.70 Environmental policy | 3.70.16 Law and environment, liability |
| 3. Community policies | 3.70 Environmental policy | 3.70.17 European ecolabel and ecolabelling, ecodesign |
| 3. Community policies | 3.70 Environmental policy | 3.70.18 International and regional environment protection measures and agreements |
| 3. Community policies | 3.70 Environmental policy | 3.70.20 Sustainable development |
| 4. Economic, social and territorial cohesion | 4.10 Social policy, social charter and protocol | 4.10.02 Family policy, family law, parental leave |
| 4. Economic, social and territorial cohesion | 4.10 Social policy, social charter and protocol | 4.10.03 Child protection, children's rights |
| 4. Economic, social and territorial cohesion | 4.10 Social policy, social charter and protocol | 4.10.04 Gender equality |
| 4. Economic, social and territorial cohesion | 4.10 Social policy, social charter and protocol | 4.10.05 Social inclusion, poverty, minimum income |
| 4. Economic, social and territorial cohesion | 4.10 Social policy, social charter and protocol | 4.10.06 People with disabilities |
| 4. Economic, social and territorial cohesion | 4.10 Social policy, social charter and protocol | 4.10.07 The elderly |
| 4. Economic, social and territorial cohesion | 4.10 Social policy, social charter and protocol | 4.10.08 Equal treatment of persons, non-discrimination |
| 4. Economic, social and territorial cohesion | 4.10 Social policy, social charter and protocol | 4.10.09 Women condition and rights |
| 4. Economic, social and territorial cohesion | 4.10 Social policy, social charter and protocol | 4.10.10 Social protection, social security |
| 4. Economic, social and territorial cohesion | 4.10 Social policy, social charter and protocol | 4.10.11 Retirement, pensions |
| 4. Economic, social and territorial cohesion | 4.10 Social policy, social charter and protocol | 4.10.12 Housing policy |
| 4. Economic, social and territorial cohesion | 4.10 Social policy, social charter and protocol | 4.10.13 Sport |
| 4. Economic, social and territorial cohesion | 4.10 Social policy, social charter and protocol | 4.10.14 Demography |
| 4. Economic, social and territorial cohesion | 4.10 Social policy, social charter and protocol | 4.10.15 European Social Fund (ESF), Fund for European Aid to the Most Deprived (FEAD) |
| 4. Economic, social and territorial cohesion | 4.10 Social policy, social charter and protocol | 4.10.16 Social and community life, associations, foundations |
| 4. Economic, social and territorial cohesion | 4.10 Social policy, social charter and protocol | 4.10.25 Social problems: delinquency, violence, crime |
| 4. Economic, social and territorial cohesion | 4.15 Employment policy, action to combat unemployment | 4.15.02 Employment: guidelines, actions, Funds |
| 4. Economic, social and territorial cohesion | 4.15 Employment policy, action to combat unemployment | 4.15.03 Arrangement of working time, work schedules |
| 4. Economic, social and territorial cohesion | 4.15 Employment policy, action to combat unemployment | 4.15.04 Workforce, occupational mobility, job conversion, working conditions |
| 4. Economic, social and territorial cohesion | 4.15 Employment policy, action to combat unemployment | 4.15.05 Industrial restructuring, job losses, redundancies, relocations, Globalisation Adjustment Fund (EGF) |
| 4. Economic, social and territorial cohesion | 4.15 Employment policy, action to combat unemployment | 4.15.06 Professional qualifications, recognition of qualifications |
| 4. Economic, social and territorial cohesion | 4.15 Employment policy, action to combat unemployment | 4.15.08 Work, employment, wages and salaries: equal opportunities women and men, and for all |
| 4. Economic, social and territorial cohesion | 4.15 Employment policy, action to combat unemployment | 4.15.10 Worker information, participation, trade unions, works councils |
| 4. Economic, social and territorial cohesion | 4.15 Employment policy, action to combat unemployment | 4.15.12 Workers protection and rights, labour law |
| 4. Economic, social and territorial cohesion | 4.15 Employment policy, action to combat unemployment | 4.15.14 Social dialogue, social partners |
| 4. Economic, social and territorial cohesion | 4.15 Employment policy, action to combat unemployment | 4.15.15 Health and safety at work, occupational medicine |
| 4. Economic, social and territorial cohesion | 4.20 Public health | 4.20.01 Medicine, diseases |
| 4. Economic, social and territorial cohesion | 4.20 Public health | 4.20.02 Medical research |
| 4. Economic, social and territorial cohesion | 4.20 Public health | 4.20.03 Drug addiction, alcoholism, smoking |
| 4. Economic, social and territorial cohesion | 4.20 Public health | 4.20.04 Pharmaceutical products and industry |
