

# “One Person, One Vote”: The Effect of Direct Elections on US Senators

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  - We empirically leverage variation across time (before and after the reform) and across chambers (Senate and House).
- ▶ **Results:**
  - The amendment had a significant impact on senators' agendas, as reflected in their speeches: they aligned their policy focus more closely with that of House representatives and concentrated on a less diverse set of topics.
  - But, we find no discernible effect on their roll-call voting behavior

## Senate Elections Before 1913

- ▶ Until 1913, U.S. Senators were chosen by state legislatures, not by popular vote.
- ▶ The Founders believed this would strengthen the connection between state and federal governments (Jenkins, 2005).
- ▶ However, this system presented several issues:
  1. Frequent deadlocks due to poor coordination between legislative chambers, leaving Senate seats vacant (Schiller, 2006).
  2. Excessive lobbying by political and business elites, often involving bribery, undermined the integrity of elections (Schiller et al., 2013; Schiller and Stewart III, 2015).
  3. Persistent internal party disputes complicated election processes further.

## The “Progressive Era” and 17th Amendment in 1913

- ▶ In the late 19th century, a grassroots movement emerged advocating greater political representation and electoral transparency, laying the foundation for future reforms.
- ▶ State legislatures increasingly responded to public demands for electoral reform.
- ▶ Between the late 19th and early 20th centuries, many states adopted popular primaries for senator selection, reflecting a growing trend toward voter participation, though legislatures maintained ultimate authority.
- ▶ Serious discussions regarding federal reform of the method for electing U.S. senators, initiated during the 61st Congress (1909–1911), ultimately led to the ratification of the 17th Amendment by the 63rd Congress in 1913, establishing the direct election of senators nationwide.

# Timeline

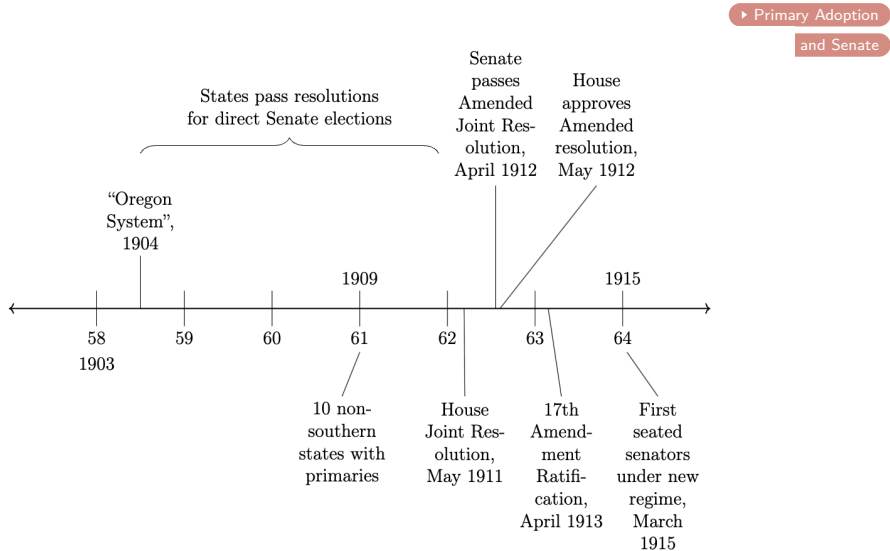


Figure: Path to 17th Amendment

# Data Sources

**Study Period:** 1879–1935 (46th to 73rd Congress)

## **Congressional Speeches:**

- ▶ Congressional speech transcripts from Gentzkow et al. (2019).
- ▶ Analysis restricted to speeches by voting congressional representatives:
  - ▶ 5,323,119 speeches analyzed.
  - ▶ 405,078,270 words, 2,276,167,184 characters.

## **Congressional Records:**

- ▶ Historical records from the U.S. House and Senate.
- ▶ DW-NOMINATE ideological scores (Lewis et al. (2023)).

# Political Agenda from Congressional Speeches

- ▶ We use topic models on congressional speeches to identify representatives' political agendas and policy preferences.
- ▶ Same method used, e.g., by Mueller and Rauh 2022, Hansen et al 2018, Hansen et al 2019.
- ▶ Latent Dirichlet Allocation (LDA) identifies latent topics within speech texts (Blei, Ng, and Jordan, 2003):
  - ▶ A probabilistic generative model assuming:
    - ▶ Each speech consists of a mixture of latent topics.
    - ▶ Each topic is represented by a distribution over words.
- ▶ Iteratively assigns topics to speeches and words to topics.
- ▶ Outputs interpretable topics defined by sets of associated words.

