Online Appendix for
Intra-Cabinet Politics and Fiscal Governance in Times of Austerity [*]

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1 Data

1.1 Budget debates

Our analysis is based on cabinet members' contributions to the annual budget debate – "one of the very few times of the year when the public follows politics as closely as do those in the political-media bubble" (Leahy, 2013, 359), which is also one of the reasons why these debates are not cheap talk. The budget debate usually takes place in the first week of December of each year and begins with a statement by the Minister for Finance that contains a summary of the budget measures. The content of the budget is closely guarded and covered by the state secrets provision, thus reinforcing the powerful position of the Minister for Finance. The Taoiseach has an advance view of the finance minister's budget statement, with his or her office preparing for any possible political landmines. However, the degree of advanced warning varied with finance ministers. In what is possibly an extreme case, Leahy (2009, 183-185) describes that Charlie McCreevy would often give Taoiseach half an hour to look through the statement on the Monday of budget week. At the same time, the rest of the cabinet would be briefed on general highlights on the morning of budget day by McCreevy, omitting the details of his afternoon statement. Ministers would receive a more detailed briefing around lunchtime by officials from the Department of Finance. In turn, the budget document would be circulated to parliamentarians once the Minister's speech began. The statement by the Minister of Finance is the first speech on budget day and is followed by statements from the official financial spokespersons from opposition parties, the prime minister, cabinet members, party leaders, and backbenchers from the government and opposition. The budget debate usually lasts over a number of weeks.

We collected all contributions to budget debates from a new database of parliamentary speeches in Ireland that contains all speeches since 1922, in addition to each member's parliamentary history, such as party affiliation and ministerial appointments. Due to data availability of comparable budgetary information, we limit our analysis to the time period 1999 to 2013.[1]

Table 1.1 provides a summary of the cabinets included in our analysis. Between 1999 and 2011, the cabinet was dominated by Fianna Fáil (FF), the largest party at that time, which appointed both the Taoiseach and Minister for Finance. In 2011, after a disastrous election outcome for FF and its small coalition partner, the Green Party, the government was replaced by a coalition between Fine Gael (FG) and the Labour party (LAB). During most of the time period in our sample, the cabinet leadership was in the hands of Bertie Ahern (FF), who, following a payment scandal, resigned from his position in 2008 and was replaced by his finance minister, Brian Cowen. For the finance ministry, four office-holders are included in our data: Charlie McCreevy (FF, 1997–2004), Brian Cowen (FF, 2004–2008), Brian Lenihan (FF, 2008–2011), and Michael Noonan (FG, 2011–2016).[2]

The Irish constitution limits the number of cabinet ministers to 15. Due to scheduling constraints, not all cabinet members participate in the budget debate. Some are replaced by their junior ministers who we therefore include in our analysis. Other departments are represented by more than one person (i.e., the cabinet minister and a junior minister, or two junior ministers),

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[1]Information about the allocation of government budgets is only available in electronic format from 1999 onward. We also do not proceed beyond 2013 when Ireland exited an EU/ECB/IMF bailout and subsequently showed signs of recovery (dubbed "Celtic Phoenix") to capture the boom to bust economic cycle in our analysis.

[2]In July 2011 the functions of public expenditure were moved to a newly created Department of Public Expenditure and Reform (DPER) by the incoming Fine Gael-Labour government. Because both Finance and this newly created department oversaw budgetary decisions, we combine the speeches of the two respective ministers, noting that our results are robust to treating DPER and Department of Finance as one.

Table 1.1: Cabinet composition and data overview

Budget year	Prime Minister	Finance Minister	Govt. parties	No. obs.[a]	No. portfolios[b]	Avg. length[c]
1999	Bertie Ahern (FF)	Charlie McCreevy (FF)	FF, PD	19	12	1,387
2000	Bertie Ahern (FF)	Charlie McCreevy (FF)	FF, PD	13	11	1,295
2001	Bertie Ahern (FF)	Charlie McCreevy (FF)	FF, PD	7	5	1,714
2002	Bertie Ahern (FF)	Charlie McCreevy (FF)	FF, PD	9	7	1,203
2003	Bertie Ahern (FF)	Charlie McCreevy (FF)	FF, PD	8	8	1,267
2004	Bertie Ahern (FF)	Charlie McCreevy (FF)	FF, PD	12	11	1,148
2005	Bertie Ahern (FF)	Brian Cowen (FF)	FF, PD	9	8	1,267
2006	Bertie Ahern (FF)	Brian Cowen (FF)	FF, PD	11	10	1,309
2007	Bertie Ahern (FF)	Brian Cowen (FF)	FF, PD	11	10	1,251
2008	Bertie Ahern (FF)	Brian Cowen (FF)	FF, PD, GRE	14	11	1,120
2009	Brian Cowen (FF)	Brian Lenihan (FF)	FF, GRE	24	14	1,218
2010	Brian Cowen (FF)	Brian Lenihan (FF)	FF, GRE	4	4	2,088
2011	Brian Cowen (FF)	Brian Lenihan (FF)	FF, GRE	11	11	1,263
2012	Enda Kenny (FG)	Michael Noonan (FG)	FG, LAB	16	13	1,289
2013	Enda Kenny (FG)	Michael Noonan (FG)	FG, LAB	9	9	1,114
Total				177		
Average				12	10	1,329

Note: FF: Fianna Fáil, PD: Progressive Democrats, GRE: Green Party, FG: Fine Gael, LAB: Labour

[a] Number of cabinet members (ministers and junior ministers) who participated in the budget debate

[b] Number of portfolios represented in each debate

[c] Average length of speeches in number of words

[d] The Progressive Democrats formally dissolved in 2009 and its two members of parliament continued to support the government.

while others are not represented at all. This introduces two potential biases into our analysis. First, junior ministers might express a policy position that differs from the (unobserved) position of their department head. However, as discussed in the main text this is unlikely in the Irish context.[3] Second, the fact that some departments are not represented in a debate may indicate a systematic exclusion of certain cabinet ministers, for example, those with the largest spending cuts or those most opposed to the government budget. However, the number of departments that are not represented in each year is relatively small and we have not found a significant effect between budget shares and representation in the debate in our data.[4]

