Online Appendix: Party and Policy in Lineland

Appendix A:

Formal Statement of Assumptions: Legislative Action in the Chamber.

1. MCs: There are K members of a legislative chamber akin to the U.S. House (hence, aka MCs).

K = {1, 2, …. , k, …. , K}

2. Political Parties: Every MC is a member of exactly one of two political parties. Denote these as **M** for Majority party and **m** for minority party.

2a. #**M** > #**m**

2b. **M** ∩ **m** = ∅

2c. **M** ∪ **m** = **K**

3. Dimensionality: There are n policy instruments (or dimensions) on which the legislature can take action. These can be represented by points in an n-dimensional Euclidean space. Both the Status Quo (SQ) and all bills and amendments to change the SQ are represented as points in that n-space.

3a. Special Case 1: n = 1 (unidimensionality or "Lineland").

3b. Special Case 2: If there are legislative committees, each is assigned a unique single dimension as their jurisdiction. Thus there are n committees and thus committee jurisdictions cover the policy space in the sense of Shepsle (1979).

4. Utility Functions: All MCs have (induced) policy preferences that are additively separable on each of the n dimensions, when n > 1. Each MC k has an ideal point, x_i^k, on dimension i and utility declines with increasing distance between the issue-specific ideal points and policy outcomes: $u_k(z) = - \Sigma_i |x_i^k - z_i|$. All MCs seek to maximize utility they derive from the choices on each dimension and vote strategically on each attempt to change the SQ on dimension i.

5. Choice: Voting is binary between all motions, that is, between points in X, decided by simple majority rule. SQ always enters the voting in the last pairing, and only in that last pairing. It faces a proposal to change SQ as the proposal was modified by amendments, if any.

6. Bill proposal: Every MC is free to enter any permissible bill, b_i, as option to change the status quo on dimension i. There are three methods of defining agendas that determine which bills

reach the floor and how they may be amended (see below). All amendments in each of the three agenda designs must be germane, that is to change SQ_i via a bill and any amendments along dimension i only.[1]

7. Amendments: there are two rules governing amendments;

7a. The Open Rule permits any MC to propose any germane amendment they want. Amendments will be voted on separately in sequence by binary choices decided by simple majority rule, with the winner being the version of the possibly amended bill that makes it to the final passage vote or SQ, whichever receives a simple majority vote.

7b. The Closed Rule prohibits any MC from proposing any amendment, germane or not. Thus, any proposal that makes it to the floor faces a single "up or down" vote, that is pitting it versus SQ, decided by simple majority rule.

8. Access to the floor: The three methods of controlling access to the floor are:

8a. Floor dominance ("Majoritarian Theory"): Every MC can propose any bill they choose and it will be voted on. Any MC can propose any amendment to any proposal they want. Each bill will be taken up one at a time and each amendment to that bill will be taken up one at a time. That is, each bill gets its vote. Each amendment is voted on, with every vote being binary, decided by simple majority rule.

8b. Majority Party with Negative Agenda Control ("Party Cartel Theory"): Party leaders ("senior partners of the majority party" in Cox and McCubbins terminology) alone can block bills from reaching the floor.

8c. Majority Party with Positive Agenda Control ("The Theory of Conditional Party Government"): Party leaders alone (or in combination with the Rules Committee if there is one) can ensure that any bill reaches the floor, or does not. They can also use their resources to secure an open or a closed rule for amendments.

Using this structure we can derive implications of what proposal(s) will be made and what bills (or Status Quo) will result

1. **Floor Dominance (or Majoritarianism):**

If Assumptions 1, 2, 3a, 4, 5, 6, 7a, and 8a hold, then:

1. At least one bill will be proposed at every opportunity unless $SQ = F_m$, where F_m denotes the floor median.

2. It will reach the voting stage.

[1] Under 3a, unidimensionality, every proposed policy or amendment is necessarily germane.

3. If the special rule is open (7a) amendments will be offered as desired by individual MCs. Unless the bill, b, is at the floor median, the MC with ideal point at F_m will want to, and be able to, offer her ideal point.

4. Once F_m enters the voting agenda, whether as SQ, as a bill or as an amendment, it will win every binary vote thereafter and thus be chosen.

