Online Methods Appendix: Occupy the Government

APPENDIX A: SUPPLEMENTARY TABLES

Table A1. Keywords by Number of Arrests and Number of Cities with Occupy Arrests, 2009-2015

	No Arrests		1-100 Arrests		> 100 Arrests		F-Test	
President Obama	N	Mean	N	Mean	N	Mean	F	Bonferroni
Arrests[1]								
Inequality Count	2323	4.25	172	8.73	15	14.53	28.14***	Pass***
Fair Share Count	2323	0.23	172	1.13	15	2.40	62.28***	Pass***
Arrests – Lag 1 Day								
Inequality Count	2322	4.26	172	9.03	15	9.40	23.79***	Fail
Fair Share Count	2322	0.24	172	1.16	15	1.53	50.27***	Pass***
U.S. Congress								
Arrests[1]								
Inequality Count	2323	103.76	172	128.85	15	205.53	5.23**	Fail
Fair Share Count	2323	0.90	172	2.20	15	2.13	16.18***	Fail
Arrests – Lag 1 Day								
Inequality Count	2322	104.76	172	115.84	15	206.67	3.60*	Fail
Fair Share Count	2322	0.92	172	1.76	15	3.33	10.64***	Pass***

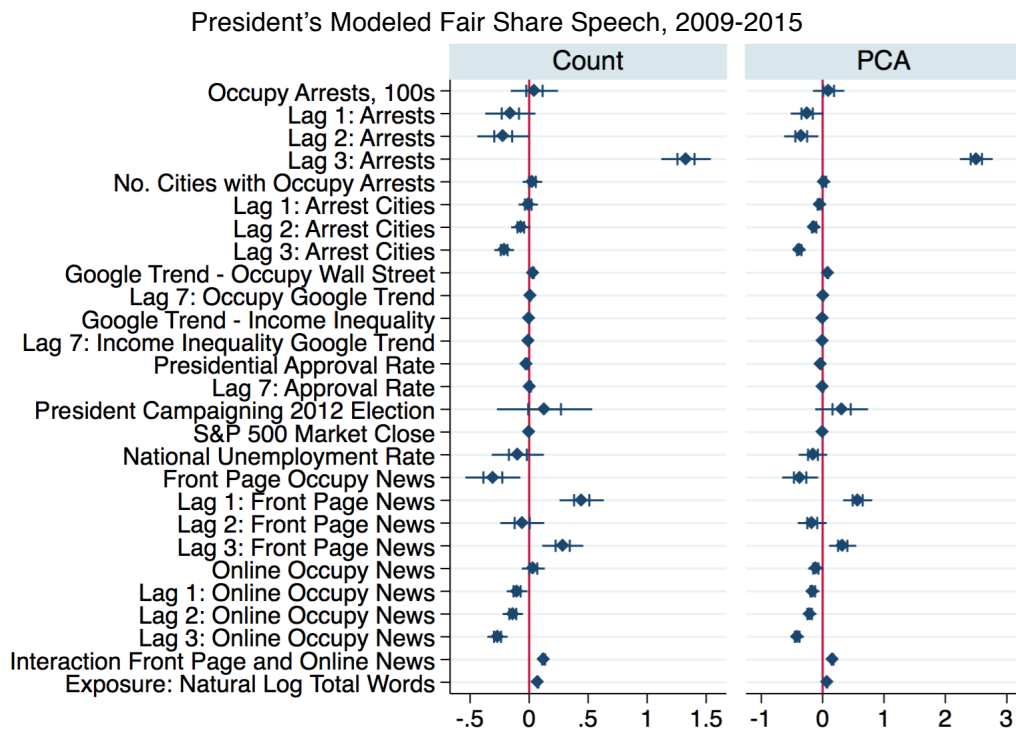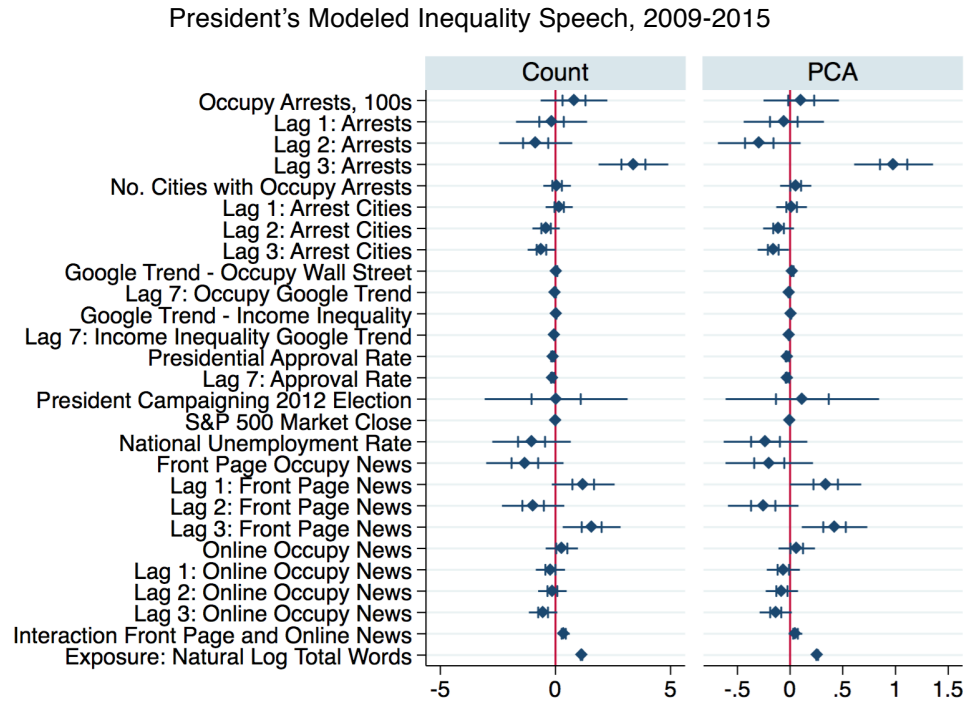|	No Arrest Cities		1-4 Arrest Cities		> 4 Arrest Cities		F-Test	
President Obama	N	Mean	N	Mean	N	Mean	F	Bonferroni
Arrest Cities[1]								
Inequality Count	2323	4.25	155	9.95	32	5.50	28.51***	Fail
Fair Share Count	2323	0.23	155	1.32	32	0.78	57.41***	Pass*
Arrest Cities – Lag 1 Day								
Inequality Count	2322	4.26	155	9.43	32	7.28	24.52***	Fail
Fair Share Count	2322	0.24	155	1.17	32	1.25	50.27***	Pass***
U.S. Congress								
Arrest Cities[1]								
Inequality Count	2323	103.76	155	130.48	32	156.91	3.92*	Fail
Fair Share Count	2323	0.90	155	2.15	32	2.44	16.30***	Pass*
Arrest Cities – Lag 1 Day								
Inequality Count	2322	104.76	155	116.11	32	157.09	2.15	Fail
Fair Share Count	2322	0.92	155	1.81	32	2.22	10.64***	Pass**

