Proportional Representation Increases Party Politics: Evidence from New Zealand Parliament using a Supervised Topic Model*

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Abstract

This paper investigates how electoral systems influence political attention in parliamentary democracies. The empirical setting is the 1993 electoral reform in New Zealand, which replaced a first-past-the-post system with a mixed-member proportional representation system. To analyze how this reform changed the allocation of political attention, we use a new supervised topic model to learn the distribution of political attention in the text of 300,000 parliamentary speeches for the years 1987 through 2002. The main finding is that the reform increased the attention share devoted to party politics, which includes discussions of party competence or incompetence (rather than policy). Discussion of policy-oriented topics decreases. This finding highlights the perhaps under-appreciated cost of partisan conflict in proportional representation systems.

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1 Introduction

How does the design of a country's electoral system influence the political and economic decisions of its government? In the space of representative democracy, a first-order distinction is that between majoritarian and proportional systems (Lijphart, 1999). Previous research has examined the implications of electoral systems for phenomena such as economic growth, redistribution, political instability, political behavior, and the background of elected parliamentarians (e.g., Carey and Hix, 2011; Cox, 1990; Morelli, 2004; Persson and Tabellini, 2000; Proksch and Slapin, 2015). Much of this work is theoretical, and the empirical work mostly consists of cross-country cross-sectional regressions which rely on strong econometric assumptions. Among these empirical papers, there is little evidence on how electoral systems influence the policymaking priorities of the legislature.

The goal of this paper is to add to this evidence. The empirical setting is the 1993 electoral reform in New Zealand, which changed the electoral system from a first-past-the-post system to a mixed-member proportional electoral system. This reform provides a useful case for analyzing the implications of electoral systems for policy priorities. To measure these priorities, we introduce a new corpus of nearly 300,000 parliamentary speeches for the period from 1987 until 2002. We exploit the panel variation in our data to look at how the allocation of speeches to policy topics changed in response to the reform, holding politician-level characteristics constant.

A first-order challenge is how to measure the policy content of parliamentary speeches. To this end, we apply methods from machine learning to the text features of the transcribed speeches. We propose a new supervised topic model, constructed using a large corpus of policy statements hand-coded by the Manifesto Project (Budge et al., 2001; Klingemann et al., 2006)[1]. This training set, consisting of 52,056 English-language political statements, is hand-annotated to one of 19 policy categories. Using these statements, we train a machine classifier to assign speeches to topics. In a held-out test sample, the classifier ranks the correct category 52.8 percent of the time. We provide a range of validations of the method, including visual validation that the classifier uses text features that are intuitively related to the topics.

We apply the topic model to the New Zealand parliamentary speech corpus. Our measure of political attention is the probability that a speech focuses on each topic.

[1] Available at `manifesto-project.wzb.eu` (accessed on December 9, 2016).

We ask how the topic probabilities have changed over time – and in particular, how they changed in response to the 1993 electoral reform.

The primary effect of the move to proportional representation is increased attention towards the *party politics* category – that is, references towards party (in)competence. Attention toward more policy-oriented topics decreases after the reform. This effect is statistically significant and robust to the inclusion of speaker fixed effects and a range of control variables and alternative specifications. In the preferred specification, the parliamentary attention share on party politics increases by 3 percentage points. Put differently, we can say that the attention towards policy-oriented topics *decreases* by 3 percentage points. The effect is particularly strong for general debates, where attention towards party politics increases by 6 percentage points. This result points to a perhaps under-appreciated cost of proportional representation democracy (relative to first-past-the post elections): a reduction in policy discussion due to more discussion of party politics.

An important mechanism is that under proportional electoral systems, parties and parliamentarians have a stronger incentive of creating a unified party label because citizens vote for the parties rather than the individual parliamentarians (Proksch and Slapin, 2012). In proportional systems, party leaders also have more tools to discipline parliamentarians. These institutions lead to political effort on non-policy issues such as party competence (Budge et al., 2001; Klingemann et al., 2006; Høyland and Søyland, 2017). In addition, principal-agent conflicts in coalition governments may further increase attention towards party politics. This situation is reflected in our data as more discussions of party politics.

We report a set of follow-up results to assist with understanding the relevant mechanisms. First, we find that attention towards party politics increases significantly after the reform came into effect and not in the transitional period. This shows that electoral pressures, by themselves, are not driving the effect; instead, party politics increases only after the new proportional representation regime is implemented. Second, the increase in party politics stems from changes for incumbent parliamentarians, rather than selection of new parliamentarians, consistent with an institutional/incentive effect rather than a change in the types of politicians selected.

These results contribute to existing research in three key areas. First, we contribute to the research on the causes and consequences of electoral systems by analyzing the electoral reform in New Zealand (e.g., Carey and Hix, 2011; Catalinac, 2018; Cox, 1990;

Morelli, 2004; Persson and Tabellini, 2000; Proksch and Slapin, 2015). We examine the effect of electoral rules on parliamentary attention using parliamentary speeches as data, which allows new insights based on the behavior of parliamentarians in debates. By exploiting within-country variation, we avoid the well-known omitted variable bias problems related to cross-sectional studies (e.g., Dow, 2011). While existing evidence typically compares parliamentary behavior in single- and multi-member districts (e.g., Carey and Hix, 2011; Catalinac, 2018; Høyland and Søyland, 2017), our study investigates a reform from first-past-the post to a mixed-member electoral system.

Second, we contribute to the methodological literature on topic models by proposing a new method to identify policy topics in individual parliamentary speeches (e.g., Blei, Ng and Jordan, 2003; Grimmer, 2010, 2013; Lucas et al., 2015; Quinn et al., 2010). In comparison to existing topic models, our approach relies on expert knowledge about policy areas and allows direct comparison across different documents. In addition, the unsupervised topic models are sensitive to the parameter choice for number of topics.[2] We believe the proposed technique offers several avenues for research. Besides facilitating the estimation of policy-area specific positions (König, Marbach and Osnabrügge, 2017; Laver, Benoit and Garry, 2003), our method can be used to identify ideological speeches and to compare manifestos to speech priorities. Furthermore, our approach can be used to classify other documents such as party press releases, statutes, treaties, or newspaper articles.

Third, our research contributes to research on New Zealand and, more generally, the evolution of majoritarian or Westminster democratic systems (Barker et al., 2003; Eggers and Spirling, 2016; Miller, 2005; Peterson and Spirling, 2018; Proksch and Slapin, 2015; Vowles et al., 2002). We provide the first study that investigates systematically political attention based on the text of parliamentary debates in New Zealand. Our study provides evidence on how a reform of the Westminster system towards more proportional representation may affect political attention in debates. For example, the House of Commons discussed in 2016 a potential reform of first-past-the-post, when a Green parliamentarian introduced a legislative proposal to change the electoral system.[3] Similar debates about reforming the electoral system to increase proportional

[2]We replicated our analysis with LDA, but found that the result was sensitive to the number of topics chosen (see appendix section 10).

[3]Source: Stone, Jone. 2016. MPs reject bill to change Britain's voting system to proportional representation. *The Independent*. Link: http://www.independent.co.uk/news/uk/politics/mps-reject-bill-to-change-britains-voting-system-to-proportional-representation-a7146676.html (accessed July 30, 2017).

representation exist in the United States. Recently, the public debated a reform in light of Donald Trump's electoral success without achieving a relative majority of votes.[4]

2 Electoral Reform in New Zealand

The reform process began in 1986 when the Labour government appointed a Royal Commission to study a potential electoral reform in New Zealand. The Commission examined fourteen electoral systems on the basis of ten criteria and finally recommended a reform towards a mixed-member electoral system. In 1993, 54 percent of the population decided in favor of the reform in a referendum and in 1996 the new electoral rules were applied for the first time. Several factors are important to understand the introduction of the reform. First, the population increasingly perceived election results and the resulting democratic representation as unfair. In 1979 and 1981 the Labour party received a majority of votes, but a minority of seats. Second, small parties and ethnic minorities were underrepresented in the parliament. Third, citizens were unsatisfied with the economic situation and the adversarial style of majoritarian systems. Lastly, citizens wanted to reduce 'electoral dictatorship' of majority parties (Lamare and Vowles, 1996; Vowles, 1995). In 2001 a parliamentary committee reviewed and confirmed the mixed-member electoral system (Vowles et al., 2002).

The reform changed the electoral system from a first-past-the-post to a mixed-member proportional electoral system. In the first-past-the-post electoral system, candidates competed in ninety-five single-member districts and four parallel Maori districts, where the number of Maori districts was fixed. After the reform voters elected sixty members in general districts, five members in the Maori districts and fifty-five members via national and closed party lists. The 1993 Electoral Act highlights that parties have to use "democratic procedures" to select list candidates (p. 43). Notice that Maori citizens can decide every five years whether they want to vote in the general or Maori districts. The reformed system allows variation in the number of Maori districts in case their population or the number of registered Maori changes (e.g., Barker

[4]Source: McFaul, Michael. 2016. Trump is right: The United States needs electoral reform. *The Washington Post*. Link: https://www.washingtonpost.com/news/global-opinions/wp/2016/10/31/trump-is-right-the-united-states-needs-electoral-reform/?utm_term=.53075b2f3f19 (accessed July 30, 2017). See also the following report: Kuo, Didi. 2014. *Electoral System Reform in the United States*. Stanford University.

and McLeah, 2002). To enter parliament, parties have to receive at least five percent of the list votes or win in a district.

The new electoral system allows for two different types of parliamentarians: district and list parliamentarians. The selection process differs. While national committees (Labour party) or local delegates (National party) elect district parliamentarians, parties and party leaders play a more important role in the selection of list candidates. In most parties either the party leader (United Future, New Zealand First) or a national committee (Labour and National party) decides on the list. For example, Winston Peters, the party leader of New Zealand First decided personally on the ranking of candidates. One exception are the Greens, where the selection of candidates is more decentralized (Miller, 2005, pp. 113-117). According to Barker and McLeah (2002, p. 139), list and district parliamentarians exhibited no major differences in their behavior in the first three years after the reform.

Previous research shows that the reform contributed to a party system change because new parties such as the ACT New Zealand, the Maori Party and the Greens entered the parliament (Barker et al., 2003; Miller, 2005). Second, the composition of government changed after the reform. In the period from 1935 until 1993, all governments in New Zealand were single-party governments. However, in 1996 New Zealand experienced a coalition government between the National party and New Zealand First, where Jim Bolger served as prime minister. Since 1996 coalition governments in New Zealand have become the norm rather than the exception. In addition, governments have become less durable since the reform (Barker et al., 2003, pp. 23-25). Third, the representativeness and diversity of parliamentarians increased (Miller, 2005, pp. 201-206). The reform lead to a substantial increase of Maori and women parliamentarians. These changes occurred largely due to the list mandates and remained stable after 1999.

Fourth, existing research has investigated the implications of the reform for electoral turnout. In 1996 electoral turnout increased because extreme left voters were more likely to participate (Karp and Banducci, 1999). However, the turnout decreased in 1999 and in subsequent years. Vowles (2010) argues that the turnout would probably be even lower under the first-past-the-post system. He explains the decreasing turnout on the basis of generational effects, decreasing party competition and a change of district boundaries. Lastly, research examined the influence of the reform on the participation of parliamentarians in budgetary debates. Proksch and Slapin (2015)

show that the same rebel backbenchers were less likely to participate after the reform taking into account the period from 1993 until 1999. The authors argue that under a closed-list mixed-member electoral system party leaders have a stronger incentive to ensure party unity.

Our study contributes to existing knowledge by systematically evaluating how the reform influenced political attention in parliamentary debates.

3 Theoretical background

Electoral rules can influence parliamentary behavior and speeches by selecting different types of politicians and imposing different incentives on sitting politicians. Proksch and Slapin (2012, 2015) provide a model of how electoral systems influence ideological positions. Their model presents parliamentary speech-making as a delegation game, where the party leader decides about delegating a speech to a backbencher. The main theoretical expectation is that mixed-member electoral systems produce more party cohesiveness than first-past-the-post systems because party leaders have a stronger incentive and more means to ensure cohesiveness. Several studies provide evidence in line with this theory by examining participation in parliamentary debates (Alemán, Ramírez and Slapin, 2017; Giannetti and Pedrazzani, 2016; Proksch and Slapin, 2015).

Recently, scholars have started to evaluate the theory of Proksch and Slapin using text of parliamentary speeches. Baumann, Debus and Klingelhöfer (2017) focus on the mixed-member electoral system in Germany and show that deviation from the party leader position worsens the list placement of opposition parliamentarians. Høyland and Søyland (2017) examine the 1919 electoral reform in Norway, which changed the system from a single-member district to a multi-member district electoral system. The authors argue that the reform increases attention towards general topics related to party ideology and decreases attention towards constituency-specific topics. Høyland and Søyland (2017, p. 4) apply an unsupervised structural topic model to provide evidence in line with their theoretical argument.

Electoral rules can also influence the style of legislative speech. For example, Spirling (2016) shows that the franchise extension of the second reform act increased the comprehensibility of speeches of cabinet members. Spirling argues that cabinet members use more comprehensible speech to appeal to the new, less educated voters.

We focus on the parliamentarians' incentives to talk about party politics versus

a substantive policy area. In comparison to majoritarian systems, we expect that proportional electoral systems increase the parliamentarians' incentive to talk about party politics. There are two main reasons.