- ▶ Remove stopwords and procedural terms.
- ▶ Apply stemming for vocabulary reduction.
- ▶ Correct OCR errors (typos).
- ▶ Identify frequent bigram collocations (*noun\_noun*, *verb\_noun*, *adj\_noun*).
- ▶ After removing speeches shorter than 4 tokens, we are left with approximately 1.2 million speeches, comprising a vocabulary of 26,438 unique words.
- ▶ Finally, we train the model on a third of corpus and predict topics for each speech in the corpus

# Topic Labels

Topic No.	Label	Word List
1	Transportation and Commerce Regulation	interst_commerc, railroad_compani, railway_compani, interst
2	Public Buildings and Urban Development	avenu, architect, rent, public_build
3	Native American Affairs	choctaw, indian_tribe, tribe, indian_appropri
4	Military and Defense Matters	militari_affair, enlist_men, nation_guard, marin_corp
5	Political and Social Reform	general_welfar, evil, reform, unjustic
6	Parliamentary Debates and Media	teller, filibust, lobbi, disagre
7	Textiles and Tariffs	wool, chief_valu, yarn, leather
8	General Discontent and Economic Conditions	great_troubl, senat_posit, outlook, war_industri
9	Naval Affairs and Defense	yard, naval, arsenal, powder
10	Economic Policies and Budget	economi, spent, program, reced
11	Patriotism and National Identity	devot, born, die, father, patriot
:	:	:
32	Waterways and Infrastructure Projects	dam, navig_stream, bridg, navig_water
33	Agriculture and Forestry	seed, cattl, anim, beef
34	Veterans and Disability Benefits	widow, disabl, sick, pension_bureau
35	Monetary Policy and Currency	silver, redeem, coin, circul
36	Crime and Law Enforcement	kill, attack, arm, murder

Table: LDA Topic labels and word-list

## Notable Examples

- ▶ **William Borah:** Championed isolationism, opposed the League of Nations, and advocated for progressive and anti-imperialist policies. ▶ Borah
- ▶ **Robert M. La Follette:** Advocated for progressive reforms, opposed corporate power, and fought for labor rights and civil liberties. ▶ La Follette
- ▶ **Carter Glass:** Instrumental in shaping banking and economic policies. Played a crucial role in the creation of the Federal Reserve System with the Glass-Owen Act of 1913. ▶ Glass
- ▶ **Morris Sheppard:** Known as the “Father of National Prohibition”, championed Prohibition laws in Congress throughout the 1920s and 1930s. ▶ Sheppard

## Relevant Variables from Topic Model Analysis

- ▶ **Topic Similarity with House Representatives:** Cosine similarity between senators' topic vectors and average House representatives' vectors, from the same state-congress ▶ Example :

$$\cos(\theta_{ist}) = \frac{\mathbf{S}_{ist} \cdot \bar{\mathbf{H}}_{st}}{\|\mathbf{S}_{ist}\| \|\bar{\mathbf{H}}_{st}\|} = \frac{\sum_{l=1}^K S_{l,ist} \bar{H}_{l,st}}{\sqrt{\sum_{l=1}^K S_{l,ist}^2} \sqrt{\sum_{l=1}^K \bar{H}_{l,st}^2}}$$

- ▶ **Topic Relevance:** Share of speeches devoted to specific topics.
- ▶ **Breadth of Policy Discussion:** Concentration or diversification of topics, measured by entropy ▶ Example :

$$H_{it} = - \sum_{z=1}^{36} x_{izt} \ln(x_{izt})$$

## Empirical Strategy

$$\text{Similarity}_{l,it} = \alpha_i + \beta \text{Post17}_t + X'_{it}\gamma + \epsilon_{it} \quad (1)$$

- ▶ The outcome variable, **Similarity** $_{l,it}$ , directly captures the difference in speeches between senator  $l$ , from seat  $i$ , with the average topic structure of House representatives from the same state.
- ▶ The coefficient  $\beta$  identifies how adopting direct election of Senators changed their relative alignment with House representatives.
- ▶ Observations are at the seat- Congress level.
- ▶ Additional controls ( $X_{it}$ ) include: indicator for seeking re-election, for reaching term limits, seat, and individual fixed effects
- ▶ Standard errors clustered at the state level.