Sources: (1) Congressional rhetoric taken from the daily U.S. congressional record, Jan 01, 2009 to February 12, 2016. (United States, Government Printing Office 2016). The data was downloaded and keyword terms were counted for each category using replicable Python and Bash scripts (Author 2016a-c). (2) OccupyArrests (2014). Data shown from dates January 1, 2009 to November 15, 2015. Data truncated to show statistics for period of multivariate analysis.

*Note*s: Significance levels as follows: *p<.05, **p<.01, ***p<.001. F-test compares with Bonferroni pairwise comparisons. Bonferroni pairwise comparisons illustrate the difference between each of the possible pairwise comparisons between the keyword and arrests or arrest cities. In the Bonferroni column, I highlight the three most important pairwise comparisons of the arrests and arrest city categories versus no arrests or no arrest cities. If there was a statistically significant difference between (1) no arrests and 1-100 arrests AND (2) no arrests and > 100 arrests, I denote this condition a "pass." Likewise if there was a statistically significant difference between (1) no arrest cities and 1-4 arrest cities AND (2) no arrest cities and > 4 arrest cities, I denote this condition a "pass." If any of these three failed, I denote a "fail." For passes, I indicate the most conservative probability level of each Bonferroni comparison.

Table A2. ARFIMA Models: President's Speech on Inequality and Fair Share, 2009-2015

