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# Network Patterns of Legislative Collaboration in Twenty Parliaments

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## Short presentation note

In recent years, the ties that Members of Parliament (MPs) create by cosponsoring legislation together have attracted interest from scholars adopting a network approach to lawmaking. This brief note expands the empirical base of these studies by introducing a dataset of 150 bill cosponsorship networks that cover 27 parliamentary chambers from 19 European countries, plus Israel. The data show the extent of partisanship expressed by MPs through their propensity to cosponsor bills within and across party lines, in several different parliamentary systems.

In recent years, the ties that Members of Parliament (MPs) create by cosponsoring legislation together have attracted interest from scholars adopting a network approach to lawmaking. The general objective of that approach, which takes advantage of important developments in the statistical modeling of political and social networks (Cranmer & Desmarais, 2011; Snijders, 2011), consists in identifying the relational determinants that underlie legislative production, such as shared attributes of legislators or ‘friend-of-a-friend’ effects. From that perspective, the formation of cosponsorship ties is a possible entry point into the collaborative structure of parliamentary chambers (Kirkland, 2014), and a useful complement to legislative productivity and roll-call voting records in the study of parliamentary behaviour.

To our knowledge, such network approaches to legislative cosponsorship have so far been conducted on a limited range of country cases. The literature that we reviewed includes numerous studies of both Congressional houses of the United States, pioneered by the work of Fowler (2006a; 2006b), as well as studies of its state legislatures (Bratton & Rouse, 2011; Clark & Caro, 2013; Kirkland, 2013). We also located studies of legislative cosponsorship networks in the parliaments of Argentina (Alemán & Calvo, 2013; Micozzi, 2014), Chile (Alemán & Calvo, 2013) and a subset of the Romanian parliament (Chiru & Neamțu, 2012).<sup>1</sup> However, no comprehensive dataset currently exists to allow for the comparative analysis of such networks over a more diverse set of legislative environments.

This brief note therefore aims at contributing to network studies of legislative cosponsorship by expanding their empirical base to several additional countries. Through the use of various web scraping technologies (Munzert *et al.*, 2015), we tried to collect information on private bills<sup>2</sup> and their sponsors from the official websites of 33 parliaments, or from

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<sup>1</sup>Our search also returned visual explorations of bill cosponsorship in the lower houses of the French (Coulmont, 2011) and Czech (Gregor, 2013) parliaments, and similar research on Korean legislators (Ji-yeon Lee & Yoon, 2014).

<sup>2</sup>We focused our attention on private bills, defined as laws initiated by one or more MPs that become binding if they make it through the legislative process of their country of introduction. This definition is compatible with theoretical assumptions on how MPs signal their positions to their constituents or to third parties, and is comparable across countries.

Table 1: Overview of country-chamber sample

Region	Country	Chamber	Period	Years	Legislatures
East	Bulgaria	Unicameral	2005–2015	11	4
	Czech Republic	Lower	1996–2015	20	6
		Upper	1996–2015	20	6
	Estonia	Unicameral	2007–2015	9	3
	Hungary	Unicameral	1998–2015	18	5
	Lithuania	Unicameral	1992–2015	24	6
	Romania	Lower	1996–2015	20	5
		Upper	1996–2015	20	5
West	Slovakia	Unicameral	1998–2015	18	5
	Austria	Lower chamber only	1994–2015	22	7
	Belgium	Lower	1991–2015	25	7
		Upper	1995–2014	20	5
	France	Lower	1986–2015	25 <sup>a</sup>	6
		Upper	1986–2015	30	7
	Ireland	Lower	1997–2015	19	4
		Upper	1997–2015	19	4
	Italy	Lower	1983–2015	33	9
		Upper	1996–2015	20	5
	Portugal	Unicameral	1991–2015	25	7
	Switzerland	Lower	1995–2015	21	5
		Upper	1995–2015	21	5
North	Denmark	Unicameral	2001–2015	15	5
	Finland	Unicameral	1999–2014	16	4
	Iceland	Unicameral	1995–2015	21	6
	Norway	Unicameral	1985–2015	31	8
	Sweden	Unicameral	1988–2015	28	8
Asia	Israel	Unicameral	2009–2015	7	3

<sup>a</sup>Missing legislature 10 (1993–1997) of the French lower chamber.

related open data portals. Our country sample included all current member states of the European Union, plus the four members of the European Free Trade Association (Iceland, Liechtenstein, Norway and Switzerland) and Israel.

