Supporting Materials
for
A Cross-National Measure of Electoral Risk

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Abstract

Electoral competitiveness is a key explanatory construct across a broad swath of phenomena, finding application in diverse areas related to political incentives and behavior. Despite its frequent theoretical use, no valid measure of electoral competitiveness exists that applies across different electoral and party systems. We argue that one particular type of electoral competitiveness – electoral risk – can be estimated across institutional contexts and matters most for incumbent behavior. We propose, estimate and make available a cross-nationally applicable measure for elections in 22 developed democracies between 1960 and 2011. Unlike extant alternatives, our measure captures vote volatility and is constructed at the party (not system) level, exogenous to most policy predictors, and congruent with the perceptions and incentives of policy-makers.

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Supporting Materials

1 Seats-Votes

In Figure 1, to illustrate change over time, we plot the seats-votes elasticities (or swing ratios) for Canada, an SMD country with a particularly volatile electoral history.

For PR systems, we assume a seats-votes elasticity (swing-ratio) of 1. As detailed in the main text of our article, we verify the assumption empirically by estimating seats-votes elasticities for a more typical PR case, the 2006 Austrian parliamentary election, and for a limiting case, the 2008 Spanish general election. We use Linzer's (2012*a*) approach, which is implemented in an R library (Linzer, 2012*b*) called `seatsvotes` (Linzer, 2012*c*). Since the current release of `seatsvotes` only implements the plurality rule, we have written a PR rule specific to the Austrian and Spanish systems.[1]

The estimated seats-votes elasticities for all parties that won seats in the 2006 Austrian parliamentary election are shown in Figure 2. All of the estimated seats-votes elasticities are indeed approximately one. Specifically, the estimated seats-votes elasticities are 1.01 for the SPÖ, 1.03 for the ÖVP, 1.06 for the GRÜNE, 1.00 for the FPÖ and 0.95 for the BZÖ. Figure 3 shows that the major parties in the 2008 Spanish election (the PP and PSOE) also experienced seats-votes relationships near 1. We therefore proceed with the assumption that seats-votes elasticities are equal to one for parties in PR systems and will estimate seats-votes elasticities only for parties in SMD systems.

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[1]The specifics of PR rules vary widely across countries, so that a generic function for PR rules is not easily implemented. If researchers want to estimate seats-votes elasticities for other PR systems, they will have to provide their own user-written functions. The Austrian PR rule is based on the description of the votes-seats translation provided by Erich Neuwirth at SunSITE Austria at the University of Vienna (at `http://sunsite.univie.ac.at/Austria/elections/nrw95/nrw94man.html`).
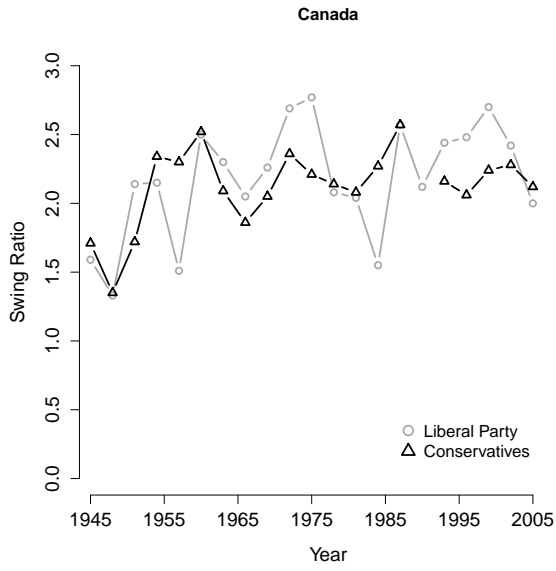
Figure 1: *Seats-votes elasticities (or swing ratios) for the two largest parties in Canada, 1945-2011. The seats-votes elasticities were estimated using the method by Linzer (2012a), which is implemented in an R (R Development Core Team, 2013) library (Linzer, 2012b) called* seatsvotes *(Linzer, 2012c).*