## Topics Similarity between Senators and House representatives

<i>Y mean</i> = 0.795	Topics Similarity		
	(1)	(2)	(3)
Post 17th amendment	0.056*** (0.005)	0.047*** (0.009)	0.039*** (0.010)
Seat FE	✓	✓	✓
Congress FE			
Individual FE		✓	✓
Controls		✓	✓
Linear Time Trend			✓
<i>N</i>	1,861	1,784	1,784

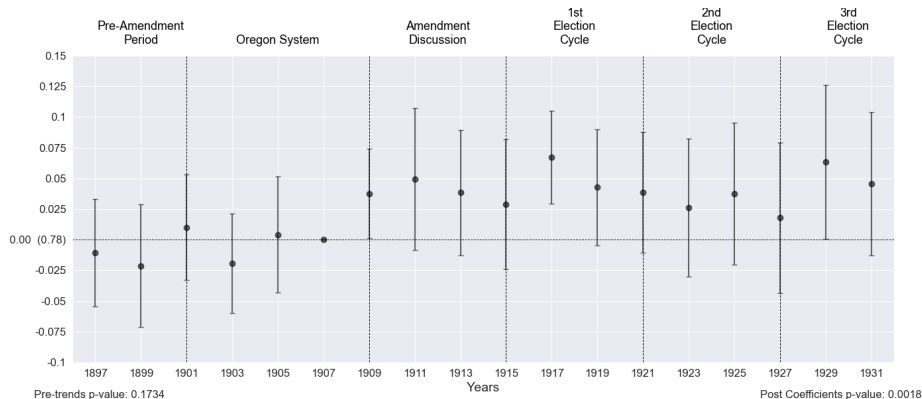
- ▶ Following the introduction of the 17th Amendment, there is an increase in topic similarity compared to the mean of the pre-reform period of 4.8% or 28% of the standard deviation

▶ Heterogeneity Analysis

▶ Robustness - Measures

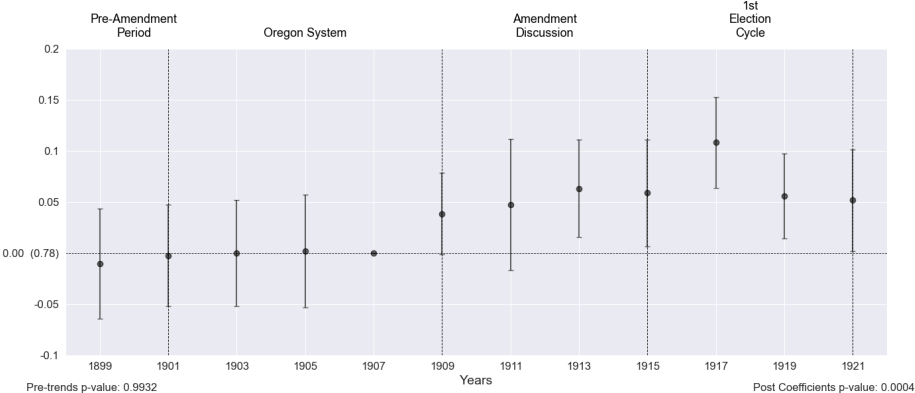
▶ Robustness - LDA models

# Topics Similarity - Event Study



- ▶ No evidence of pre-trends and the effect begins immediately with the 61st Congress (*anticipation*) and remains stable across all election cycles following the ratification.

# Platform Similarity - Political Selection

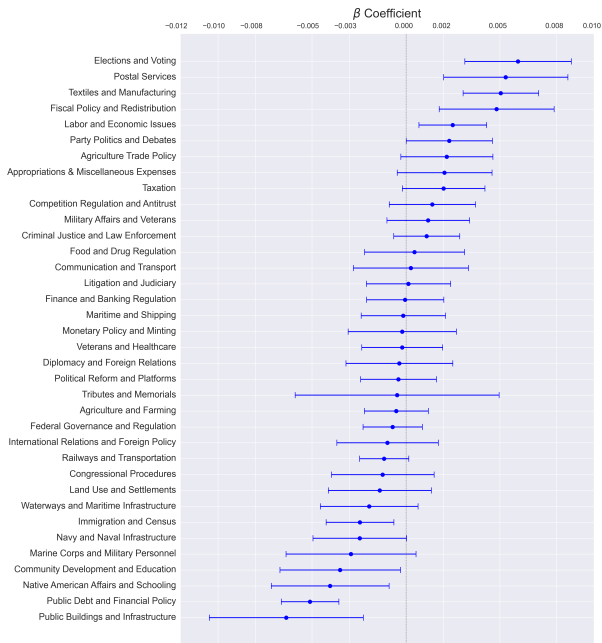


## Topic Relevance

$$\text{Topics}_{l,it}^k = \alpha_i + \delta_t + \beta \text{Senator}_l \times \text{Post17}_t + X'_{it}\gamma + \epsilon_{it} \quad (2)$$

- ▶ We estimate the equation separately for each topic  $k \in K$  using the share of speeches devoted to specific topics as the dependent variable.
  - ▶ Each speech is assigned to the topic with the largest share
- ▶ The coefficient  $\beta$  captures the shift in Senators' topic emphasis due to the reform.