First, parliamentarians have an electoral incentive to strengthen the party label. Parliamentarians use speeches to communicate with voters and increase their probability of re-election (Ash, Morelli and Van Weelden, 2017). In contrast to majoritarian electoral systems, the party vote determines the overall share of parliamery seats in proportional electoral systems. To enhance the party label, parliamentarians may use more partisan language by, for example, referring more often to party names or by discussing the competence of parties. Similarly Proksch and Slapin (2012) argue that mixed-member electoral systems induce party leaders to delegate less speeches to rebel parliamentarians than in first-past-the-the-post systems. The rationale behind this argument is that more ideologically cohesive parties facilitate building a party label.

Second, the nature of coalition governments may further reinforce this electoral incentive. While majoritarian systems facilitate single-party governments, proportional systems usually lead to coalition governments.[5] In multiparty systems with coalition governments, parliamentarians cannot only outline the difference between the government and opposition, but also need to talk about the difference across different government and opposition parties (Martin and Vanberg, 2008). In line with this argument previous research highlights that coalition governments are not unitary actors, but involve inherent principal-agent problems among coalition partners (Martin and Vanberg, 2004, 2005; Strøm, Müller and Bergman, 2006).

Due to the increasing electoral incentive and the emergence of coalition governments, we expect that the reform increases the number of speeches that focus on party politics rather than the substantive content of the legislation.

4 Data

To study the effect of the reform on political attention, we use speech data. This data source is especially suited for the analysis of political attention for several reasons. First, speeches allow to study political attention at the individual level. Second, text

[5] In New Zealand, all governments were single-party governments before the transition to the new electoral system. After the reform, all governments were coalition governments and/or minority governments that relied on support from other parties (Boston, Church and Bale, 2003; Karp and Bowler, 2001; Malone, 2015).

data on speeches can be used to conduct more fine-grained analysis than data on roll-call votes or legislative initiatives. Third, the data on speeches is well-documented by the Hansard, which is the official documentation of the New Zealand Parliament.[6]

We extract the speech data from the Hansard, which is the official documentation of the New Zealand Parliament. We access the data for the period from 1987 to 2002 via the private sector company *The Knowledge Basket*. The data came in a series of zip archives, which included a set of files in HTML format.[7]

A set of Python scripts is used to parse the HTML and extract the speeches along with corresponding meta-data, most importantly the speaker. We identify 436,660 speeches and applied a set of filters as follows. We remove speeches held by the Speaker of the New Zealand Parliaments and its deputy because these parliamentarians are supposed to act in line with the general interest and not defend ideological or policy positions. Furthermore, we remove short oral contributions held by 'government member(s)' and 'opposition member(s)' without further information on the name of the speakers. We also drop speeches with less than 40 characters (excluding numbers) and oral contributions in Maori language.[8]

The final dataset has 289,791 speeches, where 154,369 files are speeches, 135,331 are questions, and 91 observations have a different type. In the appendix we show that the number of speeches, and total volume of speech (in words spoken), did not change significantly after the reform. There was a drop in the number of speeches, and total speech output, in 1996, but it returned to the pre-reform level in subsequent years. Therefore we can say that our results are driven by changes in the allocation of speeches across topics, rather than changes in the total flow of speech.

We also add detailed meta-data using information from the Hansard and the New Zealand Parliamentary Information Service. We identify the party membership, the election mechanism (list, constituency, Maori constituency) and the gender of the speaker. Furthermore, we collect data on whether the parliamentarian held a committee membership and whether he entered the parliament after the electoral reform. Regarding the type of speech, we know the date of the speech, the type of oral con-

[6] A fourth advantage is that speech data is directly related to electoral manifestos. Parliamentarians try to implement in parliament the electoral manifestos of their parties. Hence, speeches are more comparable to manifestos than other data sources such as news articles. This advantage is important because we train our supervised learning model with annotated manifesto data.

[7] The contact details of the company are as follows: The Knowledge Basket. PO Box 3152, Ohope 3161, New Zealand.

[8] To remove speeches held in Maori language, we use the *polyglot* Python module.

tribution (speech vs. question) and the stage of the speech (e.g., general debate). We include a variable on whether a party is in the opposition or a junior coalition partner. Finally, we control for the government cycle, which is equal to the number of days to the next change of government divided by 100.

5 Supervised Topic Model

Supervised learning algorithms are increasingly used in political science (e.g., Hopkins and King, 2010; Laver, Benoit and Garry, 2003; Workman, 2015; Zirn et al., 2016). Previous work has applied supervised learning models to identify topics in text documents such as e-mails, electoral manifestos, or laws (e.g., Hopkins and King, 2010; Workman, 2015; Zirn et al., 2016). To infer topics this research uses hand-coded phrases, e-mails or legislative texts to infer the topic of other phrases, e-mails or legislative texts. Hence, supervised learning models are mainly used to extend coding schemes to the same type of documents and save labor costs.

Building upon existing work, we introduce a novel method to measure ideological topics in individual speeches. This method is designed to assess the policy content of any block of text. We propose to use existing knowledge about the phrases associated to manifesto topics, to learn the topics expressed in different documents (e.g., speeches). Technically, we first train a supervised learning algorithm with the manifesto statements, which the Manifesto Project coded by topic. Then we predict the topic of each legislative speech (Shmueli, 2010). While this "ideological topic model" is used here to analyze the implications of the electoral reform in New Zealand, it could be used in many contexts. In the following, we present the details of our method.

We start with downloading all of the coded manifesto statements from the Manifesto Project web site (Budge et al., 2001; Klingemann et al., 2006; Lehmann et al., 2017). We used the *langdetect* module in Python to filter out non-English policy statements. This data set has $N = 52,056$ rows of annotated policy statements. The statement "and reduce global warming emissions" refers, for example, to environment (category 501) and the statement "We can't afford another dose of Labour" to political authority (category 305).

We created our topics based on the manifesto categories in three steps. First, we merged categories on the same topic, but different direction (positive/negative). For example, we put together categories "per607 Multiculturalism: Positive" and "per608

Multiculturalism: Negative" to create one "Multiculturalism" topic. Second, we used the categorization of König and Luig (2012) to combine several categories into substantive topics. Third, we calculated a confusion matrix and merged correlated topics (see appendix) . This procedure lead to 19 topics. The appendix provides a complete list and descriptive information on our 19 topics.

Next, we featurize the statements in the manifesto corpus. The text is normalized by removing stopwords, punctuation, and capitalization. N-grams up to length three are constructed from the resulting tokens, excluding any N-grams appearing in more than 40 percent of statements, or in fewer than 10 statements. We then computed term-frequency/inverse-document-frequency (TF-IDF) weights for each N-gram, where each statement is treated as a document. The resulting feature set has $M = 7,646$ columns.

Using these TF-IDF frequencies as feature inputs, we would like to train a model to predict the manifesto topic code. Having tried a variety of approaches, we obtained the best performance using a regularized multinomial logistic model (Hastie, Tibshirani and Friedman, 2009). The probability mass function of the multinomial logistic (also called a softmax or logit model) is

$$P(Y_i = c) = \frac{e^{\beta_c X_i}}{\sum_{k=1}^{K} e^{\beta_k X_i}}, \tag{1}$$

where $c \in 1,...,K$ are the topic labels and β is an $M \times K$ matrix of parameters. This model is a machine learning workhorse widely used in un-ordered multiclass prediction problems.

The model is trained by minimizing the regularized cost function

$$J(\beta) = -\frac{1}{N}\left[\sum_{i=1}^{N}\sum_{k=1}^{K} \mathbf{1}\{y^i = k\} \log \frac{e^{\beta_k X_i}}{\sum_{l=1}^{K} e^{\beta_l X_i}}\right] + \gamma \sum_{j=1}^{M}\sum_{k=1}^{K} \beta_{jk}^2, \tag{2}$$

where γ is the regularization hyperparameter calibrating the strength of the L2 penalty. The model is estimated with the newton-cg solver using the Python Scikit-Learn implementation (Pedregosa et al., 2011; Yu, Huang and Lin, 2011). Three-fold cross-validation grid search selected $\gamma = 1/2$. We got slightly worse test-sample prediction with L1 and combined L1/L2 penalties.

For predictive validation we first trained the model on a 75 percent random sample of the manifesto statements. In the 25-percent held-out test sample, the trained model

Table 1: Confusion Matrix: True vs. Predicted Manifesto Topics

	Admin.	Agri.	Cult.	De-cent.	Econ.	Educ.	Freed.	Intnl.	Labor	Milit.	Natl Way Life	Demos	Other	Party Pol.	Quality	Target	Tech	Morals	Wel-fare	Total True
Adminis-tration	270	5	2	7	77	12	71	7	5	3	4	1	78	11	36	3	11	0	101	**704**
Agricul-ture	5	114	0	3	24	3	7	4	2	0	2	2	23	1	56	0	7	0	22	**275**
Culture	8	3	155	5	22	21	22	4	0	1	19	4	56	3	18	7	17	1	26	**392**
Decentral-ization	27	2	6	73	16	11	24	1	0	1	3	1	32	7	20	0	13	2	22	**261**
Economics	59	12	5	4	715	13	29	16	19	2	11	4	138	30	96	1	49	2	126	**1331**
Education	7	1	9	1	17	461	8	0	0	0	1	4	75	10	10	2	37	3	69	**715**
Freedom	51	0	9	20	41	13	642	19	3	16	12	6	126	34	16	4	14	7	89	**1122**
Interna-tionalism	8	1	4	3	33	2	45	245	2	14	11	1	46	9	19	3	3	0	26	**475**
Labor Groups	11	2	2	0	36	7	12	2	92	0	2	3	20	3	13	0	6	1	40	**252**
Military	7	0	1	0	7	1	24	27	2	118	5	0	32	2	10	0	9	1	13	**259**
Nat'l Way of Life	4	1	5	3	38	3	32	17	2	6	88	6	61	21	19	2	2	4	44	**358**
Non-Econ Demo Grps	7	1	7	0	15	15	30	1	5	2	5	95	36	8	4	5	5	5	104	**350**
Other Topic	38	14	17	13	78	48	86	25	20	12	20	26	1263	39	71	20	48	7	159	**2004**
Party Poli-tics	20	5	5	2	44	2	48	9	4	5	10	0	80	183	25	4	10	2	53	**511**
Quality of Life	21	17	9	4	102	9	13	14	7	3	7	1	112	16	684	0	42	0	34	**1095**
Target Groups	11	2	7	2	7	17	24	2	4	0	8	1	28	4	1	67	8	1	63	**257**
Tech & In-fra	22	8	5	8	57	31	6	6	5	1	4	2	85	1	62	1	413	0	40	**757**
Trad'l Morality	2	0	2	0	6	9	21	2	0	0	8	3	25	4	1	1	0	61	40	**185**
Welfare	33	6	11	3	93	32	62	3	10	1	9	26	142	37	29	11	23	7	1173	**1711**
Total Predicted	**611**	**194**	**261**	**151**	**1428**	**710**	**1206**	**404**	**182**	**185**	**229**	**186**	**2458**	**423**	**1190**	**131**	**717**	**104**	**2244**	

predicts the correct category label 52.8 percent of the time, corresponding to an F1 score of 0.528 using micro weighting.[9] The in-sample prediction is 70.6 percent accurate. Given that there are 19 topic labels to be assigned, and given that there is some human coder error in the training data, we would argue that 52.8 percent accuracy is quite high. Choosing randomly would be correct 5 percent of the time; choosing the top category (other topic) would be correct 15 percent of the time.

The confusion matrix in Table 1 provides intuitive visual evidence of the accuracy of the model. In the table, the rows index true categories, while the columns index predicted categories. One can see in the bright green cells that the true category tends to be selected most often across rows (with the exception of "Non-economic demographic groups," which is often mis-classified as "welfare"). We can also see, perhaps unsurprisingly, that many statements are mis-classified as "other topic."

Having validated the predictive accuracy, we re-train the model using these hyperparameters on the full training set of manifesto statements. The model produces a predicted probability distribution across topics given a vector of phrase frequencies. This model can be applied to any document.

In our case, we used the trained classifier to form topic predictions for each speech in the New Zealand corpus. These speech-level topic vectors are used in the analyses reported below.

In comparison to unsupervised learning models such as the Latent Dirichlet Allocation (LDA) and structural topic models (Blei, Ng and Jordan, 2003; Grimmer, 2010; Lucas et al., 2015), the ideological topic model systematically includes existing knowledge about the relation between phrases and topics. The LDA and structural topic models require to specify ex ante an arbitrary number of topics and then the content of the topics needs to be interpreted ex post facto. In contrast, our method allows to include expert knowledge about the substantive content and the number of topics. In addition, the supervised topic model identifies the identical topics across different type of documents. We replicated our analysis with LDA, but found that the result was sensitive to the number of topics chosen (see appendix section 10). Our preferred method - using the manifesto topics based on expert knowledge - does not have this shortcoming.[10]

[9] The F1 scores are 0.468 using macro weighting and 0.538 when re-weighted by support.

[10] The main goal of our machine learning approach is to predict the topics of individual speeches using existing knowledge from the manifesto project (Shmueli, 2010). It is clear that speeches contain words and phrases that are not contained in manifestos. To further improve the estimates, we would

6 Validation

We validate the method by interpreting how the model classifies parliamentary speeches. First, we read the ten speeches with the highest probability of belonging to a topic. We found in general that the speeches correspond very well to the specified topics. The appendix includes several examples for speeches on party politics.