Budget speeches are an excellent data source to measure cabinet members' policy preferences. While speeches may be prepared by departmental officials or special advisors, by delivering the speech to the plenary the minister expresses his or her official position. First, contributions to the budget debate are more political than technical in nature and give members of the Dáil the opportunity to issue their opinions on the proposed distribution of government resources.[5] Second, in contrast to many other countries budget debates in Ireland involve the majority of cabinet members (e.g. in the UK only a handful of ministers take part in budget debates). Third, budget debates happen annually and are about a clearly identified topic, which makes it possible to measure changes in preferences over time. Fourth, given the institution of strict party discipline that is typical for parliamentary systems in Europe, voting against the party would almost always lead to expulsion from the party, which results in almost perfect voting cohesion in roll-call votes (Hansen, 2009). In an example over the anti-stag hunting legislation, several parliamentarians, including some ministers, "stood up in the Dail and denounced the legislation, before voting for it" (Leahy, 2013, 86). Herzog and Benoit (2015) use Irish budget debates to show that despite strict party discipline and voting cohesion, verbal opposition to government policy by ordinary legislators from the governing coalition has increased with the introduction of unpopular austerity budgets. Speeches are, therefore, an alternative vehicle for cabinet members to express their opinions within the constraints of collective cabinet responsibility. In the following two sections, we explain in more detail how we estimate the preferences of cabinet ministers and provide an overview of our data.[6]

To extract latent traits from the budget speeches, we use the supervised text scaling method *Wordscores* (Laver, Benoit and Garry, 2003).[7] Wordscores classifies unseen, target documents

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[3]We can perform a crude test of this assumption by looking at the cases in which a department was represented by more than one speaker in a debate, which happened in 39 (23%) cases. The average distance between speakers from the same department across all years is 0.42 ($s.d. = 0.33$). In comparison, the average distance between speakers from different departments in each debate is 1.01 ($s.d. = 0.31$). In short, speakers from the same department have, on average, relatively similar positions. This is also illustrated in Figure 1.2, which shows the position of each speaker by department in each year.

[4]A notable exception is the debate in 2009 for the 2010 budget. Because parliament had already spent significant time on the bank bailout debate, it was decided to shorten the budget debate and to only include – in addition to the Taoiseach and minister for finance – the party leaders and finance spokespersons. All results presented below are robust to including or excluding the 2010 budget debate.

[5]The speeches we use in the analysis are part of the general budget debate that follows the official introduction of the budget by the finance minister. The more technical aspects of the budget are discussed in specialized committees after the general budget debate has taken place, and specific fiscal policies are introduced in the subsequent Finance Bill. We exclude these more technical discussions from our analysis.

[6]We provide a detailed analysis of the content of budget speeches in Appendix 5. There we show that position on the estimated PM-FM dimension is related to the topics covered in the debates. In addition we show that most of the ministers discuss topics beyond their immediate portfolio, with the more political topics discussed by almost all the ministers.

[7]For text preprocessing and analysis we use the R package `quanteda` (Benoit and Nulty, 2013b). We follow standard preprocessing: tokenization, stemming and normalization, and stopword removal and controlled vocabulary filtering (Manning, Raghavan and Schütze, 2008).

(known as the test set) based on their word frequencies into known, *a priori* defined categories. This constitutes scaling the documents in the test set on a single dimension that is defined by these *a priori* selected categories. To this end, the researcher defines a training set, which is a set of documents that are known to belong to one of the two categories that anchor the dimension. The key assumption of Wordscores is that texts in the training and test sets are similar or come from the same distribution. Then, based on the word frequencies in the training set, Wordscores calculates the conditional probability that a document in the test set belongs to one of the categories based on their word frequencies. Wordscores calculates the latent position of each document in the test set as the arithmetic mean of the posterior probabilities.[8]

As discussed in the main text, the delegation regime of fiscal governance is structured by the preferences of the finance minister. The effectiveness of the mechanism is determined by the support from the prime minister that may become unsustainable during economic crisis. Also discussed was the fact that spending preferences of individual ministers are expected to differ from the preferences of the finance minister. In order to capture these dynamics, we define the underlying dimension as that of fiscal governance effectiveness. This dimension is anchored by the preferences of the prime minister and finance minister. We aim to scale fiscal preferences of individual cabinet ministers on this dimension, and trace how ministers' positions on the dimension change over the economic cycle. This determines the design of our text analysis: budget statements by the prime minister and finance minister constitute our training set, while budget statements of individual ministers form our test set. We believe that in this setting the key assumption of Wordscores is satisfied as all documents are budget statements delivered in similar settings and likely come from the same distribution.[9]

Figure 1.1 plots the raw word scores for our test (virgin) set, including PM and FM in this set. Plot of raw word scores helps identify whether PM and FM are closer to each other (or equivalently ministers outside the bounds set by PM and FM). We show that PM and FM are consistently spatially separated with individual ministers placed between them. This provides empirical support for our assumption about the structure of this dimension.

Figure 1.2 provides a detailed summary of each portfolio's estimated position in each year.

1.2 Budget composition

The literature on pork-barrel politics suggests that pork spending usually comes in the form of public investment rather than current expenditure (e.g. Drazen and Eslava, 2010; Khemani, 2004). This is done so as not to increase overall election year deficits that are not viewed favorably by voters (e.g. Peltzman, 1992; Brender, 2003; Brender and Drazen, 2008). Capital expenditure is also more "visible" to voters, for example, in the form of new road construction or infrastructure-building (Kneebone and McKenzie, 2001), or, more generally, targeted at specific voter groups (Drazen and Eslava, 2010).

In turn, during fiscal adjustments, politicians face the choice of whether to cut current or capital expenditure. Alesina et al. (1998) argue that this choice revolves around short- and long-term political perspectives. Some current expenditure cuts (e.g., spending on social welfare programs) may be more permanent and can result in positive wealth and economic expectation

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[8]Wordscores is an implementation of the Naive Bayes classifier (Benoit and Nulty, 2013*a*) used in natural language processing for text classification (see e.g. Manning, Raghavan and Schütze, 2008).

