

LETTER

# Studying Multi-Level Systems with Cross-Level Data: Introducing Three Integrated Datasets

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(Received 3 November 2023; revised 14 March 2024; accepted 26 September 2024)

## Abstract

Most political systems consist of multiple layers. Yet datasets are predominantly situated at a single territorial tier, encouraging methodological nationalism, regionalism, and localism. We present three new integrated datasets that include electoral, institutional, ideological, and government composition data on the country and regional level (RD|CED, RED and RPSD). With this data, we cover 337 country elections on the regional level, 2,226 regional elections, and 2,825 regional cabinets in 365 regions of 21 countries from 1941 to 2019, accounting for 800 political parties and their ideological positions. Combined, these data complement and extend existing datasets and facilitate the study of political interaction across levels. Data are available at <http://multi-level-cross-level-politics.eu/> or can be accessed through the Havard Dataverse repository. We conclude with an agenda for future cross-level studies.

**Keywords:** data; multi-level; ideology; regional elections; regional governments

## Introduction

Most political systems consist of multiple layers. While this fact is widely acknowledged, datasets in political science are still predominantly situated at a single territorial tier. These datasets provide impressive coverage for the country level over time and geographies (Armingeon et al. 2023a; Armingeon et al. 2023b; Comparative Study of Electoral Systems 2021; Döring, Huber, and Manow 2023; Lehmann et al. 2024) and are increasingly complemented by datasets that provide regional (Alonso, Gómez, and Cabeza 2013; Hooghe, Marks, and Schakel 2016; Massetti and Schakel 2016; Massetti and Schakel 2021; Schakel and Romanova 2023; Shair-Rosenfield, Schakel, and Niedwiecki 2021), municipality or local data (Bremer, Di Carlo, and Wansleben 2023; Debus and Gross 2016; Gross and Jankowski 2020).

However, these datasets rarely harmonize and integrate data across several tiers (exceptions are Garritzmann, Röth, and Kleider 2021; Schakel 2009; Schakel 2013a; Schakel 2013b; Schakel and Jeffery 2013). The provision of data always promotes some research angles more than others. A predominance of national data encourages methodological and empirical nationalism (Schakel and Jeffery 2013), whereas isolated regional or local data will encourage methodological regionalism and localism (Garritzmann, Röth, and Kleider 2021). While we do not deny the value of numerous studies on a single territorial tier, integrating data across levels is crucial for any research agenda that takes the study of multi-level systems seriously because a key characteristic of

multi-level systems is that political processes and outcomes are affected by interdependencies and interplay between different territorial tiers (Garritzmann, Röth, and Kleider 2021; Hooghe 1996; Hooghe and Marks 2001; Marks 1993; Marks, Hooghe, and Blank 1996; Papadopoulos 2007; Rhodes 1997; Rokkan and Flora 2000; Scharpf 2001).<sup>1</sup>

This research note introduces three datasets that seek to fill this void by combining electoral, ideological, and institutional data across the nation-state and the regional level in twenty-one countries from 1941 to 2019 (see Appendix for the coverage). We start by summarizing the literature that highlights the interaction of territorial tiers. We next survey existing datasets that provide cross-level information and discuss their strengths and weaknesses. We then introduce the three new datasets – RD|CED, RED, and RPSD – and highlight their complementary value. We conclude by pointing to the significant benefits multi-level datasets afford.

### Beyond the Single-Tier Perspective

From the introduction of the term ‘multi-level governance’ in 1993 (Marks 1993), all canonical studies on multi-level governance have stressed one key attribute of multi-level systems – interdependence across tiers (Hooghe 1996; Hooghe and Marks 2001; Marks, Hooghe, and Blank 1996; Papadopoulos 2007; Rhodes 1997; Rokkan and Flora 2000; Scharpf 2001). In multi-level systems, because no level holds absolute power to achieve (or prevent) political solutions, this necessarily involves interaction, competition, and collaboration across levels. Interdependencies generate the need for interaction across levels, and studying such interactions requires data that reach beyond a single tier. Self-evidently, interdependencies equally exist across units within one level – let us say, across regions. These are *horizontal* dependencies, while requirements for coordination and interdependencies between tiers are *vertical* (Schakel and Romanova 2021).

Empirically, vertical interdependencies can take many forms but are typically informed by the description of specific competencies backed up by authority (Hooghe, Marks, and Schakel 2016). In highly decentralized systems, the country level depends on the coordination and cooperation of lower levels – as studies on education, health, and immigration have repeatedly shown (see, for example, Bélanger and Lavenex 2023; Garritzmann, Röth, and Kleider 2021; Zapata-Barrero, Caponio, and Scholten 2017). Not only does the distribution of policy competencies matter but also whether those competencies are backed up by fiscal capacities. This has been termed the difference between fiscally balanced and imbalanced multi-level arrangements (Lin and Zhou 2021). Fiscal dependencies can exist in many ways; for example, in asymmetry between policy responsibilities and funding opportunities or in terms of public deficits and bail-out obligations (Hernández Rodríguez 2008) – the so-called bailout problem (Von Hagen and Eichengreen 1996). The distribution of resources on one level might in part depend on the political willingness and ideological or organizational alignment to actors on other tiers, as the literature on pork-barrel politics and alignment has shown (Hanretty 2021; Kleider, Röth, and Garritzmann 2020; Solé-Ollé and Sorribas-Navarro 2008). Thus, interdependencies exist even in the constellation of a formally clear separation of authority across levels (self-rule). In many multi-level systems, interdependencies are formally in-built by defining authority over policy domains as a joint competence across levels (shared rule). Self and shared rules provide different institutional incentives for competition and collaboration in multi-level systems (Mueller 2019). In short, multi-level systems provide a variety of interdependencies that are inscribed into their political systems.