Figure 2: *Seats-votes elasticities for the 2006 Austrian National-alratswahl. The seats-votes elasticities were estimated using the method by Linzer (2012a), which is implemented in an R (R Development Core Team, 2013) 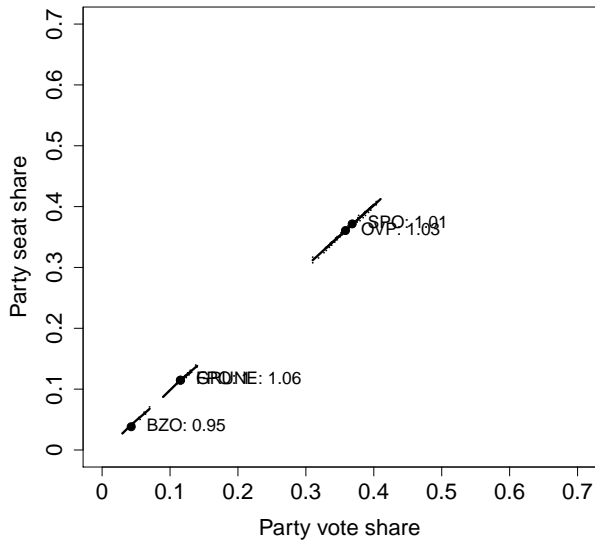library (Linzer, 2012b) called* seatsvotes *(Linzer, 2012c). The PR rule was written by the authors, and the corresponding R code is available upon request. The estimated seats-votes elasticities are 1.01 for the SPÖ, 1.03 for the ÖVP, 1.06 for the GRÜNE, 1.00 for the FPÖ and 0.95 for the BZÖ.*
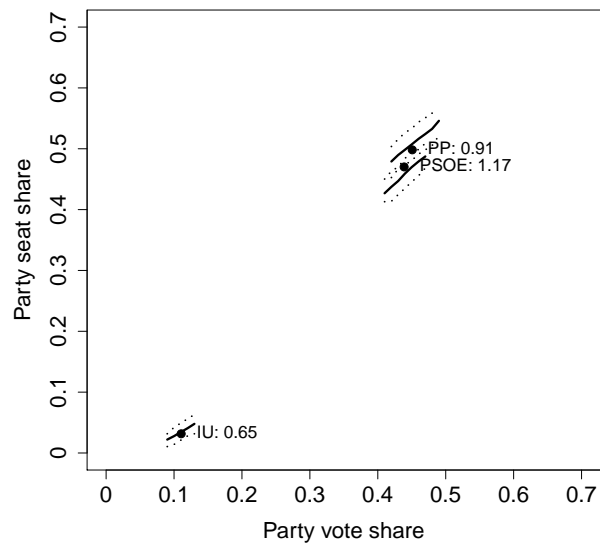
Figure 3: S-V elasticities in Spain, 2008
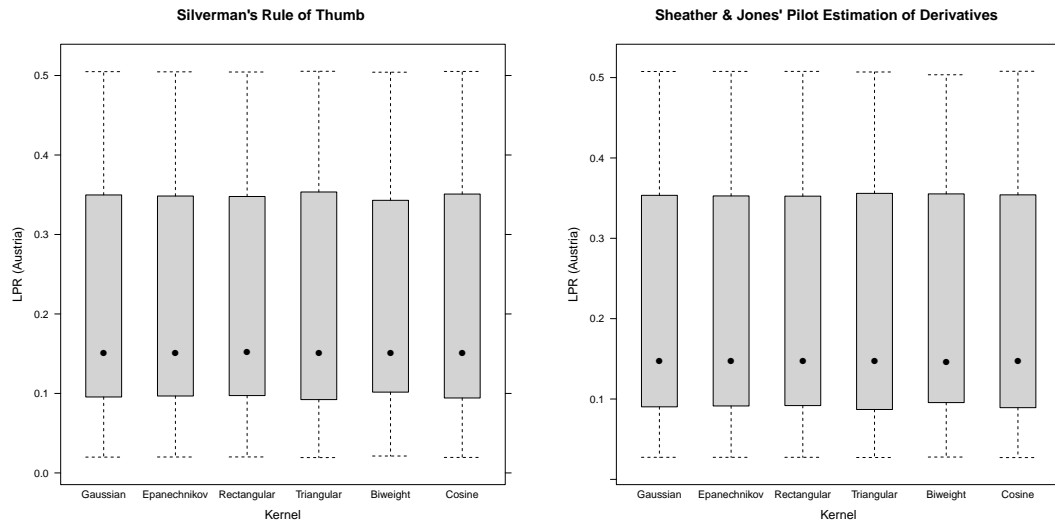
2 Robustness check: Kernel density estimates