[9]We apply Wordscores separately to each budget debate with the dimension bounded at +1 and -1 using within the training set the prime minister's and finance minister's speeches respectively. Predicted scores for the test set documents were then rescaled to these bounds (Martin and Vanberg, 2007) to make estimates comparable across years.
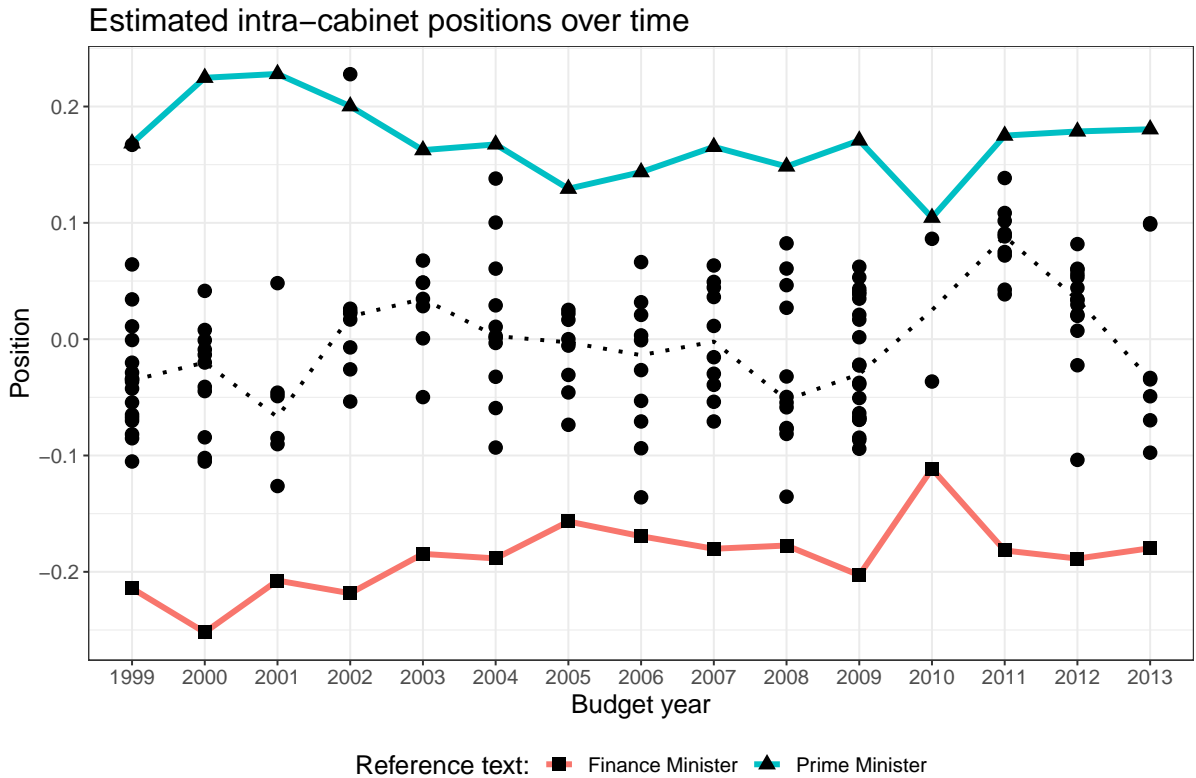
Estimated intra–cabinet positions over time

Reference text: ■ Finance Minister ▲ Prime Minister

Figure 1.1: Estimated policy positions for Irish Cabinet members, 1999–2013 (original, un-scaled Wordscores estimates). The dashed line indicates the position of the median cabinet member.

effects. However, such welfare cuts may be politically untenable. At the same time, cuts in capital expenditure are less costly in the short run, albeit with higher productivity-diminishing costs in the long run. Depending on politicians' time horizons, they may prefer to introduce investment cuts (Alesina et al., 1998). In this setting, Rogoff (1990) suggests that under the conditions of informational lags, voters may actually reward governments for choosing to cut capital rather than current expenditure. Ireland implemented expenditure cuts during its first deep fiscal crisis of the 1980s: while current expenditure was largely not targeted, capital spending was severely cut (McCarthy, 2009, 6). Lessons from previous consolidation also seem to have affected the handling of the latest economic crisis (Dellepiane and Hardiman, 2012).

We obtained information for the budget composition in each year from the annual Revised Estimates for Public Services. These are technical documents published by the Department of Finance that provide a detailed breakdown of spending, separated into capital and current. Since 2003, the spending items in these documents are categorized into ministerial voting groups that correspond to individual government departments. For earlier years, we used Finance Accounts (Audited Financial Statements of the Exchequer) that contain estimates for individual budgetary votes. We used a guide note from the Ministry for Finance to map individual votes into ministerial voting groups.[10] Based on these documents, we calculated our variable of interest – each department's share of current and capital expenditure. Because department names change over time, we distinguish between 15 general government portfolios:

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[10]"List of Ministerial Vote Groups, Accounting Officers and Vote Numbers," http://govacc.per.gov.ie/files/2013/07/Votes-and-Vote-Groups-July.pdf. Last accessed on May 22, 2016.
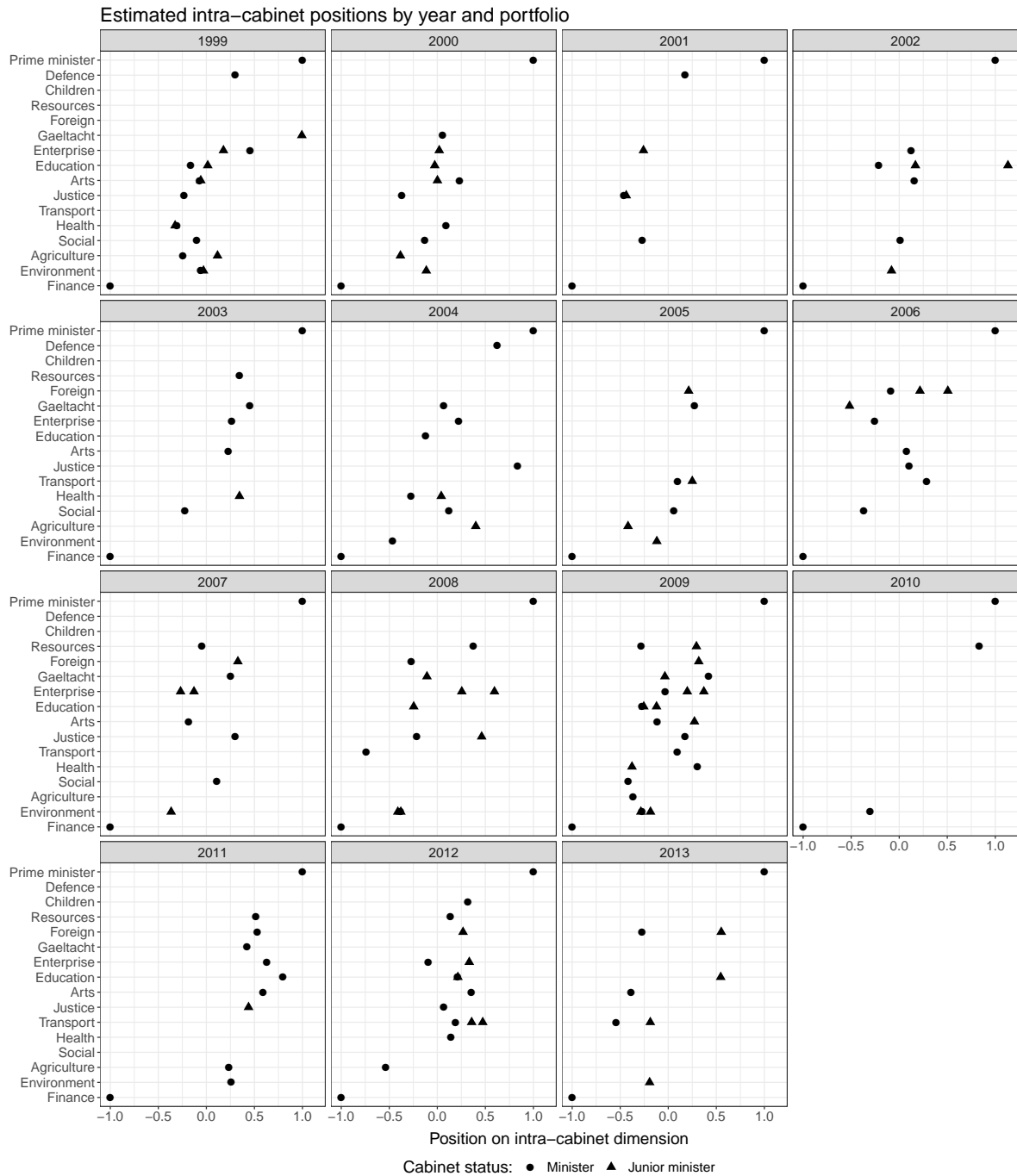
Figure 1.2: Estimated positions by cabinet portfolio and budget year. Portfolios are ordered by the average position across all years.

