Lobbying in the European Commission: A hypergraph analysis

The complex and multi-level structure of European Union institutions has led to substantial public and academic debate about their legitimacy and democratic quality (Schmitt and Thomassen 1999; Holzhacker 2007). One of the focal point of this debate is the European Commission (EC) that is often seen as lacking electoral-based legitimacy (Drake 1997; Tsakatika 2005; Schmidt 2020; Thomas 2009). In view of addressing these concerns, the Treaty on European Union has aimed to introduce a from of "consultative legitimacy" by specifying in its article 11 that " *The European Commission shall carry out broad consultations with parties concerned in order to ensure that the Union's actions are coherent and transparent.*" The Treaty further specifies that these engagements with interest groups must align with specific performance criteria: accountability, transparency, efficiency, openness, and inclusiveness (Schmidt 2020). In this paper, we use a large open dataset on meetings between European commissioners and stakeholders to investigate quantitatively whether the actual implementation of the consultation process is in line with the principles of openness and inclusiveness put forward. Openness entails granting all parties, whether organizations or citizens, the opportunity to express their views. Inclusiveness encourages the consideration of a diverse range of perspectives, ensuring a balance and fairness in their representation.

The EC consults with stakeholders through two main channels: through written/online consultations and through face-to-face meetings. Although the former is the most common form of consultation, the latter has been identified as a channel through which substantial influence can be exerted (Heinz et al. 1997; E.Friedkin 1998; Zeng and Battiston 2016; Pappi and Henning 1999). Our paper studies this high influence channel through an analysis of the network of interactions between EC commission staff (commissioners, their cabinet members, and directorate generals) and stakeholders/third-parties. Notably, we investigate whether the distribution of network centrality across agents, which is standardly considered as a measure of influence in social organisations (Jackson et al. 2008), is consistent with the principles of openness and inclusiveness.
To investigate this, we compile information on meetings held by EC representatives and build a hypergraph, where the vertices represent EC members and organizations and hyperedges involve the entities that attend meetings. We begin with examining the overarching structure of the network and assess the centrality of different groups, categorized by country, organization type, and sectors. Subsequently, our analysis narrows down to companies and groups, where we compare their size to their centrality within the network, with the aim of identifying if there is a representation bias in favor of certain subgroups. For our research, we draw upon data from the Transparency Register of the EU and the Orbis dataset. Meeting data is accessible through the EC members' website.

We have gathered data on meetings conducted by commissioners, cabinet members, and directorate generals since the commencement of the current commission's term on December 1, 2019. These meetings are represented using a hypergraph, which we denote as $\mathcal{H}(V, E, w)$. In this hypergraph, V encompasses the set of vertices, E the set of hyperedges. The weight w_e is associated with each hyperedge e and corresponds to the aggregated sum of occurrences of e

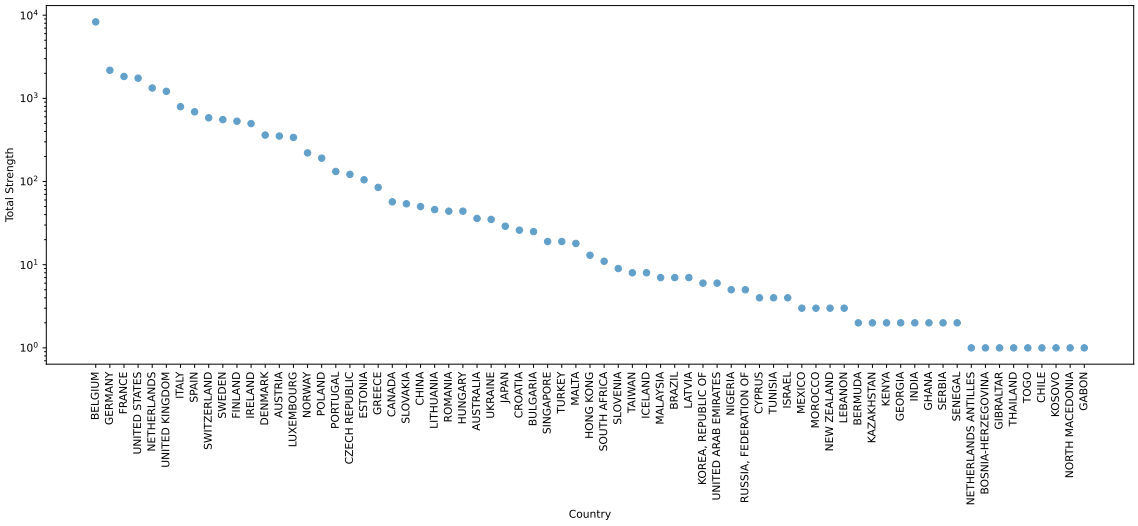

Figure 1: Total strength per country. For country A, the total strength is set as $\sum_{i:i\in A} s_i$

over time. Our resulting hypergraph features $|V| = 4868$ nodes, $|E| = 13331$ edges, and a total of $\sum_e w_e = 16870$ distinct meetings. The hypergraph has a diameter of 7. The average size of hyperedges e is 2.74 with a standard deviation of 2.05. Although the number of large hyperedges is limited, they play a crucial role in the overall connectivity of the hypergraph, as demonstrated by the substantial correlation between betweenness centrality and the size of hyperedges, which stands at 0.73.

Here are some preliminary results. We define the strength of a node i as $s_i = \sum_{e:i\in e} w_e$. The distribution of strength has a fat tail. We compute the weight of social categories by summing the strength of nodes belonging to the corresponding social group.

Figure 1 displays the total strength per country on a logarithmic scale. Belgium attains a notably high value, which is mainly explained by the presence of a high number of interest groups that acts at a European level and that are localized in Brussels. Beyond the clear overall heterogeneity, non-European country such as the United States, Switzerland are notably more represented than members of the EU. Additionally, among EU countries, central European countries such as Latvia, Slovenia, Bulgaria, Croatia, Hungary, Romania, Luthania, Slovekia are clearly under-represented.

In table 1, we computed the strength per category of registration in the Transparency Register. Business interests represented by companies and groups as well as trade and business association are notably overrepresented.

Category of registration	Total Strength
Companies and groups	7573
Trade and business associations	6015
Non-governmental organisations, platforms and networks and similar	5503
Trade unions and professional associations	1258
Think tanks and research institutions	869
Professional consultancies	607
Other organisations, public or mixed entities	524
Academic institutions	219
Associations and networks of public authorities	143
Organisations representing churches and religious communities	50

Table 1: Total strength per category. For category A, the total strength is set as $\sum_{i:i\in A} s_i$

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