Table 1 summarises the data that we managed to collect, which cover 20 countries and 27 parliamentary chambers, over a total of 558 years and 150 legislatures, understood as periods between two nationwide legislative elections. The sample contains a mix of unicameral and bicameral parliamentary systems from Eastern, Northern and Western Europe, including three federal regimes (Austria, Belgium and Switzerland). The R code (R Core Team, 2015) used to collect the data and assemble the cosponsorship networks is available at <https://github.com/briatte/parlnet>, along with detailed replication instructions.

Using the same parliamentary sources as for bills, we then retrieved as much information as possible on the individual legislators who nominally sponsored the bills. The variables collected across all countries include sponsor age, sex and parliamentary career information (time in office, constituency, committee membership and party affiliation), for a total of over 18,000 MPs who appeared on at least one cosponsored bill. To further characterize the positions of bill sponsors relative to each other, we also proceeded to match their party

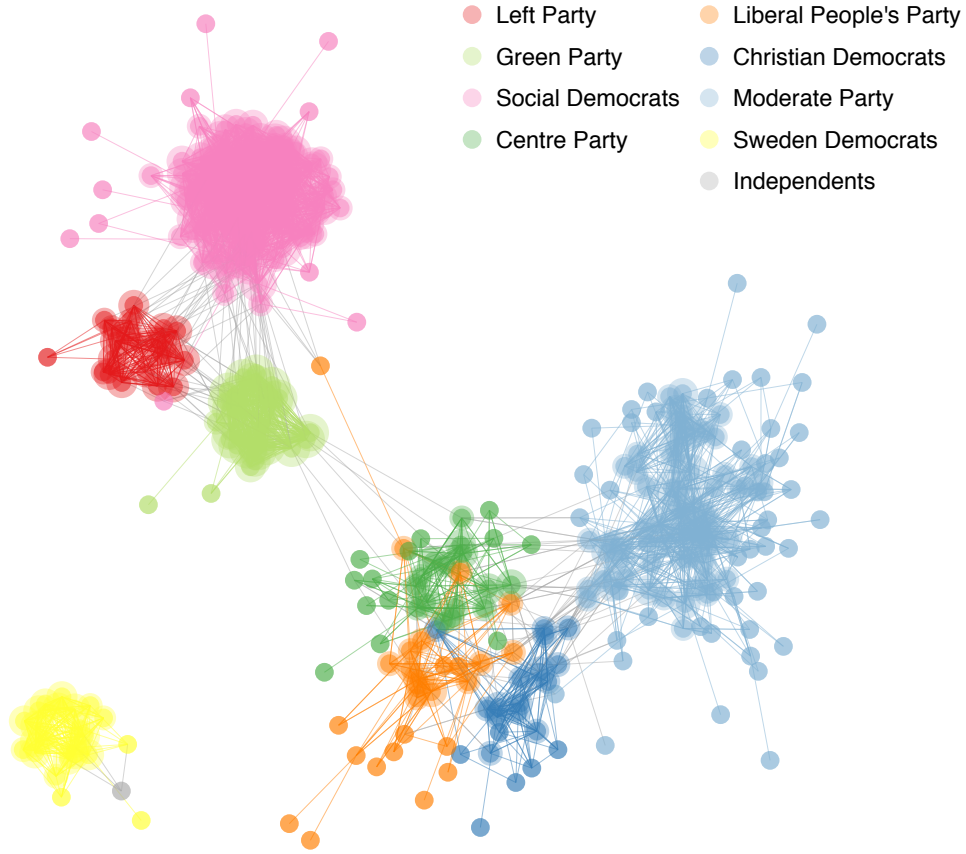


Figure 1: Bill cosponsorships in the Swedish Riksdag, years 2010–2014. Vertex colors designate party affiliations.

affiliations with an indication of where the party sits on a standardized Left/Right scale. In order to do so, we used the scores available in the latest edition of the ParlGov database (Döring & Manow, 2014), which are time-invariant scores computed as the weighted mean values of party positions taken from several expert surveys on political parties.<sup>3</sup>

Figure 1 shows one of the cosponsorship networks that can be constructed from the data we collected, using force-directed placement (Fruchterman & Reingold, 1991). The network, which shows bill cosponsorship ties in the ongoing legislature of the unicameral parliament of Sweden, is a one-mode projection of the  $b \times a$  two-mode matrix, where  $b$  denotes bills and  $a$  denotes their sponsors, that connects the first author of each bill to all other sponsors on that bill. The resulting adjacency matrix  $A_{ij}$  of directed ties between MPs ( $i, j$ ) is asymmetric and contains no self-loops.