Table Corresponding to Coefficient Plots Displayed in Table 4 of the Article

VARIABLES	Inequality				Fair Share			
	(1) Count		**(2) PCA**		**(3) Count**		**(4) PCA**	
	Beta	**SE**	**Beta**	**SE**	**Beta**	**SE**	**Beta**	**SE**
Occupy Wall Street Protesters Arrested (100's)								
Base: Arrests Today	1.05	(0.71)	0.19	(0.17)	0.05	(0.09)	0.04	(0.12)
Lag 1: Arrests Yesterday	-0.76	(0.77)	-0.21	(0.19)	-0.28**	(0.10)	-0.49***	(0.13)
Lag 2: Arrests Two Days Past	-1.84*	(0.78)	-0.56**	(0.19)	-0.41***	(0.10)	-0.70***	(0.13)
Lag 3: Arrests Three Days Past	2.70***	(0.74)	0.79***	(0.18)	1.07***	(0.10)	2.01***	(0.12)
Public Perception Controls								
U.S. Google Trend: "Occupy Wall Street"‡								
Base: Occupy Google Trend Current Date	0.04	(0.06)	0.02	(0.02)	0.04***	(0.01)	0.09***	(0.01)
Lag 7: Occupy Google Trend Last Week	-0.05	(0.05)	-0.02	(0.01)	0.00	(0.01)	-0.00	(0.01)
U.S. Google Trend: "Income Inequality"‡								
Base: Inequality Google Trend Current Date	0.06*	(0.02)	0.01*	(0.01)	0.00	(0.00)	-0.00	(0.00)
Lag 7: Inequality Google Trend Last Week	-0.04	(0.02)	-0.01	(0.01)	-0.01*	(0.00)	-0.01	(0.00)
Political Controls								
Presidential Approval Rate ‡								
Base: Presidential Approval Current Date	-0.14	(0.11)	-0.03	(0.03)	-0.02	(0.01)	-0.03	(0.02)
Lag 7: Presidential Approval Last Week	-0.17	(0.11)	-0.04	(0.03)	0.00	(0.01)	0.00	(0.02)
President Campaigning for 2012 Election	0.64	(1.64)	0.27	(0.39)	0.33	(0.20)	0.63**	(0.24)
Current Economic Conditions Controls								
S&P 500 Market Close ‡	-0.00	(0.00)	-0.00	(0.00)	-0.00	(0.00)	-0.00	(0.00)
National Unemployment Rate ‡	-0.70	(0.93)	-0.16	(0.22)	-0.08	(0.11)	-0.12	(0.14)
Media Coverage of Occupy Wall Street								
Major World Newspapers, Front Page Coverage								
Base: Front Page Occupy News Today	-1.73	(0.93)	-0.31	(0.23)	-0.35**	(0.12)	-0.45**	(0.15)
Lag 1: Front Page Occupy News Yesterday	1.29	(0.75)	0.36	(0.18)	0.47***	(0.10)	0.61***	(0.12)
Lag 2: Front Page Occupy Two Days Past	-1.15	(0.75)	-0.30	(0.18)	-0.10	(0.10)	-0.27*	(0.12)
Lag 3: Front Page Occupy Three Days Past	1.65*	(0.69)	0.43*	(0.17)	0.27**	(0.09)	0.27*	(0.11)
Online News Coverage								
Base: Online News Today	0.07	(0.39)	0.02	(0.09)	0.00	(0.05)	-0.16*	(0.06)
Lag 1: Online News Yesterday	0.05	(0.35)	-0.01	(0.09)	-0.08	(0.05)	-0.13*	(0.06)
Lag 2: Online News Two Days Past	0.06	(0.34)	-0.03	(0.08)	-0.13**	(0.04)	-0.21***	(0.06)
Lag 3: Online News Three Days Past	-0.62	(0.34)	-0.15	(0.08)	-0.28***	(0.04)	-0.42***	(0.06)
I1: Interaction Today's Front Page and Online News	0.49***	(0.14)	0.08*	(0.04)	0.14***	(0.02)	0.18***	(0.02)
Constant	30.04	(15.60)	5.60	(3.74)	2.25	(1.97)	2.69	(2.37)
AR-1	0.56***	(0.05)	0.54***	(0.05)	0.48***	(0.06)	0.45***	(0.07)
AR-2	-0.08**	(0.03)	-0.10***	(0.03)	-0.04	(0.03)	-0.05	(0.03)
MA-1	-0.73***	(0.06)	-0.66***	(0.08)	-0.63***	(0.08)	-0.59***	(0.09)
D	0.37***	(0.06)	0.33***	(0.06)	0.30***	(0.06)	0.27***	(0.07)
Sigma^2	74.07***	(2.10)	4.42***	(0.12)	1.25***	(0.04)	2.00***	(0.06)
Log Likelihood	-8929.27		-5404.34		-3830.97		-4414.70	
AIC	17914.55		10864.67		7717.94		8885.41	
BIC	18077.62		11027.75		7881.01		9048.48	
N	2500		2500		2500		2500	