Second, we examine the phrases that are positively and negatively correlated to topics in the speeches data. We start by extracting informative phrases from the speeches (see Handler et al., 2016; Denny and Spirling, 2018). This approach allows us to recognize key phrases such as "new zealand", and treat them as single tokens. We tag parts of speech and identify phrases with up to four words using tag patterns, which results in a collection of noun and verb phrases.[11] We remove upper-case and punctuation and then lemmatize the tokens to remove uninformative word endings. We filter out rare sequences that appear in fewer than 20 speeches or fewer than 30 times in total. We rank the phrases by their relative collocation (point-wise mutual information) to get key phrases.[12] We filter out a set of policy-irrelevant words (e.g., names). The implemented vocabulary includes 20,956 words and phrases. Each speech is represented as a relative frequency distribution over that vocabulary.

Then we calculate t-statistics on the correlation between phrase frequency and topic probabilities and plot phrases with the highest t-statistic. Figure 1 illustrates the wordclouds' phrases that are positively related to the eight topics with the largest number of speeches. The figure first illustrates the wordcloud for party politics and then shows further seven topics, which are ordered in decreasing order. In the appendix, we present the wordclouds with positively and negatively related words for all 19 topics.

Overall, the topic party politics is the second most frequent topic. We used the manifesto category political authority to measure party politics because this topic

need a random sample of phrases used in speeches and the corresponding categorizations to topics (Hopkins and King, 2010, 234). However, this data is unfortunately not available. Hence, we use existing data and implement a number of validity tests to ensure that the predictions are accurate.

[11] We use the following tag patterns: 'A', 'N', 'V', 'P', 'C', 'D', 'AN', 'NN', 'VN', 'VV', 'NV', 'VP', 'NNN', 'AAN', 'ANN', 'NAN', 'NPN', 'VAN', 'VNN', 'AVN', 'VVN', 'VPN', 'ANV', 'NVV', 'VDN', 'VVV', 'NNV', 'VVP', 'VAV', 'VVN', 'NCN', 'VCV', 'ACA', 'PAN', 'NCVN', 'ANNN', 'NNNN', 'NPNN', 'AANN', 'ANNN', 'ANPN', 'NNPN', 'NPAN', 'ACAN', 'NCNN', 'NNCN', 'ANCN', 'NCAN', 'PDAN', 'PNPN', 'VDNN', 'VDAN', 'VVDN'. A: adverbs and adjectives, C: conjunctions, D: pronouns, N: nouns, P: prepositions, V: verbs.

[12] This is done by calculating the geometric mean of the pointwise mutual information criterion, since this metric can be calculated using the absolute rather than the relative frequencies. We set the following mininum levels: bigrams: 0.004, trigrams: 0.003, quadgrams: 0.002.

captures references to a "party's competence to govern" and to the "other party's lack of such competence". The words that are positively related to this category are the names of the main parties such as national, labour and alliance. Furthermore, multiple verbs on political action such as raise or want are related positively to this topic. The topic is also associated to the words leadership, vision and politics.[13]

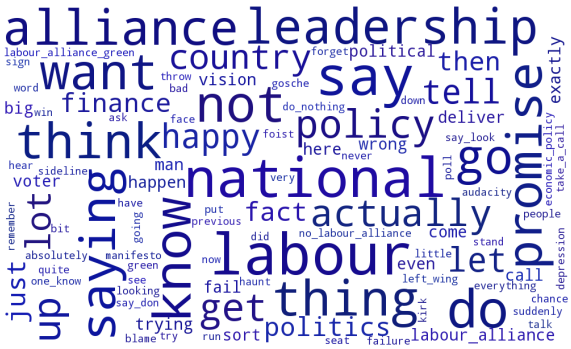
The other topics play a secondary role in our analysis, but still provide encouraging support for the success of our method. The figure includes the most frequent topics besides party politics. The topic freedom includes the manifesto categories law and order, democracy, constitution as well as freedom and human rights. This topic is associated to words such as offender, police, crime an democracy. The third most frequent topic is economics, which includes multiple manifesto categories on economic topics. This topic is related among others to the words company, tax, debt, market and percent. The fourth topic is welfare and includes words such as health, hospital, patient and surgery.

The fifth topic is administration and is based on the manifesto categories on governmental and administrative efficiency, corporatism, economic planning and political corruption. This topic is related to words such as department, performance and expenditure. The next topic education and encompasses among others the words school, teacher education, tertiary institution learning and parent. The seventh topic is quality of life, which includes the manifesto categories, anti-growth economy, environmentalism and productivity. The topic quality of life is associated to words such as environment, export, growth and energy efficiency. The eighth topic includes technology and model structure, and relates to the words rail, road, public transport and research.

[13]The manifesto category political authority also captures "favourable mentions of the desirability of a strong and/or stable government in general." We read all annotated manifesto statements on political authority in English language and only found an very small number of references on political instability. Hence, we decided to use this category to capture party politics. The low number of references to political instability might be due to the high level of political stability of English-speaking countries (e.g., United Kingdom, Australia, United States).

Figure 1: Wordclouds for the eight most frequent topics

(a) party politics



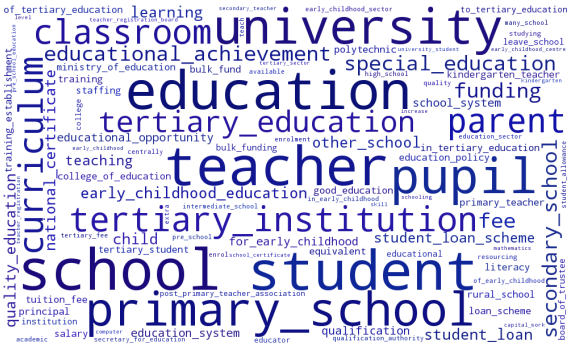
(b) freedom

(c) economics

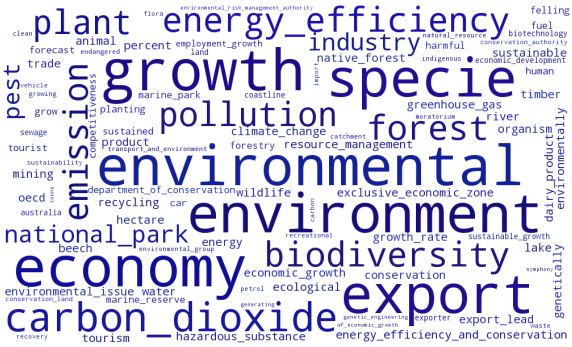
(d) welfare

(e) administration

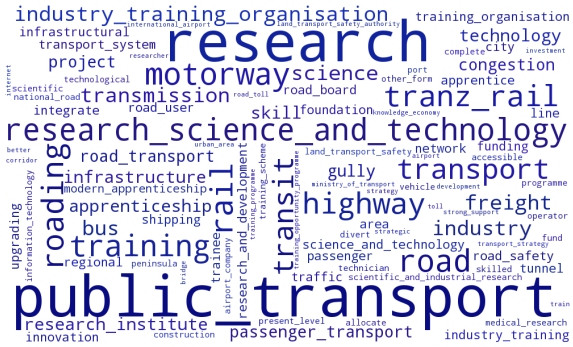
(f) education



(g) quality of life



(h) technology and infrastructure



7 Results

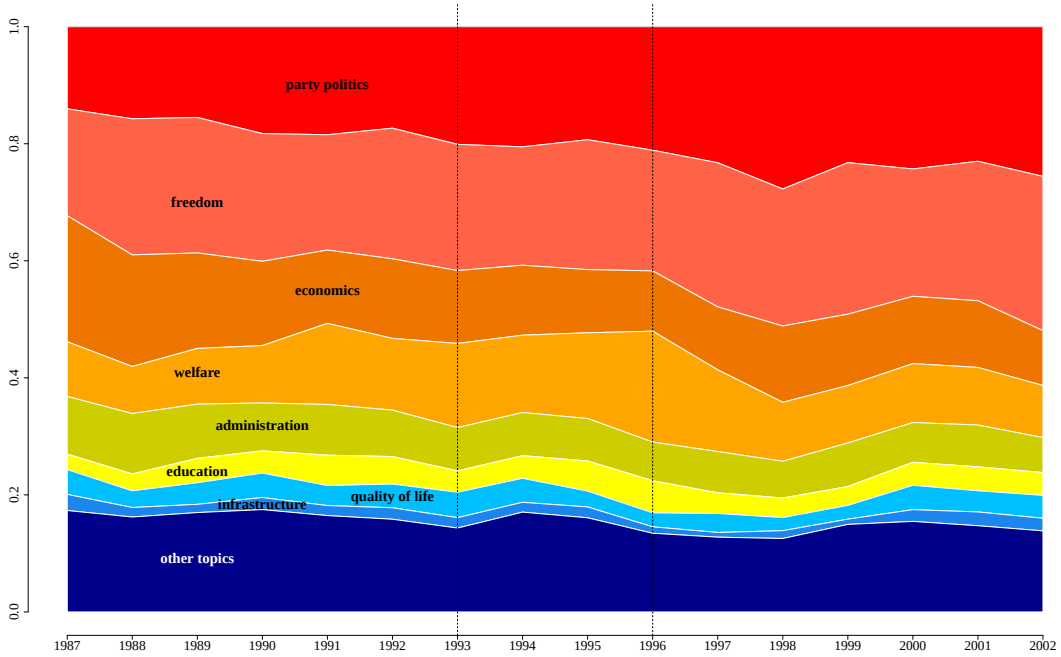
We analyze the speech-level incentives to emphasize topics. We proceed in several steps. First, we examine graphically how the relative frequency of topics changed over time and across policy areas. We assign speeches to the topic that is most likely to reflect the content of the speeches. Second, we use an event study to inspect how the reform changed the mean probability that a speech focuses on party politics. Then we continue by applying linear regression models to examine the effects of the reform on the probability that a speech refers to party politics.

Figure 2 shows the relative frequency of the topic party politics and the other seven largest policy areas. The topic party politics exhibits a large increase in the relative frequency after the electoral reform. While before the reform between 14 and 21 percent of all speeches belong to this topic, after the reform the relative frequency increases to up to 28 percent.

The most frequent topic in our data is freedom. This topic is relatively constant over time, but seems to increase slightly after the reform. The third topic is economics and exhibits no clear trend. The fourth topic is welfare. The share of speeches on welfare increase until 1997 to 19 percent, and then decrease again to its initial relative frequency. The fifth topic is administration, which also exhibit a roughly constant relative frequency. This finding is in line with Boston, Church and Bale (2003, p. 12), who find that the electoral reform did not significantly reduce the "administration's capacity to develop and implement new policies or enact legislation".

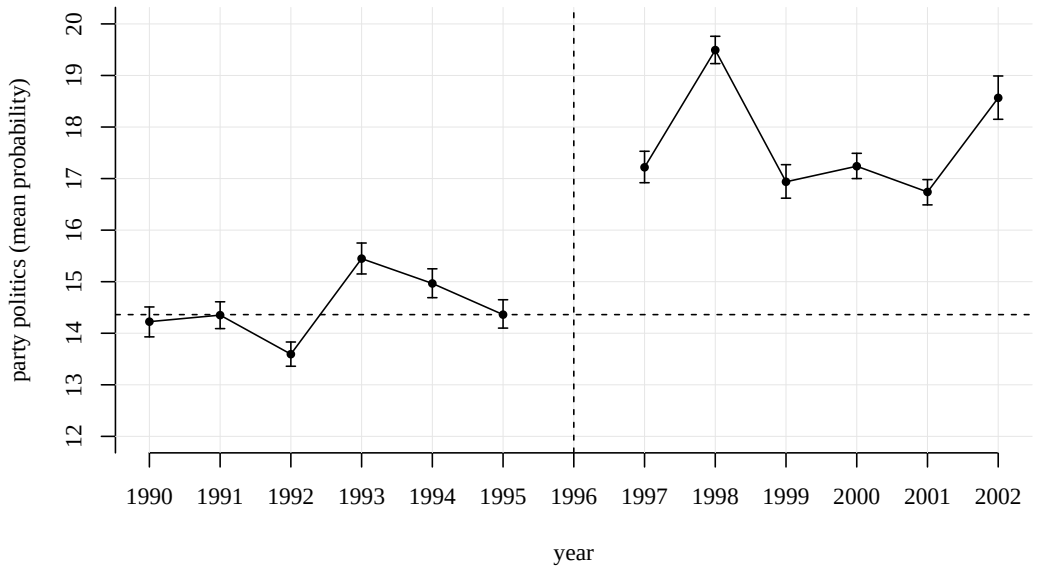
The sixth topic is education and exhibits a relative frequency between 2.6 and 5.5 percents. The seventh topic is quality of life, which is slightly decreasing after the reform, but then returns to levels similar to the pre-reform period. Also the eight topic on infrastructure and technology does not experience a significant change since the relative frequency always lies between 0.8 and 2.8 percents. The final topic captures all the remaining topics and is relatively constant.

Figure 2: Share of speeches by topics.



Note: The dashed lines refers to the decision to introduce the reform (1993) and the first elections held under the new electoral system (1996). The figure illustrates first the relative frequency of the topic party politics. The other policy areas are ordered in decreasing order according to their sample size.

Figure 3: Share Party Politics Over Time



Note: This graph shows the mean party politics by year for 1990-2002. We calculated the 95% confidence intervals using bootstrapping.