5. In addition to being the Condorcet winner, it also follows that the simple majority relation over points in X will be an order (complete, reflexive, and transitive) (Black, 1948).

6. Voting is binary between all motions, that is, between points in X, decided by simple majority rule. SQ always enters the voting in the last pairing, and only in that last pairing. It faces a proposal to change SQ the original proposal or one that was modified by amendments

Proof: Application of Black, 1948.

2. **Negative Agenda Control (or Party Cartel)**

2a. If Assumptions 1, 2, 3a, 4, 5, 6, 7a, and 8b hold, then:

1. At least one bill will be proposed at every opportunity unless SQ = F_m.

2. It will reach the floor unless it is in the Cox-McCubbins' original Majority Party Blockout Zone ("BOZ," see below).

3. If it reaches the floor, amendments will be offered as desired by the individual MCs. Unless the bill, b, is at the floor median, the MC with ideal point at F_m will want to, and be able to, offer her ideal point.

4. Once F_m enters the voting agenda, whether by being SQ, the bill, or the amendment, it will win every binary vote and thus be chosen.

5. In addition to being the Condorcet winner, it also follows that the simple majority relation over points in X will be an order (complete, reflexive, and transitive) (Black, 1948).

6. Letting M_m denote the median ideal point in the majority party, and assuming $M_m < F_m$, the Blockout Zone is the set of points $[(2M_m - F_m), F_m]$. When $M_m > F_m$, the Blockout Zone is $[F_m, (2M_m - F_m)]$. The remaining possibility is that $F_m = M_m$ in which case there is no Blockout Zone. If SQ is in the Blockout Zone, no bill reaches the floor. Otherwise, F_m is chosen (Proof: Cox and McCubbins, 2005).

2b. If Assumptions 1, 2, 3a, 4, 5, 6, 7b, and 8b hold, then we have the closed-rule counterpart:

1. At least one bill will be proposed at every opportunity unless SQ ε BOZmod, in which case no bill reaches the floor.

2. If it reaches the floor (i.e., is not in BOZmod), no amendments are permitted, by assumption 7b. The bill will propose either Mm or SQ-Fm depending on the location of SQ.

3. Since b was chosen to be the point in BOZmod that the majority party most prefers by pairwise majority voting and that also defeats SQ, b defeats SQ by simple majority rule and is thus chosen.

4. Letting M_m denote the median ideal point in the majority party, and assuming $M_m < F_m$, the modified Blockout Zone (BOZmod) is the set of points that the majority party prefers to Fm and that a majority of the chamber prefers to SQ.

3. **Positive Agenda Control (or Conditional Party Government)**

3a. If Assumptions 1, 2, 3a, 4, 5, 6, 7a, and 8c hold, then:

1. At least one bill will be proposed at every opportunity unless SQ = F_m.

2. It will reach the voting stage if it is in the Majority Party Proposal Set ("MPPS," see below).

3. If it reaches the floor with assumption 7a, amendments will be offered as desired by the individual MCs. Unless the bill, b, is at the floor median, the MC with ideal point at F_m will want to, and be able to, offer her ideal point.

4. Once F_m enters the voting agenda, whether SQ, the bill or the amendment, it will win every binary vote.

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4. Once F_m enters the voting agenda, whether SQ, the bill or the amendment, it will win every binary vote.

3b. If Assumptions 1, 2, 3a, 4, 5, 6, 7b, and 8c hold, then:

1. At least one bill will be proposed at every opportunity unless SQ = F_m.

2. It will reach the voting stage if it is in the Majority Party Proposal.

3. If it reaches the floor with assumption 7b, no amendments will be offered.

4. Once b is offered and the closed rule accepted, it will, by construction, win by simple majority rule, that is defeat SQ, and will be the point that the majority party most prefers that is preferred by at least a majority of M to Fm, and that is preferred by a simple majority of the whole chamber to SQ.

Appendix B:

Formal Statement of Assumptions: Candidates, Voters, and Resources in Elections.

1. All K seats in the legislature are up for vote in every election. All K incumbents are eligible for reelection, all seats are based on single-member districting.

2. In the general election, there is always exactly one candidate from party D and one candidate from party R, and no third-party candidates are running. Each district is thus pairwise and decided by simple majority. The party whose candidates wins the most seats becomes party M, the majority party in the chamber.