Agriculture, Arts, Children, Defense, Education, Enterprise, Environment, Foreign, Gaeltacht, Health, Justice, Reform, Resources, Social, and Transport.[11] In each year, each portfolio represents exactly one department, that is, we do not lump different departments into the same portfolio. Figure 1.3 shows current and capital spending for each portfolio for the time 1999 to 2013.

Figure 1.4 shows variation in our two dependent variables. The majority of portfolios have

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[11]The Children and Reform portfolios are new government departments created in 2011.
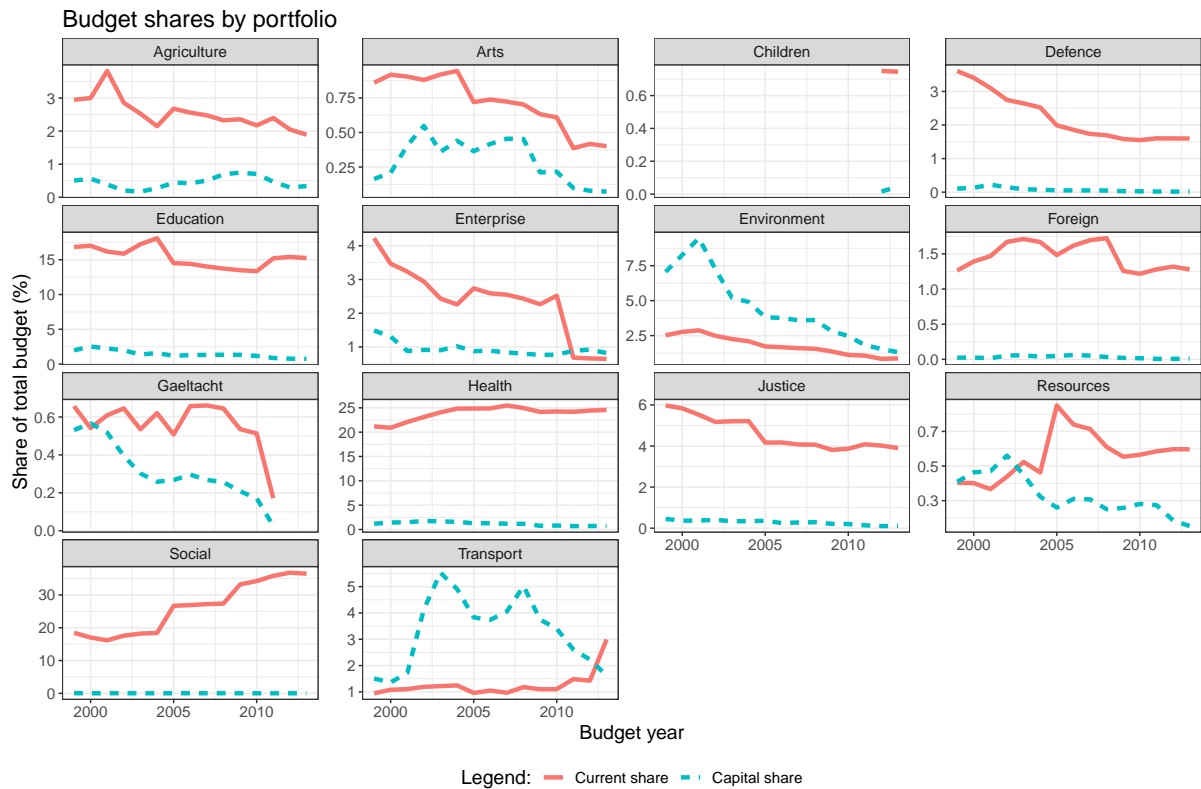
Figure 1.3: Current and capital expenditures as shares of total budget, 1999–2013.

seen changes in the range of -0.5 and 0.5 percentage points, with an average of -0.08 for capital spending (std.dev=0.32, min=-2.2, max=1.20) and 0.005 for current spending (std.dev=0.66, min=-1.84, max=5.83). While these changes seem small, recall that they reflect changes in percentage points on the overall budget. With an average total budget of €46.4bln between 1999–2013, a 0.5 percentage point change corresponds to a change of €232mln in absolute terms. The average portfolio in our sample has an average total budget of €3.1bln, which means a change of €232mln is equivalent to a change of about 7.5% of total portfolio budget.
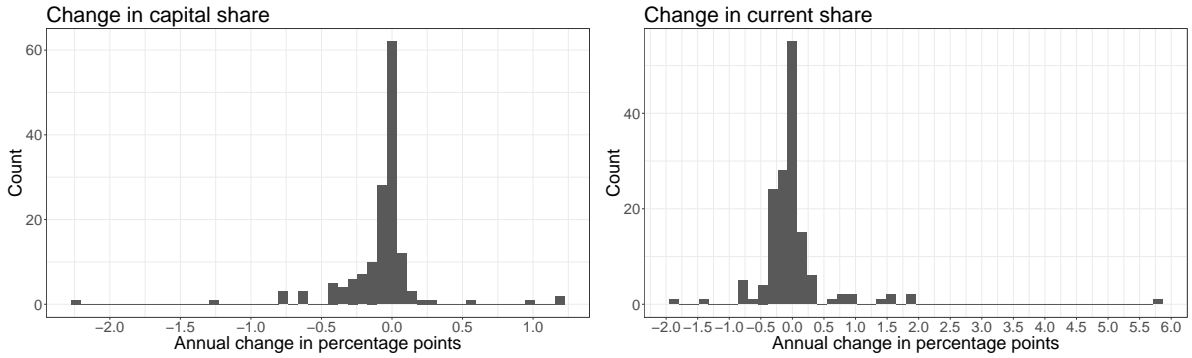
Figure 1.4: Variation in dependent variables: annual changes in budget shares of capital expenditures (left) and current expenditures (right).