The effect on party politics is further emphasized in the event study graph reported in Figure 3. This graph illustrates the jump in party politics after the reform, with little sign of a pre-trend. The effect happens after the first proportional election (1996) rather than before, which rules out a strong anticipation or incentive effect in the transitional period between 1993 and 1996. We observe the effect after the reform when a new population of speakers enters. In the analysis, we will examine whether the reform increases political attention due to changing incentives or the selection of new parliamentarians.

We assess the statistical significance of the graphical evidence in a linear regression framework. These regression estimates are reported in Table 2. There are two sets of regressions: the change in incumbent parliamentarians due to the reform (Models 1 through 6), and the difference between parliamentarians selected before and after the reform (Models 7 and 8). The table focuses on the explanatory variables, but the appendix includes all coefficients.

Models 1 through 6 look at the effect of the reform on sitting speakers. We model

the probability that speech i focuses on party politics, y_{ist}, for speaker s at time t as

$$y_{ist} = \alpha_s + \alpha_t + \rho \text{Reform}_t + X'_{ist}\beta + \varepsilon_{ist} \tag{3}$$

where α_s includes speaker fixed effects, α_t includes a quadratic time trend, Reform_t is an indicator variable equaling one for years after the reform, and X_{ist} includes a set of controls to assess robustness. Standard errors are robust and clustered by speaker (although statistical tests are robust to two-way clustering by speaker and year).

First, Model 1 includes the baseline model with just a constant and a quadratic in time. According to Model 1, the probability that a specific speech corresponds to the topic party politics increases by about 3 percentage points after the reform, relative to a pre-treatment baseline of 14.5 percent. Model 2 adds speaker fixed effects, and Model 3 includes speaker-time trends. Finally, Model 4 is the same as Model 2 (speaker fixed effects), but the observations are weighted by length of the speech (in number of words). In all cases, the effect of the reform is stable and significant.

Model 5 provides further probing of robustness by adding to the regression a set of covariates. These include speaker-level dummies for list MP, cabinet member, committee chair, and Maori constituency. They include speech-level dummies for question, general debate, administrative speech, and committee stage, and a continuous variable for the timing in the governing cycle. They include party-level dummies for opposition party, and coalition partner. As seen in Column 5, the effect of the reform is estimated to be smaller (2 percentage points) but still significant at the 0.01 level. Further, these results are robust to fully interacting these controls with the reform dummy.[14]

In Model 6, we focus on the set of speeches where parliamentarians have relatively high discretion over their speeches – general debates. According to (Maltzman and Sigelman, 1996, p. 819), general debates provide "unconstrained floor time", where parliamentarians are not restricted to talk about a particular legislative proposal (see also Alemán, Ramírez and Slapin, 2017). This is reflected in the parliamentary rules, which

[14]We do not report the coefficients on the covariates but they are summarized as follows. We find that senior politicians taking over responsibility as cabinet member or committee chair talk less about party politics. Parliamentarians from the opposition party exhibit a higher probability of talking about party politics. Parliamentarians tend to talk more about party politics at the beginning of the government cycle (when governments are forming). Politicians who are member of a small coalition party speak about 3.7 percent more about party politics. Furthermore, the probability that a speech is about party politics decreases in administrative speeches and legislative speeches held at the committee of the whole house stage. Questions of parliamentarians are less likely to focus on party politics than ordinary speeches.

provide that in general debates "members may raise matters of concern to them"[15].

By interacting reform with a dummy for the speech being in general debates, we see the reform is especially strong for these speeches. In general debates the probability that a speech is about party politics increases by about 6 percent. With more discretion in speech content, the institutional factors driving within-speaker changes are seen more clearly.

We are also interested in distinguishing the incentive effect from the selection effect of the reform. In Models 7 and 8 we analyze the selection effect using

$$y_{ist} = \alpha_t + \rho \text{PostReform}_s + X'_{ist}\beta + \varepsilon_{ist} \tag{4}$$

where α_t now includes a full set of year fixed effects, and PostReform_s is an indicator variable equaling one if speaker s was selected after the reform. The other items are the same as before. With the inclusion of year fixed effects, we are measuring the differences between parliamentarians selected under different systems (majoritarian or proportional), holding contemporaneous institutional and incentive factors constant.

We find a negative coefficient in these regressions. Individuals selected after the reform tend to be less partisan in their speech. The size of the effect (-2.68 to -3.72 percent) is similar in magnitude to the within-speaker effects from the previous models.

To summarize, moving from majoritarian to proportional elections causes sitting parliamentary members to increase their use of party politics in speech. But if we look at the types of politicians selected under proportional elections, the effect is negative. Meanwhile, the transitional period does not exhibit a substantial increase in party politics. However, the attention towards party politics increases after the implementation of the proportional electoral system, which is consistent with an institutional effect of having more parties active in the parliament. Because the selection effect is negative, in the longer run the differences between electoral systems might become smaller.

[15]New Zealand Parliament. Standing Orders. 1999. Number 379.

Table 2: Regression Results: Effect of Reform on Party Politics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post Electoral Reform	3.251**	2.953**	3.356**	2.784*	2.084**	1.912**		
	(0.897)	(0.823)	(0.985)	(1.133)	(0.579)	(0.577)		
Post Reform × General Debate						3.825**		
						(1.247)		
Selected after Reform							-2.687*	-3.719**
							(1.163)	(0.991)
Quadratic Trend	X	X	X	X	X	X		
Speaker Fixed Effects		X	X	X	X	X		
Speaker Trends			X					
Controls					X	X		X
Weighting by Speech Length				X				
Year Fixed Effects							X	X
N	289791	289791	289791	289791	289791	289791	289791	289791
R^2	0.010	0.056	0.070	0.091	0.145	0.145	0.013	0.115

Standard errors, clustered by speaker, in parentheses. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

8 Robustness and Validity

To check the robustness, we run a number of tests. First, we remove all speeches held in the committee of the whole house stage; before the electoral reform, the parliament did not cover all speeches held at the committee of the whole house stage (McGee, 2017). Second, we remove all administrative speeches. Third, we use a multilevel model and estimate random intercepts for each parliamentarian instead of using speaker fixed effects and clustered standard errors. Fourth, we control for a linear time trend. Fifth, we re-run our analysis with the log of party politics and, alternatively, a binary variable that is equal to one if the speech is most likely to be about party politics and zero otherwise. Sixth, we estimate the topics using a one-versus-all model rather than a multinomial model. Seventh, we remove several topics affected by coder missclassification and train our model only using party politics speeches that mention the words party, parties as well as the name of parties (Mikhaylov, Laver and Benoit, 2012). Across all these tests, we find that the analysis of party politics is robust.

Following Catalinac (2018), we run a regression of our dependent variable on the time trend. The Chow test (Chow, 1960) detects a statistically significant structural break after the reform in 1996 ($p<0.01$). In the appendix, we discuss whether other economic or political shocks may explain changing levels of political attention after the reform.

Furthermore, we examine the comparability of manifesto and speech data. We

believe that the comparability of manifesto and speech data is high because both texts stem from party members. In addition, parliamentarians work in parliament to implement policies that the manifestos present. Nevertheless, one potential concern is that manifesto and speech data use different language because speeches may contain procedural language. To examine this concern, we create a new topic on procedural language using all phrases included in the glossary of the New Zealand Parliament webpage. Our findings remain the same. As a validity test, we also study how party politics evolved in the electoral manifestos for New Zealand in the period 1981-2008 (Lehmann et al., 2017). The figure confirms that the trend estimated in speech data is similar to the trend exhibited in electoral manifestos. The details are in the appendix.

9 Concluding Remarks

This study investigates the implications of the electoral reform in New Zealand for political attention. We focus on the 1993 electoral reform in New Zealand, which changed the electoral system from a first-past-the-post to a closed-list mixed electoral system. This reform constitutes an ideal setting to study the implications of electoral systems for political attention because it allows to keep country-specific and for some parliamentarians individual-specific characteristics constant.

Our theoretical expectation is that electoral systems influence political attention towards party politics. In contrast to the first-past-the-post-system, parliamentarians in mixed-member electoral systems have a stronger incentive to create a unified party label because the party vote usually determines the number of seats (Proksch and Slapin, 2012). Party leaders also tend to have more means to ensure that parliamentarians act in line with party interests. Furthermore, proportional electoral systems tend to facilitate the creation of coalition governments, where multiple parties work together to form a government and adopt legislation. Hence, parliamentarians need to highlight party differences rather than government-opposition differences to appeal to voters (Martin and Vanberg, 2008).

Our results suggest that the reform increased attention towards party politics, which includes references to party competence. The effect is around 3 percent on average and in general debates it increases to around 6 percent. This finding is robust across different subsets of the data and estimation techniques. These findings highlight a potential source of policymaking frictions generated by proportional representation

institutions.

We believe that our work increases our understanding on the implications of electoral systems on party competition. Previous research has examined the effects on ideological positions and speech comprehensibility (e.g., Catalinac, 2018; Spirling, 2016), but we have little evidence about the topics parliamentarians emphasize. Our results highlight that the reform increased political attention towards the process of democratic decision-making. This effect stems largely from changing behavior of existing parliamentarians rather than the entering of new parliamentarians. Furthermore, we provide a novel supervised learning method to estimate topics in parliamentary speeches. This method may help to answer new questions in the analysis of manifesto data.

Our study has normative and policy implications about the role of electoral systems in parliamentary democracies. While mixed-member electoral systems allow minorities and underrepresented groups to enter the parliament, our results highlight a potential disadvantage, which is the increasing discussion about party politics rather than substantive topics. This may potentially reinforce legislative gridlock and political distrust. More generally, we want to highlight that the effects of any reform depend on the geography of the electorate. Hence, a reform from first-past-the-post to a mixed-member electoral system may not always increase a focus on party politics.

In the future, scholars may increase our understanding of party competition by applying and improving the used machine classification techniques. Our method opens several interesting avenues for future research. For example, scholars can use our tool to compare party priorities expressed in legislative speeches to priorities expressed in manifestos. Another interesting extension would be to classify manifesto categories to different issue dimensions and then estimate ideological positions for each of these dimensions. Finally, our method may allow one to identify ideological topics in other documents such as party press releases, legislative texts and coalition agreements.

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Appendix: Proportional Representation Increases Party Politics: Evidence from New Zealand Parliament using a Supervised Topic Model

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1 Details on the Electoral Reform

Table 1 summarizes the main differences between the electoral systems before and after the reform. In the first-past-the-post system, voters have one vote to select a candidate in their electorate. In the mixed-electoral proportional system, voters have two votes. Citizens can use the first vote to select a party at the national level and the second vote to select a candidate in the electorate. The reform increased the size of the parliament from 99 to 120 members. Notice that the size of the New Zealand varied in the period before the reform. The number of parliamentarians elected via district decreased from 95 to 60. The number of Maori districts increased from four to five with the option of further increases. Under the mixed-electoral system, the remaining (list) seats are allocated using the Saint Laguë formula. Similar to the electoral system in Germany, parties have to achieve at least 5 percent of the party votes or win an electorate (Barker et al., 2003; Vowles et al., 2002).[1]

Table 1: Comparison of First-Past-The-Post and Mixed-Member Electoral System.

	first-past-the-post	mixed-electoral system
number of votes	1	2
number of MPs	99	120 (+overhang)
number of districts	95	60
number of list MPs	95	55
number of Maori district	4	5
electoral rule (districts)	relative majority	relative majority
minimum entry criteria	win an electorate	5% party votes or win an electorate
formula for list seats	-	Saint Laguë formula

2 Economic Development in New Zealand

We want to make sure that the changes in political attention after the 1996 electoral reform were not caused by other events that took place at the same time. For this purpose, we checked whether any shock occurred that could have changed political attention after 1996.

First, we examine economic indicators from New Zealand. More precisely, a significant economic recession could have increased the division between National and

[1] See http://www.elections.org.nz/ (accessed on July 30, 2017).

Labour parliamentarians. Figure 1 illustrates the long-term development of four economic indicators: gross domestic product, gross domestic product (GDP) per capita, the unemployment rate and the inflation rate.[2] The figures show the GDP, the GDP per capita and the inflation rate in the period 1982 until 2008. The unemployment rate is illustrated for the years between 1986 and 2008.

The gross domestic product has in 1996 around 70 billion US Dollars measured in current dollars. After the electoral reform, the GDP seems to slightly decrease, but then increases again. Hence, the average value of the gross domestic product in the legislative periods 1993-1996 and 1996-1999 is very similar. The trend in economic development seems to be in line with a normal long-term growth trend and not a period of economic crisis. The graph of the gross domestic product per capita, the consumer price index and the unemployment rate also do not provide evidence of a major economic crisis that could have substantially changed political attention after 1996. The inflation decreases after 1996 to about 1 percent, which is similar to the inflation rate in the early 1990s. The unemployment rate is in 1996 6.6 and then increases in 1999 to 7.7, but still remains at a low level that is similar to unemployment levels in the late 1980s.

Second, we controlled whether New Zealand underwent in 1996 any other substantial reform besides the electoral reform (Evans et al., 1996; Scott, 1996). Indeed, New Zealand government implemented important economic and public sector reforms since 1984. The reforms liberalized the markets (e.g., financial and labour markets) and aimed at making the public sector more efficient (e.g., privatization, reduction of employees). However, many of these reforms were already implemented in the 1980s or early 1990s. This timing suggests that the reforms cannot explain substantial changes in political attention after 1996.