Because interdependencies are in-built into the institutions of multi-level systems, political behaviour is shaped across levels, too. Studies on second-order elections have demonstrated how dynamics on one level can affect behaviour on another (Baethge, Dallendörfer, and Kaiser 2019; Marsh 1998; Reif, Schmitt, and Norris 1997; Schakel and Jeffery 2013; Swenden and Maddens

<sup>1</sup>The datasets presented are in fact two level: they cover the regional and country levels, capturing one of the most important cross-level interactions in many multi-level systems. Our data does not currently cover the local or supra-national levels.

2009). Similar conclusions can be drawn from the debate about blame attribution in multi-level systems (Baute and Pellegata 2023; Heinkelmann-Wild and Zangl 2020; León, Jurado, and Madariaga 2020).

At the partisan level, many studies have addressed how the fortunes of a programmatic orientation of specific parties or party families on one level can be influenced by parties on another level (Deschouwer 2003; Detterbeck and Hepburn 2010; Fabre 2008; Guinjoan 2016; Meguid 2015; Swenden and Maddens 2009; Thorlakson 2018). The causes of voters' and politicians' behaviour on one level might often be informed by considerations on another level or multiple levels simultaneously. The effects parties have on each other across levels do not, of course, remain on the micro level but can influence entire party systems (Hepburn 2018, 168). In other words, micro effects translate into macro phenomena such as polarization or fragmentation that, again, create follow-up dynamics. Very few studies have looked at such micro-macro, macro-micro, or macro-macro interactions (see for a similar argument Golder et al. 2017).

The study of all these cross-level interactions and dynamics necessarily requires integrated data across levels that are typically gathered for every individual study in isolation. Accordingly, the accumulation of evidence on how multi-level systems operate could benefit from ready-made datasets that allow researchers to leapfrog resource-intensive data generation and processing steps. For a long time, those data have not existed and are still relatively sparse. In the following section, we describe existing cross-level data sources and point to the additions that our datasets provide.

### Three New Datasets

If researchers are working with a cross-level question and using existing datasets, the chance is very high that Arjan Schakel is involved. Arjan Schakel has been involved in mapping political authority in multi-level systems (Hooghe, Marks, and Schakel 2016; Shair-Rosenfield, Schakel, and Niedwiecki 2021), and has mapped fine-grained policy competencies across levels (Schakel 2009; Schakel 2010). He gathered extensive data on regional, regionally disaggregated national, and European elections (Schakel and Romanova 2023). With Emanuele Massetti, he engaged in mapping the ideology of regionalist parties and collected data on regional government compositions (Massetti and Schakel 2016; Schakel 2018).<sup>2</sup> The gathering of our data has benefited from Arjan Schakel's pioneering work in many ways.

Despite some overlap, our three datasets provide important complements to the existing datasets that cover multiple levels. First, our datasets are easy to merge and thus provide a single source that combines electoral, institutional and partisan information on the partisan and macro levels. Second, they provide electoral data on regional elections and regionally disaggregated country-level elections in countries that have not so far been covered. Third, it is by far the most encompassing dataset on the regional level that includes partisan ideology measures, as well as regional government composition and ideology measures. Finally, combining partisan ideology and government ideology data on the regional and country levels with institutional variables provides a new and unique opportunity to study multi-level politics.

Notwithstanding our core claim that multi-level data are required for multi-level questions, we provide the data in a structure of three distinct datasets. These distinct datasets allow for various individualized combinations of merged multi-level data while, at the same time facilitating the parsimonious use of single datasets for other research questions. For example, disaggregated country-level election data might not be of interest to researchers working on regional elections. Others might benefit only from the dataset providing regional government positions. Thus, we encourage multi-level research but do not want thereby to hamper single-tier research.

In the following, we describe the complementary contribution of the new datasets in more detail. The first two datasets cover different aspects of elections in multi-level systems at the party

<sup>2</sup><https://www.arjanschakel.nl/index.php/regional-elections>.

level. The third moves to the regional party system level, including information such as regional government positions, regional electoral systems, and socio-demographic data on the regional level. Most importantly, the three datasets are easy to combine and allow the study of cross-level interactions. Before we introduce the three new datasets, it is helpful to set out three concepts that are crucial for the composition of all three: the definition of a region, the definition of a party, and the temporal specification:

**Definition of a region:** The definition of a region is closely related to the definition within the dataset of the Regional Authority Index (Hooghe, Marks, and Schakel 2016). A region is defined as a jurisdiction between the country government and local government. We do not apply the population criterion used by Hooghe, Marks, and Schakel (2016), but define a region as the second jurisdictional tier below the country level (compare the coverage table in the Appendix as well as the codebooks).