2 Regression Models

We explain in the main text our choice of economic variables (debt and unemployment). Here we additionally note that both debt and unemployment have continuously increased during the time period in our sample, which means we would introduce high multicollinearity into our model if we were to simultaneously control for the economic effects as well as time fixed effects. For the same reason we do not include fixed effects for budget years in our models. Instead, we estimate standard errors clustered by budget years to account for potential correlation between budget items in each year. However, we note that our substantive conclusions are robust to estimating the models with or without clustered standard errors.

Further, we exclude from the analysis government departments that did not participate in the budget debate. We also exclude the budgets for the Department of Finance and Department of the Taoiseach, with the ministers from those departments forming our training set in the Wordscores estimation. Using this restricted estimation set allows us to avoid deterministic dependencies across rows of the data. We therefore estimate our models using simple linear regression with standard errors clustered by budget years.

3 Full Model and Robustness Checks

As a robustness check, we replicated all models with two alternative specifications: (1) taking the average change in the dependent variables for cases in which a minister was assigned to more than one portfolio (Table 4.4), and (2) only including cabinet ministers in the model (i.e., excluding junior minsters) (Table 4.5). In both cases, the results were substantively identical to those presented in the main paper.

Table 3.2 shows all coefficient estimates (including portfolio fixed effects) for the model summarized in Table 1 in the main text.

As a robustness check to test whether our key results depend on a particular portfolio, we re-estimate our main model 14 times, each time leaving out one of the portfolios. In Table 3.3, we summarize the resulting coefficient estimates for intra-cabinet position, prime ministers, and interaction terms. Each two rows in this table correspond to one regression model using the same specifications as for the models reported in the main text, but leaving out the portfolio listed in the first column.

The results show that our key findings are not affected by any particular portfolio. There are only two instances where one of the coefficients fails to reach standard significant levels: the model leaving out the environment portfolio, which results in the interaction between Cowen and intra-cabinet position to be not significant; and the model leaving out transportation, which leads to an non significant coefficient for the Kenny main effect. However, note that leaving out the environment portfolio reduces the number of observations by 16, or about 11% of the total number of observations.

Table 3.2: OLS regression of changes in budget shares conditional on changes in debt (% of GDP), changes in the unemployment rate (%), PM in office, and control variables.

	Capital	**Current**	**Capital**	**Current**	**Capital**	**Current**
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
	(s.e.)	(s.e.)	(s.e.)	(s.e.)	(s.e.)	(s.e.)
Junior minister	0.00	0.01	-0.01	0.01	-0.00	0.02
	(0.03)	(0.05)	(0.03)	(0.05)	(0.04)	(0.07)
Same party	-0.00	-0.09	0.00	-0.09	0.02	-0.12
	(0.06)	(0.06)	(0.06)	(0.06)	(0.07)	(0.07)
Intra-cabinet position	**-0.18***	-0.03	-0.13	-0.13	**-0.21***	-0.00
	(0.07)	(0.09)	(0.08)	(0.11)	(0.08)	(0.11)
ΔDebt	**-0.01***	**0.01***				
	(0.00)	(0.00)				
ΔDebt $\times$ position	**0.01***	-0.02				
	(0.00)	(0.01)				
ΔUnempl.			-0.08	**0.06***		
			(0.04)	(0.02)		
ΔUnempl. $\times$ position			0.09	-0.04		
			(0.04)	(0.09)		
Cowen					**-0.21***	0.12
					(0.06)	(0.07)
Kenny					**-0.13***	0.19
					(0.05)	(0.09)
Cowen $\times$ position					**0.27***	-0.19
					(0.10)	(0.40)
Kenny $\times$ position					**0.32***	**-0.62***
					(0.10)	(0.26)
Intercept	-0.01	-0.05	-0.04	-0.03	0.02	-0.07
	(0.09)	(0.17)	(0.09)	(0.16)	(0.08)	(0.19)
Arts	0.03	0.08	0.01	0.09	0.00	0.11
	(0.08)	(0.16)	(0.08)	(0.15)	(0.07)	(0.18)
Children	**0.15***	**0.47***	0.12	**0.48***	0.06	**0.56***
	(0.06)	(0.19)	(0.06)	(0.15)	(0.06)	(0.17)
Defence	0.11	-0.01	0.09	0.02	0.08	0.01
	(0.06)	(0.17)	(0.06)	(0.16)	(0.06)	(0.18)
Education	0.05	0.21	0.06	0.22	0.02	0.26
	(0.07)	(0.24)	(0.08)	(0.24)	(0.06)	(0.25)
Enterprise	0.03	-0.16	0.04	-0.16	0.00	-0.12
	(0.08)	(0.24)	(0.08)	(0.22)	(0.07)	(0.24)
Environment	-0.23	-0.04	-0.19	-0.07	-0.25	0.00
	(0.29)	(0.16)	(0.31)	(0.15)	(0.29)	(0.18)
Foreign	0.10	0.09	0.09	0.10	0.05	0.13
	(0.07)	(0.18)	(0.07)	(0.17)	(0.06)	(0.19)
Gaeltacht	0.02	0.06	0.04	0.05	-0.01	0.10
	(0.05)	(0.22)	(0.06)	(0.20)	(0.05)	(0.23)
Health	-0.07	0.02	-0.05	0.02	-0.09	0.08
	(0.13)	(0.46)	(0.13)	(0.45)	(0.12)	(0.48)
Justice	-0.00	0.01	0.01	-0.01	0.00	0.01
	(0.06)	(0.15)	(0.07)	(0.14)	(0.06)	(0.16)
Resources	0.07	0.03	0.07	0.01	0.05	0.04
	(0.08)	(0.18)	(0.07)	(0.17)	(0.07)	(0.20)
Social	-0.02	0.76	0.01	0.73	-0.03	0.80
	(0.04)	(0.73)	(0.05)	(0.72)	(0.05)	(0.72)
Transport	-0.17	0.32	-0.21	0.37	-0.23	0.36
	(0.21)	(0.26)	(0.23)	(0.31)	(0.21)	(0.25)
R-squared	0.19	0.14	0.17	0.12	0.18	0.13
N. of cases	151	151	151	151	151	151

* p<0.05

Note: Standard errors clustered by budget years. Reference category for portfolio fixed effects is the agriculture portfolio.

Table 3.3: Re-estimated results for intra-cabinet position, prime ministers, and interaction terms in the model with share of capital expenditure as the dependent variable. Each row shows estimated coefficients and standard errors when the portfolio listed in the first column is excluded from the analysis.