In order to further explore the collaborations that take place in legislative cosponsorship networks, we also built interactive versions of the same graphs, which allow the user to explore the ego networks of specific MPs. These visualisations, an example of which is shown in Figure 2, are available online at <http://f.briatte.org/parlviz/>.

<sup>3</sup>See <http://www.parlgov.org/documentation/party-positions/> for further details on ParlGov Left/Right party positions. The scores, which range from 0 to 10, are listed in full in the appendix, along with the recodings that we applied to match the ParlGov data with ours.

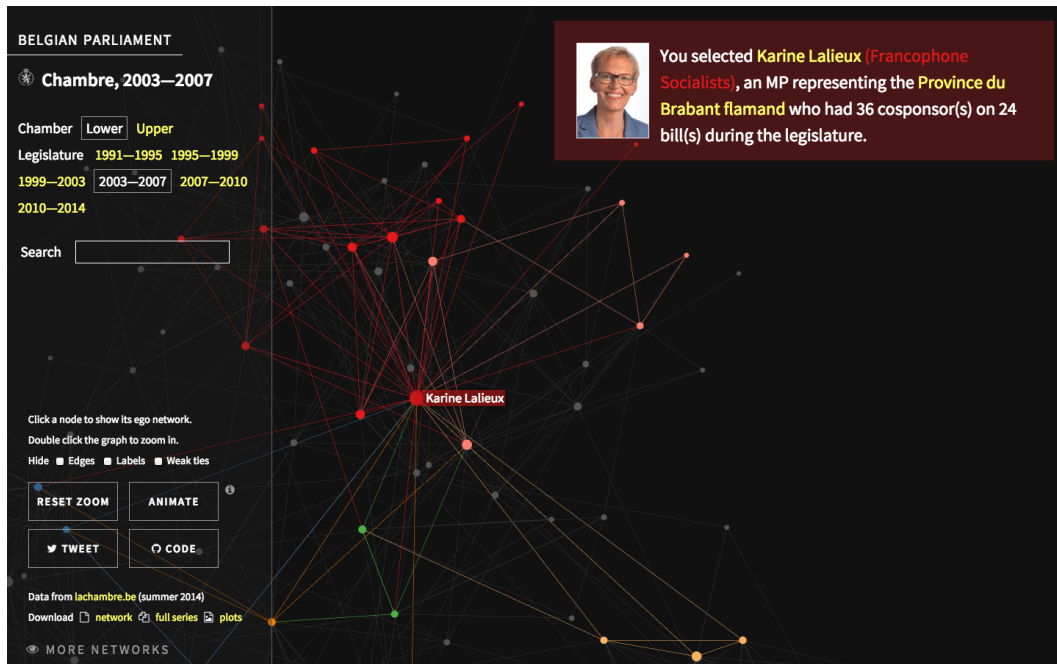


Figure 2: Visualization of the Belgian Chamber of Deputies, years 2003–2007.

Last, because legislative cosponsorship networks are based on ties that represent one or more than shared bill(s) between two MPs, we computed several measures to weight their edges accordingly. These measures (raw cosponsorship counts, the weighted quantity of bills cosponsored and the weighted propensity to cosponsor) are taken from existing studies of legislative cosponsorship in the U.S. Congress (Fowler, 2006a; Gross *et al.*, 2012), and are documented in full in the appendix to this note.

As illustrated in Figure 1 and as visible in the interactive visualizations previously mentioned, all of the 146 observed networks clearly show the influence of party affiliations over decisions to cosponsor bills. Using these data, the extent of partisanship expressed by MPs through their propensity to cosponsor bills within and across party lines might be measured through different methods: several studies of the U.S. Congress (Zhang *et al.*, 2008; Waugh *et al.*, 2009; Moody & Mucha, 2013) use the modularity network statistic (Newman & Girvan, 2004; Leicht & Newman, 2008) to that effect, but the data are also amenable to other estimation methods, such as exponential random graph models (Cranmer & Desmarais, 2011; Snijders, 2011). Such measures should confirm that, as Sartori (1976/2005) observed several decades ago, the distribution of power between political parties can take many different forms in highly competitive electoral environments, as “the fragmentation of the party system can reflect either a situation of *segmentation* or a situation of *polarisation*, i.e., of ideological distance” (p. 111).

The levels of party polarization shown in the networks under study represent only one of many possible ways to explore the individual and institutional determinants that govern over the decisions of MPs to cosponsor each other’s bills. In similar fashion to Moody and Mucha (2013), we therefore hope that the data presented in this note, might serve as an introduction to a complex empirical puzzle, extended to a set of country cases that allow for comparative inquiry, and supported by interactive network visualizations.

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