**Definition of a party:** We use the definition of a political party as indicated by our sources. However, we put in a great deal of effort to identify and synchronize the partisan names and IDs across sources and levels. The IDs always favour continuity over change. For example, a party might change its name but otherwise remain the same in terms of organization and personnel; here we change the name but retain the old ID. This solution has the advantage that more fine-grained distinctions can easily be made ex-post, whereas the harmonization of IDs in the case of different party names would be more demanding.

**Temporal specification:** We provide two distinct temporal configurations of the dataset. In its standard configuration, the dataset is based on electoral periods. A second specification provides yearly data.

### **The Regionally Disaggregated Country Elections Dataset (RD|CED)**

The Regionally Disaggregated Country Elections dataset (RD|CED) entails country-level election results at the regional level. This dataset is unique in terms of temporal and geographical coverage and was initially gathered to analyse the electoral importance of regions for country governments. Accordingly, it includes many variables based on partisan electoral results that capture the relative electoral importance of regions from a country's partisan perspective (see Alonso 2012; O'Neill 2003; Röth and Kaiser 2019; Röth et al. 2016 for related arguments).

In terms of coverage, Schakel's data cover substantially more countries in Eastern Europe whereas the RD|CED adds some countries in Latin America. Furthermore, the RD|CED – while typically starting in the mid-1940s – is more up-to-date (terminating in 2019 instead of 2009). However, both datasets can and should be combined as necessary. The most substantial difference is that the RD|CED is already combined into a single data frame and includes IDs that allow easy merging with other datasets, such as those on party positions (Manifesto Project IDs, Regional Manifestos Project IDs, Chapel Hill Expert Survey IDs) or the Regional Authority Index (harmonized regional IDs). Furthermore, the RD|CED can be combined with our two further datasets (compare Table 1 for the key contribution of the RD|CED). Please consult the RD|CED codebook for a detailed overview of concepts, decisions, sources, coverage and variables (Röth et al. 2025c).

### **The Regional Elections Dataset (RED)**

The Regional Elections dataset (RED) covers regional election results. Coverage is necessarily less comprehensive than the RD|CED because regional elections must exist in the first place in order to generate data. However, whenever regional elections took place in the sample of the RD|CED, we

**Table 1.** Key contributions of the RD|CED

<i>Regionally disaggregated election data from the country level</i>	Party-level election results as well as regional and country-level electoral information such as turnout and valid votes
<i>Electoral importance of a region</i>	Several variables cover the relative electoral importance of regions on the party level from a country perspective
<i>Ideological positions</i>	Different party-position measurements on the country, regional, and country-cabinet levels, weighted ideological positions of the region (centres of gravity) and ideological distance measures between a region and the country level
<i>ID-based links to other datasets</i>	ID-based links to datasets such as the Regional Authority Index (Shair-Rosenfield, Schakel, and Niedwiecki 2021), country-level Manifesto Project (Lehmann et al. 2024), Regional Manifestos Project (Alonso, Gómez, and Cabeza 2013), CHES (Jolly, Bakker, and Hooghe 2022) and the new datasets RED and RPSD

also captured the results at the level of single parties. The RED can thus be easily merged with the RD|CED dataset to compare electoral results across levels or regions.

We invested a good deal of effort in providing party positions on the regional level. Country-level party positions exist in various forms, typically based either on manifestos with good coverage across time and geography or on expert surveys, reaching beyond pledges from party platforms but with lower coverage, particularly across time. For the regional level, while there exists a manifesto-based equivalent (Alonso, Gómez, and Cabeza 2013), it has significantly lower coverage (covering regions in the UK, Spain, and Italy), but no systematic expert survey data exists. For the provision of regional party positions with broader coverage, we proceed as follows:

- (1) Party positions from the country-level Manifesto Project are used, based on the nearest temporal match and party ID.
- (2) Parties not thereby covered are given decade averages from the same party family in the Manifesto Project. Party family affiliations are qualitatively located, using ideological markers such as social democracy, socialism or conservatism that we identified in descriptions of the parties.

The party positions are based on three distinct procedures and cover an overall left-right (RILE; Lehmann et al. 2024), a state market, and a cultural dimension. We included the RILE as the most prominent measurement of an overall left-right dimension. We decided to add a cultural and economic dimension based on manifesto data but scaled by latent item response models (compare Garritzmann, Röth, and Kleider 2021; Röth 2017) because it has been shown to have higher convergence validity with expert surveys. Furthermore, we provide a cultural and economic dimension because scholars increasingly acknowledge the multi-dimensionality of party competition.

Using country-level party positions for parties that compete on the regional level is probably the most controversial decision in the setup of this dataset. We justify and validate this choice in the codebook of the RED (part 4), where we discuss the different options in terms of validity, comparability, and coverage. Validating our positions with regional manifestos is a methodological challenge in itself, which is described in closer detail in the RED codebook. The correlation between the overall left-right positions of the same party on the regional and country levels depends on the positional measure. For the standard measure, RILE, the correlation is 0.73, whereas item response-based positions reach a correlation of 0.84 (based on manifestos from the UK, Spain, and Italy). For such validation, we put regional and country-level manifestos in a single positional space by running latent item response models on a combined dataset (compare Table 2 for the results). The size of these correlations is comparable to the size of

**Table 2.** Correlation table of country-level and regional party positions of the same parties (closest temporal match)

	All parties	Country-level parties	Regionalist parties
RILE	0.73	0.74	0.29
Item response left and right	0.84	0.86	0.45
Market dimension	0.80	0.81	0.36
Cultural dimension	0.71	0.74	0.41
<i>n</i>	653	400	153

**Note:** Results are based on a generalized item response model using the logarithm of dimension-based issue salience as provided by the country and regional manifesto projects. We exclude observations where the distance between the regional and national manifesto was higher than 5 years.