Left-out portfolio	N obs.		Intra-cabinet position	Cowen	Kenny	Cowen × position	Kenny × position
Agriculture	144	coef.	-0.23*	-0.21*	-0.13*	0.32*	0.33*
		(s.e.)	(0.08)	(0.07)	(0.06)	(0.11)	(0.12)
Arts	140	coef.	-0.21*	-0.20*	-0.14*	0.27*	0.35*
		(s.e.)	(0.08)	(0.07)	(0.06)	(0.11)	(0.11)
Children	150	coef.	-0.21*	-0.21*	-0.13*	0.27*	0.32*
		(s.e.)	(0.08)	(0.06)	(0.05)	(0.10)	(0.10)
Defence	148	coef.	-0.21*	-0.21*	-0.13*	0.27*	0.32*
		(s.e.)	(0.08)	(0.06)	(0.05)	(0.10)	(0.10)
Education	134	coef.	**-0.21**†	-0.23*	-0.13*	0.35*	0.33*
		(s.e.)	(0.10)	(0.06)	(0.05)	(0.12)	(0.11)
Enterprise	129	coef.	-0.26*	-0.25*	-0.16*	0.30*	0.36*
		(s.e.)	(0.11)	(0.07)	(0.05)	(0.11)	(0.10)
Environment	135	coef.	**-0.16**†	-0.14*	-0.13*	**0.12**	0.29*
		(s.e.)	(0.07)	(0.03)	(0.06)	(0.08)	(0.10)
Foreign	140	coef.	-0.22*	-0.21*	-0.14*	0.27*	0.35*
		(s.e.)	(0.09)	(0.06)	(0.06)	(0.10)	(0.11)
Gaeltacht	138	coef.	-0.22*	-0.22*	-0.13*	0.28*	0.33*
		(s.e.)	(0.09)	(0.06)	(0.05)	(0.10)	(0.10)
Health	142	coef.	-0.22*	-0.19*	-0.14*	0.26*	0.32*
		(s.e.)	(0.08)	(0.06)	(0.05)	(0.11)	(0.10)
Justice	139	coef.	-0.26*	-0.22*	-0.14*	0.31*	0.38*
		(s.e.)	(0.09)	(0.06)	(0.05)	(0.12)	(0.12)
Resources	141	coef.	-0.22*	-0.22*	-0.13*	0.25*	0.34*
		(s.e.)	(0.09)	(0.06)	(0.06)	(0.11)	(0.11)
Social	142	coef.	-0.22*	-0.22*	-0.13*	0.31*	0.33*
		(s.e.)	(0.08)	(0.07)	(0.05)	(0.11)	(0.09)
Transport	141	coef.	-0.14*	-0.16*	**-0.04**	0.21*	0.18*
		(s.e.)	(0.06)	(0.06)	(0.03)	(0.08)	(0.08)

* $p < 0.05$, † $p < 0.1$. Coefficients in bold text are not significant, or significant at $p < 0.1$ only.

4 Alternative Model Specifications

The regression models in Table 4.4 replicate the models from Table 1 in the main text using the average change in the dependent variables for cases in which a minister was assigned to more than one portfolio.

Table 4.4: OLS regression of changes in budget shares conditional on changes in debt (% of GDP), changes in the unemployment rate (%), PM in office, and control variables.

	Capital Coef. (s.e.)	**Current** Coef. (s.e.)	**Capital** Coef. (s.e.)	**Current** Coef. (s.e.)	**Capital** Coef. (s.e.)	**Current** Coef. (s.e.)
Junior minister	-0.01	0.07	-0.02	0.07	-0.01	0.07
	(0.04)	(0.07)	(0.03)	(0.05)	(0.05)	(0.08)
Same party	-0.01	-0.02	-0.00	-0.04	0.02	-0.06
	(0.07)	(0.05)	(0.08)	(0.06)	(0.08)	(0.06)
Intra-cabinet position	-0.19	-0.00	-0.13	-0.13	-0.23	0.08
	(0.10)	(0.13)	(0.11)	(0.16)	(0.12)	(0.14)
ΔDebt	**-0.01***	**0.01***				
	(0.00)	(0.00)				
ΔDebt × position	**0.01***	**-0.03***				
	(0.00)	(0.01)				
ΔUnempl.			-0.08	**0.08***		
			(0.04)	(0.03)		
ΔUnempl. × position			0.10	-0.10		
			(0.05)	(0.10)		
Cowen					**-0.23***	**0.18***
					(0.08)	(0.07)
Kenny					-0.13	0.23
					(0.06)	(0.12)
Cowen × position					**0.33***	-0.49
					(0.13)	(0.42)
Kenny × position					**0.36***	**-0.72***
					(0.13)	(0.24)
Intercept	0.02	-0.23	-0.01	-0.17	0.05	-0.26
	(0.11)	(0.13)	(0.12)	(0.12)	(0.10)	(0.15)
Portfolio dummies	*included*	*included*	*included*	*included*	*included*	*included*
R-squared	0.19	0.17	0.17	0.14	0.18	0.16
N. of cases	131	131	131	131	131	131

* p<0.05

Note: Standard errors clustered by budget years.

The regression models in Table 4.5 replicate the models from Table 1 in the main text using cabinet ministers only (i.e., excluding junior ministers).

Table 4.5: OLS regression of changes in budget shares conditional on changes in debt (% of GDP), changes in the unemployment rate (%), PM in office, and control variables.

	Capital	Current	Capital	Current	Capital	Current
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
	(s.e.)	(s.e.)	(s.e.)	(s.e.)	(s.e.)	(s.e.)
Same party	**-0.14***	0.26	-0.09	0.13	**-0.14***	0.22
	(0.04)	(0.14)	(0.05)	(0.13)	(0.04)	(0.13)
Intra-cabinet position	-0.33	0.16	-0.25	-0.18	-0.42	0.26
	(0.16)	(0.23)	(0.15)	(0.28)	(0.22)	(0.28)
ΔDebt	**-0.01***	**0.02***				
	(0.00)	(0.01)				
ΔDebt × position	0.01	**-0.05***				
	(0.01)	(0.02)				
ΔUnempl.			-0.03	0.18		
			(0.03)	(0.11)		
ΔUnempl. × position			0.05	-0.24		
			(0.04)	(0.20)		
Cowen					**-0.21***	**0.50***
					(0.05)	(0.19)
Kenny					**-0.14***	0.22
					(0.05)	(0.20)
Cowen × position					0.39	**-1.18***
					(0.23)	(0.54)
Kenny × position					**0.58***	-0.88
					(0.26)	(0.43)
Intercept	0.12	-0.62	-0.02	-0.37	0.21	-0.64
	(0.11)	(0.35)	(0.12)	(0.31)	(0.13)	(0.39)
Portfolio dummies	*included*	*included*	*included*	*included*	*included*	*included*
R-squared	0.39	0.24	0.29	0.20	0.43	0.21
N. of cases	80	80	80	80	80	80

* p<0.05

Note: Standard errors clustered by budget years.

5 Content of Budget Debates

Budget debates cover a variety of topics. Figure 5.5 provides a very general, high level overview of the key terms that appear in our text corpus as a word cloud of 200 most frequently used terms in the corpus.

Figure 5.5: Top 200 words by frequency from our text corpus.