| 4. Economic, social and territorial cohesion | 4.20 Public health | 4.20.05 Health legislation and policy |
| 4. Economic, social and territorial cohesion | 4.20 Public health | 4.20.06 Health services, medical institutions |
| 4. Economic, social and territorial cohesion | 4.20 Public health | 4.20.07 Medical and para-medical professions |
| 4. Economic, social and territorial cohesion | 4.20 Public health | 4.20.30 Civil protection |
| 4. Economic, social and territorial cohesion | 4.30 Civil protection |  |
| 4. Economic, social and territorial cohesion | 4.40 Education, vocational training and youth | 4.40.01 European area for education, training and lifelong learning |
| 4. Economic, social and territorial cohesion | 4.40 Education, vocational training and youth | 4.40.03 Primary and secondary school, European Schools, early childhood |
| 4. Economic, social and territorial cohesion | 4.40 Education, vocational training and youth | 4.40.04 Universities, higher education |
| 4. Economic, social and territorial cohesion | 4.40 Education, vocational training and youth | 4.40.06 Teachers, trainers, pupils, students |
| 4. Economic, social and territorial cohesion | 4.40 Education, vocational training and youth | 4.40.07 Recognition of diplomas, equivalence of studies and training |
| 4. Economic, social and territorial cohesion | 4.40 Education, vocational training and youth | 4.40.10 Youth |
| 4. Economic, social and territorial cohesion | 4.40 Education, vocational training and youth | 4.40.15 Vocational education and training |
| 4. Economic, social and territorial cohesion | 4.40 Education, vocational training and youth | 4.40.20 Cooperation and agreements in the fields of education, training and youth |
| 4. Economic, social and territorial cohesion | 4.45 Common cultural area, cultural diversity | 4.45.02 Cultural programmes and actions, assistance |
| 4. Economic, social and territorial cohesion | 4.45 Common cultural area, cultural diversity | 4.45.06 Heritage and culture protection, movement of works of art |
| 4. Economic, social and territorial cohesion | 4.45 Common cultural area, cultural diversity | 4.45.08 Cultural and artistic activities, books and reading, arts |
| 4. Economic, social and territorial cohesion | 4.50 Tourism |  |
| 4. Economic, social and territorial cohesion | 4.60 Consumers' protection in general | 4.60.02 Consumer information, advertising, labelling |
| 4. Economic, social and territorial cohesion | 4.60 Consumers' protection in general | 4.60.04 Consumer health |
| 4. Economic, social and territorial cohesion | 4.60 Consumers' protection in general | 4.60.06 Consumers' economic and legal interests |
| 4. Economic, social and territorial cohesion | 4.60 Consumers' protection in general | 4.60.08 Safety of products and services, product liability |
| 4. Economic, social and territorial cohesion | 4.70 Regional policy | 4.70.01 Structural funds, investment funds in general, programmes |
| 4. Economic, social and territorial cohesion | 4.70 Regional policy | 4.70.02 Cohesion policy, Cohesion Fund (CF) |
| 4. Economic, social and territorial cohesion | 4.70 Regional policy | 4.70.04 Urban policy, cities, town and country planning |
| 4. Economic, social and territorial cohesion | 4.70 Regional policy | 4.70.05 Regional cooperation, cross-border cooperation |
| 4. Economic, social and territorial cohesion | 4.70 Regional policy | 4.70.06 Outlying and outermost regions, overseas countries and territories |
| 4. Economic, social and territorial cohesion | 4.70 Regional policy | 4.70.07 European Regional Development Fund (ERDF) |
| 5. Economic and monetary system | 5.03 Global economy and globalisation |  |
| 5. Economic and monetary system | 5.05 Economic growth |  |
| 5. Economic and monetary system | 5.10 Economic union | 5.10.01 Convergence of economic policies, public deficit, interest rates |
| 5. Economic and monetary system | 5.10 Economic union | 5.10.02 Price policy, price stabilisation |
| 5. Economic and monetary system | 5.20 Monetary union | 5.20.01 Coordination of monetary policies, European Monetary Institute (EMI), Economic and Monetary Union (EMU) |
| 5. Economic and monetary system | 5.20 Monetary union | 5.20.02 Single currency, euro, euro area |
| 5. Economic and monetary system | 5.20 Monetary union | 5.20.03 European Central Bank (ECB), ESCB |
| 6. External relations of the Union | 6.10 Common foreign and security policy (CFSP) | 6.10.01 Foreign and common diplomatic policy |
| 6. External relations of the Union | 6.10 Common foreign and security policy (CFSP) | 6.10.02 Common security and defence policy (CSDP); WEU, NATO |
| 6. External relations of the Union | 6.10 Common foreign and security policy (CFSP) | 6.10.03 Armaments control, non-proliferation nuclear weapons |