Figure 4: *Distributions of loss probabilities for the case of Austria for different specifications of the kernel function (Gaussian, Epanechnikov, rectangular, triangular, biweight and cosine) as well as different bandwidth specifications [Silverman's (1986) rule of thumb and Sheather and Jones's (1991) pilot estimation of derivates]. See also the documentation of the density function in R (R Development Core Team, 2013).*

3   LPR by Plurality Party Change Treatment

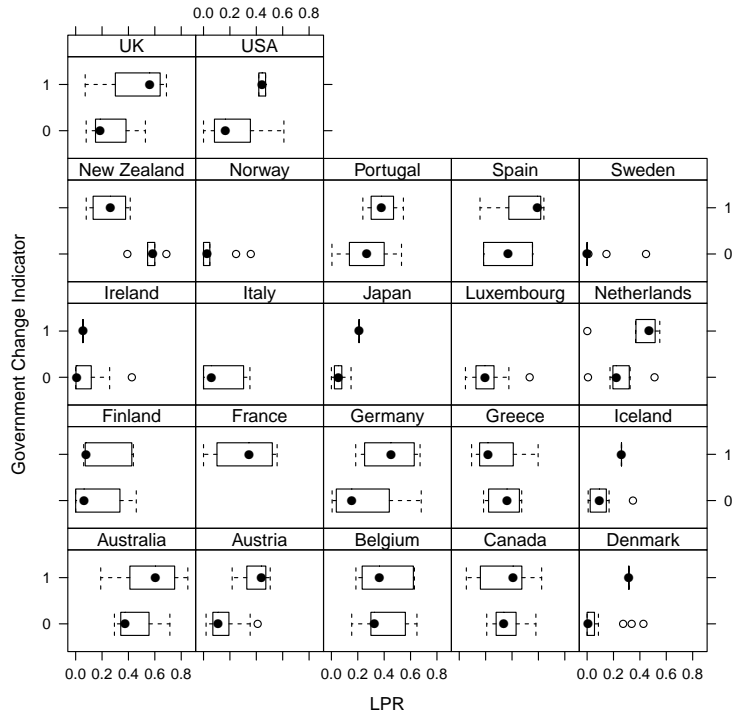Figure 5: *Distribution of loss probabilities by country and plurality party change indicator. Boxplots with plurality party change indicator equal to 0 show the distribution of LPR for a country for those elections in which no change in the plurality party occurred, whereas boxplots with change indicator equal to 1 show the distribution of LPR for a country for those elections in which a plurality party change occurred.*