**Table 3.** Key contributions of the RED

<i>Regional election data</i>	Regional election results on the party level including information such as votes, seats, turnout, and valid votes
<i>Regional cabinet data</i>	Regional cabinet information and participation data on the party level
<i>Ideological positions</i>	Ideological positions of parties on the regional level based on country and regional manifestos and expert surveys
<i>ID links to other datasets</i>	ID-based links to datasets such as the Regional Authority Index (Shair-Rosenfield, Schakel, and Niedwiecki 2021), country-level Manifesto Project (Lehmann et al. 2024), and Regional Manifestos Project (Alonso, Gómez, and Cabeza 2013), CHES (Jolly, Bakker, and Hooghe 2022), as well as the new RD CED and RPSD

correlations between positions for European and country elections (Braun and Schmitt 2020) or the comparison of regional and country-level manifesto-based positions in Germany (compare Kleider, Röth, and Garritzmann 2020).

Those who prefer alternative measurements are free to take advantage of the different harmonized manifesto IDs. The dataset includes IDs and alternative positional measurements from datasets such as CHES (Jolly, Bakker, and Hooghe 2022), the Regional Manifestos Project (Alonso, Gómez, and Cabeza 2013) and the country-level Manifesto Project (Lehmann et al. 2024). The RED entails yearly dummies for parties’ inclusion in the regional cabinet, acknowledging that regional cabinets change during electoral periods (compare Table 3 for the key contribution of the RED). Please consult the RED codebook for a detailed overview of concepts, decisions, sources, coverage, and variables (Röth et al. 2025a).

**The Regional Party-System Dataset (RPSD)**

The Regional Party-System dataset (RPSD) aggregates and complements party-level data into a dataset with regional party-system information. It covers not only regional government positions but a series of party-system-level features such as turnout, party-system fragmentation, party-system polarization, and regional centres of gravity. Furthermore, we include country cabinet information to take cross-level relations between regions and countries into account. Country government ideology scores on comparable scales allow the comparison to regional governments and serve as a basis for ideological alignment/proximity scores across levels. We complement the RPSD with institutional information such as electoral systems, district magnitude, degree of self-rule or shared rule, and overall regional authority. Finally, we add regional socio-demographics to the RPSD. Thus, the data include regional unemployment rates, regional growth, GDP per capita, population, and population density measures (compare Table 4 for the key contribution of the RPSD). Please consult the RPSD codebook for a detailed overview of concepts, decisions, sources, coverage and variables (Röth et al. 2025b).



**Table 4.** Key contributions of the RPSD

<i>Regional cabinet data</i>	Regional cabinet information such as head of the regional cabinet, number of parties in government, and period of incumbency
<i>Regional party-system characteristics</i>	Regional electoral system information such as electoral system, and district magnitude; party-system characteristics such as fragmentation and polarization scores
<i>Regional government positions</i>	Ideological positions of regional government based on several party positions measures
<i>Regional socio-demographics</i>	Socio-demographic information about regions, such as unemployment, growth, GDP per capita, people > 65
<i>ID links to other datasets</i>	ID-based links to datasets such as the Regional Authority Index (Shair-Rosenfield, Schakel, and Niedwiecki 2021), as well as the new RED and RD CED

All three datasets can be easily combined to match party-level with party-system-level variables across two territorial tiers. This allows a whole new dimension of data to address questions related to the cross-level nature of multi-level systems. However, such a data structure quickly becomes complex, and temporalities across levels must be synchronized. If we think about ideological alignment or cross-level congruence in the vote, we face country-region dyads. Those dyads change with every change in a variable at either level. We make this manageable by creating yearly data that use the concept of the longest attribute in a year. If we think of ideological alignment and a regional cabinet governing throughout an entire year, and we observe a shift at the country level in October, we attribute the entire year to the alignment score visible from January to October.

## Sources

The most important variables in the datasets rely on election results as well as partisan and institutional information. We primarily used national and regional electoral commission reports, national statistical yearbooks, archival data from electoral commissions, and secondary sources if no primary sources were available. Wikipedia was among these secondary sources; it reports reliable information on regional and country-level elections, as well as regional and national government compositions (Döring and Schwander 2015). Resource constraints prevented the extensive use of media reports. Election data provided by Schakel (2013a; 2021) validated and occasionally complemented some of our own. In cases where regional results were missing or political-administrative reforms rearranged the region's municipal composition, we aggregated municipal-level election results. Where data conflicted, we used the most comprehensive source available with a strong preference for primary sources.