# Topic Relevance



- ▶ **Gained Prominence:** Elections and Voting, Labor and Economic Issues, Fiscal Policy, Textiles and Manufacturing.
- ▶ **Lost Prominence:** Infrastructure Building, Native American Affairs, Immigration, and Debt Settlements.
- ▶ Emphasis shifted toward issues impacting average voters, moving away from topics with less immediate visibility or relevance to the broader electorate.

## Additional Results: Policy Focus and Voting Behavior

$$Y_{l,it} = \alpha_i + \delta_t + \beta \text{Senator}_i \times \text{Post17}_t + X'_{it} \gamma + \epsilon_{it} \quad (3)$$

- ▶ Policy Platform Concentration (Entropy): Captures changes in how narrowly or broadly senators focus their speeches and policy platforms (Jennings et al, 2011).
- ▶ DW-NOMINATE Scores (Roll-call Voting): Measures shifts in senators' ideological positions based on their voting behavior.

## Breadth of Political Discussions

Table: Additional Results: Concentration of Policy Platform

<i>Y mean</i> =3.232	Entropy		
	(1)	(2)	(3)
Treatment	-0.027* (0.015)	-0.046** (0.022)	-0.048** (0.023)
Seat FE	✓	✓	✓
Congress FE	✓	✓	✓
Individual FE		✓	✓
Controls		✓	✓
Linear Time Trend			✓
<i>N</i>	9,573	8,709	8,709

- ▶ Direct elections led Senators to focus their policy agendas on fewer topics, entropy goes down by 1.4% of the mean and 14% of the standard deviation.

## Roll-Call behavior

Table: DW-Nominate Regression Results

	DW-NOMINATE		
	(1)	(2)	(3)
Treatment	-0.003 (0.006)	-0.000 (0.004)	-0.000 (0.001)
Seat FE	✓	✓	✓
Congress FE	✓	✓	✓
Individual FE			
Controls		✓	✓
Linear Time Trend			✓
<i>N</i>	9,529	9,529	9,529

- ▶ Direct elections did not affect voting behavior

## Conclusion

- ▶ After the adoption of the 17th Amendment, Senators' policy platforms became significantly more similar with those of House Representatives, suggesting greater responsiveness to voter preferences.
- ▶ This convergence is not solely due to a new "type" of senators entering under the reformed system, as incumbent senators also adjusted their policy platforms accordingly.
- ▶ Clear shifts emerged in policy priorities: increased emphasis on fiscal policy and political representation, with reduced attention to education, native american affairs, and infrastructure.
- ▶ Senators' platforms grew more concentrated around fewer, more salient issues.
- ▶ Nevertheless, no clear change occurred in senators' roll-call ideological positions (DW-NOMINATE), aligning with findings from Gentzkow et al. (2018).

Thank you!



## Example Cosine [▶ back](#)

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>1</b>	1.000	0.949	0.877	0.439	0.598	0.378
<b>2</b>	0.949	1.000	0.971	0.693	0.756	0.478
<b>3</b>	0.877	0.971	1.000	0.808	0.891	0.663
<b>4</b>	0.439	0.693	0.808	1.000	0.891	0.663
<b>5</b>	0.598	0.756	0.891	0.891	1.000	0.904
<b>6</b>	0.378	0.478	0.663	0.663	0.904	1.000

# Direct Primaries

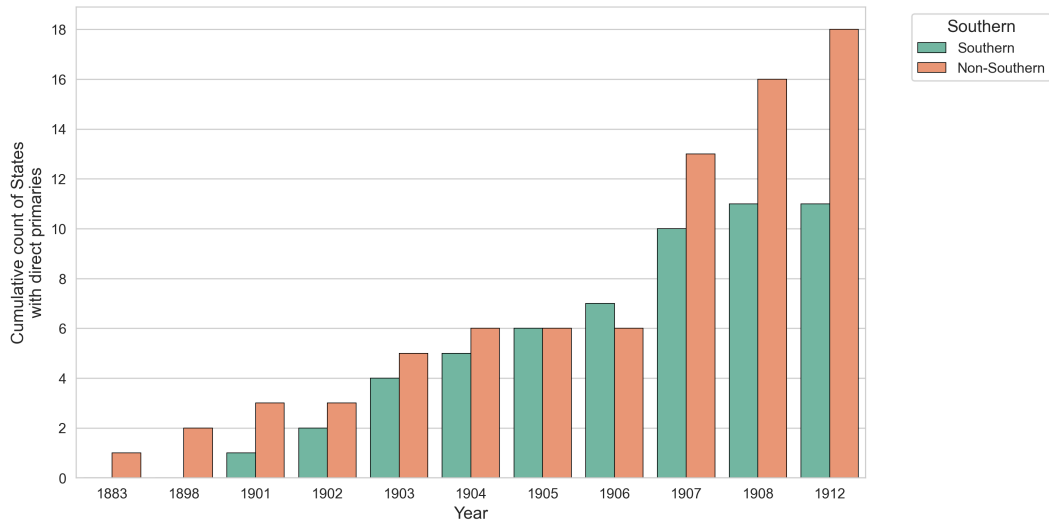


Figure: Direct Primaries for Electing US Senator

# House and Senate

## ▶ **Membership and Representation:**

- ▶ House: Members are based on state population, with larger states having more representatives.
- ▶ Senate: Each state, regardless of its population, has two senators.