Note: Significance levels using z-test. +p<0.1, *p<.05, **p<.01, ***p<.001. Terms, designated by ‡, imputed to carry over last value or convert to a daily scale. Models 1-4: ARFIMA models of count data and PCA of count data with OIM S.E., respectively.
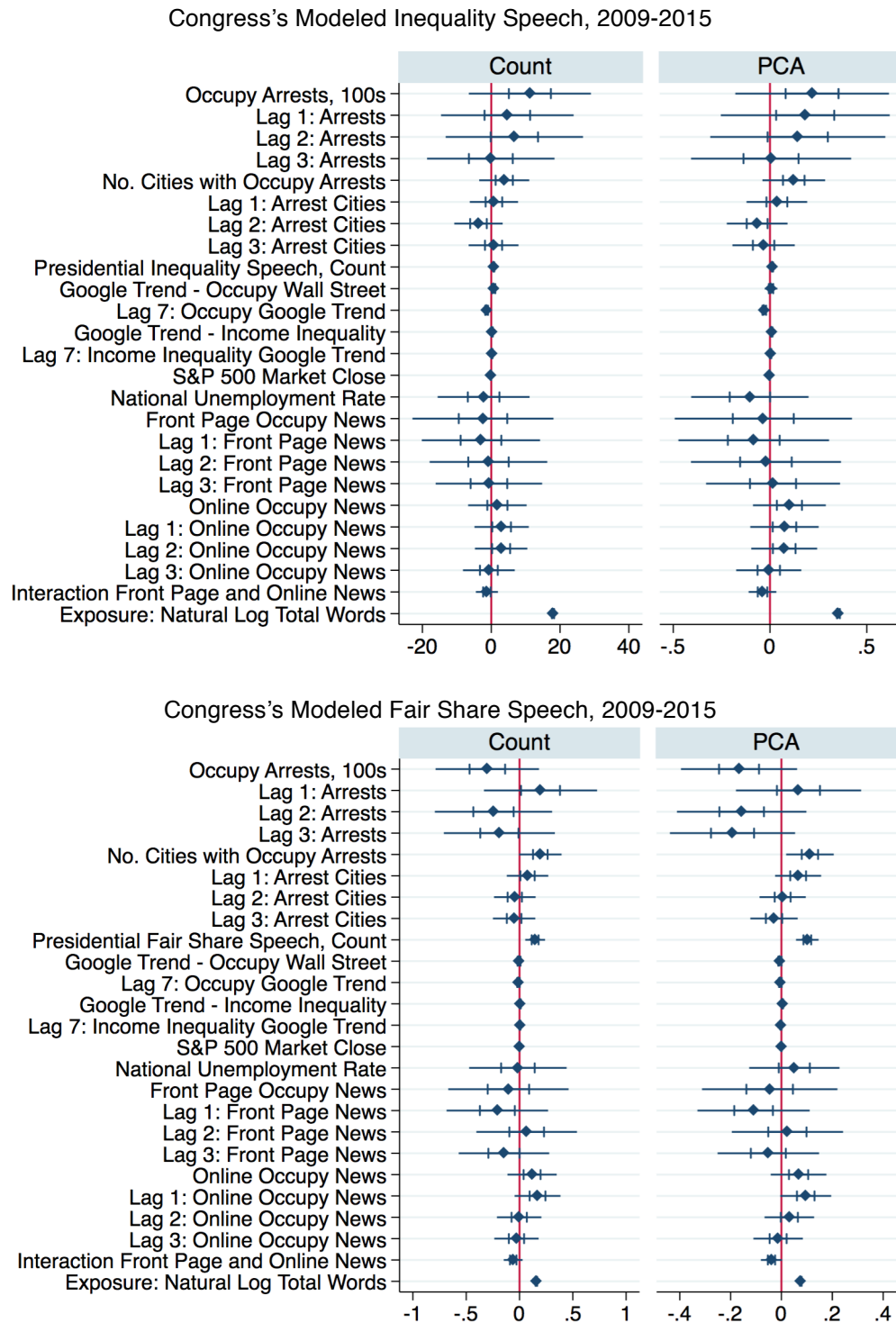
Table A3. ARFIMA Models of President Obama's Speech with Exposure Term, 2009-2015

President's Modeled Inequality Speech, 2009-2015

President's Modeled Fair Share Speech, 2009-2015

Note: Significance levels using z-test. Confidence bars in coefficient plot represent the 95% confidence intervals around the point estimate. Models 1-4: ARFIMA (2, d, 1) models of count data and PCA of count data with OIM S.E., respectively for inequality and fair share rhetoric. N=2,500.

Table A4. ARFIMA Models: Congress's Speech on Inequality and Fair Share, 2009-2015