Identifying and merging partisan information across sources and levels is a time-consuming and sometimes complicated task. Party names often differ, and alliances are sometimes but not always considered. The continuity of parties after splits or renaming is handled differently across sources. We treated this issue by using IDs that have a strong preference for continuity. For example, where a party changes its name but remains organizationally highly similar, we change the name but keep the same ID. This decision facilitates the study of parties over time but might be problematic for other purposes: in such cases, users might need to consider creating new IDs. For a more detailed description of the sources and decisions, please consult the country notes in the codebooks.

## Data access

Version 1 of our datasets is accessible via Havard Dataverse. Through our GitHub repository, anyone can propose extensions and corrections to our data on a rolling basis. After reviewing and

curating push requests, further versions will be periodically updated. The aggregated data can be inspected and displayed on the new data portal: <http://multi-level-cross-level-politics.eu/>.

## Conclusion

The more authority is dispersed across different levels of government, the more we must acknowledge the cross-level interdependencies of political dynamics in our studies. While this fact is widely recognized, datasets in political science are still predominantly situated on a single territorial tier. The provision of data always promotes some research angles more than others. A predominance of national data encourages methodological and empirical nationalism, whereas isolated regional or local data will encourage methodological regionalism and localism.

In response, we present three new integrated datasets that include electoral, institutional, ideological and government-composition data on the country and regional levels: RD|CED, RED and RPSD. With this data, we cover 337 country-level elections on the regional level, 2,226 regional elections, and 2,825 regional cabinets in 365 regions of 21 countries from 1941 to 2019, accounting for 800 political parties and their ideological positions. In combination, these data complement and extend existing datasets and facilitate the study of political interaction across levels.

The provision of data and the study of cross-level interactions increases complexity in the sense that it demands harmonization of concepts as well as temporal and geographical specifications across levels. This multi-dimensional harmonization has progressed significantly on the country level, where units of analysis, temporal configurations, sampling strategies, and key concepts are often widely agreed upon. We are far away from such achievements on other levels of territoriality and, in particular, across levels. Accordingly, our datasets may be challenged based on the means by which we achieved – perhaps sometimes almost forced – harmonization. But we attempt to provide a service with plausible solutions for all those who want to study multi-level dynamics without the means or willingness to collect, harmonize and process large amounts of data themselves.

**Supplementary material.** The supplementary material for this article can be found at <https://doi.org/10.1017/S0007123424000553>.

**Data availability statement.** Replication data (Röth *et al.* 2025d) for this article can be found in Harvard Dataverse at: <https://doi.org/10.7910/DVN/FGQFAX>.

**Acknowledgements.** We are very grateful to all the student assistants who have worked on the project over the years: Ben Stefani, Çağan Varol, Keno Röller-Siedenburg, Kristina Ophey, Marcel Buchwald, Mingyi Zhang, Rebecca Kittel, Saskia Gottschalk, Taiwo A. Ahmed, and Vera Serbenyuk. We further had a fruitful collaboration with external researchers such as Arjan Schakel (University of Bergen), Sandra León (Universidad Carlos III de Madrid), and Emanuele Massetti (University of Trento). Finally, we like to thank the editor and three anonymous reviewers of BJPS for their constructive advice and suggestions.

**Financial support.** We are very thankful for the generous funding by the Deutsche Forschungsgemeinschaft (DFG) – Grant numbers: KA 1741/10-1 and KA 1741/10-2.

**Competing interests.** The author(s) declare none.

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## Appendix – Coverage of the Regionally Disaggregated Country Elections dataset (RD|CED)

Country	ID	Regions	Party country- cabinet observations	Period covered	Yearly party observations	Period covered
Australia	2	Australian Capital Territory, New South Wales, Northern Territory, Queensland, South Australia, Tasmania, Victoria, Western Australia	1,683	1946–2019	2,723	1949–2019
Austria	1	Burgenland, Kärnten, Niederösterreich, Oberösterreich, Salzburg, Steiermark, Tirol, Vorarlberg, Wien	1,243	1945–2017	2,552	1949–2017
Belgium	3	Flandern, Wallonien, Brüssel-Halle-Vilvoorde	1,007	1946–2014	1,616	1949–2014
Bosnia and Herzegovina	40	Federation of Bosnia and Herzegovina, Serb Republic	324	1996–2018	497	1996–2018
Canada	4	Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, Northwest Territories, Nova Scotia, Ontario, Prince Edward Island, Quebec, Saskatchewan, Yukon, Nunavut	1,579	1945–2015	4,949	1949–2015
Denmark	5	Copenhagen-Frederiksberg, Faroe Islands, Greenland, Islands, Jutland, Hovedstaden, Midtjylland, Nordjylland, Sjælland, Syddanmark	904	1950–2007	1,717	1950–2007
France	17	Alsace, Aquitaine, Auvergne, Basse-Normandie, Bourgogne, Bretagne, Centre, Champagne-Ardenne, Corse, Franche-Comte, Haute-Normandie, Ile-de-France, Languedoc-Roussillon, Limousin, Lorraine, Nord-pas-de-Calais, Pays-de-la-Loire, Picardie, Poitou-Charente, Provence-Alpes-Cote-d'Azur, Pyrenees, Rhone-Alpes	3,784	1962–2012	5,703	1962–2012
Germany	8	Baden-Württemberg, Bayern, Bremen, Hamburg, Hessen, Niedersachsen, Nordrhein-Westfalen, Rheinland-Pfalz, Schleswig-Holstein, Saarland, Berlin, Brandenburg, Mecklenburg-Vorpommern, Sachsen, Sachsen-Anhalt, Thüringen	3,827	1949–2017	10,461	1949–2017
Italy	10	Abruzzo, Basilicata, Calabria, Campania, Emilia Romagna, Friuli Venezia Giulia, Lazio, Liguria, Lombardia, Marche, Molise, Piemonte, Puglia, Sardegna, Sicilia, Toscana, Trentino Alto Adige, Umbria, Valle d'Aosta, Veneto, Circoscrizione Estero	6,244	1948–2018	6,294	1948–2018
Mexico	36	Aguascalientes, Baja California, Baja California Sur, Campeche, Chiapas, Chihuahua, Coahuila, Colima, Distrito Federal, Durango, Guanajuato, Guerrero, Hidalgo, Jalisco, Mexico, Michoacan, Morelos, Nayarit, Nuevo Leon, Oaxaca, Puebla, Queretaro, Quintana Roo, San Luis Potosí, Sinaloa, Sonora, Tabasco, Tamaulipas, Tlaxcala, Veracruz, Yucatan, Zacatecas	2,963	1964–2015	8,889	1964–2015