3. Candidates take positions in the same n-space as above, which we can refer to as their electoral platform. Voters base their choices on where the candidates stand on these n-policy positions.

4. If the incumbent runs for reelection, their platform is, in whole or part, the results of votes in the prior term in Congress.

5. All citizens have (induced) policy preferences over the n-dimensions (where, here, n = 1). Each voter i has an ideal point, x_i^l on dimension l and utility declines with the sum of distances between the ideal point and policy option z_j: $u_l(z) = - \sum j|x_i^l - z_j|$. We use lower case letters to denote candidates, etc., in the voter's district. Capital letters denote values for the nation as a whole, that is in the chamber. Thus, D_j denotes the position of the party (the chamber median of MCs in party D) on issue j).

6. Citizens assess turnout via an expanded calculus of voting.

Hence for turnout for citizen i in district j

$$Re_i = p_{ij}b_{ij} + b_{ij} + P_{ij}B_{ij} + B_{ij} + rs_{ij} + Du_i - C_i, \text{ where}$$

p = the efficacy of the vote in the district.

$b = ||x_i - d_j| - |x_i = r_j||$

P = the efficacy of the vote in the nation.

$B = ||x_i - D_j| - |x_i = R_j||$

rs_{ij} = personal benefits ("resources") I receives from the preferred candidate to offset costs of voting.

Du_i = citizen i's intrinsic benefits from voting.

C_i = citizen i's personal costs associated with voting.

7. Resources given to the candidate are based on how close the candidate is to the median position of their party in the chamber.

8. Candidates maximize expected plurality and utilize resources to maximize the number who support them (that is, are closer to their position, whether the citizens vote or not) and turnout of that set. Turnout of that set is increasing in resources. Thus, candidates might take a position with a smaller base of support that turns out a higher proportion of that base if the expected support for the candidate is larger that way, in expectation.

Consequences of this Theory of Voting (Aldrich and Rohde, forthcoming):

Assumptions of the Standard Model:

Assume R[1], the standard calculus of voting, and citizens as voters (but not activists).

Assume there are exactly two candidate, and both are single-minded seekers of election and reelection.

Assume voters maximize policy rewards, i.e., maximize Re in the calculus of voting.

Derivations from the Standard Calculus for Candidates/MCs and for Citizens as Voters:[2]

1. Every district's electorate satisfies the conditions for Black and Downs.

It therefore follows that:

a. Candidates converge to the ideal point of the median voter in every district,

b. And thus d = r = ideal point of median voter in that district.

c. Thus, b = 0 and pb = 0 for all, citizens.

2. Therefore:

a. Citizens in the standard calculus vote only if $Du - C > 0$.

b. Citizens in the expanded calculus vote only if $B + Du - C > 0$.[3]

3. Every winner and therefore every MC in the next congress is equally likely to be a d as an r.

4. Therefore, MCs vote independently of party until and unless there is a non-zero b (and hence non-zero pb) and/or a non-zero B used by voters in the district.

5. Therefore, the distribution of (induced) policy preferences in Congress is, on average, the same in each party on the House floor.

[2] Derived by application of Black, 1948, Downs, 1957 (see also, e.g., Shepsle, 2010, 112-118).

[3] Note that Aldrich and Rohde are assuming an instrumental local and expressive national calculus of voting.

6. The distribution of preferences of MCs in Congress is precisely the distribution of the ideal points of the 435 median voters in the districts, modified only by how they imagine their district's median might differ in two years.

Derivations from the Expanded Calculus for Candidates/MCs and for Citizens as Voters and Chamber Parties as Source of Campaign Resources:

1. If the resources are insufficiently valuable, candidates converge to the voters' median.
2. If resources are sufficiently valuable, candidates diverge such that d[r] locates in the equilibrium policy position between the ideal point of the median voter and the ideal point of the median MC in the chamber. Just where depends upon the amount of resources gathered by diverging from the center and their ability to translate those resources into increased turnout of the candidate's supporters.
3. The collection of the 435 MCs therefore is (likely) to be more broadly dispersed on (induced) policy preferences, that is to say the MCs will have a greater variation in induced policy ideal points with parties as sources of resources.
4. MCs as reelection seekers will have a party component in the arguments of their utility function, because their expected outcome is dependent in part on the policy positions of MCs.