[2]Sources: The data on the GDP, GDP per capita and CPI stems from the Worldbank, and the data on the unemployment rate from NZ stats.

Figure 1: Economic Indicators.

3 Data

We use the Hansard as a source to identify the parliamentary speeches. This document offers a verbatim record of parliamentary speeches.[3] The New Zealand in-house service to report on debates was established in 1867 and in 1899 the reports became "substantially verbatim" (Edwards, 2015, p. 8). The goal of Hansard is to give the public un-biased information on parliamentary speeches. The name Hansard has its origins in England. Thomas Curzon Hansard compiled the debates of the House of Commons. In England, the Parliament took control of the reporting in 1909 (Ralphs, 2009, p. 8). The Hansard is an established source in political science and has mainly been used to study parliamentary speeches held in the House of Commons (Peterson and Spirling, 2018; Spirling, 2016). To our knowledge, the texts of parliamentary debates in New Zealand have not yet been systematically analyzed using quantitative text analysis.

We access the data via the database provider *The Knowledge Basket*[4]. The company provides us the speeches as html files. We wrote a python script to extract and segment the speeches. In addition, we identify relevant meta-data such as the stage of the speech, the date, the speaker name and type of speech. In the paper, we focus on the time period from 1987 until 2002. Our corpus takes into account 289,791 oral contributions including 154,369 speeches, 135,331 questions and 91 observations with a different type. Figure 2 illustrates the number of speeches by year. The number of speeches appears to be relatively constant over time with a slight increase after the 1996 electoral reform. We observe that in elections years the number of speeches is lower than in non-election years because the parliament has fewer sessions.

Figure 3 shows the number of speeches by party. We observe that the number of speeches correlates with the number of seats held in the New Zealand Parliament. The two parties with the largest number of speeches are the National and Labour parties followed by New Zealand First and ACT. Our data involves speeches from eight different parties: ACT, Alliance, Green, Labour, National, New Labour, NZ First, United New Zealand. The National party is a conservative and the ACT a liberal party. On the left side of the political spectrum, the New Zealand party system exhibits the Labour party as well as New Labour and the Alliance party. New Zealand First is a right-wing populist party and United New Zealand is located in the political

[3] Additional information can be found on the webpage of the New Zealand Parliament: https://www.parliament.nz/en/pb/hansard-debates/what-is-hansard/ (accessed on July 5, 2017).

[4] http://www.knowledge-basket.co.nz (accessed on July 7, 2017).

center (Miller, 2005, chapter 8).

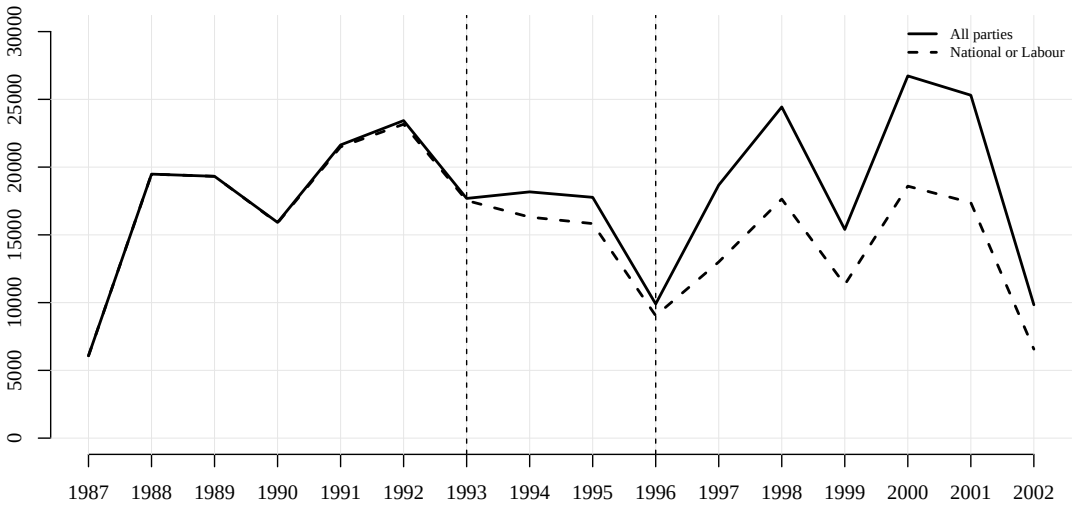
We also collect data on individual-level characteristics of parliamentarians. First, we identify data on the party membership and election mechanism (list vs. district election). For the period from 1987 until 1996, we use data provided by the Information Service of the New Zealand Parliament. For the period from 1996 until 2002 we examine data from the New Zealand Electoral Commission. We measure cabinet membership and party leadership based on the Hansard and information delivered by the political parties. In addition, we code the gender of the parliamentarian based on the speaker name.

Table 2 provides descriptive statistics on the variables used in the regression analysis.

Table 2: Summary Statistics

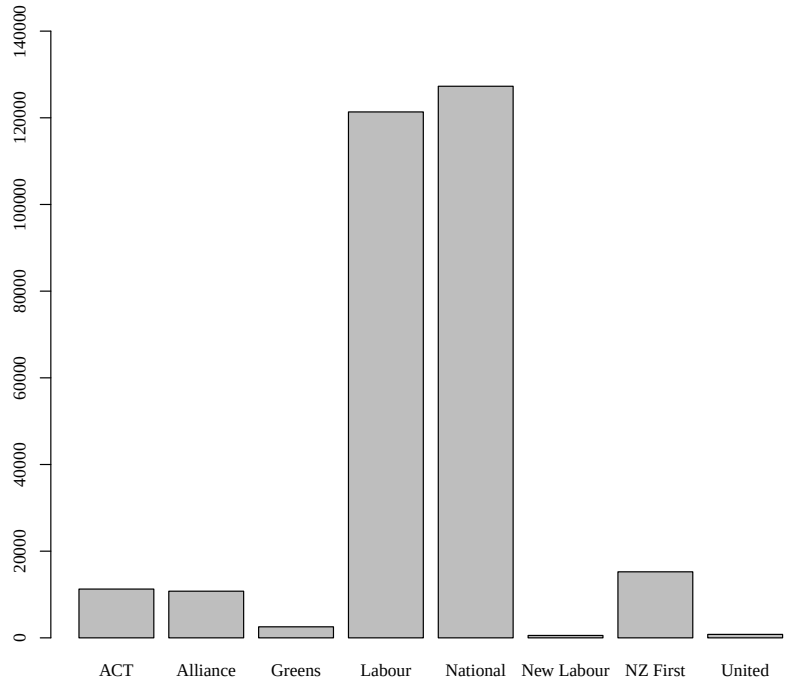
Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**
Party Politics	15.511	19.577	0	99.839
Post Electoral Reform	0.416	0.493	0	1
Selected after Reform	0.131	0.338	0	1
List MP	0.18	0.384	0	1
Cabinet Member	0.312	0.463	0	1
Committee Chair	0.131	0.338	0	1
Maori Constituency	0.018	0.134	0	1
Question	0.467	0.499	0	1
General Debate	0.044	0.206	0	1
Administrative Speech	0.013	0.113	0	1
Committee Stage	0.104	0.306	0	1
Opposition Party	0.464	0.499	0	1
Coalition Partner	0.043	0.203	0	1
Government Cycle	527.071	286.659	45	1138
Female	0.172	0.377	0	1
N		289791		

Figure 2: Number of Speeches by Year



Note: The dashed lines refers to the decision to introduce the reform (1993) and the first elections held under the new electoral system (1996).

Figure 3: Number of Speeches by Party



4 Manifesto Categories and Topics

We classify speeches to topics that are based on the Manifesto Project categories (Budge et al., 2001; Klingemann et al., 2006). In the following, we provide a list of manifesto categories. The detailed description of the manifesto categories can be found in the manifesto codebook.[5]

- per101 Foreign Special Relationships: Positive
- per102 Foreign Special Relationships: Negative
- per103 Anti-Imperialism
- per104 Military: Positive
- per105 Military: Negative
- per106 Peace
- per107 Internationalism: Positive
- per108 European Community/Union: Positive
- per109 Internationalism: Negative
- per110 European Community/Union: Negative
- per201 Freedom and Human Rights
- per202 Democracy
- per203 Constitutionalism: Positive
- per204 Constitutionalism: Negative
- per301 Decentralization
- per302 Centralisation
- per303 Governmental and Administrative Efficiency

[5]Manifesto Project Dataset. 2015. Codebook. https://manifestoproject.wzb.eu/down/documentation (accessed on November 10, 2017).

- per304 Political Corruption
- per305 Political Authority
- per401 Free Market Economy
- per402 Incentives: Positive
- per403 Market Regulation
- per404 Economic Planning
- per405 Corporatism/Mixed Economy
- per406 Protectionism: Positive
- per407 Protectionism: Negative
- per408 Economic Goals
- per409 Keynesian Demand Management
- per410 Economic Growth: Positive
- per411 Technology and Infrastructure: Positive
- per412 Controlled Economy
- per413 Nationalisation
- per414 Economic Orthodoxy
- per415 Marxist Analysis
- per416 Anti-Growth Economy: Positive
- per501 Environmental Protection
- per502 Culture: Positive
- per503 Equality: Positive
- per504 Welfare State Expansion
- per505 Welfare State Limitation

- per506 Education Expansion
- per507 Education Limitation
- per601 National Way of Life: Positive
- per602 National Way of Life: Negative
- per603 Traditional Morality: Positive
- per604 Traditional Morality: Negative
- per605 Law and Order: Positive
- per606 Civic Mindedness: Positive
- per607 Multiculturalism: Positive
- per608 Multiculturalism: Negative
- per701 Labour Groups: Positive
- per702 Labour Groups: Negative
- per703 Agriculture and Farmers: Positive
- per704 Middle Class and Professional Groups
- per705 Underprivileged Minority Groups
- per706 Non-economic Demographic Groups

We created our topics as follows. First, we merged manifesto categories on the same topic, but different direction (positive/negative). For example, we combined the categories "per607 Multiculturalism: Positive" and "per608 Multiculturalism: Negative" to create one "Multiculturalism" topic. Second, we used the categorization of König and Luig (2012) to merge categories into more general topics. Third, we calculated a confusion matrix (see Tables 3 and 4), which gives the pair-wise correlations between the topics predicted by the logistic model. These correlations were used to further combine related topics. This procedure lead to the following 19 topics:

- Administration: per203, per304, per404, per405

- Agriculture: per703
- Culture: per502, per607, per608
- Decentralisation: per301, per302
- Economics: per401, per402, per403, per406, per407, per408,per409, per414, per412, per413, per415
- Education: per506, per507
- Freedom: per201, per202, per203, per204, per605
- International cooperation: per101, per102, per103, per107,per108, per109, per110
- Labour groups: per701, per702
- Military: per104, per105, per106
- National way of life: per606, per601, per602
- Non-economic demographic groups: per706
- Other topic: This topic captures statements that the manifesto project coded with 0
- Party politics: per305
- Quality of life: per410, per416, per501
- Target groups: per704, per705
- Technology and infrastructure: per411
- Traditional morality: per603, per604
- Welfare: per503, per504, per505