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Country	ID	Regions	Party country- cabinet observations	Period covered	Yearly party observations	Period covered
Nicaragua	55	Boaco, Carazo, Chinandega, Chontales, Estelí, Granada, Jinotega, León, Madriz, Managua, Masaya, Matagalpa, Nueva Segovia, Región Autónoma Atlántico Norte, Región Autónoma Atlántico Sur, Río San Juan, Rivas, Chontales-Boaco-Zelaya Central, Las Segovias, Matagalpa-Jinotega, Occidente, Oriente	460	1984–2016	2,280	1984–2016
Norway	13	Akershus, Aust-Agder, Buskerud, Finnmark - Finnmark, Hedmark, Hordaland, Møre og Romsdal, Nord-Trøndelag, Nordland, Oppland, Oslo, Østfold, Rogaland, Sogn og Fjordane, Sør-Trøndelag, Telemark, Troms - Romsa, Vest-Agder, Vestfold, Bergen	6,668	1945–2017	13,185	1949–2017
Portugal	53	Açores, Aveiro, Beja, Braga, Bragança, Castelo Branco, Coimbra, Europa, Évora, Faro, Fora de Europa, Guarda, Leiria, Lisboa, Madeira, Portalegre, Porto, Santarém, Setúbal, Viana do Castelo, Vila Real, Viseu, Emigração, Macau, Moçambique	3,045	1975–2015	5,768	1975–2015
Serbia	45	Central Serbia (Republic), Kosovo and Metohija (Autonomous Province), Vojvodina (Autonomous Province)	449	2000–2016	811	2000–2016
Spain	14	Andalusia, Aragon, Asturias, Balearic Islands, Canary Islands, Cantabria, Castille and Leon, Castille la Mancha, Catalonia, Ceuta, Extremadura, Galicia, La Rioja, Madrid, Melilla, Murcia, Navarra, Pais Vasco, Valencia	1,848	1977–2019	4,242	1977–2019
Sweden	15	Aelvsborg läns, Blekinge läns, Fyrstads Läns, Gävleborgs läns, Göteborgs och Bohus läns, Gotlands läns, Hallands läns, Jämtlands läns, Jönköpings läns, Kalmar läns, Kopparberg läns, Kristianstads läns, Kronobergs läns, Malmöhus läns, Norrbottens läns, Oerebro läns, Oestergötlands läns, Skaraborgs läns, Södermanlands läns, Stockholm, Uppsala läns, Värmlands läns, Västerbottens läns, Västernorrlands läns, Västmanlands läns, Malmö Läns, Dalarnas län, Skåne läns, Västra Götalands län	5,106	1944–2018	10,823	1948–2018
Switzerland	16	Aargau, Appenzell Ausserrhoden, Appenzell Innerrhoden, Basel-Landschaft, Basel-Stadt, Bern, Freiburg, Genf, Glarus, Graubünden, Luzern, Neuenburg, Nidwalden, Obwalden, Sankt Gallen, Schaffhausen, Schwyz, Solothurn, Tessin, Thurgau, Uri, Waad, Wallis, Zug, Zürich, Jura	6,826	1947–2015	25,036	1947–2015

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Country	ID	Regions	Party country- cabinet observations	Period covered	Yearly party observations	Period covered
Turkey	44	Adana, Adiyaman, Afyon, Agri, Amasya, Ankara, Antalya, Artvin, Aydin, Balikesir, Bilecik, Bingöl, Bitlis, Bolu, Burdur, Bursa, Canakkale, Cankiri, Corum, Denizli, Diyarbakir, Edirne, Elazig, Erzincan, Erzurum, Eskisehir, Gaziantep, Giresun, Gümüşhane, Hakkari, Hatay, Icel, Isparta, Istanbul, Izmir, Kahramanmaras, Kars, Kastamonu, Kayseri, Kirklareli, Kirsehir, Kocaeli, Konya, Kütahya, Malatya, Manisa, Mardin, Mugla, Mus, Nevsehir, Nigde, Ordu, Rize, Sakarya, Samsun, Sanliurfa, Siirt, Sinop, Sivas, Tekirdag, Tokat, Trabzon, Tunceli, Usak, Van, Yozgat, Zonguldak, Aksaray, Bartin, Batman, Bayburt, Karaman, Kirikkale, Sirnak, Ardahan, Düzce, Igdir, Karabük, Kilis, Osmaniye, Yalova	10,207	1950–2015	14,873	1950–2011
United Kingdom	18	England, Northern Ireland, Scotland, Wales	449	1945–2017	1,074	1950–2017
19 countries	365	regions	58,616	1944–2019	123,493	1948–2019