4   Measurement

Since we derive our measure of electoral competitiveness – loss probability or LPR – using not just observed quantities (historical vote swings), but also estimated quantities (swing ratios), our measure, by definition, is measured with uncertainty. As such, when scholars use our LPR measure as an explanatory variable in their research, they might want to check the robustness of their findings with respect to electoral risk by accounting for this uncertainty. For that reason, we not only provide the point estimates of LPR based on the median swing ratio estimates but also standard deviations for the LPR measure based on bootstrapping the swing ratios.
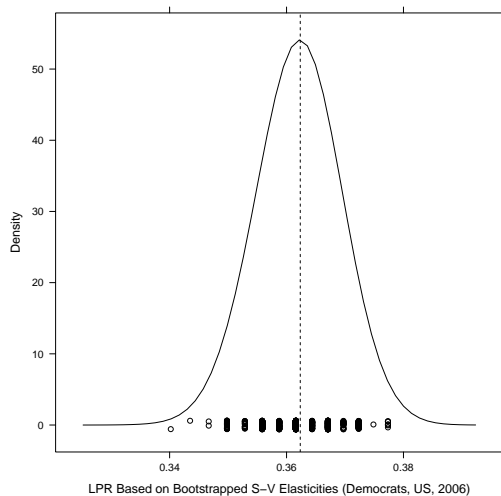

Figure 6: *Density of bootstrapped LPR distribution (median LPRs) for the Democratic Party in the US House (2006). The bootstrap is based on 1,000 samples of size 100 each of the swing ratios, which are then used to calculate the LPRs (following the steps described in Section 2.1).*

In particular, we take the distribution of the swing ratio estimates generated by applying the Linzer (2012a) method and take 1,000 samples of size 100 each from that distribution. We then calculate the median for each of the 1,000 samples. In turn, we use those medians and plug them into Equation 1 to calculate bootstrapped seat-swing distributions and then follow the remaining steps described in Section 2.1 to calculate 1,000 LPRs. In the data set,

we report the median and the standard deviation of the bootstrapped LPRs. In Figure 6, we plot the density of one of those bootstrapped LPR distributions for the Democratic Party in the US House for the year 2006. Researchers may use the bootstrapped LPRs to account for measurement error and explore variation in its explanatory power with respect to relevant outcome variables.[2]

5 Alternative measures

One component of measurement validity is the degree to which a measure captures only the construct it is intended to capture. We argue that alternative measures of competitiveness, such as vote margins and Vanhanen's (2000) competition measure, do not sufficiently consider the core actors of electoral competition — political parties — and their geographic distribution of support. Instead, these measures tend to be derivatives of electoral system characteristics. Our measure of electoral risk, LPR, addresses this shortcoming, while at the same time shedding new light on the relationship between electoral institutions and competitiveness (see Table 1 and Figure 1 in the main article). Figure 8, which plots LPR against the effective number of parties, confirms that LPR is independent of system-level characteristics. Whereas both vote margins and Vanhanen's competition measure are correlated with the effective number of parties (see Figure 7), the relationship between LPR and the effective number of parties is flat.

Vote margins only consider the two top parties. But what if multiple opposition parties are able to unite against a plurality party? The largest party in parliament in such a situation, even with large margins and low swings, might nevertheless be denied the premiership. Vanhanen (2000) accounts for this possibility by operationalizing electoral competition as the percentage of votes won by all but the largest vote-receiving party. This measure, however, makes no allowances for the fragmentation of the opposition. For example, an