Table 3: Pair-wise Correlations between Topic Probabilities, by Manifesto Speech

	adminis-tration	agricul-ture	anti-im-peralism	civic minded-ness	consti-tution	culture	decen-tralisa-tion	eco-nomic goals	educa-tion	enter-prise	europe	foreign special	freedom	interna-tional-ism	labour groups
administration	1														
agriculture	-0.02963	1													
anti-imperalism	0.012328	-0.00221	1												
civic mindedness	-0.01348	-0.01862	0.054817	1											
constitution	0.029932	-0.01909	0.022817	0.018304	1										
culture	-0.03758	-0.01882	0.001066	0.006315	-0.01346	1									
decentralisation	0.046443	-0.01787	0.027507	0.031079	0.00233	0.006129	1								
economic goals	-0.01947	0.030284	0.03837	0.004883	-0.01201	-0.00459	-0.01475	1							
education	-0.07668	-0.05776	-0.04529	-0.05493	-0.03911	-0.02428	-0.04694	-0.06922	1						
enterprise	0.005706	-0.01158	0.029212	-0.00149	-0.01324	-0.03343	-0.01743	0.046277	-0.07886	1					
europe	-0.02232	-0.00062	0.014074	-0.00236	0.019981	-0.01211	-0.00332	-0.00214	-0.03616	-0.01452	1				
foreign special	-0.03616	-0.02175	0.05699	0.028262	0.002852	-0.01643	-0.00421	-0.00157	-0.04833	-0.00384	0.011962	1			
freedom	-0.0328	-0.07574	0.021486	0.018248	0.05714	-0.05478	-0.01293	-0.0829	-0.11282	-0.06402	-0.01499	0.016934	1		
internationalism	-0.05034	-0.02308	0.087133	-0.00211	-0.00563	-0.02362	-0.01539	-0.01379	-0.06355	-0.02482	0.050775	0.168433	-0.02051	1	
labour groups	-0.02549	-0.02847	0.005127	0.002337	-0.01066	-0.03421	-0.03986	0.15139	-0.05793	0.04069	-0.0039	-0.02162	-0.04687	-0.03227	1
macroeconomics	0.018515	-0.02487	0.008893	-0.01983	-0.01415	-0.03093	-0.02195	0.090181	-0.05049	0.037597	-0.00692	-0.02224	-0.07014	-0.01965	-0.0134
market	0.01569	-0.00868	0.001181	-0.03352	-0.0224	-0.039	-0.02619	0.092157	-0.08509	0.132969	-0.01114	-0.03579	-0.09106	-0.04904	0.003772
marxist analysis	-0.00134	-0.00815	0.031463	0.013605	0.00193	-0.00893	-5.4E-05	0.062452	-0.03031	0.041518	0.008679	0.001139	-0.02173	0.003742	0.014384
military	-0.04414	-0.02906	0.039695	-0.0052	-0.00897	-0.02705	-0.02905	-0.02198	-0.05565	-0.03155	0.016292	0.103251	-0.00454	0.089676	-0.02985
multiculturalism	-0.02621	-0.0229	0.034098	0.055907	0.008151	0.077355	0.015444	-0.01841	0.004399	-0.02186	-0.00367	0.002458	-0.02404	-0.01097	-0.02683
national way of life	-0.04136	-0.01334	0.07785	0.152054	0.016748	0.005838	-0.00422	0.03193	-0.06416	0.015024	-0.00352	0.055711	-0.00287	0.03297	-0.02814
Non-econ demos	-0.05355	-0.04537	0.000266	0.017158	-0.00329	-0.01382	-0.03388	-0.04175	-0.02848	-0.04588	-0.02127	-0.02868	-0.02236	-0.0443	-0.01255
other topic	-0.12927	-0.07634	-0.05941	-0.06042	-0.03971	-0.05096	-0.07767	-0.08493	-0.11255	-0.09554	-0.03384	-0.06185	-0.125	-0.08447	-0.09215
political authority	-0.01494	-0.0406	0.033446	0.045983	0.007168	-0.04742	-0.02952	0.006598	-0.07647	-0.01541	-0.00853	0.009013	-0.00531	-0.01635	-0.01308
political corruption	0.041043	-0.01724	0.019513	0.01652	0.035106	-0.0104	-0.00134	-0.0075	-0.03447	0.00287	-0.00342	0.000666	0.037795	-0.00483	-0.00752
protectionism	-0.02433	0.031314	0.022571	-0.00603	-0.00639	-0.00614	-0.01305	0.053606	-0.03863	0.068248	0.004672	0.046942	-0.04431	0.037963	-0.0129
quality of life	-0.06291	0.051466	-0.02184	-0.04538	-0.04639	-0.03305	-0.03317	0.071643	-0.12189	-0.03204	-0.02472	-0.04456	-0.14765	-0.0275	-0.04216
target groups	-0.02132	-0.04006	0.026569	0.015945	-0.00355	-0.01653	-0.01992	-0.02403	-0.02742	-0.03328	-0.01203	-0.01066	-0.01046	-0.0222	-0.00336
Tech & infra	-0.05821	-0.01605	-0.02579	-0.05398	-0.04182	-0.02255	-0.01856	0.004922	-0.01896	-0.02338	-0.03199	-0.03782	-0.12745	-0.05533	-0.04163
traditional morality	-0.04486	-0.03154	0.0103	0.031701	0.002228	-0.02441	-0.02498	-0.01755	-0.01647	-0.02668	-0.01063	0.001194	-0.00908	-0.01915	-0.00606
welfare	-0.06794	-0.08872	-0.04762	-0.03162	-0.0546	-0.07739	-0.0607	-0.07626	-0.09153	-0.07273	-0.05278	-0.07772	-0.14123	-0.09957	-0.03486

Table 4: Pair-wise Correlations between Topic Probabilities, by Manifesto Speech (cont.)

	macro-economics	market	marxist analysis	military	multi-culturalism	national way of	non-economic	other topic	political authority	political corruption	protectionism	quality of life	target groups	technology & infra	traditional moral	welfare
macroeconomics	1															
market	0.06181	1														
marxist analysis	0.0571	0.05943	1													
military	-0.02805	-0.04945	-0.00764	1												
multiculturalism	-0.0277	-0.04047	-0.00169	-0.01591	1											
national way of life	-0.00672	-0.04491	0.01251	0.02043	0.05498	1										
Non-econ demos	-0.04524	-0.0501	-0.0135	-0.03136	-0.01135	-0.02018	1									
other topic	-0.07943	-0.12531	-0.03481	-0.07162	-0.0575	-0.07599	-0.09477	1								
political authority	0.05365	-0.05839	0.02144	-0.00876	-0.0195	0.07553	-0.05421	-0.07156	1							
political corruption	-0.00765	-0.01173	0.0071	-0.00825	-0.00144	0.00725	-0.01084	-0.04564	0.01348	1						
protectionism	-0.00245	0.0128	0.00611	-0.00416	-0.00538	0.03299	-0.03262	-0.05043	-0.01828	-0.00313	1					
quality of life	-0.02103	-0.04579	-0.01486	-0.05615	-0.05149	-0.02647	-0.10797	-0.13046	-0.06783	-0.0369	0.03778	1				
target groups	-0.04089	-0.0441	-0.00314	-0.02347	0.09409	0.01538	0.05867	-0.08142	-0.03612	-0.00877	-0.01495	-0.08592	1			
Tech & infra	-0.0412	-0.02221	-0.02348	-0.05154	-0.04522	-0.05417	-0.07597	-0.11507	-0.08621	-0.03294	-0.01321	-0.00989	-0.06127	1		
traditional morality	-0.02403	-0.02257	0.00179	-0.01573	0.00013	0.0244	0.05301	-0.06361	-0.00967	-0.00583	-0.01841	-0.07364	0.01892	-0.06412	1	
welfare	-0.05365	-0.07055	-0.00751	-0.09389	-0.05262	-0.07873	0.08298	-0.19882	-0.09271	-0.04606	-0.06751	-0.18899	0.0188	-0.1422	0.00256	1

5 Number of Speeches by Policy Areas and Legislative Period

Table 5 summarizes the number of speeches by topic and legislative period. The topics are ordered alphabetically. The total number of topics in the table is 19.

Table 5: Number of Speeches by Topics and Legislative Period

Policy area	87-90	90-93	93-96	96-99	99-02	Total
Administration	5539	5183	3298	4001	4211	22232
Agriculture	743	433	272	491	327	2266
Culture	453	591	477	622	505	2648
Decentralisation	593	551	446	287	403	2280
Economics	10247	8319	5107	7076	6882	37631
Education	2063	2943	2163	1976	2473	11618
Freedom	13170	13663	9641	14362	14464	65300
International cooperation	993	912	827	677	935	4344
Labour groups	871	1148	545	597	1050	4211
Military	449	328	322	368	857	2324
National way of life	790	889	856	997	1202	4734
Non-economic demographic groups	566	717	697	647	390	3017
Other topic	3882	3998	2395	2478	3125	15878
Party politics	9490	11903	9194	14777	14862	60226
Quality of Life	2139	2509	1460	1517	2411	10036
Target groups	475	520	367	441	250	2053
Technology& infrastructure	1058	1171	743	614	1345	4931
Traditional morality	85	79	83	162	186	595
Welfare	5334	8602	6885	6588	6058	33467

6 Wordclouds for Topics

In the following, we illustrate wordclouds with phrases that are positively and negatively related to the probability that a speech belongs to a particular topic. To produce the wordclouds, we regress the phrase frequencies on the topic probabilities and rank the phrases on the basis of the t-statistics.

Figure 4: Wordclouds for Topics I

(a) administration

(b) administration

(c) agriculture

(d) agriculture

(e) culture

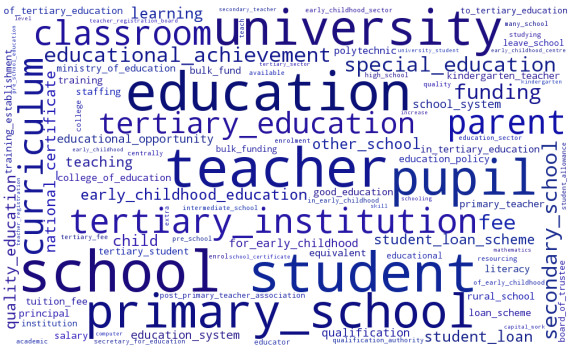
(f) culture

(g) decentralisation

(h) decentralisation

Figure 5: Wordclouds for Topics II

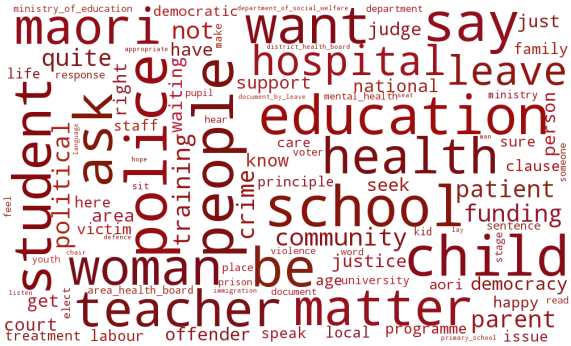
(a) education pos



(b) education neg

(c) economics pos

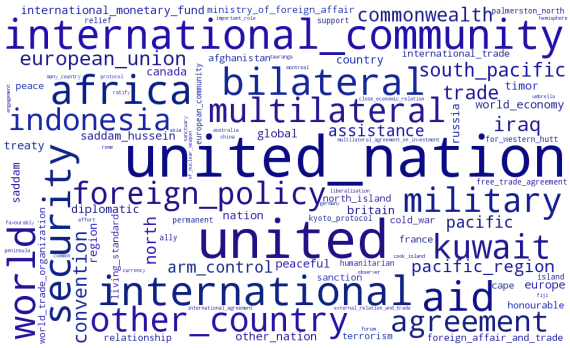
(d) economic neg



(e) freedom pos

(f) freedom neg

(g) international cooperation pos



(h) international cooperation neg

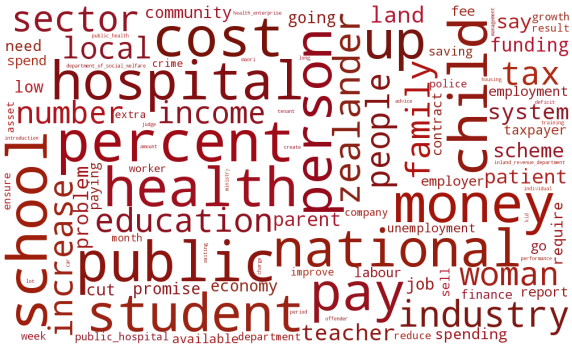
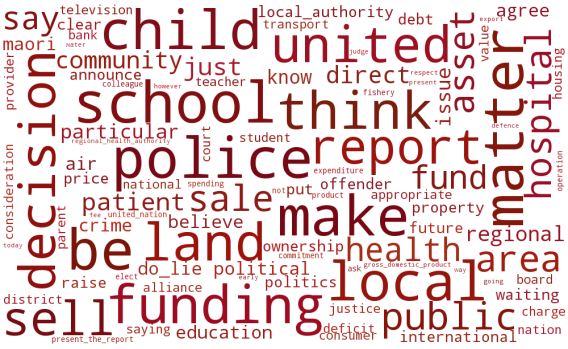