## ▶ **Term Length:**

- ▶ House: Members serve 2-year terms.
- ▶ Senate: Senators serve 6-year terms.

## ▶ **Origination of Legislation:**

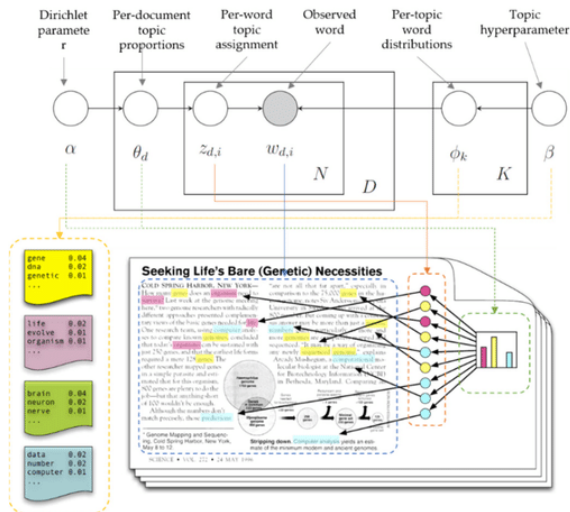
- ▶ House: All revenue-raising bills must originate in the House.
- ▶ Senate: All international treaties ratified by the Senate

## ▶ **Similarity:**

- ▶ Both chambers are required to pass a bill in the exact same form before it is sent to the President for signature.

# Latent Dirichlet Analysis

(a) LDA document generation process



(b) An illustrative example of LDA document generation process

(c) Two outputs of LDA

(c-1) Per-document topic proportions ( $\theta_d$ )

	Topic 1	Topic 2	Topic 3	...	Topic K
Doc 1	0.20	0.50	0.10	...	0.10
Doc 2	0.50	0.02	0.01	...	0.40
Doc 3	0.05	0.12	0.48	...	0.15
...	...	...	...	...	...
Doc N	0.14	0.25	0.33	...	0.14

(c-2) Per-topic word distributions ( $\phi_k$ )

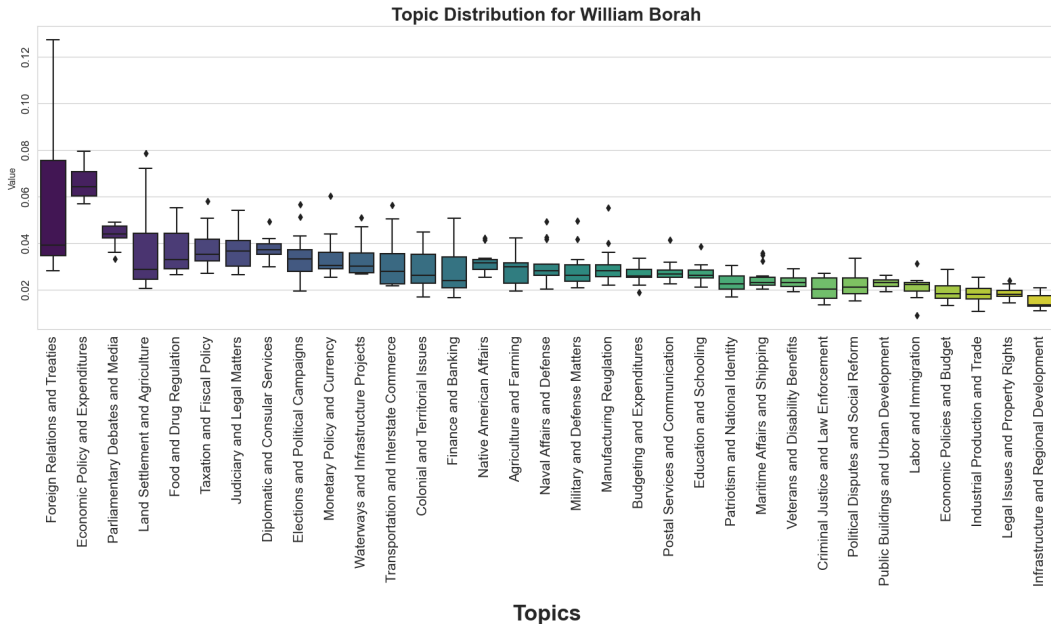
	Topic 1	Topic 2	Topic 3	...	Topic K
word 1	0.01	0.05	0.05	...	0.10
word 2	0.02	0.02	0.01	...	0.03
word 3	0.05	0.12	0.08	...	0.02
...	...	...	...	...	...
word N	0.04	0.01	0.03	...	0.07