| 6. External relations of the Union | 6.10 Common foreign and security policy (CFSP) | 6.10.04 Third-country political situation, local and regional conflicts |
| 6. External relations of the Union | 6.10 Common foreign and security policy (CFSP) | 6.10.05 Peace preservation, humanitarian and rescue tasks, crisis management |
| 6. External relations of the Union | 6.10 Common foreign and security policy (CFSP) | 6.10.08 Fundamental freedoms, human rights, democracy in general |
| 6. External relations of the Union | 6.10 Common foreign and security policy (CFSP) | 6.10.09 Human rights situation in the world |
| 6. External relations of the Union | 6.20 Common commercial policy in general | 6.20.01 Agreements and relations in the context of the World Trade Organization (WTO) |
| 6. External relations of the Union | 6.20 Common commercial policy in general | 6.20.02 Export/import control, trade defence, trade barriers |
| 6. External relations of the Union | 6.20 Common commercial policy in general | 6.20.03 Bilateral economic and trade agreements and relations |
| 6. External relations of the Union | 6.20 Common commercial policy in general | 6.20.04 Union Customs Code, tariffs, preferential arrangements, rules of origin |
| 6. External relations of the Union | 6.20 Common commercial policy in general | 6.20.05 Multilateral and plurilateral economic and trade agreements and relations |
| 6. External relations of the Union | 6.20 Common commercial policy in general | 6.20.06 Foreign direct investment (FDI) |
| 6. External relations of the Union | 6.20 Common commercial policy in general | 6.20.07 Macro-financial assistance to third countries |
| 6. External relations of the Union | 6.30 Development cooperation | 6.30.01 Generalised scheme of tariff preferences (GSP), rules of origin |
| 6. External relations of the Union | 6.30 Development cooperation | 6.30.02 Financial and technical cooperation and assistance |
| 6. External relations of the Union | 6.30 Development cooperation | 6.30.03 European Development Fund (EDF) |
| 6. External relations of the Union | 6.40 Relations with third countries | 6.40.01 Relations with EEA/EFTA countries |
| 6. External relations of the Union | 6.40 Relations with third countries | 6.40.02 Relations with central and eastern Europe |
| 6. External relations of the Union | 6.40 Relations with third countries | 6.40.03 Relations with South-East Europe and the Balkans |
| 6. External relations of the Union | 6.40 Relations with third countries | 6.40.04 Relations with the Commonwealth of Independent States (CIS) |
| 6. External relations of the Union | 6.40 Relations with third countries | 6.40.05 Relations with the Mediterranean and southern European countries |
| 6. External relations of the Union | 6.40 Relations with third countries | 6.40.06 Relations with ACP countries, conventions and generalities |
| 6. External relations of the Union | 6.40 Relations with third countries | 6.40.07 Relations with African countries |
| 6. External relations of the Union | 6.40 Relations with third countries | 6.40.08 Relations with Asian countries |
| 6. External relations of the Union | 6.40 Relations with third countries | 6.40.10 Relations with Latin America, Central America, Caribbean islands |
| 6. External relations of the Union | 6.40 Relations with third countries | 6.40.11 Relations with industrialised countries |
| 6. External relations of the Union | 6.40 Relations with third countries | 6.40.12 Relations with developing countries in general |
| 6. External relations of the Union | 6.40 Relations with third countries | 6.40.13 Relations with/in the context of international organisations: UN, OSCE, OECD, Council of Europe, EBRD |
| 6. External relations of the Union | 6.40 Relations with third countries | 6.40.14 Relations with non-governmental organisations, NGOs |
| 6. External relations of the Union | 6.40 Relations with third countries | 6.40.15 European neighbourhood policy |
| 6. External relations of the Union | 6.50 Emergency, food, humanitarian aid | 6.50.01 Aid to refugees |
| 6. External relations of the Union | 6.50 Emergency, food, humanitarian aid | 6.50.02 Emergency Aid Reserve |
| 7. Area of freedom, security and justice | 7.10 Free movement and integration of third-country nationals | 7.10.02 Schengen area, Schengen acquis |
| 7. Area of freedom, security and justice | 7.10 Free movement and integration of third-country nationals | 7.10.04 External borders crossing and controls, visas |
| 7. Area of freedom, security and justice | 7.10 Free movement and integration of third-country nationals | 7.10.06 Asylum, refugees, displaced persons; Asylum, Migration and Integration Fund (AMIF) |
| 7. Area of freedom, security and justice | 7.10 Free movement and integration of third-country nationals | 7.10.08 Migration policy |