Figure 6: Wordclouds for Topics III

(a) labour groups pos

(b) labour groups neg

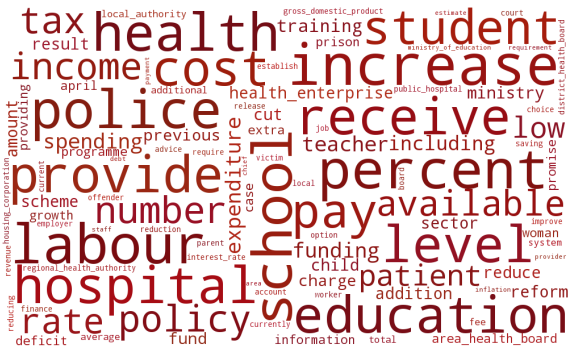


(c) military pos

(d) military neg

(e) national way of life pos

(f) national way of life neg



(g) noneconomic demographic groups pos

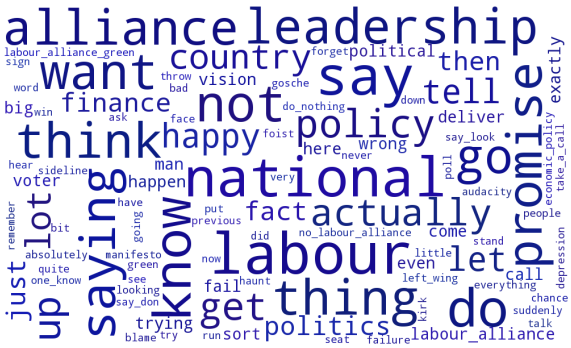
(h) noneconomic demographic groups neg

Figure 7: Wordclouds for Topics IV

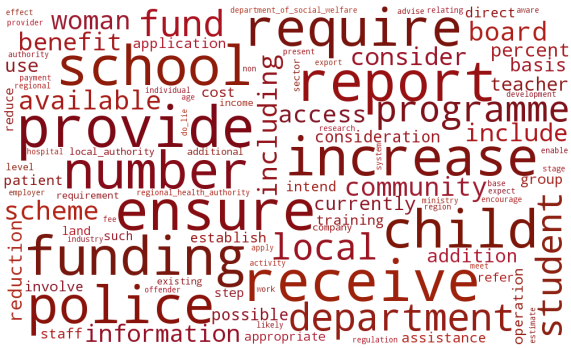
(a) other topic pos

(b) other topic neg

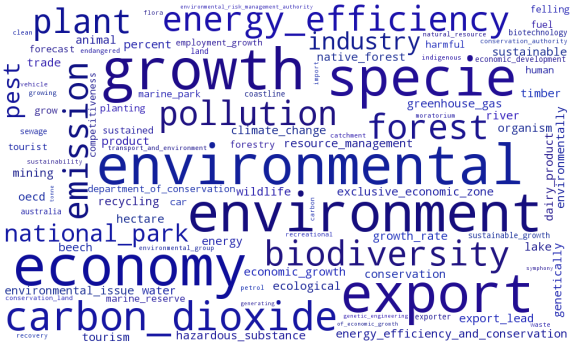
(c) party politics pos



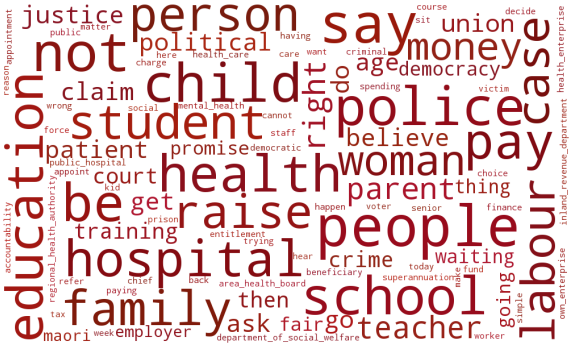
(d) party politics neg



(e) quality of life pos



(f) quality of life neg

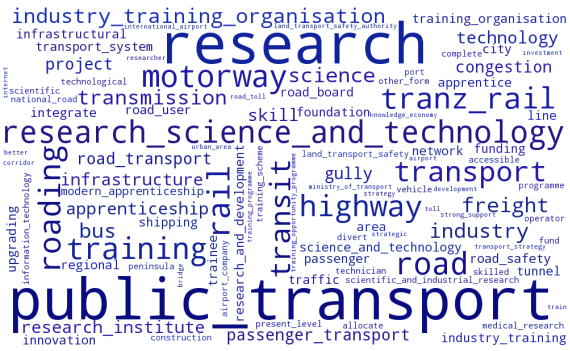


(g) target groups pos

(h) target groups neg

Figure 8: Wordclouds for Topics V

(a) technology and infrastructure pos



(b) technology and infrastructure neg

(c) traditional morality pos

(d) traditional morality neg

(e) welfare pos

(f) welfare neg

7 Regression Models and Robustness

In the following, we present our results and robustness tests. The linear regression models use robust and clustered standard errors at the speaker level. Table 6 presents the main analysis with all covariates. Table 7 replicates Table 6 using the logarithm of party politics as dependent variable. The results on the electoral reform remain the same.

Table 8 includes three tests. Model 1 examines the effect without taking into account the committee of the whole house stage. Model 2 removes administrative speeches. For example, these administrative statements are points of order, statements at the beginning of the day or Speaker's Rulings. As the table shows, the effects of the electoral reform are robust and the effect size is very similar to the size described in the paper. In Model 3, we include a linear time trend, which increases by one on a yearly basis. The effect of the electoral reform remains statistically significant.

Table 9 presents the results of a multilevel model. We run a mixed-effects linear regression models with random intercepts by speaker (Gelman and Hill, 2007). The first part of the table includes the fixed effect and the second part the random effect parameters. The fixed-effect estimates on the reform are very similar to the ones presented in the paper.

Table 6: Robustness I: Regression Analysis of Political Attention (Main Results)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post Electoral Reform	3.251**	2.953**	3.356**	2.784*	2.084**	1.912**		
	(0.897)	(0.823)	(0.985)	(1.133)	(0.579)	(0.577)		
Selected after Reform							-2.687*	-3.719**
							(1.163)	(0.991)
Post Reform × General Debate						3.825**		
						(1.247)		
List MP					-0.721	-0.703		-0.856
					(0.450)	(0.447)		(0.779)
Cabinet Member					-2.148**	-2.161**		-0.678
					(0.409)	(0.409)		(0.529)
Committee Chair					-0.320	-0.308		-1.772**
					(0.475)	(0.477)		(0.592)
Maori Constituency					0.247	0.154		-1.344
					(1.900)	(1.960)		(1.308)
Question					-7.824**	-7.809**		-7.817**
					(0.354)	(0.352)		(0.356)
General Debate					14.218**	12.979**		14.687**
					(0.860)	(0.925)		(0.870)
Committee Stage					-0.752**	-0.675**		-1.133**
					(0.244)	(0.242)		(0.312)
Administrative Speech					-3.555**	-3.527**		-2.980**
					(0.600)	(0.600)		(0.581)
Opposition Party					2.963**	2.956**		3.924**
					(0.301)	(0.301)		(0.432)
Coalition Partner					3.704**	3.674**		4.419**
					(0.911)	(0.913)		(1.540)
Government Cycle					0.044+	0.045+		0.305**
					(0.023)	(0.023)		(0.052)
Female								-2.548**
								(0.784)
Constant	11.846**	11.566**	9.448**	5.925	13.558**	13.614**	15.864**	16.597**
	(0.755)	(0.808)	(1.606)	(30.696)	(0.479)	(0.479)	(0.504)	(0.809)
Quadratic trend	X	X	X	X	X	X	X	X
Speaker fixed effects		X	X	X	X	X		
Speaker trends			X					
Year fixed effects							X	X
Weighting by speech length				X				
N	289791	289791	289791	289791	289791	289791	289791	289791
R^2	0.010	0.056	0.070	0.091	0.145	0.145	0.013	0.115

Standard errors, clustered by speaker, in parentheses
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table 7: Robustness II: Regression Analysis of Political Attention (Main Results Using log of Party Politics)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post Electoral Reform	0.251**	0.229**	0.275**	0.185+	0.145*	0.142*		
	(0.092)	(0.085)	(0.102)	(0.099)	(0.065)	(0.066)		
Selected after Reform							-0.232*	-0.355**
							(0.096)	(0.080)
Post Reform × General Debate						0.068		
						(0.062)		
List MP					-0.012	-0.011		-0.017
					(0.043)	(0.044)		(0.063)
Cabinet Member					-0.302**	-0.302**		-0.161**
					(0.047)	(0.047)		(0.059)
Committee Chair					0.039	0.039		-0.089
					(0.044)	(0.044)		(0.063)
Maori constituency					-0.083	-0.085		-0.052
					(0.163)	(0.164)		(0.122)
Question					-0.467**	-0.466**		-0.492**
					(0.024)	(0.024)		(0.026)
General Debate					0.697**	0.675**		0.724**
					(0.044)	(0.051)		(0.044)
Committee Stage					0.090**	0.092**		0.054*
					(0.019)	(0.019)		(0.026)
Administrative Speech					0.008	0.008		0.088*
					(0.041)	(0.041)		(0.042)
Opposition Party					0.315**	0.314**		0.411**
					(0.035)	(0.035)		(0.042)
Coalition Partner					0.299**	0.298**		0.342**
					(0.062)	(0.062)		(0.123)
Government Cycle					0.003	0.003		0.025**
					(0.002)	(0.002)		(0.004)
Female								-0.268**
								(0.076)
Constant	1.648**	1.612**	1.400**	1.398	1.713**	1.714**	1.933**	1.914**
	(0.079)	(0.089)	(0.161)	(3.286)	(0.043)	(0.043)	(0.045)	(0.078)
Quadratic Trend	X	X	X	X	X	X	X	X
Speaker Fixed Effects		X	X	X	X	X		
Speaker Trends			X					
Weighting by Speech Length				X				
Year Fixed Effects							X	X
N	289791	289791	289791	289791	289791	289791	289791	289791
R^2	0.011	0.083	0.101	0.127	0.154	0.154	0.015	0.110

Standard errors, clustered by speaker, in parentheses
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table 8: Robustness III: Regression Analysis of Political Attention (Robustness Tests)

	(1)	(2)	(3)
Post Electoral Reform	2.398**	2.168**	11.210**
	(0.632)	(0.580)	(3.050)
List MP	-0.890^{+}	-0.761^{+}	-0.704
	(0.456)	(0.444)	(0.442)
Cabinet Member	-2.246**	-2.174**	-2.194**
	(0.410)	(0.415)	(0.403)
Committee Chair	-0.402	-0.338	-0.362
	(0.472)	(0.482)	(0.482)
Maori Constituency	-0.499	0.443	0.101
	(2.277)	(1.923)	(1.941)
Question	-7.857**	-7.830**	-7.786**
	(0.355)	(0.354)	(0.351)
General Debate	14.220**	14.217**	14.246**
	(0.860)	(0.860)	(0.864)
Committee Stage		-0.756**	-0.766**
		(0.244)	(0.247)
Administrative Speech	-3.532**		-3.505**
	(0.602)		(0.594)
Opposition Party	2.910**	2.930**	2.924**
	(0.299)	(0.306)	(0.304)
Coalition Partner	3.515**	3.673**	3.612**
	(0.919)	(0.896)	(0.893)
Government Cycle	0.032	0.034	0.190**
	(0.023)	(0.024)	(0.047)
Constant	13.781**	13.660**	11.632**
	(0.474)	(0.478)	(0.702)
Quadratic Trend	X	X	
Speaker Fixed Effects	X	X	X
Speaker Trends			
Controls	X	X	X
Weighting by Speech Length			
Year Fixed Effects			
N	259589	286075	289791
R^2	0.151	0.146	0.146

Standard errors, clustered by speaker, in parentheses
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table 9: Robustness IV: Regression Analysis of Political Attention (Multilevel Model)

	(1)	(2)	(3)
Post Electoral Reform	2.953**	2.096**	1.923**
	(0.172)	(0.180)	(0.181)
Post Reform × General Debate			3.817**
			(0.350)
List MP		-0.863**	-0.844**
		(0.165)	(0.165)
Cabinet Member		-2.041**	-2.053**
		(0.144)	(0.144)
Committee Chair		-0.332*	-0.320*
		(0.142)	(0.142)
Maori Constituency		-0.069	-0.154
		(0.618)	(0.618)
Question		-7.830**	-7.815**
		(0.079)	(0.079)
General Debate		14.221**	12.984**
		(0.170)	(0.204)
Committee Stage		-0.756**	-0.680**
		(0.125)	(0.125)
Administrative Speech		-3.541**	-3.513**
		(0.304)	(0.304)
Opposition Party		3.016**	3.010**
		(0.126)	(0.126)
Coalition Partner		3.595**	3.565**
		(0.251)	(0.251)
Government Cycle		0.043**	0.044**
		(0.013)	(0.013)
Constant	9.871**	11.379**	11.428**
	(0.327)	(0.339)	(0.340)
Random Effect MP	20.495	28.232	18.262
	(1.996)	(1.793)	(1.787)
Random Effect Residual	360.774	327.974	327.839
	(0.948)	(0.862)	(0.862)
Quadratic Trend	X	X	X
Speaker Fixed effects			
Speaker Trends			
Weighting by Speech Length			
Year Fixed Effects			
N	289791	289791	289791

Standard errors in parentheses
$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

8 Speeches on Party Politics

We illustrate the three speeches with the highest probability of belonging to the party politics topic. We limited ourselves to three speeches because the texts are long.

1, MP: John Carter, Date: 1998-05-6

One of the interesting things with by-elections is that one gets to see a lot of different results that are not trends in general elections. I guess that all the parties that contested the by-election will now be doing a whole lot of analysis of the outcomes. It is interesting to look at the result for the National Party and the coalition Government. Undoubtedly, the analysis done by the National Party and the coalition Government will be considered seriously. A number of issues will certainly be considered and contemplated.

But I am happy to follow the previous speaker, for this reason. Undoubtedly, the Labour Party, the Alliance, and ACT are doing their own analysis on exactly what happened and on why the results were the way they were. It was interesting to listen to Mr Cullen's speech. In his 5 minutes he portrayed what the Labour Party did in the by-election. All it was able to do was constantly criticise, try to pull down, and comment negatively on what is happening in this country, rather than putting before the people any positive policy at all. Throughout the by-election campaign it was difficult to find any positive policy put forward by the Labour Party. Surely, one of the things it would have learnt by now is that the way to attract votes is, first, to let New Zealanders know exactly what it stands for, and, secondly, to have policy that explains that policy position. But unfortunately in the by-election, and indeed generally, the Labour Party has had nothing at all to offer the public of New Zealand, and as a consequence it was able to drag up only 17 percent support in the by-election.

Two interesting things came out of the by-election. Firstly, there was the absolute disagreement between the Labour Party and its supposed coalition partner. During the by-election it came to a head, and it continues right now. There are some people in the Labour Party who detest the people in the Alliance, and vice versa. The other interesting point that came out—even though the Labour Party has tried to avoid it—is that when one looks at the result for all the Alliance parties, including the Greens, one finds that the Labour Party came fourth in the by-election. It is not a thing that the Labour Party likes to admit, but when one adds together the Alliance vote and the Greens vote—that is, the Alliance as it is in the House today—one finds that the Labour Party came fourth. Whether or not Labour members like to admit it, to them coming fourth in a by-election is just a disgrace.

It is no wonder they got the results they did, when one considers that they have no policy and when one looks at the performance they put on in the by-election. The interesting

thing is that they have no policy at all. There is nothing new. Every now and again they will come out and say: "Well, we are for higher taxes.", then they will say: "We aren't for higher taxes." Now, apparently, their position on taxation is that they are not for higher taxes. But if one asks their proposed coalition partner, the Alliance, what its tax policy is, one is told it is for higher taxes. That caused a whole lot of confusion in the Taranaki - King Country by-election. One has to ask oneself whether that is the reason they have no credibility and are still declining in the polls. Is that the reason that even though they claim to be an alternative Government, in fact they are not?

