Look Who’s Talking: Bipartite Networks as Representations of a Topic Model of New Zealand Parliamentary Speeches

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Motivation

- Lack of quantitative methods to measure the participation to parliamentary debate and discourse of elected Members of Parliament (MPs).

- To develop an exploratory study for a quantitative analysis of politics, using parliamentary speeches and based on topic modeling and network analysis.
Background

- Two-party era for most of the 20th century: National (right-leaning) and Labour (left-leaning).

- Adoption of mixed-member proportional (MMP) system in 1996: smaller parties join.

- Smaller parties balancing the power.


- Government transition in period analyzed: Labour (2002-2008) and National (2008-).
Dataset

- New Zealand Hansard database - speeches,
- more than 150 words long,
- about 48,000 speeches.
- nearly 40 million words
Topic modeling
Bipartite networks
Degree distributions

- Number of MPs per topic
- Number of topics of interest per MP
- MPs connectivity

The charts illustrate the frequency distribution of MPs per topic, topics of interest per MP, and MPs connectivity for different sessions of the parliament (47th to 50th).
MPs and average degree

<table>
<thead>
<tr>
<th>Term</th>
<th>National</th>
<th>Labour</th>
<th>Greens</th>
<th>others</th>
</tr>
</thead>
<tbody>
<tr>
<td>47th</td>
<td>26</td>
<td>52</td>
<td>8</td>
<td>19</td>
</tr>
<tr>
<td>48th</td>
<td>48</td>
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<td>16</td>
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<td>49th</td>
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</tr>
<tr>
<td>50th</td>
<td>61</td>
<td>39</td>
<td>14</td>
<td>11</td>
</tr>
</tbody>
</table>

The table shows the average degree for MPs in the 47th to 50th Parliaments.

The graph illustrates the average degree for different parties across the parliaments.
Party homophily

- Empirical network
- Configuration model
Communities
Conclusions

- Opposition party tends to be more verbose in parliament.
- Topic preferences: environment (Green) and economy (National).
- More heterogeneity of topics of interest over time.
- Increasing homophily (MPs sharing more interests within their parties).
- Formation of big National community - party cohesion once in government, different behavior than when Labour was in government.
- Influence of small parties are reducing over time.
Thank you! Questions?