Table Corresponding to Coefficient Plots Displayed in Table 5 of the Article

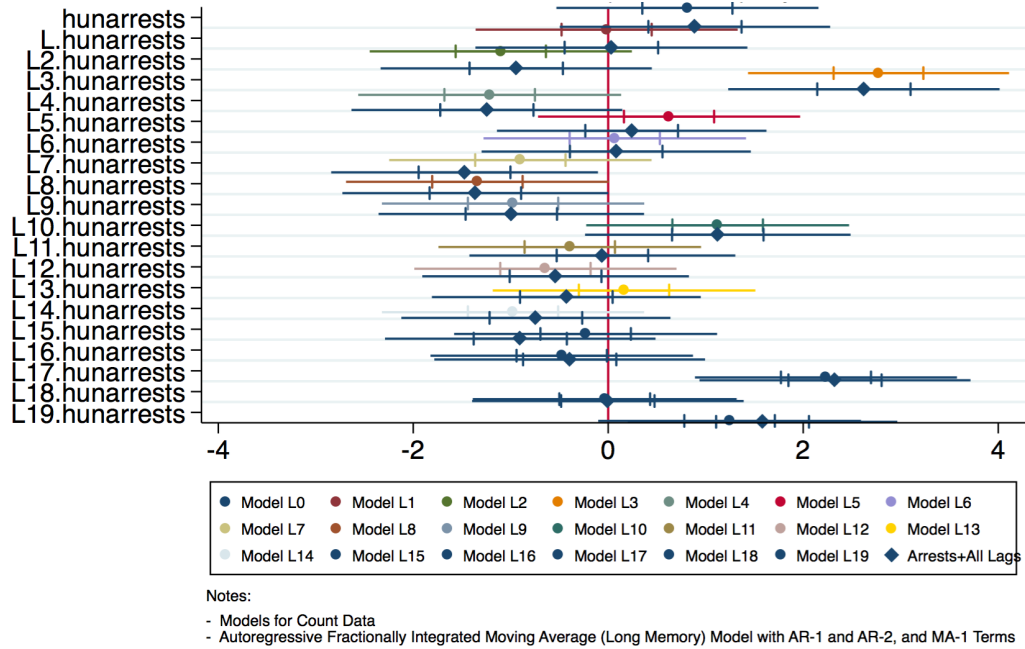| VARIABLES	Inequality				Fair Share			
	(1) Count		(2) PCA		(3) Count		(4) PCA	
	Beta	SE	Beta	SE	Beta	SE	Beta	SE
Number of Cities with Occupy Arrests								
Base: Arrest Cities Today	10.21**	(3.84)	0.25**	(0.08)	0.22*	(0.09)	0.12**	(0.04)
Lag 1: Arrest Cities Yesterday	5.95	(4.08)	0.15	(0.09)	0.14	(0.09)	0.10*	(0.04)
Lag 2: Arrest Cities Two Days Past	-3.63	(3.98)	-0.07	(0.09)	-0.11	(0.09)	-0.04	(0.04)
Lag 3: Arrests Cities Three Days Past	-2.30	(3.87)	-0.11	(0.08)	-0.12	(0.09)	-0.08	(0.04)
President Obama's Speech Rhetoric								
President's Inequality Speech (Count)	0.81***	(0.23)	0.01*	(0.01)				
President's Fair Share Speech (Count)					0.15***	(0.05)	0.10***	(0.02)
Public Perception Controls								
U.S. Google Trend: "Occupy Wall Street"‡								
Base: Occupy Google Trend Current Date	-0.66	(1.00)	-0.02	(0.02)	-0.01	(0.02)	-0.01	(0.01)
Lag 7: Occupy Google Trend Last Week	-1.69	(0.92)	-0.04	(0.02)	-0.01	(0.02)	-0.01	(0.01)
U.S. Google Trend: "Income Inequality"‡								
Base: Inequality Google Trend Current Date	0.69	(0.41)	0.02	(0.01)	0.01	(0.01)	0.01	(0.00)
Lag 7: Inequality Google Trend Last Week	0.47	(0.41)	0.01	(0.01)	0.01	(0.01)	-0.00	(0.00)
Current Economic Conditions Controls								
S&P 500 Market Close ‡	-0.05	(0.05)	-0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
National Unemployment Rate ‡	6.02	(11.60)	0.03	(0.25)	0.08	(0.23)	0.08	(0.09)
Media Coverage of Occupy Wall Street								
Major World Newspapers, Front Page Coverage								
Base: Front Page Occupy News Today	-3.27	(11.67)	-0.06	(0.25)	-0.11	(0.29)	-0.06	(0.14)
Lag 1: Front Page Occupy News Yesterday	0.96	(12.04)	-0.02	(0.26)	-0.24	(0.25)	-0.14	(0.12)
Lag 2: Front Page Occupy Two Days Past	0.53	(12.27)	0.02	(0.26)	0.07	(0.25)	0.01	(0.12)
Lag 3: Front Page Occupy Three Days Past	-0.56	(9.32)	0.05	(0.20)	-0.10	(0.22)	-0.03	(0.11)
Online News Coverage								
Base: Online News Today	5.20	(4.70)	0.16	(0.10)	0.16	(0.12)	0.09	(0.06)
Lag 1: Online News Yesterday	6.59	(5.08)	0.13	(0.11)	0.21	(0.11)	0.12*	(0.05)
Lag 2: Online News Two Days Past	6.52	(5.02)	0.15	(0.11)	0.03	(0.11)	0.05	(0.05)
Lag 3: Online News Three Days Past	3.68	(4.51)	0.08	(0.10)	-0.05	(0.11)	-0.03	(0.05)
I1: Interaction Today's Front Page and Online News	0.07	(1.74)	-0.02	(0.04)	-0.05	(0.05)	-0.03	(0.02)
Constant	92.22	(151.24)	1.31	(3.24)	-0.22	(2.99)	-0.88	(1.20)
AR-1	1.03***	(0.03)	1.00***	(0.03)	0.78***	(0.06)	0.84***	(0.07)
AR-2	-0.50***	(0.02)	-0.47***	(0.02)	-0.21***	(0.02)	-0.18***	(0.02)
MA-1	-0.50***	(0.05)	-0.49***	(0.05)	-0.61***	(0.07)	-0.68***	(0.10)
D	0.21***	(0.04)	0.21***	(0.04)	0.21***	(0.05)	0.16**	(0.06)
Sigma²	13525.19***	(382.55)	6.33***	(0.18)	7.56***	(0.21)	1.68***	(0.05)
Log Likelihood	-15438.23		-5855.06		-6076.44		-4198.70	
AIC	30928.46		11762.13		12204.88		8449.40	
BIC	31079.88		11913.55		12356.31		8600.82	
N	2500		2500		2500		2500	

Note: Significance levels using z-test. +p<0.1, *p<.05, **p<.01, ***p<.001. Terms, designated by ‡, imputed to carry over last value or convert to a daily scale. Models 1-4: ARFIMA models of count data and PCA of count data with OIM S.E., respectively.