## Appendix – Coverage of the Regional Elections dataset (RED)

Country	ID	Regions	Yearly party observations	Period covered
Australia	2	Tasmania, Victoria, Western Australia, Queensland, South Australia, New South Wales, Northern Territory, Australian Capital Territory	2,512	1941–2012
Austria	1	Burgenland, Kärnten, Niederösterreich, Oberösterreich, Salzburg, Steiermark, Tirol, Vorarlberg, Wien	3,148	1945–2018
Belgium	3	Vlaanderen, Wallonie, Bruxelles-Capitale	489	1995–2014
Canada	4	Prince Edward Islands, Saskatchewan, Quebec, New Brunswick, Ontario, Manitoba, Nova Scotia, British Columbia, Alberta, New Foundland and Labrador, Yukon	2,840	1943–2015
Denmark	5	Faroe Islands, Frederiksberg Municipality, Nordjyllands, Arhus, Bornholms, Fyns, Ribe, Ringkobing, Roskilde, Sonderjyllands, Storstroms, Vejle, Vestjaellands, Viborg, Kobenhavn Municipality, Kobenhavns, Frederiksborg, Gronland, Hovedstaden, Sjælland, Syddanmark, Midtjylland, Nordjylland	5,918	1966–2009
France	17	Alsace, Aquitaine, Auvergne, Basse-Normandie, Bourgogne, Bretagne, Centre, Champagne-Ardenne, Franche-Comté, Haute-Normandie, Île-de-France, Languedoc-Roussillon, Limousin, Lorraine, Midi-Pyrénées, Nord-Pas-de-Calais, Pays de la Loire, Picardie, Poitou-Charentes, Provence-Alpes-Côte d'Azur, Rhône-Alpes, Corse, Alsace-Champagne-Ardenne-Lorraine, Aquitaine-Limousin-Poitou-Charentes, Auvergne-Rhône-Alpes, Normandie, Bourgogne-Franche-Comté, Centre-Val de Loire, Languedoc-Roussillon-Midi-Pyrénées, Nord-Pas-de-Calais-Picardie	4,021	1986–2015
Germany	8	Bremen, Brandenburg, Hamburg, Hessen, Mecklenburg-Vorpommern, Rheinland-Pfalz, Saarland, Sachsen, Thüringen, Baden-Württemberg, Berlin, Niedersachsen, Nordrhein-Westfalen, Schleswig-Holstein, Bayern, Sachsen-Anhalt	4,462	1946–2017

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Country	ID	Regions	Yearly party observations	Period covered
Italy	10	Sicilia, Alto Adige, Trentino, Sardegna, Valle d'Aosta, Friuli-Venezia Giulia, Abruzzo, Basilicata, Calabria, Campania, Emilia-Romagna, Lazio, Liguria, Lombardi, Marche, Molise, Piemonte, Puglia, Tosca., Umbria, Veneto	12,116	1947–2019
Norway	13	Ostfold, Akershus, Oslo, Hedmark, Oppland, Buskerud, Vestfold, Telemark, Aust-Agder, Vest-Agder, Rogaland, Hordaland, Sogn og Fjordane, Møre og Romsdal, Sør-Trøndelag, Nord-Trøndelag, Nordland, Troms, Finnmark	8,555	1975–2015
Spain	14	Navarra, Pais Vasco, Cataluna, Galicia, Andalucía, Aragon, Asturias, Baleares, Canarias, Cantabria, Castilla y Leon, Castilla-La Mancha, Extremadura, Madrid, Murcia, Valencia, La Rioja, Ceuta, Melilla	3,621	1979–2019
Sweden	15	Älvsborg, Blekinge, Gotlands, Gävleborg, Göteborgs, Halland, Jämtland, Jönköping, Kalmar, Kristianstad, Kronoberg, Malmöhus, Norrbotten, Örebro, Östergötland, Skaraborg, Stockholm, Södermanland, Uppsala, Värmland, Västerbotten, Västernorrland, Västmanland, Dalarna, Malmö, Bohus, Skåne, Västra	13,102	1942–2014
Switzerland	16	Basel Stadt, St. Gallen, Uri, Thurgau, Schwyz, Schaffausen, Wallis-Valais, Aargau, Neuchâtel, Solothurn, Graubünden-Grigioni, Genève, Freiburg-Fribourg, Vaud, Nidwalden, Bern, Obwalden, Glarus, Jura, Zug, Basel Land, Ticino, Zürich, Luzern, Appenzell A.Rh., Appenzell Inner-Rhoden	5,505	1980–2010
United Kingdom	18	Northern Ireland, Scotland, Wales, London	829	1945–2012
13 countries	217	regions	67,118	1941–2019