| 7. Area of freedom, security and justice | 7.30 Police, judicial and customs cooperation in general | 7.30.02 Customs cooperation |
| 7. Area of freedom, security and justice | 7.30 Police, judicial and customs cooperation in general | 7.30.05 Police cooperation |
| 7. Area of freedom, security and justice | 7.30 Police, judicial and customs cooperation in general | 7.30.08 Action to combat racism and xenophobia |
| 7. Area of freedom, security and justice | 7.30 Police, judicial and customs cooperation in general | 7.30.09 Public security |
| 7. Area of freedom, security and justice | 7.30 Police, judicial and customs cooperation in general | 7.30.12 Control of personal weapons and ammunitions |
| 7. Area of freedom, security and justice | 7.30 Police, judicial and customs cooperation in general | 7.30.20 Action to combat terrorism |
| 7. Area of freedom, security and justice | 7.30 Police, judicial and customs cooperation in general | 7.30.30 Action to combat crime |
| 7. Area of freedom, security and justice | 7.40 Judicial cooperation | 7.40.02 Judicial cooperation in civil and commercial matters |
| 7. Area of freedom, security and justice | 7.40 Judicial cooperation | 7.40.04 Judicial cooperation in criminal matters |
| 7. Area of freedom, security and justice | 7.90 Justice and home affairs |  |
| 8. State and evolution of the Union | 8.10 Revision of the Treaties, intergovernmental conferences |  |
| 8. State and evolution of the Union | 8.20 Enlargement of the Union | 8.20.01 Candidate countries |
| 8. State and evolution of the Union | 8.20 Enlargement of the Union | 8.20.04 Pre-accession and partnership |
| 8. State and evolution of the Union | 8.30 Treaties in general | 8.30.10 Principles common to the Member States, EU values |
| 8. State and evolution of the Union | 8.40 Institutions of the Union | 8.40.01 European Parliament |
| 8. State and evolution of the Union | 8.40 Institutions of the Union | 8.40.02 Council of the Union |
| 8. State and evolution of the Union | 8.40 Institutions of the Union | 8.40.03 European Commission |
| 8. State and evolution of the Union | 8.40 Institutions of the Union | 8.40.04 Court of Justice, Court of First Instance |
| 8. State and evolution of the Union | 8.40 Institutions of the Union | 8.40.05 Court of Auditors |
| 8. State and evolution of the Union | 8.40 Institutions of the Union | 8.40.07 European Investment Bank (EIB) |
| 8. State and evolution of the Union | 8.40 Institutions of the Union | 8.40.08 Agencies and bodies of the EU |
| 8. State and evolution of the Union | 8.40 Institutions of the Union | 8.40.09 European officials, EU servants, staff regulations |
| 8. State and evolution of the Union | 8.40 Institutions of the Union | 8.40.10 Interinstitutional relations, subsidiarity, proportionality, comitology |
| 8. State and evolution of the Union | 8.40 Institutions of the Union | 8.40.11 Relations with Member State governments and national parliaments |
| 8. State and evolution of the Union | 8.40 Institutions of the Union | 8.40.14 European Council |
| 8. State and evolution of the Union | 8.40 Institutions of the Union | 8.40.16 Relations with interest representatives |
| 8. State and evolution of the Union | 8.50 EU law | 8.50.01 Implementation of EU law |
| 8. State and evolution of the Union | 8.50 EU law | 8.50.02 Legislative simplification, coordination, codification |
| 8. State and evolution of the Union | 8.60 European statistical legislation |  |
| 8. State and evolution of the Union | 8.70 Budget of the Union | 8.70.01 Financing of the budget, own resources |
| 8. State and evolution of the Union | 8.70 Budget of the Union | 8.70.02 Financial regulations |
| 8. State and evolution of the Union | 8.70 Budget of the Union | 8.70.03 Budgetary control and discharge, implementation of the budget |
| 8. State and evolution of the Union | 8.70 Budget of the Union | 8.70.04 Protecting financial interests of the EU against fraud |
| 8. State and evolution of the Union | 8.70 Budget of the Union | 8.70.40 Basic budgetary texts |
| 8. State and evolution of the Union | 8.70 Budget of the Union | 8.70.49 2025 budget |
| 8. State and evolution of the Union | 8.70 Budget of the Union | 8.70.50 2020 budget |
| 8. State and evolution of the Union | 8.70 Budget of the Union | 8.70.51 2021 budget |
| 8. State and evolution of the Union | 8.70 Budget of the Union | 8.70.52 2022 budget |
| 8. State and evolution of the Union | 8.70 Budget of the Union | 8.70.53 2023 budget |
| 8. State and evolution of the Union | 8.70 Budget of the Union | 8.70.54 2024 budget |
| 8. State and evolution of the Union | 8.70 Budget of the Union | 8.70.58 2018 budget |
| 8. State and evolution of the Union | 8.70 Budget of the Union | 8.70.59 2019 budget |
| 8. State and evolution of the Union | 8.70 Budget of the Union | 8.70.70 Flexibility instrument |

