

# Submission to the Electoral Commission of NZ on the MMP Review Proposals Paper

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This submission addresses the value of the party vote threshold, proposed by the Commission to be 4%. We have assumed that the abolition of the one electorate threshold will occur, and aimed to study the optimal value of the party vote threshold. We are not convinced by the verbal arguments of the Commission. Clearly there is some tradeoff between proportionality and governability, but it should be studied quantitatively.

To this end we have performed simulations. Each simulation takes each of the historical MMP election results from 2002 as a starting point. Using voter preference data from the NZES Election Study, we generate hypothetical voter preferences using a simple probabilistic model of preference change, where a voter switches its 1st and 2nd preferences, or 1st and 3rd preferences, with a given probability. We use a range of values for the switching probabilities, from 0 to 0.18 and 0 to 0.12 respectively. These are derived from the NZES survey data.

We assume that each preference distribution in the population is translated into votes in the same way as it was in the actual election (in other words, there is no change in strategic behaviour of voters, and the St Lague allocation formula is used as usual).

We thereby create a constellation of hypothetical elections around each real one, which allows us to see how robust are the results we obtain simply by looking at the historical elections.

For each simulation we use the following standard measures of disproportionality, calculated using the share of party votes  $v_i$  of party  $i$  and the share of seats  $s_i$ .

- Gallagher index:  $\sqrt{\frac{1}{2} \sum_i (v_i - s_i)^2}$
- Loosemore-Hanby index  $\frac{1}{2} \sum_i |v_i - s_i|$

We also use the following measures of fragmentation.

- The “effective number of parties” of Laakso and Taagepara, given by  $1/\sum_i p_i^2$ , where  $p_i$  denotes the fraction of seats awarded to party  $i$ .
- An analogue based on voting power rather than representation, where  $p_i$  denotes the Shapley-Shubik power of party  $i$ .

Each index is such that smaller values are considered better (more proportional, less fragmentation). In the attached graphs, each colour represents a different value of the threshold. Those in which a given colour occurs very often near the bottom left corner of the graph have good performance with respect to these two competing criteria.

The results obtained in these simulations suggest strongly that 4% is substantially better than 5% as a threshold, but that 3% is even better. In fact, a lower value than 3% may be preferable. We also computed results for thresholds larger than 5% and less than 2% (not shown in our graphs), and as expected they yield inferior results, although the larger thresholds were much worse.

**Our recommendation** is that the one seat electorate threshold be removed, and the party vote threshold set as low as possible, subject to meeting concerns on minimum size of a party in parliament for the party itself to be able to operate fully. The Proposal Paper makes clear that the Commission considers 3% to be the minimum to meet the latter criterion. We have no opinion on that issue, but as discussed above, prefer this clearly to 4%.

We would be happy to undertake further modelling work on this issue, or to make our code available.

Figure 1: 2% (orange), 3% (green), 4% (blue), 5% (purple)

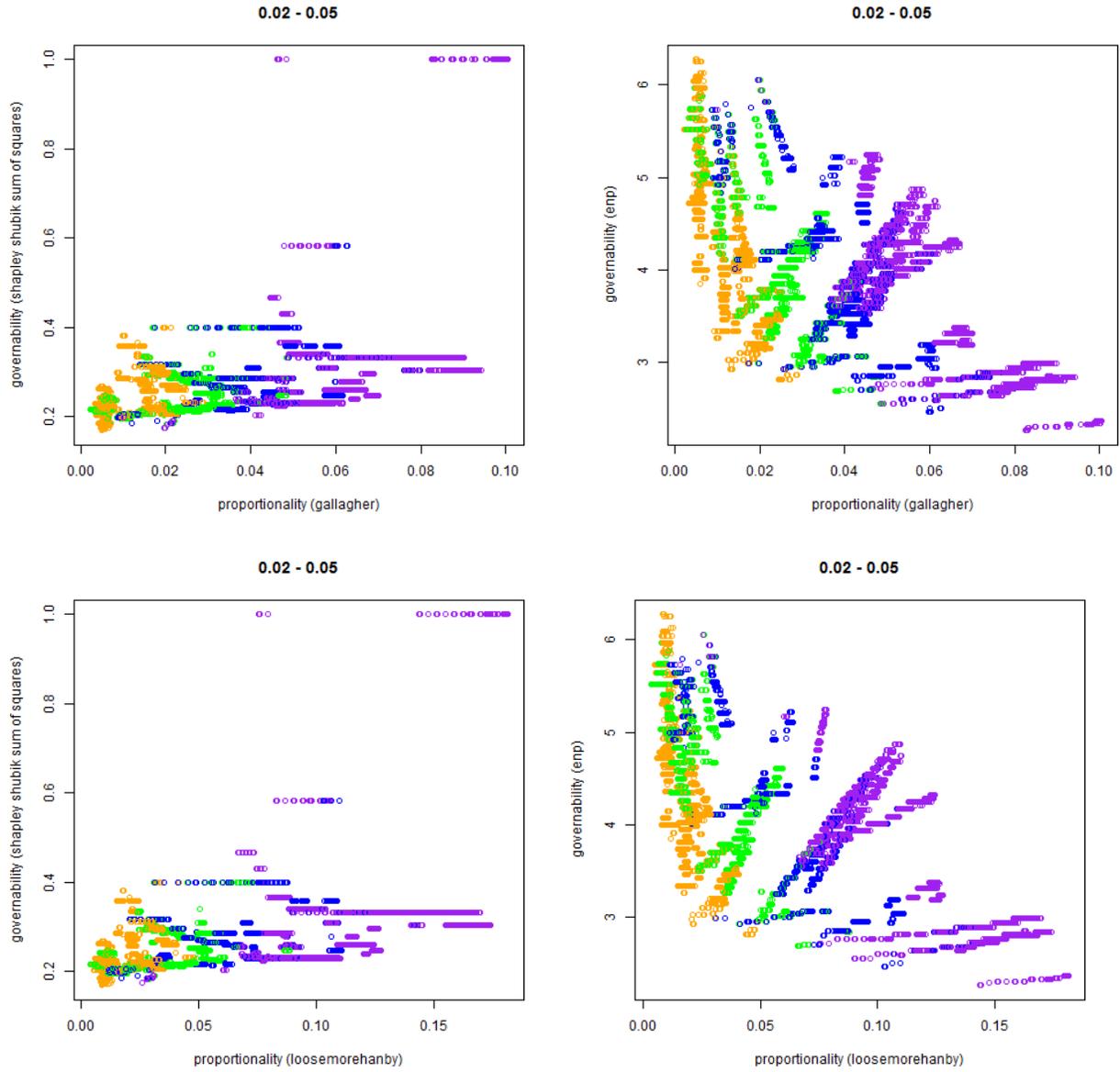


Figure 2: 3% (red) versus 4% (blue)