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[2]See Treier and Jackman (2008) for an example of how to account for uncertainty in regression results when dealing with explanatory variables that are measured with error (and the measurement error is known).
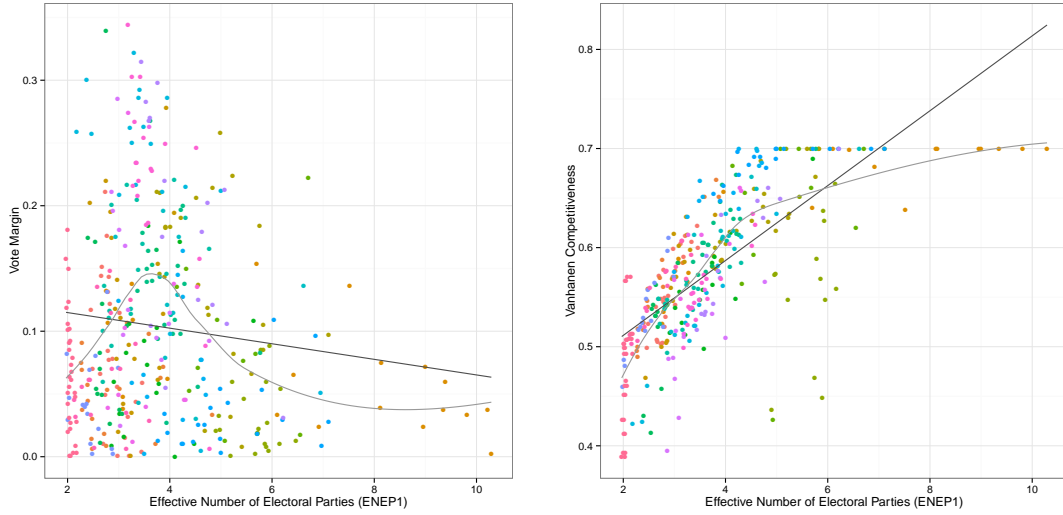
Figure 7: *Two measures of electoral competitiveness plotted against the effective number of electoral parties (ENEP) with least-squares line and loess smoother. N=393 and 359, respectively. OECD sample, 1945-2011. ENEP (i.e., ENEP1) from Bormann and Golder (2013). Vanhanen Competitiveness from Vanhanen (2000). ENEP is a significant predictor of the dependent variable in both panels; a one point increase in ENEP is associated with a 0.7 percentage-point drop in Vote Margin and a 3.6 percentage-point drop in the Vanhanen Competitiveness measure.*
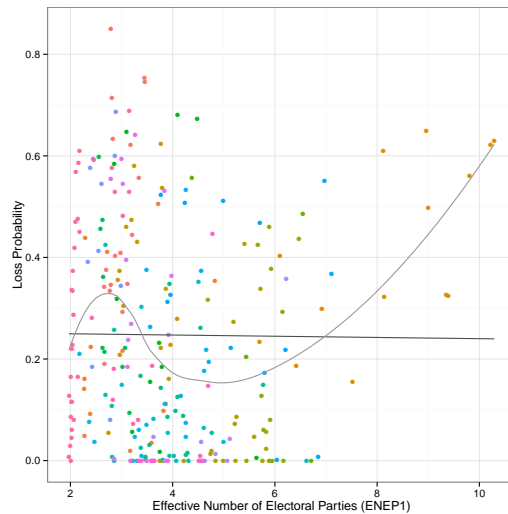
Figure 8: *Loss probability (LPR) plotted against the effective number of electoral parties (ENEP) with least-squares line and loess smoother. N=266. OECD sample, 1945-2011. ENEP (i.e., ENEP1) from Bormann and Golder (2013).*

opposition of eight parties dividing, say, 45% of the vote would pose as great a challenge to the plurality party as a single-party opposition with the same electoral support. Moreover, as Figure 7 shows, the Vanhanen measure is strongly associated with the effective number

of electoral parties. No less than 48% of its variation is explained by the effective number of electoral parties in the system.

6   Data

Our district-level election data come from three broad sources:

1. Dawn Brancati. Global Elections Database [computer file]. New York, NY: Global Elections Database [distributor]. Website: `http://www.globalelectionsdatabase.com`.

2. Ken Kollman, Allen Hicken, Daniele Caramani, and David Backer. Constituency-Level Elections Archive (CLEA; `www.electiondataarchive.org`), December 17, 2012 [dataset]. Ann Arbor, MI: University of Michigan, Center for Political Studies [producer and distributor].