Figure: LDA Procedure

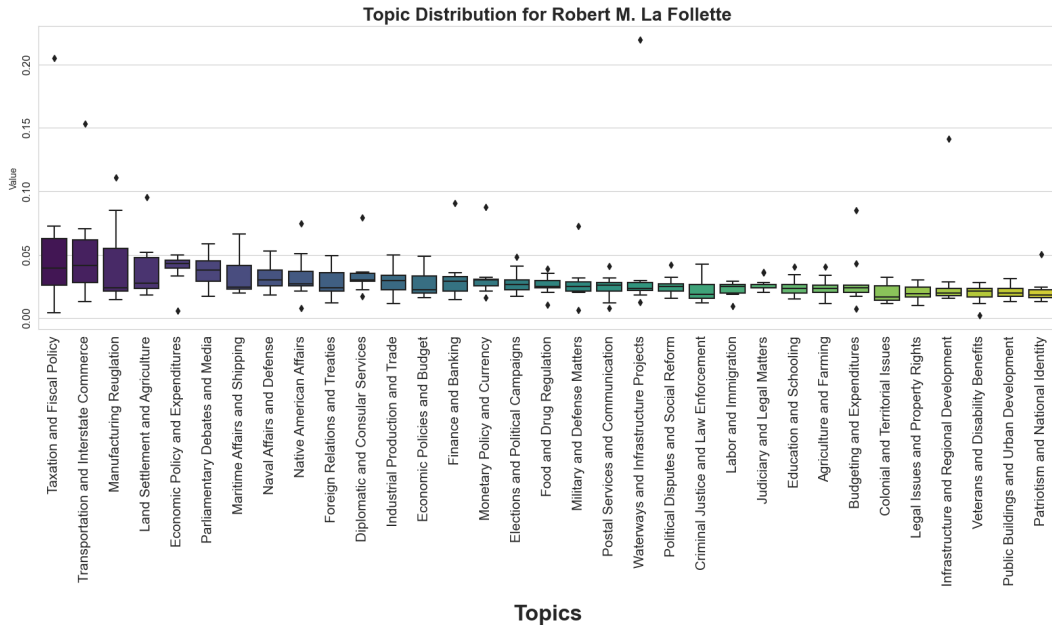
## Pre-processing - Descriptive

	Number of Words	Vocabulary Size	Number of Speeches
Raw Text	457,544,195	2,253,385	6,531,892
Removing Short Speeches	415,644,247	2,183,801	2,634,239
Stopwords, Stemming and OCR adjustment	108,876,306	16,108	2,557,946
Bigrams	94,518,986	1,174,329	2,557,946
Frequency Adjustment	54,681,862	37,746	2,247,690
Final revision	19,198,831	26,407	1,989,923