Table A5. ARFIMA Models of Congress's Speech with Exposure Term, 2009-2015

Congress's Modeled Inequality Speech, 2009-2015
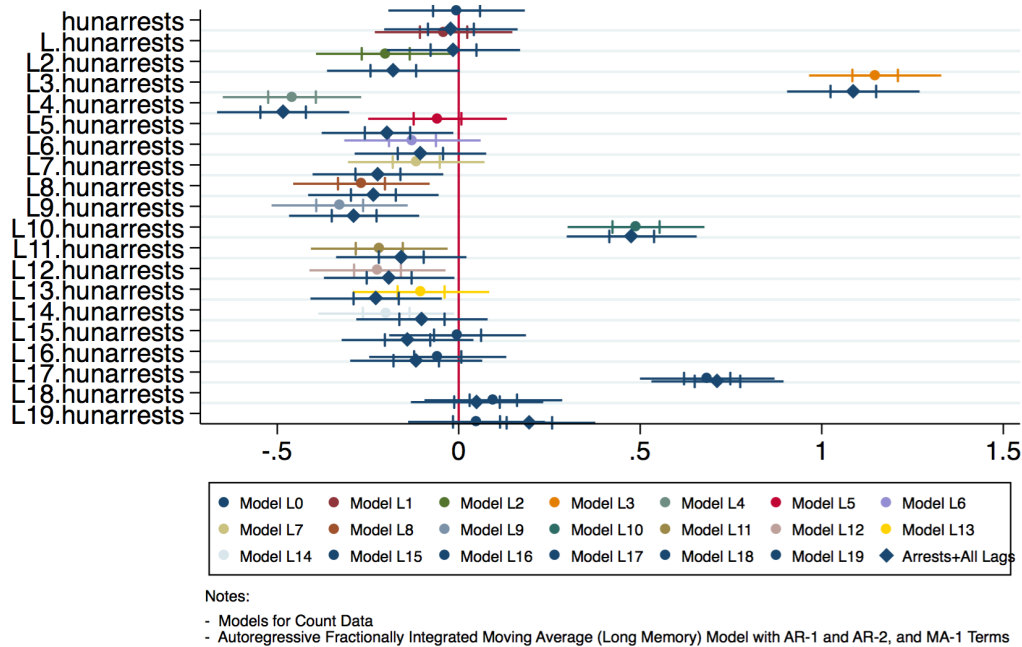

Congress's Modeled Fair Share Speech, 2009-2015

Note: Significance levels using z-test. Confidence bars in coefficient plot represent the 95% confidence intervals around the point estimate. Models 1-4: ARFIMA (2, d, 1) models of count data and PCA of count data with OIM S.E., respectively for inequality and fair share rhetoric. N=2,500.