3. Own data collection (manual entry from books).

7   Two-Party Basis for Loss Probabilities

Our decision to consider only the two largest parties for the calculation of loss probabilities hinges on the assumption that parties that are in third place or below in one election typically do not become the plurality party in the next election. Based on our sample of 459 elections in 23 countries, this appears to be a very reasonable assumption. We never observe third- or lower-placed parties jump to the top in the following election in Australia, Austria, Canada, Denmark, Germany, Iceland, Ireland, Luxembourg, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the UK or the US.[3] Moreover, there have been no such cases in Greece

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[3]Cases that we do not consider violations of this rule, but which are not immediately obvious, include the 1979 election in Portugal (won by the Democratic Alliance, which included the Social Democratic Party who had placed second in 1976); the 1971 election in Belgium (won by the Christian People's Party, which was previously called the Christian Social Party); and elections in Italy beginning in 1994, which, while dominated by party alliances with changing names, do not violate the assumption.

since it became a Democracy (1974) or Japan since the introduction of the modern party system (1958). Only in the following 12 elections has that pattern been violated:

- Netherlands: 2002 and 2010

- Belgium: 2007 and 2010

- Finland: 1948, 1958, 1962, 1966 and 1991

- France (since the beginning of the 5th Republic): 1981, 1993 and 1997

Consequently, 97.4% of the observations in our data set are consistent with the assumption that plurality parties consider second-placed parties their main competitors in upcoming elections.

8 France

With the brief exception of the election in 1986, the French Fifth Republic has had a two-round majoritarian electoral system. If a party wins a simple majority in the first round, they win the district's seat and no second round takes place. Barring this outcome, any party receiving the vote of more than 12.5% of registered voters is eligible to compete in the second round in which the plurality party wins the seat. In practice, however, ideologically allied parties usually avoid competing with each other in a *triangulaire*, a three-party run-off, in which they could split the vote on one end of the ideological spectrum, thereby allowing the other party to win. Thus, parties form ideological alliances in which the weaker parties within an ideological grouping in the first round promise to withdraw from the second round. Mainstream left parties (Socialist, Greens, Left Front, Radical Party of the Left, various smaller parties) have a long-standing agreement to this effect. Right parties collaborate on a more ad-hoc basis.

As a district-level plurality in the second round determines which party wins a seat, **we employ second-round election data** in our estimates of seats-votes elasticities. Some

districts are allotted on the basis of first-round majorities, however. In these cases, we simulate what would have happened in a second round based on voting patterns in other districts. Similarly, in the rare cases of single-party run-offs (when two allied parties qualify for a run-off and one withdraws), we also simulate results of what would have happened if the top party of the opposing grouping had qualified.

From the perspective of a prime minister, what matters most in France is party groupings rather than parties, themselves. If the same party grouping controls the presidency and the legislature, then the president appoints a prime minister from the same grouping but not necessarily from the party with the greatest vote or seat share. A well-known example is the first term of Raymond Barre during the presidency of Valery Giscard d'Estaing. Barre, an independent nominally attached to the UDF, did not come from the electorally more successful Gaullists (RPR) under the leadership of Jacques Chirac. Under the less common *cohabitation*, when the presidency and legislature are controlled by different groupings, the prime minister may also come from a non-plurality party although this was not the case for any of the three cohabitating prime ministers in the fifth republic.

Accordingly, in terms of electoral risk, we use party groupings instead of parties. What matters most may be the plurality of one's grouping, not of one's party. We model this directly by aggregating parties into groupings and estimating seats-votes elasticities and vote swings for groupings. Information on party ideological positions and vote shares is from *www.parlgov.org*.