While illustrative, word clouds do not capture sufficient structural information to understand the content of the debates. Here, we implement a structural topic model (STM) (Roberts et al., 2013). This enables us to identify the key topics discussed in the budget debate by cabinet ministers. We model topic prevalence in the context of the structural covariates. We control for the year spline to capture any time-related covariates. In addition we want to investigate whether the estimated Wordscores positions of the ministers are related to the topics covered in the debates. The model allows us to test the degree of association between covariates and the average proportion of a budget debate contribution discussing a topic.

We assess the optimal number of topics that need to be specified for the STM analysis. We follow the recommendations of the original STM paper and focus on exclusivity and semantic coherence measures. Mimno et al. (2011) propose semantic coherence measure, which is closely related to point-wise mutual information measure posited by Newman et al. (2010) to evaluate topic quality. Mimno et al. (2011) show that semantic coherence corresponds to expert judgments and more general human judgments in Amazon's Mechanical Turk experiments.

Exclusivity scores for each topic follows Bischof and Airoldi (2012). Highly frequent words in a given topic that do not appear very often in other topics are viewed as making that topic exclusive. Cohesive and exclusive topics are more semantically useful. Following
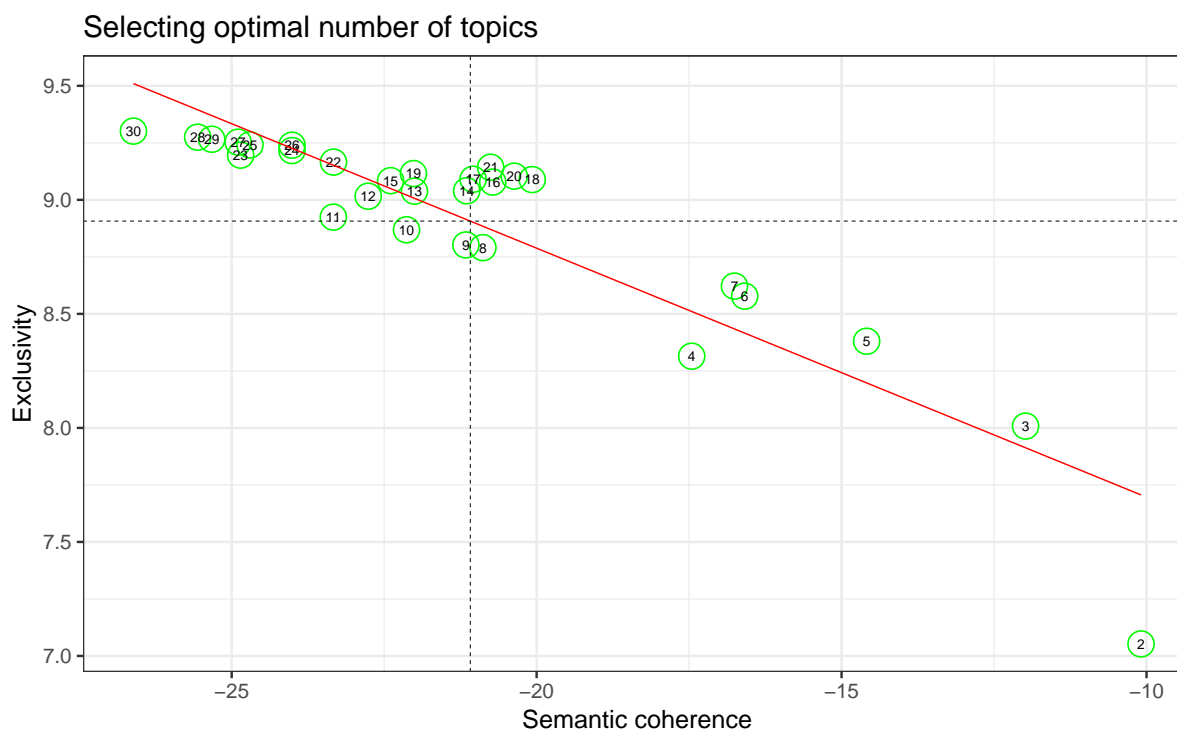
Figure 5.6: Searching for optimal number of topics.

Roberts, Stewart and Tingley (2016) we generate a set of candidate models ranging between 2 and 30 topics. We then plot the exclusivity and semantic coherence (numbers closer to 0 indicate higher coherence), with a linear regression overlaid (Figure 5.6). Models above the regression line have a "better" exclusivity-semantic coherence trade off. We select the 18-topic model, which has the largest positive residual in the regression fit, and provides higher semantic coherence at the same level of exclusivity.

The topic quality is usually evaluated by highest probability words. Consistent with our model selection approach we use here the words with the highest FREX score (which combines exclusivity and word frequency). Figure 5.7 shows the list of top 15 terms by their FREX score for each topic in our 18-topic model. For example, Topic 2 appears to cover agriculture related issues.

The topics appear to be very consistent and cover clear portfolio-related issues but also some cross-cutting issues.

We are also interested whether the content of the debates is related to the expressed position of ministers on the PM-FM dimension of our paper. Overall, 7 topics out of 18 (topics 3, 7, 6, 9, 5, 12, and 4) show some statistically significant relationship at 95% CI level with the estimated Wordscores positions of the ministers. Topics 7 and 6 exhibit a negative relationship, meaning that ministers closer to the FM discuss these topics more. Remaining topics are positively related, i.e. ministers closer to the PM are more likely to discuss these topics. Figure 5.8 plots the effect for these topics over the range of the Wordscores estimates.