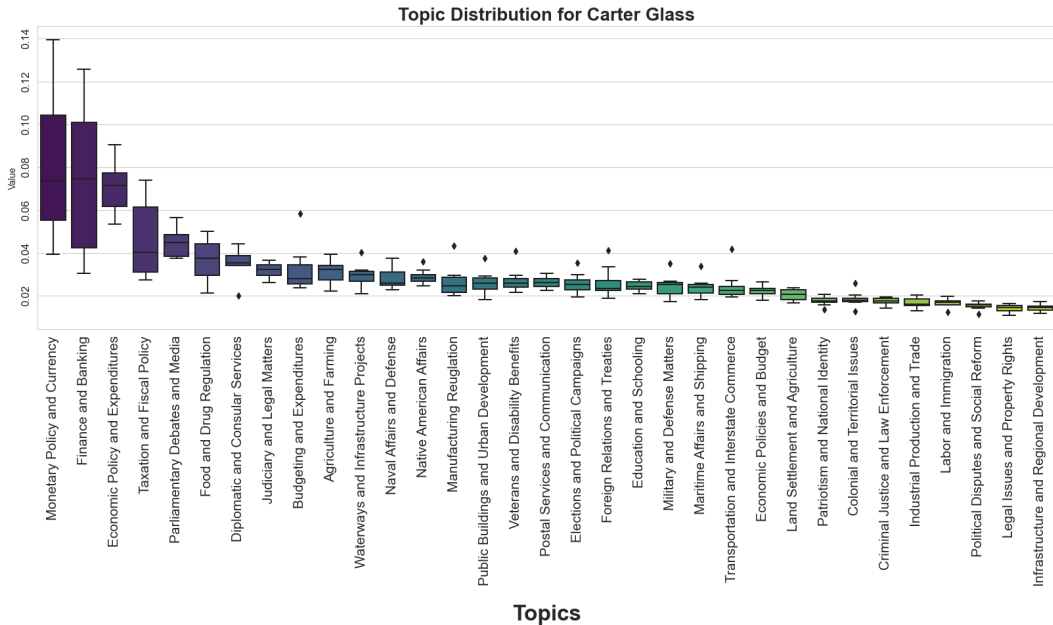
# William Borah - Platform Example



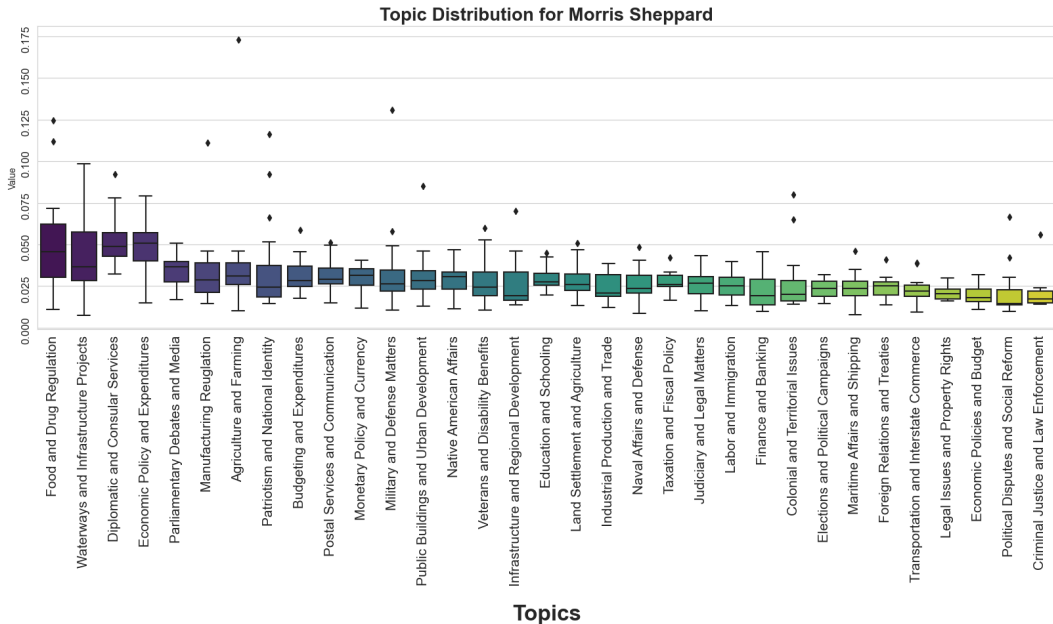
# Robert La Follette - Platform Example



# Carter Glass - Platform Example



# Morris Sheppard - Platform Example



**Table:** Descriptive Statistics

	Pre-Amendment		Post-Amendment		Overall	
	House	Senate	House	Senate	House	Senate
<i>Panel A: Individual Variables</i>						
Cosine Similarity		0.795 (0.137)		0.847 (0.109)		0.826 (0.123)
KL-Divergence (Inverted)		0.824 (0.113)		0.871 (0.088)		0.852 (0.102)
Jensen-Shannon Divergence (Inverted)		0.949 (0.041)		0.964 (0.029)		0.958 (0.035)
Bhattacharyya Distance (Inverted)		0.944 (0.049)		0.962 (0.034)		0.955 (0.042)
Abs(DW-Nominate)	0.401 (0.121)	0.394 (0.134)	0.356 (0.135)	0.344 (0.170)	0.378 (0.13)	0.369 (0.155)
Entropy	3.232 (0.332)	3.392 (0.189)	3.31 (0.267)	3.441 (0.136)	3.28 (0.296)	3.421 (0.16)
Sought re-election == 1	0.907 (0.291)	0.723 (0.448)	0.942 (0.233)	0.804 (0.397)	0.928 (0.259)	0.773 (0.419)
Reached end of term == 1	0.973 (0.162)	0.972 (0.164)	0.972 (0.164)	0.954 (0.209)	0.972 (0.165)	0.961 (0.193)
Number of Missed Roll-Call Votes	71.706 (58.883)	64.628 (64.823)	52.953 (53.237)	97.117 (89.899)	58.427 (55.858)	81.543 (80.454)
Number of Speeches	77.298 (147.823)	236.497 (284.223)	119.91 (289.616)	464.204 (556.776)	101.95 (241.582)	368.31 (470.99)
<i>N</i>	3,102	825	4,568	1,125	8,091	2,051
<i>Panel B: Congressional Variables</i>						
Number of Roll-Call Votes	181.778 (71.683)	197.667 (143.993)	195.727 (86.619)	361.455 (159.752)	185.952 (78.178)	285.619 (166.7)
Majority Party (D==1)	0.222 (0.441)	0.111 (0.333)	0.364 (0.505)	0.273 (0.467)	0.333 (0.483)	0.19 (0.402)
<i>N</i>	9	9	11	11	21	21