# Appendix D

**Political formation of the EP**

During the 9th term of the EP, MEPs were organized into seven distinct parliamentary groups, each representing a coalition of national parties with shared ideological and policy orientations. Additionally, there were several NI members who did not affiliate with any official group. Below is an overview of these parliamentary groups (and the set of NI MEPs) and their ideological positioning:

EPP - European People’s Party Group

The EPP is the largest and most influential group in the EP. It brings together Christian democratic, conservative, and center-right parties from across the EU that support greater EU integration while balancing national sovereignty. It advocates a strong single market, ensuring fair competition, consumer protection, and digital innovation to enhance the EU’s competitiveness. On migration and security, the EPP promotes stronger border controls, increased cooperation with third countries, and a reformed asylum system, aiming to strengthen EU security while allowing controlled legal migration. It also supports Schengen improvements and EU-wide police cooperation. Economically, the EPP pushes for fiscal discipline, tax harmonization, and stronger EU financial mechanisms, reinforcing the Eurozone’s stability. It also prioritizes economic cohesion by investing in infrastructure and employment, reducing regional disparities. In foreign relations, the EPP favors EU enlargement, stronger global partnerships, and a common security policy. On governance, the EPP backs more power for the EP, deeper institutional cooperation, and treaty reforms to make decision-making more efficient. Overall, the EPP’s policies support deeper European integration, strengthening economic, political, and security ties while maintaining some national flexibility.

*In:* [*https://www.eppgroup.eu/*](https://www.eppgroup.eu/)

S&D - Progressive Alliance of Socialists and Democrats

The S&D is the second-largest group in the EP. It is composed of social democratic, socialist, and labor parties, advocating for social justice, workers’ rights, and a balanced approach between economic growth and social protection. S&D in the EP is a pro-integration, center-left group that prioritizes social justice, economic equality, and stronger EU cooperation. On migration, it advocates a fair and humane asylum system, ensuring solidarity among EU member states and opposing strict border policies. In the single market, S&D pushes for workers’ rights, consumer protections, and fair trade, while supporting regulations on big corporations to promote fairness. Economically, S&D favors progressive taxation, strong social protections, and EU-wide policies to reduce inequality. It supports a stronger Eurozone and economic policies that prioritize public investment over austerity. The group also champions regional development to close economic gaps between richer and poorer member states. In foreign relations, S&D supports EU enlargement, global human rights, and fair trade policies. On security and justice, it promotes civil liberties, cooperation in law enforcement, and the protection of fundamental rights. S&D strongly backs deeper European integration, advocating for more power to EU institutions, stronger social policies, and a united foreign policy. Its vision fosters a more cohesive, socially responsible, and fair EU, reinforcing common European values like democracy, equality, and solidarity.