Based on Figure 5.7, Topic 3 is likely to tap into more general aspects of political competition in Ireland. Picking up aspects of government vs opposition, coalition government, elections, and electoral promises. Propensity to discuss this topic increases as ministers move closer to PM. Similar direction of the effect, although statistically weaker, is observed for topics related to sports and tourism (topic 9), healthcare (topic 5), fiscal policy (topic 12), and envi-
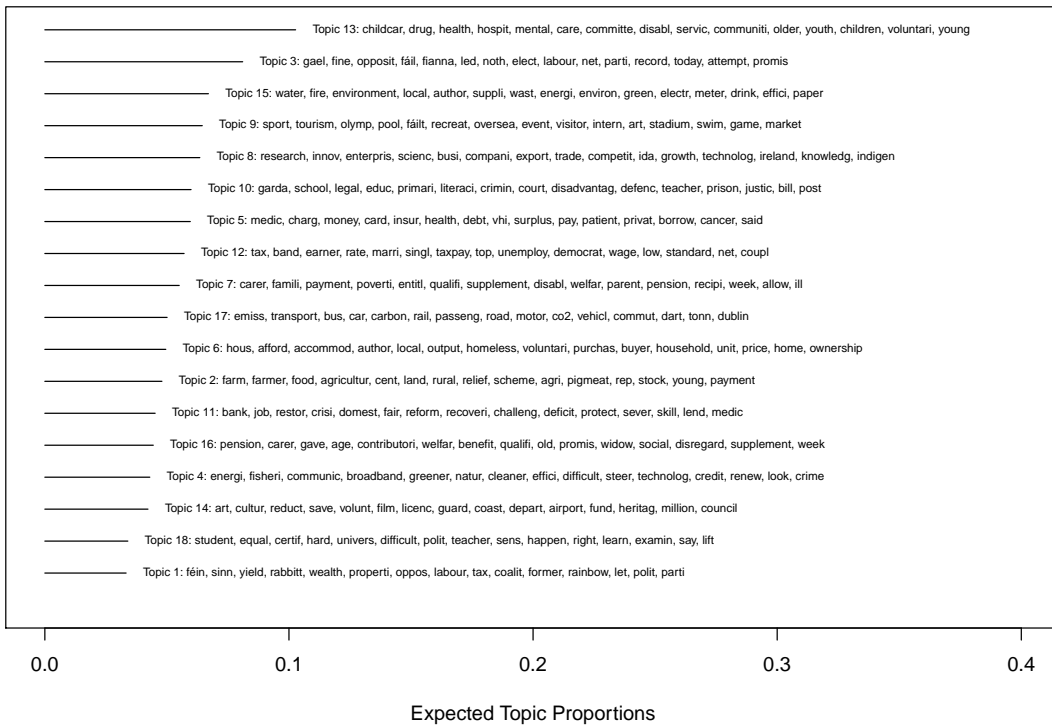
Top 15 most important words (by FREX)

Figure 5.7: Content of topics and topic proportions.

ronment (topic 4). On the other hand, topic 7 (similarly based on the top FREX terms in Figure 5.7) taps into issues of social security and welfare, while topic 6 focuses issues of housing and home ownership. Ministers closer to FM are more likely to cover these two topics.

Another aspect of the debates we can explore with our topic modeling results is the diversity of topics covered by each minister and whether ministers discuss only aspects of their own portfolio. Figure 5.9 plots percentage of each topic by portfolio. Most of the topics are covered by more than one minister. For example, Topic 3, which is a more political topic as discussed above, is discussed by all but three ministers. While topic 17 (tapping into transport) is predominantly discussed by ministers for transport and environment. At the same time, topic 2 (agriculture) is predominantly covered just by the minister for agriculture. These results also provide a sanity check on the quality of our fitted topic model.
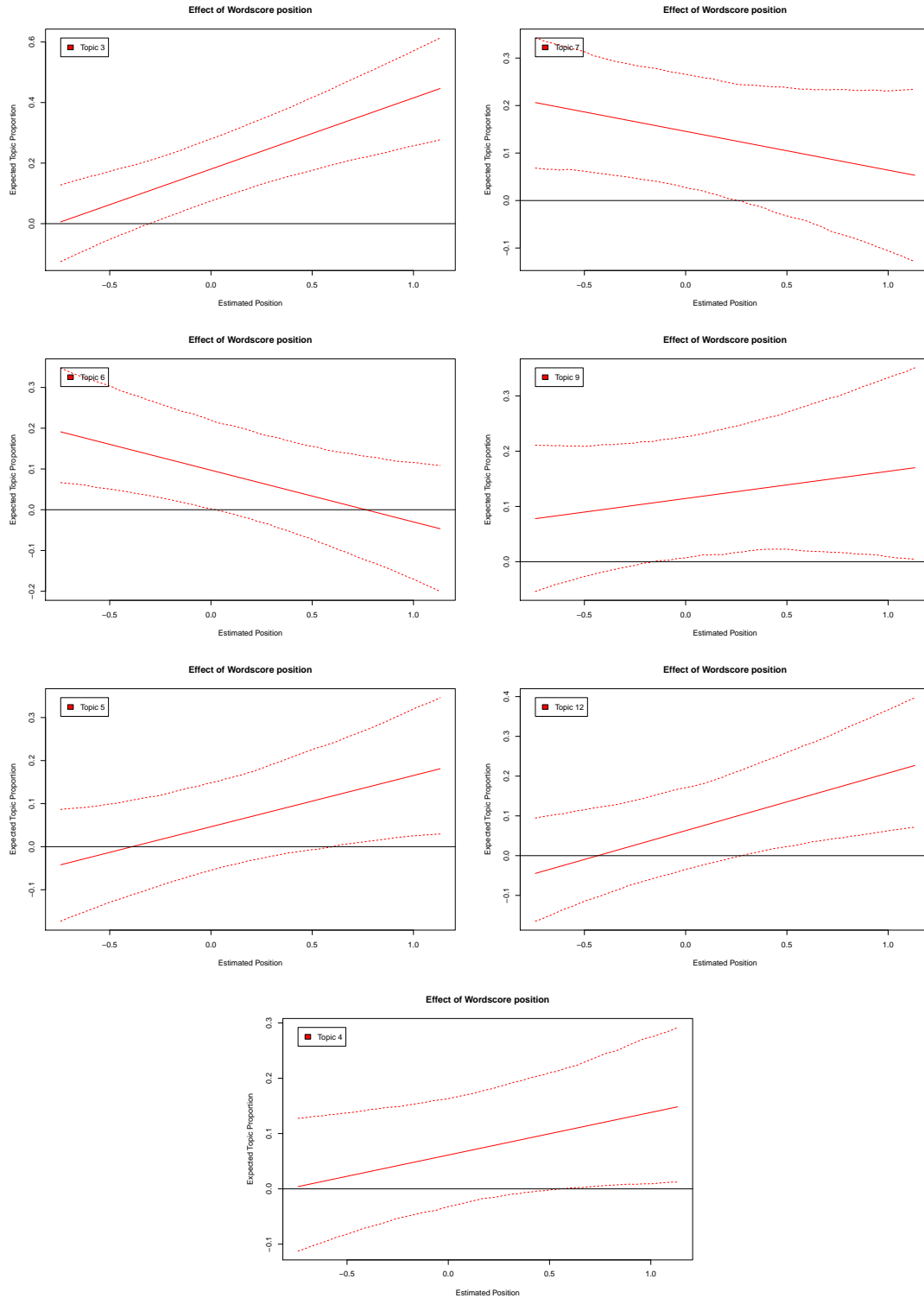
Figure 5.8: Relationship between content of the debates and estimated Wordscores positions.

Figure 5.9: Panels on the graph represent percentage of each of the 18 topics coming from the statements covering each of the 14 portfolios. On the y-axis numerical labels represent individual portfolios used in our analysis. Portfolio labels are as follows: 1 "Agriculture"; 2 "Arts"; 3 "Children"; 4 "Defence"; 5 "Education"; 6 "Enterprise"; 7 "Environment"; 8 "Foreign"; 9 "Gaeltacht"; 10 "Health"; 11 "Justice"; 12 "Resources"; 13 "Social"; and 14 "Transport".

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