9 Articles in the AJPS, APSR and JOP Related to Electoral Competitiveness, 2009q1–2013q3

	Authors	Year	Title	Journal
1	Aklin, Michaël, and Johannes Urpelainen	2013	Political Competition, Path Dependence, and the Strategy of Sustainable Energy Transitions	AJPS 57(3)
2	Domno, Daniela	2013	Elections and Democratization in Authoritarian Regimes	AJPS 57(3)
3	Weitz-Shapiro, Rebecca	2012	What Wins Votes: Why Some Politicians Opt Out of Clientelism	AJPS 56(3)
4	Engstrom, Erik J.	2012	The Rise and Decline of Turnout in Congressional Elections: Electoral Institutions, Competition, and Strategic Mobilization	AJPS 56(2)
5	Snyder, Jr, James M., and Michael M. Ting	2011	Electoral Selection with Parties and Primaries	AJPS 55(4)
6	Yanna Krupnikov	2011	When Does Negativity Demobilize? Tracing the Conditional Effect of Negative Campaigning on Voter Turnout.	AJPS 55(4)
7	Gehlbach, Scott, Konstantin Sonin, and Ekaterina Zhuravskaya	2010	Businessman Candidates.	AJPS 54(3)
8	Eifert, Benn, Edward Miguel, and Daniel N. Posner	2010	Political Competition and Ethnic Identification in Africa.	AJPS 54(2)
9	Hayes, Danny, and Seth C. McKee	2009	The Participatory Effects of Redistricting	AJPS 53(4)
10	Hirano, Shigeo, and James M. Snyder	2009	Using Multimember District Elections to Estimate the Sources of the Incumbency Advantage	AJPS 53(2)
11	Baek, Mijeong	2009	A Comparative Analysis of Political Communication Systems and Voter Turnout	AJPS 53(2)
12	Maestas, Cherie D., and Cynthia R. Rugeley	2008	Assessing the Experience Bonus Through Examining Strategic Entry, Candidate Quality, and Campaign Receipts in U.S. House Elections.	AJPS 52(3)
13	Panagopoulos, Costas, and Donald P. Green	2008	Field Experiments Testing the Impact of Radio Advertisements on Electoral Competition.	AJPS 52(1)
14	Dube, Arindrajit, Oeindrila Dube, and Omar Garcia-Ponce	2013	Cross-Border Spillover: U.S. Gun Laws and Violence in Mexico	APSR 107(3)
15	Kim, Henry A., and Brad L. Leveck	2013	Money, Reputation, and Incumbency in U.S. House Elections, or Why Marginals Have Become More Expensive.	APSR 107(3)

	Authors	Year	Title	Journal
16	Brollo, Fernanda and Tommaso Nannicini	2012	Tying Your Enemys Hands in Close Races: The Politics of Federal Transfers in Brazil.	APSR
17	Fukumoto, Kentaro and Yusaku Horiuchi	2011	Making Outsiders Votes Count: Detecting Electoral Fraud through a Natural Experiment	APSR 105(3)
18	Folke, Olle, Shigeo Hirano, and James M. Snyder	2011	Patronage and Elections in U.S. States	APSR 105(3)
19	Berry, Christopher R., Barry C. Burden, and William G. Howell	2010	The President and the Distribution of Federal Spending.	APSR 104(4)
20	Cusack, Thomas, Torben Iversen and David Soskice	2010	Coevolution of Capitalism and Political Representation: The Choice of Electoral Systems	APSR 104(2)
21	Gamm, Gerald and Thad Kousser	2010	Broad Bills or Particularistic Policy? Historical Patterns in American State Legislatures.	APSR 104(1)
22	Druckman, James N., Martin J. Kifer and Michael Parkin	2009	Campaign Communications in U.S. Congressional Elections	APSR 103(3)
23	Brown, David S., and Ahmed Mushfiq Mobarak	2009	The Transforming Power of Democracy: Regime Type and the Distribution of Electricity	APSR 103(2)
24	Ellis, Christopher	2013	Social Context and Economic Biases in Representation	JOP 75(3)
25	Iaryczower, Matias, and Andrea Mattozzi	2013	On the Nature of Competition in Alternative Electoral Systems	JOP 75(3)
26	Wichowsky, Amber	2012	Competition, Party Dollars, and Income Bias in Voter Turnout, 19802008	JOP 74(2)
27	Kam, Cindy D., and Stephen M. Utych	2011	Close Elections and Cognitive Engagement	JOP 73(4)
28	Lazarus, Jeffrey	2009	Party, Electoral Vulnerability, and Earmarks in the U.S. House of Representatives	JOP 71(3)

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