*In:* <https://www.socialistsanddemocrats.eu/>

Renew - Renew Europe

The Renew Europe group, formerly known as the Alliance of Liberals and Democrats for Europe, represents liberal and centrist political forces in the EP. It promotes pro-European integration policies, market-friendly economic reforms, and civil liberties. On migration, Renew advocates a fair but effective asylum system, balancing strong border management with human rights protections. It promotes EU-wide coordination on migration and asylum to ensure solidarity between member states. In the single market, Renew pushes for full economic integration, fair competition, and digital innovation. It supports consumer rights, free trade, and labor mobility, ensuring mutual recognition of qualifications across Europe. Regarding EU institutions, Renew favors stronger democratic accountability and more power for the EP. Economically, Renew backs the Eurozone, harmonized tax policies, and investments in infrastructure and education to drive innovation and equal opportunities. It also promotes private sector growth alongside public investment. In foreign policy, Renew supports EU enlargement, a common defense policy, and global human rights advocacy. Overall, Renew strongly supports deeper European integration, advocating for a federalist, united, and efficient EU. Its policies reinforce economic, political, and social cohesion, ensuring that the EU is stronger, fairer, and more globally influential.

*In:* [*https://www.reneweuropegroup.eu/*](https://www.reneweuropegroup.eu/)

Greens/EFA - The Greens/European Free Alliance

The Greens/European Free Alliance consists of green parties and environmentalists and is a pro-European, progressive group in the EP that focuses on climate action, social justice, and democracy. On migration, Greens/EFA supports humane asylum policies, fair distribution of refugees, and stronger integration efforts, rejecting strict border controls. In the single market, it promotes green and fair trade, stronger consumer rights, and corporate accountability to protect workers and the environment. Regarding EU institutions, Greens/EFA pushes for more transparency and democratic reforms, giving more power to the EP. It also supports treaty changes to reinforce climate and social commitments. Economically, the group favors fair taxation, tackling corporate tax evasion, and investing in sustainable industries. It promotes regional development and social protections to reduce economic inequality. In foreign policy, Greens/EFA advocates fair trade, human rights, and climate diplomacy, opposing arms sales to authoritarian regimes. On justice and security, it prioritizes human rights, pushing for reforms to EU border control agencies like Frontex. Greens/EFA strongly supports deeper European integration, emphasizing stronger institutions, common environmental policies, and social justice. Its vision fosters a more sustainable, democratic, and united EU, reinforcing EU values of human rights, fairness, and environmental protection.

*In:* [*https://www.greens-efa.eu/en/*](https://www.greens-efa.eu/en/)

The Left - The Left in the European Parliament

The Left in the European Parliament, previously known as the European United Left/Nordic Green Left (GUE/NGL) before January 2021 (which is how it is labeled in this study’s dataset) is a left-wing to far-left parliamentary group that advocates radical social policies, wealth redistribution, and opposition to austerity measures. It is a progressive group that prioritizes workers’ rights, social justice, and environmental sustainability while opposing corporate influence in EU policies. On migration, it supports humane asylum policies, fair distribution of refugees, and strong anti-discrimination measures, promoting solidarity among member states. In the single market, The Left advocates strong consumer rights, public services protection, and fair labor conditions, opposing privatization and deregulation. Regarding EU institutions, The Left seeks more democratic transparency and citizen participation, but criticizes EU neoliberal economic policies, calling for greater control over multinational corporations. It promotes a fairer economic system, backing progressive taxation, wealth redistribution, and stronger labor protections to reduce inequality across the EU. In foreign policy, it supports international cooperation and fair trade agreements, opposing militarization and arms sales. On security and justice, it defends civil liberties while advocating human rights-based law enforcement. The Left demands reforms to make the EU more social, democratic, and sustainable. Its vision reinforces common European values of equality, social justice, and human rights while opposing policies that prioritize economic elites over citizens.

