Supplementary Online Appendix
For: Welfare, Egalitarianism, and Polarization:
The Politics of Noncontributory Social Programs

(Not Intended for Print Publication)

Supplemental Appendix A: Descriptive Statistics

This section presents descriptive statistics for the article "Welfare, Egalitarianism, and Polarization: The Politics of Noncontributory Social Programs." Table A1 lists standard summary statistics as well as Augmented Dickey Fuller tests for stationarity indicators of interest when modeled against noncontributory welfare spending. Table A2 presents the trace statistic test for co-integration and suggested lag lengths in vector error correction models (VECM). The reader should note the trace statistic listed accounts for the entire model. For example, the statistics for the noncontributory welfare line signifies results for a multivariate model that includes this indicator as well as party polarization for the House and Senate.

To give the reader a full accounting of the VECM specifications, the trace statistic presented in Table A-2 shows all rank levels between 0 and 2. The asterisk represents the rank-order used in each model. Each level presents the acceptable co-integration rank that does not exceed the 5% critical value.

For the lag selection criteria, rather than present each lag statistic for Akaike information criterion (AIC), Hannon-Quinn information criterion (HQIC), and the Schwartz information criterion (SBIC) tests, I show all lags suggested by these tests. One suggested lag indicates agreement across all tests, multiple lags indicates conflicting lag orders.

Table A1: Summary Statistics

Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**	ADF	p-value	ADF(1st Diff)	p-value
Polarization Scores								
House Polarization	3.396	1.391	1.438	6.281	-0.169	0.942	-8.074	0.000
Senate Polarization	3.262	1.505	0.790	6.761	-0.347	0.919	-7.936	0.000
Spending Indicators								
Noncontributory Individual	239,327	247,050	6,439	843,482	0.976	0.994	-7.480	0.000
Noncontributory Outlays	261,416	260,128	6,410	896,199	0.901	0.993	-7.555	0.000
Welfare Contributory	643,813	538,959	16,935	1,827,008	1.559	0.998	-7.525	0.000
Defense	518,586	186,888	145,255	918,090	-1.714	0.424	-6.616	0.000
General	84,497	63,361	7,322	243,789	-0.023	0.956	-6.784	0.000
Earmark	56,224	29,739	7,786	112,115	-1.179	0.683	-7.067	0.000
Political	104,715	68,866	-6,432	487,223	-2.547	0.104	-6.766	0.000
Inequality								
GINI	0.393	0.036	0.348	0.458	0.354	0.980	-9.709	0.000

Note: Augmented Dickey Fuller tests (ADF) are presented pre- and post-differenced. Statistically insignificant tests indicate the presence of nonstationarity. N = 72.

Table A2: Trace Statistics and Potential Lag Orders

	Trace Statistics and 5% Critical Value						
Variable	**Trace(0)**	**5%(0)**	**Trace(1)**	**5%(1)**	**Trace(2)**	**5%(2)**	Lags
Spending Indicators							
Noncontributory Individual	42.14	29.68	12.74*	15.41	1.85	3.76	2, 4
Noncontributory Outlays	41.61	29.68	12.25*	15.41	1.74	3.76	1, 4
Welfare Contributory	40.04	29.68	11.26*	15.41	2.41	3.76	1, 4
Defense	44.67	29.68	13.62*	15.41	0.23	3.76	2, 4
General	36.52	29.68	7.26*	15.41	0.71	3.76	2
Earmark	40.64	29.68	8.84*	15.41	0.07	3.76	1, 2, 4
Political	51.52	29.68	14.13*	15.41	0.06	3.76	2, 4
GINI	98.78	47.21	50.95	29.68	13.54*	15.41	1, 4

Note:* = Acceptable co-integration rank. Trace statistic does not exceed 5% critical value. N = 72.

Supplemental Appendix B: VECM Identification Parameters

As stated in the article, I use vector error correction models (VECM) to account for two factors: nonstationarity and co-integration. All the data and subsequent models used in this paper exhibit these properties where standard regression, time series, or multivariate models (vector autoregressive models (VAR)) are inappropriate. Moreover, VECMs provide the ability to test for both short- and long-run dynamics. So, where VECMs are often used in economics to explain, for example, how markets are related by a common production process, such as oil producers and gasoline retailers, or equities on the stock market that share similar underlying trading fates, the point to note is some data share commonalities that can be explained with a VECM. For this paper, it is important to highlight similar attributes are also evident in political processes. For example, this method has been used to explain interest representation in the Supreme Court (Hansford 2011). This approach, in other words, is a technique to help tap underlying commonalities that also provides robust statistical estimates.

A clearer description of VECMs is best described by Murray (1994) in *A Drunk and Her Dog: An Illustration of Cointegration and Error Correction.* The premise is as follows: If one were to follow a drunk leaving a saloon after a night of drinking, they would observe the drunk's path resembles a random walk. The drunk moves in a general direction but meanders. In a similar way, dogs, when left to explore the world on their own, wend in random or unpredictable patterns and go wherever their nose leads them. Now, if a dog belongs to the drunk, and the drunk calls for their dog, the dog will follow, though it will roam within the drunk's vicinity, still moving where it's nose guides it. Both wander together, but in the end travel int he same direction, in other words. This same analogy can be used to describe the trending properties of party polarization in Congress and federal spending. Polarization in both chambers trends in a similar direction. Neither is stationary. Noncontributory welfare spending also moves in this same general direction. All three series, as theory predicts, share this similar traits and, as I describe, co-integrate. The VECMs show this movement is not the result of chance and that welfare spending demonstrates a strong effect on the others.

Also mentioned in the article, Table B-1 presents the overall model fit for noncontributory welfare spending listed for Table 2 and Figure 2 (individual-level payments). The purpose for presenting this table is to give the reader a sense of overall model performance. Because the data displays trending properties, the VECM should show, if specified in a correct manner, an adjustment towards an equilibrium point. This means despite the theoretical belief polarization and spending trend in a similar direction on purpose, when this data is corrected, it shows the data moves in equilibrium, supporting this theoretical premise.

The findings show the estimates for the adjustment matrix, α, and imply a rapid adjustment towards equilibrium. Since the predictions from the co-integrating equation for noncontributory welfare spending is negative, this suggests as spending increases it represents the feedback necessary to bring polarization into equilibrium. These findings are further supported since at least one coefficient in the polarization equations is positive,

Table B-1: Vector Error Correction Coefficients - NonContributory Welfare Payments

	Cointegration Term (α)	Cointegrating Term (β)
Welfare	-0.081	-0.371
	(0.040)*	(0.165)*
House Polarization	-0.308	1
	(0.138)*	—
Senate Polarization	0.394	-0.956
	(0.168)*	(0.153)***
χ^2	342.635***	
Log Likelihood	56.834	
AIC	-0.393	

Note: Entries are standardized vector error correction coefficients.
Standard errors in parentheses. Cointegrating rank = 1. Lag selection = 4.
*** p<0.01, ** p<0.05, * p<0.1.

meaning as spending increases, polarization in the House adjusts to the new spending level. Finally, the β co-integrating vectors for the Johansen identification parameters show when spending is normalized, the polarization indicators are statistically different from zero. These results indicate the existence of a relationship between welfare spending and party polarization in Congress.

For the remainder of the models presented in the article, I omit these findings for all other models since results are either consistent with Table B-1 or, for models that present weak findings, these statistics have little overall value. In this latter case, I did attempt to retest these models using VAR specifications but the results are similar.

References

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