# Heterogeneity Analysis

	Platform Similarity		
	(1)	(2)	(3)
Panel A: Incumbents, serving both before and after the reform			
Treatment	0.047*** (0.008)	0.048*** (0.009)	0.038** (0.027)
<i>N</i>	721	718	718
Panel B: States without pre-reform Senate primaries			
Treatment	0.051*** (0.006)	0.049*** (0.010)	0.039** (0.036)
<i>N</i>	1,339	1,281	1,281
Seat FE	✓	✓	✓
Congress FE			
Individual FE		✓	✓
Controls		✓	✓
Linear Time-trend			✓
Panel C: All States prior to 61st Congress			
Primaries	0.016 (0.015)	0.012 (0.016)	0.012 (0.017)
<i>N</i>	1,129	1,082	1,082
Seat FE	✓	✓	✓
Congress FE			
Individual FE		✓	✓
Controls		✓	✓
Linear Time-trend			✓

# Heterogeneity Analysis

	Platform Similarity	
	(1)	(2)
Panel A: Incumbent Candidacy Status		
	Running for re-election	Not Running for re-election
Post	0.028*** (0.013)	0.041 (0.032)
<i>N</i>	1,382	353
Seat FE	✓	✓
Congress FE		
Individual FE	✓	✓
Controls	✓	✓
Linear Time-trend	✓	✓
Panel B: Incumbent vs. New Senators (Post-Reform)		
New Senators	0.017** (0.008)	0.018* (0.009)
<i>N</i>	1,084	1,784
Seat FE	✓	✓
Congress FE		
Individual FE		
Controls		✓
Linear Time-trend		✓

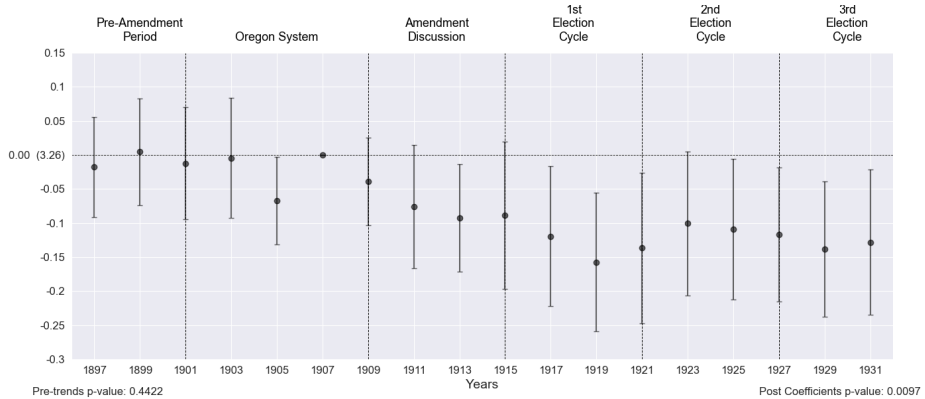
# Robustness Checks 1

	Platform Similarity		
	(1)	(2)	(3)
Panel A: Jensen-Shannon Divergence (Inverted)			
Treatment	0.017*** (0.001)	0.015*** (0.002)	0.013*** (0.0028)
Panel B: Kullback-Liebler Divergence (Inverted)			
Treatment	0.049*** (0.009)	0.045*** (0.014)	0.039*** (0.017)
Panel C: Bhattacharyya Distance (Inverted)			
Treatment	0.038*** (0.008)	0.019*** (0.001)	0.015*** (0.0044)
<i>N</i>	1,861	1,784	1,784
Seat FE	✓	✓	✓
Congress FE			
Individual FE		✓	✓
Controls		✓	✓
Linear Time-trend			✓

## Robustness Checks 2

	Platform Similarity		
	(1)	(2)	(3)
Panel A: ProdLDA 30 Topics			
Treatment	0.048*** (0.0048)	0.042*** (0.015)	0.035*** (0.011)
Panel B: ProdLDA 33 Topics			
Treatment	0.051*** (0.00499)	0.036*** (0.009)	0.031*** (0.0106)
Panel C: ProdLDA 39 Topics			
Treatment	0.053*** (0.0051)	0.048*** (0.094)	0.045*** (0.0112)
<i>N</i>	1,861	1,784	1,784
Seat FE	✓	✓	✓
Congress FE			
Individual FE		✓	✓
Controls		✓	✓
Linear Time-trend			✓

# Event-study: Entropy



▶ Back