*In:* [*https://left.eu/*](https://left.eu/)

ECR - European Conservatives and Reformists Group

The ECR is a center-right to right-wing group that supports national sovereignty, a decentralized EU, economic freedom, and free-market principles. It positions itself as an alternative to federalist visions of the EU, advocating economic liberalization and stricter migration policies. On migration, ECR supports strong national control, rejecting an EU-wide asylum system and pushing for stricter border policies. In the single market, it advocates free trade and deregulation, opposing excessive EU intervention in national economies. Regarding EU institutions, ECR rejects further EU integration, calling for more national decision-making and treaty reforms to return powers to member states. It opposes a federalist EU and favors a flexible Europe of nations. Economically, ECR promotes low taxes, fiscal responsibility, and reduced EU control over budgets. It criticizes the European Central Bank and opposes EU taxation. On foreign relations, it supports bilateral agreements over centralized EU policies. In security and justice, ECR favors strong border controls and national sovereignty over law enforcement, rejecting EU-wide judicial harmonization. ECR’s position leads to less European integration, prioritizing national independence over collective EU decision-making. It opposes deeper political unification, emphasizing a looser EU where member states maintain control over key policies, aligning with conservative and Eurosceptic values.

*In:* [*https://www.ecrgroup.eu/*](https://www.ecrgroup.eu/)

ID - Identity and Democracy

ID was a far-right, nationalist, and Eurosceptic political group that promoted stricter immigration policies, national sovereignty, opposition to deeper EU integration, and economic protectionism. On migration, ID called for strong national control over borders, rejecting EU-led asylum policies and mandatory refugee quotas. In the single market, it promoted economic protectionism, opposing EU regulations and the European Green Deal, which it sees as harmful to national industries. Regarding EU institutions, ID rejects greater power for the EP, advocating a looser EU where member states decide independently. It opposes EU cohesion funds, arguing that economic policies should be nationally controlled. ID also opposes EU taxation and fiscal integration, criticizing the European Central Bank and calling for national control over financial policies. In foreign policy, it rejects EU-wide coordination, preferring bilateral agreements and strong national defense policies. ID’s stance weakens European integration, advocating less power to EU institutions and greater national autonomy. Its vision promotes economic nationalism and strict border controls, challenging EU values of unity, cooperation, and solidarity while prioritizing national interests over collective EU policies.

As of the EP’s 10th term, the ID group ceased to exist and was replaced by a new political formation, named the Patriots for Europe group. This new group continues to advocate for nationalism, Euroscepticism, and opposition to deeper European integration, bringing together various right-wing and populist parties across the EU.

*In:* [*https://patriots.eu/home*](https://patriots.eu/home)

[*https://political.party/id-european-parliament-elections/*](https://political.party/id-european-parliament-elections/)

NI - Non-attached members

NI members are MEPs who do not belong to any of the recognized parliamentary groups. They can be independent politicians, members of national parties that do not align with existing groups, or representatives of extremist movements that are excluded from those groups.

The composition of the EP during its 9th term experienced notable changes between its commencement and conclusion, primarily due to the UK's withdrawal from the EU (Brexit) on 31 January 2020 and from MEP group changes.

Initial Composition (2 July 2019): At the outset, the EP comprised 751 MEPs distributed among seven political groups and NI MEPs.

Uma imagem com texto, captura de ecrã, diagrama

Os conteúdos gerados por IA poderão estar incorretos.

By the end of the term, the composition evolved due to various factors. These included national elections (since MEPs often interrupt their EP terms to serve in national governments), national party realignments, and individual MEPs changing affiliations. The final seat distribution was as follows.

Uma imagem com texto, captura de ecrã, diagrama

Os conteúdos gerados por IA poderão estar incorretos.

# Appendix E

Uma imagem com texto, captura de ecrã, software, Software de multimédia

Os conteúdos gerados por IA poderão estar incorretos.

A picture containing text, screenshot, font, design

Description automatically generated

1. <https://howtheyvote.eu/> [↑](#footnote-ref-2)
2. <https://oeil.secure.europarl.europa.eu/oeil/en> [↑](#footnote-ref-3)