It is true that the Alliance ran a good campaign in the townships, but the thing that the people should be worried about was that it focused on only one issue. It focused on only the towns. It had no effective campaign in the rural areas at all. The Alliance absolutely and totally ignored the rural areas of Taranaki - King Country. If it believes it is going to get traction in the next election by focusing on one single issue in small towns in New Zealand, then it is deluded as well.

Let me spend the last couple of seconds that I have on the matter of the credibility of ACT. I see that its candidate, Mr Jennings, may be speaking, and I want to say this to him: one cannot say something in Taranaki - King Country that is different from what one says here in Parliament. One has to be credible in terms of whatever one says in a by-election, and unfortunately the member was not.

Speech 2, MP: Steve Maharey, Date: 1996-12-13

I spent a lot of time doing that, like people over here, who now scoff when they say to themselves: "Hey, hold on. We argued about improving politics. We argued about honesty, and accountability, and trust." Think about it: 6 weeks ago New Zealand First was saying that National was out; they were off; they were bad. Tau would not work with Shipley; would not be anywhere near a Government that had any of these National people in it. Now he says it is a little slip of the tongue and youthful exaggeration, and he is back in here. I think he has given politicians a bad name. I think he will have to work hard over the next little while to try to improve that situation after all the promises we all made about what was happening with MMP.

I want to say something about the Alliance. The Alliance is not to blame for this deal not going through. The Alliance did exactly what it said it would do prior to the election. It stuck to its word. Alliance members can walk away from this process with their heads held high. In some ways I wish it was not so. There would be nothing nicer really, I suppose, than to be able to say that they "blew it", and we can go after their vote easily as well. But

they did not. They stuck to their word, and they would have stuck to that agreement. They would have stuck to it.

I do not care what is said on the other side. That agreement said everything it needed to say about a process, about confidence voting, about making sure that those people would stay in a working relationship with a Government that stuck to the agreement. So they are fine: head held high, did the job well. I am happy with that, and I am happy with our side too.

I went to an event last night—very good Labour Party event here in town. There were a few hundred folk there. A man came up and said: "I've been in the Labour Party for 30 years. I've never felt more proud." That is how people over this side feel about the way negotiations went. Because what they saw was a group of negotiators who had some bottom lines; who had some principles; who understood that they had 80 years of Labour history behind them and that meant market rents had to go, that we had to do something about health care and education, we had to be able to have an economy that would deliver jobs. And Michael Cullen, can I say—and I know it is hard, he is intelligent, he is a person who has a lot of ideas and he does explain things in a way that maybe is a bit intimidating to people like Jack Elder—but the fact of life is that Michael Cullen has bottom lines. Helen Clark has bottom lines.

These are people of principle who stand for something, and the people who are in the Labour Party now have never felt so proud for 30 years for the simple reason that they know they belong to a party that did not sell out. The National Party sold out—did it not, David Carter? How does he feel about this? Did he know about the position of Treasurer? Did he know about all these changes in policy? I say "They sold you out, pal." The people on the other side like Tony Ryall, Simon Upton, people who I understand over the last little while had stood for particular principles, have argued in this House consistently for a view I do not agree with but it is a clearly stated view; it is a view that comes with the market and all this stuff about individualism. I do not agree with it but they argued for it. Well, that has gone. They can stop worrying about having principles and policies that are consistent, because they now belong to another party that will rip them every which way. They have no power left.

Going back today as a National MP to a constituency must be a big ask. They will be wandering around asking: "Hey, how come we don't have any control over the economic portfolio any more?" "How come we can't write our own Budget any more?" "Didn't we get 44 seats? Didn't they get 17?". I have one thing to say to Winston Peters: "You are a helluva good negotiator to get this kind of deal out of these people. There are 44 of them and they just rolled over and gave everything to you. They have given you the 7th floor of the

Beehive. They give you the money and the slush fund. They give you everything. You are an impressive guy. I've got to say that. You've got 44 of them there saying: "Hey. We want to be in power so much Winston Peters, you can just have whatever you want." Amazing stance!

The problem is that Labour just could not match that. We could not get low enough. We could not get in the gutter enough. We could not give them enough. We could not protect them enough. All we had to offer was great education policy, great health policy, great housing policy, great jobs policy, great economic policy. In fact, the real problem why we did not get to be the Government was that we had good policies. If the New Zealand First folks had come with us they could have gone out and said: "We've made them fiscally responsible."

That is what they could have said. Going with National meant they could say: "We've got Bolger. We've made Bill Birch into a poodle. We've destroyed the National Party. We've got all these things that we've chased now." It is not as good for Maori people as it would have been with us. It is not as good for kids, is it, Brian Donnelly, as it could have been with us? It is not as good for people in State housing, is it, Tau Henare, as it could have been with us? But at least those members can look as if they did it.

That is what it was all about all the way through, right? We just offered too good a deal. So in the end, those members had to sit down and say: "Look, we want to be back here in 1999. We want to be able to keep our jobs going. We quite like it here; it's better than cleaning toilets, better than coal mining, better than real work, so let us try to stay here. How do we do that?". I will tell them how to do that. Do not go with the best option, because they might do just too good a job. Go with the worst option. In that, the man with charisma can outshine that Jim Bolger person.

I watched the other day in the Legislative Council Chamber gallery. I tell Mr Peters that he has it all over Mr Bolger. There is almost an aura around Mr Peters. That boy now is so dull that he will be gone in a year. Even if Mr Peters does not remove him no one will remember who he was. He could change his name back to Jim, James, whatever he wants. No one will know who he was. The real Prime Minister is sitting in the Deputy Prime Minister's seat now. He does not have to change. He is there right now.

The reason there is a National - New Zealand First Government in power now is that the offer on this side was too principled, too good, and left too little room for these people to exploit their own self-interest. That is what it is about. Nothing will take that away. What people now have to face—whether they are elderly or children or whatever interest group—is the fact that they got the second-best deal because it was best for New Zealand First and best for the National folks, who would do anything to stay in power. That is the sad thing.

Speech 3, MP: Tony Ryall, Date: 1999-05-26

He said that yesterday at a meeting reported by the leading press gallery reporter, Audrey Young. She reported Mr Anderton as saying: "Labour has chosen to cuddle up to the two-headed fish." There is something smelly on that side of the House, and Mr Anderton has picked up on it. Mr Anderton said that the Labour Party's seven pledges on that little plastic card of little ideas—in fact, no ideas about the future of New Zealand—do not appear to mean very much. It shows that Labour is too confused with its potential policies to be in Government.

In making the case for the second term of the Shipley Government I will talk about some of the things I would be ashamed of if I were a Labour MP. I would be ashamed to be in a party that was being led by people who had lost three successive elections—lost three successive elections of tired old people on the front bench. It is a party that does not like mainstream New Zealanders.

Dr Cullen told the media that he did not really enjoy talking to people who were not as intelligent as he was. That is not the sort of Treasurer or Finance Minister we want in this country. We want someone who has a real sense of purpose and vision, and a commitment to the future of this country. We want Treasurers of the calibre of Bill Birch and Bill English. That is what the people of this country want—people with ideas. We do not want a Government that is just interested in having tea and coffee with the intellectual elite at the universities. We need more than sociologists in order to have an impact on how this country might be run.

As I said earlier, Labour has had 9 years with no new ideas. Mr Maharey, in particular, is the best person at getting up in the House—having driven down to Wellington in his new late-model Japanese car, New Zealand - assembled—to tell people what he will do about poverty. Do members know what he will do about poverty? Nothing! I admit he will help a few people. If they are lucky enough to be in State houses they will get some help. But if those people are poorer than the people in State houses they will not get as much help as that party has promised. So the new idea in housing is the housing policy that existed before Helen Clark and Phil Goff changed the previous policy. It goes beyond where they used to be.

Labour and the Alliance are telling business audiences one thing and telling social audiences the other. Dr Cullen goes to the boardroom and says that Labour will not change a lot, that the Alliance will not let it. It states: "We will not change a lot; things will carry on." Do members think that Mr Maharey stands in front of social audiences saying that? Do members think that Mr Maharey would say that Labour will not do anything? Mr Maharey is promising, promising, promising. They tell one thing to the Business Roundtable, where

they go and have drinks—but they do not like their members to know that—and they are promising something else to the social agencies in this country.

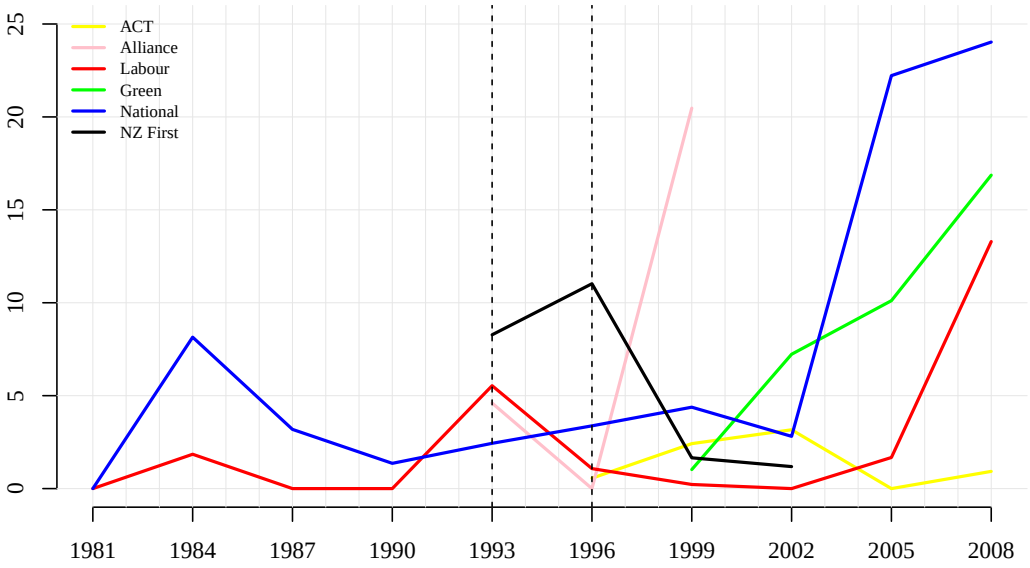
There are no effective politicians on that side of the House. They have all been in power too long. The most effective politician in the Labour Party is Mr Goff, and he is right wing. The most effective politician on the left is Jim Anderton. He is the man who is out there to deliver for ordinary New Zealanders. The Labour Party has been years in Opposition, it has no new ideas, no commitment to the future, and its ideas are limited to a few square centimetres.

This party, this Government, has boundless ideas and a new vision for the future of this country. And we will be out there over the next few months— percent a month—spreading the message that we mean business, that we mean progress and commitment for this country. Opposition members can sit there and shout, but we will spend the next few weeks telling people what it was like when Helen Clark was a Minister. She was one of the most unpopular housing Ministers in the history of this country. She was the Minister of Health who oversaw the closure of a number of hospitals by Area Health Boards. That is the sort of person about whom, if she ever came to office, New Zealanders would within months ask why National had not told them about her. We have ideas, we have vision, and we mean business.

9 Manifesto Priorities

Figure 9 illustrates the relative frequency of manifesto statements on party politics, measured with the manifesto category political authority. First, we examine the development in our period of analysis (1987-2002). We find that the average relative frequency of statements on party politics was 1.13 percent before the electoral reform (1987-1990) and 4.2 percent after the reform (1996-1999). Interestingly, the average relative frequency is highest at the 1993 elections (5.21 percent). In this election, voters also decided about the introduction of the electoral reform, which might have anticipated several consequences. The trend towards more party politics seems to become even stronger after our period of analysis.

Figure 9: Relative Frequency of Manifesto Statements on Party Politics by Party.



10 Latent Dirichlet Allocation Topic Model

We apply the Latent Dirichlet Allocation (LDA) topic model using the python implementation provided by the Scikit-Learn module (Blei, Ng and Jordan, 2003). More precisely, we estimate the model using the online variational Bayes algorithm, which allows to analyze large datasets in a reasonable time period (Hoffman, Bach and Blei, 2010). As stated in the paper, the estimation of the LDA model requires to fix ex ante the number of topics. We estimate the LDA model seven times using 2,5,10,19, 35, 45 and 60 topics. Hence, we estimate the model using the same number of topics as in our paper (19) and, in addition, three models with more and less number of topics. In the following, we summarize our main findings. First, we find that in all estimation results at least one topic is associated to terms related to party politics such as "party", "National", "Labour" etc. Second, the substantive content of these topics, and hence the effect size of the reform, depends on the number of topics. Third, the application of LDA with a large number of topics (e.g., 45, 60 topics) leads to multiple topics that are associated to party politics, which need to be merged in a discretionary manner. Fourth, the application of LDA with relatively few topics leads to a catch-all topic (e.g., 2, 5 topics). Finally, we also used the document-level probabilities to examine how the reform influences political attention and find evidence that party politics becomes increasingly relevant (e.g., 2,5,19,35 topics). Hence, we conclude that our main results can be replicated using the LDA topic model. However, the estimated effect and the substantial content of

the topics depends on the number of topics. Hence, we believe that the main advantage of using our method is that we can interpret the content and the effect size in a more confident manner.

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