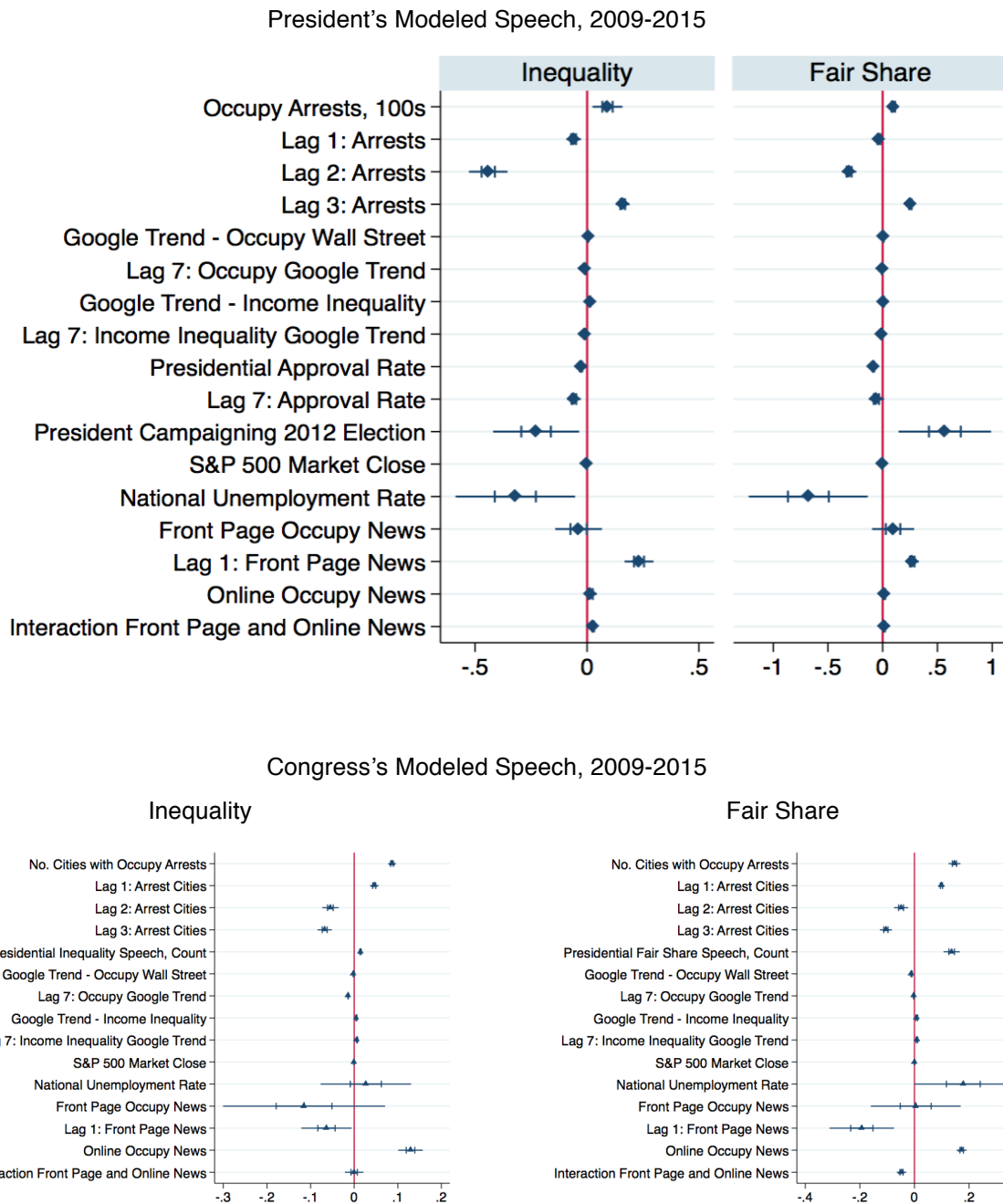**Table A6.** Coefficient Plots of Discrete Lags versus Collective Model with All Lags

Discrete versus Collective Models of President's Inequality Speech, 2009-2015

Notes:
- Models for Count Data
- Autoregressive Fractionally Integrated Moving Average (Long Memory) Model with AR-1 and AR-2, and MA-1 Terms

Discrete versus Collective Models of Congress's Fair Share Speech, 2009-2015

Notes:
- Models for Count Data
- Autoregressive Fractionally Integrated Moving Average (Long Memory) Model with AR-1 and AR-2, and MA-1 Terms

Note: Significance levels using z-test. Confidence bars in coefficient plot represent the 95% confidence intervals around the point estimate. Models 1-4: ARFIMA (2, d, 1) models of count data and PCA of count data with OIM S.E., respectively for inequality and fair share rhetoric. N=2,500.

Table A7. Negative Binomial Models of Presidential and Congressional Speech, 2009-2015

President's Modeled Speech, 2009-2015

Congress's Modeled Speech, 2009-2015

Note: Significance levels using z-test. Confidence bars in coefficient plot represent the 95% confidence intervals around the point estimate. Generalized negative binomial models of count data using (HAC), Newey-West S.E., respectively for inequality and fair share rhetoric. N=2,500.

APPENDIX B: SPEECH CLASSIFIER KEY WORDS AND PHRASES

Full code for the Presidential Speech Classifier can be found online (Author 2016c). The following terms were used in the speech classifier script. Not all categories were fully utilized. As previously indicated, the keyword categories follow Occupy's purpose to fight "the corrosive power of major banks and multinational corporations over the democratic process,…the role of Wall Street in creating an economic collapse,…[and] the richest 1% of people that are writing the rules of an unfair global economy" (Occupy 2011). Research using surveys, qualitative assessments, and computational techniques reiterates these essential ideas (DeTar 2012; DeLuca, Lawson, and Sun 2012; Gould-Wartofsky 2015; Krugman 2011a; Milkman, Luce, and Lewis 2013a-b). For example, the Occupy Wall Street survey (DeTar 2012) asked protest participants to list the top three keywords that motivated them to participate. Perhaps unsurprising, "income inequality, "inequality, "corporate influence in politics," and "corporate greed" were all top responses. Through these ideas we can see the central tenant that *the top 1% are writing their rules to the unfair world economy, and should like everyone else pay their fair share and play by the same rules*. In an alternate survey by Milkman, Luce, and Lewis (2013a), 47.5% of Occupy participants indicated that "Inequality/the 1%" was a top motivating concern in supporting Occupy. Similarly, 25.5% and 18.5% indicated that "money in politics/frustration with D.C." and "corporate greed" were top reasons for support. I operationalize my work by examining political rhetoric for discussion of these same topics. The keywords used for categories are as follows:

Table B1. Discrete Keywords by Speech Category Used by Python NLP Script (Author 2016c)

Inequality Keywords and Phrases
inequality = ["wealth", "wealthy", "income equality", "income inequality", "inequality", "privileged", "rich", "1%", "1 percent", "one percent", "99%", "99 percent", "ninety-nine percent", "ninety nine percent", "fair", "unfair", "fairness", "unfairness", "middle-class", "middle class", "working class", "working-class", "lower class", "poor", "poverty", "rich", "upper class", "equity", "inequity", "egalitarian", "disparity", "unequal", "average American", "average Americans", "Wall Street", "Main Street", "main street", "50 million", " Warren Buffet", "Warren Buffett's secretary", "secretary", "class warfare", "class warefare", "warrior for the middle class", "Giving everybody a shot", "giving everybody a shot", "everybody a fair shot", "work your way up", "working your way up", "starting at the bottom", "blood, sweat and tears", "blood sweat and tears", "blood, sweat, and tears", "willing to work hard", "fair and just", "everybody is included", " folks at the top", "folks at the bottom"]

Fair Share Keywords and Phrases
fair_share = ["fair shot", "fair shake", "gets a fair shake", "pay their fair share", "our fair share", "fair share"]

Wall Street Keywords and Phrases
wall_street = ["lobby", "lobbying", "lobbies", "special interest", "special interests", "revolving door", "campaign donor", "campaign donation", "campaign donations", "bidder", "highest bidder", "campaign contributions", "loophole", "loopholes", "tax shelter", "tax evasion", "write their own rules", "own rules", "Wall Street", "bailout", "bailouts"]

Corporate Greed Keywords and Phrases

corporate_greed = ["cheat", "cheating", "stacked against", "stacked up against", " stacked against", "good benefits", "decent salary", "stack the deck", "deck got stacked against", "exploit", "exploiting", "protect workers", "protecting workers", "protect laborers", "protecting laborers", "protect Americans", "protecting Americans", "protect employee", "protect employees", "protecting employees", "work safe", "working safely", "safe at work", "work conditions", "innocent", "minimum wage", "pollute", "polluting", "regulate", "regulating", "federal oversight", "financial reform", "gambling", "derivative", "derivatives", "sub-prime", "risky investment", "risky investments", "bust unions", "union", "unions", "labor unions", "dirtiest air", "cheapest labor", "wages", "workplace safety", "Consumer Finance Protection Bureau", "consumer protection", "unions", "union label", "union workers", "CEO", "CEO's", "corporation", "corporations"]

Top Results from the Occupy Wall Street Survey of Keywords and Phrases (DeTar 2012)[1]

OWS_survey = ["income inequality", "inequality", "economic conditions", "corruption", "justice", "corporate influence in politics", "corporations", "corporate personhood", "injustice", "social justice", "corporate greed", "anti-capitalism", "greed", "unemployment", "citizens united", "equality", "money in politics", "government corruption", "poverty", "environmental concerns", "democracy", "fairness", "freedom", "change", "inequity", "jobs", "money out of politics", "health care", "financial reform", "solidarity", "war", "movement building", "foreclosures", "frustration", "banks", "politics", "curiosity", "money", "campaign finance reform", "climate change", "education", "disparity", "bailouts", "future", "anger", "hope", "revolution", "humanity", "equity", "children", "police brutality", "rights", "community", "Oligarchy", "0.99", "fascism", "freedom of speech", "food", "civil liberties", "taxes", "peace", "plutocracy", "love", "corporate corruption", "joblessness", "campaign finance", "fraud", "Wall Street", "human rights", "compassion", "accountability", "NDAA", "debt", "tax the rich", "lobbyists", "broken political system", "agreement", "inequality", "corruption", "economy", "justice", "environment", "income inequality", "economic inequality", "healthcare", "capitalism", "corporatism", "economics", "social injustice", "income disparity", "political corruption", "government", "economic justice", "economic disparity", "economic injustice", "civil rights", "wealth disparity", "oppression", "racism", "patriarchy", "sustainability", "homelessness", "corporate power", "workers rights", "student loans", "wall street", "corrupt government", "exploitation", "accountability", "housing", "patriotism", "apathy", "responsibility", "corporations"]

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[1] *Note:* These specific terms are those indicated by Occupy Wall Street protesters in a survey as the top motivating keywords driving them to participate in the OWS protest. Respondents were offered a 1st, 2nd, and 3rd choice. This group reflects the pooled terms from the 1st, 2nd, and 3rd choice keywords or phrases listed that had greater than or equal to five respondents enter the keyword (DeTar 2012).