## Appendix – Coverage of the Regional Party-System dataset (RPSD)

Country	ID	Regions	Period covered
Austria	1	Burgenland, Kärnten, Niederösterreich, Oberösterreich, Salzburg, Steiermark, Tiro, Vorarlberg, Wien	1945–2018
Australia	2	Australian Capital Territory, New South Wales, Northern Territory, Queensland, South Australia, Tasmania, Victoria, Western Australia	1941–2013
Belgium	3	Bruxelles-Capitale, Vlaanderen, Wallonie	1995–2014
Canada	4	Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, Nova Scotia, Ontario, Prince Edward Island, Quebec, Saskatchewan, Yukon	1943–2015
Denmark	5	Arhus, Bornholms, Faroe Islands, Frederiksberg Municipality, Frederiksborg, Fyns, Gronland, Hovedstaden, Kobenhavn Municipality, Kobenhavns, Midtjylland, Nordjylland, Nordjyllands, Ribe, Ringkøbing, Roskilde, Sjælland, Sønderjyllands, Storstrøms, Syddanmark, Vejle, Vestjaellands, Viborg	1966–2009
USA	6	Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming	1990–2019
Japan	7	Aichi, Akita, Aomori, Chiba, Ehime, Fukui, Fukuoka, Fukushima, Gifu, Gunma, Hiroshima, Hokkaido, Hyogo, Ibaraki, Ishikawa, Iwate, Kagawa, Kagoshima, Kanagawa, Kouchi, Kumamoto, Kyoto, Mie, Miyagi, Miyazaki, Nagano, Nagasaki, Nara, Niigata, Ohita, Okayama, Okinawa, Osaka, Saga, Saitama, Shiga, Shimane, Shizuoka, Tochigii, Tokushima, Tokyo, Tottori, Toyama, Wakayama, Yamagata, Yamaguchi, Yamanashi	1990–2019

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Country	ID	Regions	Period covered
Germany	8	Baden-Württemberg, Bayern, Berlin, Brandenburg, Bremen, Hamburg, Hessen, Mecklenburg-Vorpommern, Niedersachsen, Nordrhein-Westfalen, Rheinland-Pfalz, Saarland, Sachsen, Sachsen-Anhalt, Schleswig-Holstein, Thuringen	1946–2017
Italy	10	Abruzzo, Alto Adige, Basilicata, Calabria, Campania, Emilia-Romagna, Friuli-Venezia Giulia, Lazio, Liguria, Lombardi, Marche, Molise, Piemonte, Puglia, Sardegna, Sicilia, Tosca, Trentino, Umbria, Valle d'Aosta, Veneto	1947–2019
Norway	13	Akershus, Aust-Agder, Buskerud, Finnmark, Hedmark, Hordaland, Møre og Romsdal, Nord-Trøndelag, Nordland, Oppland, Oslo, Ostfold, Rogaland, Sogn og Fjordane, Sør-Trøndelag, Telemark, Troms, Vest-Agder, Vestfold	1975–2015
Spain	14	Andalucía, Aragón, Asturias, Baleares, Canarias, Cantabria, Castilla y León, Castilla-La Mancha, Cataluña, Ceuta, Extremadura, Galicia, La Rioja, Madrid, Melilla, Murcia, Navarra, País Vasco, Valencia	1979–2019
Sweden	15	Blekinge, Bohus, Dalarna, Gotlands, Gävleborg, Göteborgs, Halland, Jämtland, Jönköping, Kalmar, Kristianstad, Kronoberg, Malmö, Malmöhus, Norrbotten, Skaraborg, Skåne, Stockholm, Södermanland, Uppsala, Värmland, Västerbotten, Västerorrland, Västmanland, Västra, Älvsborg, Örebro, Östergötland	1942–2014
Switzerland	16	Aargau, Appenzell Äußer-Rhoden, Appenzell Inner-Rhoden, Basel Land, Basel Stadt, Bern, Freiburg-Fribourg, Genève, Glarus, Graubünden-Grigioni, Jura, Luzern, Neuchâtel, Nidwalden, Obwalden, Schaffausen, Schwyz, Solothurn, St.Gallen, Thurgau, Ticino, Uri, Vaud, Wallis-Valais, Zug, Zürich	1980–2010
France	17	Alsace, Alsace-Champagne-Ardenne-Lorraine, Aquitaine, Aquitaine-Limousin-Poitou-Charentes, Auvergne, Auvergne-Rhône-Alpes, Basse-Normandie, Bourgogne, Bourgogne-Franche-Comté, Bretagne, Centre, Centre-Val de Loire, Champagne-Ardenne, Corse, Franche-Comté, Haute-Normandie, Languedoc-Roussillon, Languedoc-Roussillon-Midi-Pyrénées, Limousin, Lorraine, Midi-Pyrénées, Nord-Pas-de-Calais, Nord-Pas-de-Calais-Picardie, Normandie, Pays de la Loire, Picardie, Poitou-Charentes, Provence-Alpes-Côte d'Azur, Rhône-Alpes, Île-de-France	1986–2015
United Kingdom	18	London, Northern Ireland, Scotland, Wales	1945–2012
15 countries	314	regions	1941–2019