<u>Comparative Democratic *Budgeteering*</u>:
An Empirical Model of Policymakers' Context-Conditional Incentives & Capacities for Policy Manipulation

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ABSTRACT: This paper builds an estimable empirical model of modern, complexly context-conditional, theoretical understandings of democratic (re)distributive policymaking. In the model, the magnitude of the incentive for policymakers to manipulate policy for partisan and/or electoral ends, $m(\cdot)$, multiplies their strategic capacity to respond to those incentives, $s(\cdot)$, to determine the amount of policy manipulation. This product of incentive magnitude and strategic capacity, in turn, multiplies the nature of the incentive, $n(\cdot)$, which gives the *direction* of policy manipulation, in particular, the relative emphases on broad-based redistribution *versus* narrowly-targeted distribution. *Incentive magnitude*, *strategic capacity*, and *incentive nature* are all unobservable directly, but modern comparative political economy provides theories that relate them to more-observable aspects of the strategic and institutional context. For examples, *incentive magnitude* depends on electoral & governmental competitiveness; *strategic capacity* relates to partisan & governmental cohesion; *incentive nature* depends on electoral-system proportionality & party-system nationalization. The empirical model applies these theories to specify $m(\cdot)$, $s(\cdot)$, and $n(\cdot)$ as functions of such observables, $m(\mathbf{x}_m)$, $s(\mathbf{x}_s)$, and $n(\mathbf{x}_n)$, and relates their product, $m(\mathbf{x}_m)\times s(\mathbf{x}_s)\times n(\mathbf{x}_n)$, to data on the absolute and relative magnitudes of (re)distributive policies. Then, conditional on the theories specifying $m(\mathbf{x}_m)$, $s(\mathbf{x}_s)$, and $n(\mathbf{x}_n)$, and on the theories relating their product to these public policies, and on both sets of theories as specified (with *specification* understood to include *measurement*) providing sufficient empirical leverage in the data, the resulting model provides not only informative estimates of the complex context-conditionality of democratic (re)distributive policymaking, but also of the component functions and potentially their arguments. For instance, one byproduct of the empirical strategy could (depending on how the functions are specified) be country-time varying estimates of the inherently unobservable strategic unity of political parties; others could include outcome-based estimates of the relative influence of different governmental actors on (re)distributive policy and/or of parties' ideologies on a (re)distributive-policy dimension.

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<u>FAIR WARNING</u>: This is a highly preliminary draft, really more of a proposal, which describes in detail the substantive-theoretical specification of an empirical model, the proposed operationalization and measurement of its empirical inputs, and an estimation strategy. It discusses some of the promise of this (aspirational) model specifically and of the modeling and estimation strategy generally. It then, extremely disappointingly, concludes merely with some vaguely suggestive empirical results from estimations of some perhaps at least tangentially relevant models & measures, not remotely the proposed model & measures, that maybe it's not entirely insane to continue. I am hoping, but not promising, that I might have furthered the empirical implementation some by presentation time. (On the bright side, the paper is actually only 35 pages long (not the 55 the footer lists). The rest is this title, references, & appendices ☺.)

I. Introducing a Model of Comparative Democratic *Budgeteering*

Democratic policymakers possess four general classes of policy to pursue their self-seeking, office-seeking, and policy/outcome-seeking goals; arrayed broadest to narrowest in target: public-good provision (security, clean air, *etc.*), broad-based redistribution (welfare, health, *etc.*), narrowly based distribution (*pork*), and rent-extraction/delivery (bribery, graft, *etc.*).[1] This paper proposes that variation across country-times in multiple complexly interacting strategic, interest-structural, and institutional contextual factors explain the amounts and shares of these policy-types in the self-, office-, or policy/outcome-seeking policy-manipulations of democratic policymakers—i.e., in their *budgeteering*.[2,3] The paper leverages modern theories of comparative and international political economy (*C&IPE*) to build an effectively estimable empirical model of *comparative democratic budgeteering* that demonstrates (i.e., provides evidence for) and illuminates (i.e., enhances understanding of) the rich context-conditionality of democratic politics and policymaking.[4]

Although I intend the model of *comparative democratic budgeteering* to be offered here to describe (re)distributive politics and democratic policymaking more generally, the empirical application will focus specifically on the amounts and relative shares of broadly targeted redistribution *versus* narrowly targeted distribution *in the budget*, budgets being directly observable. In the model, the magnitude of policymakers' incentives to use (re)distributive policies toward partisan, electoral, and/or personal ends, $m(\cdot)$, multiplies their strategic capacity to respond to those incentives, $s(\cdot)$, yielding the amount of policy manipulation. The amount of policy manipulation given by the product of incentive magnitude and strategic capacity, in turn, multiplies the nature of the

[1] This four-fold classification follows that of Persson & Tabellini (2002), although the intellectual history of similar schema dates at least to Lowi (1964).

[2] Personal-, electoral-, and/or partisan-motivated "manipulations" occur across all policymaking and political realms, but fiscal or budgetary activities, i.e., policies involving spending and taxing, are among the most observable.

[3] The distinction of *electoral* (or *opportunistic*, *intrinsic*) from *partisan* (or *policy/outcome*, *instrumental*) motivations also has storied political-economy pedigree, dating at least to Hibbs (1977) and Tufte (1978). This statement of a fuller set, including personal motivations follows Franzese (2002a).

[4] See Franzese (2002a, 2007), e.g., for calls to expand this exploration of context-conditionality in *C&IPE*.

budgeteering incentive, $n(\cdot)$, i.e., whether policymakers better pursue their objectives by targeting policies more broadly or narrowly, to give the 'direction' of policy manipulation, i.e., the absolute and relative emphases on broad-based redistribution *vs.* narrowly-targeted distribution seen in policies, specifically in the budget.

Thus, the proposed model of *comparative democratic budgeteering* begins as this simple proposition:

$$Budgeteering \equiv B = \ldots + m(\cdot) \times s(\cdot) \times n(\cdot) + \ldots \tag{1}$$

We cannot generally observe directly the magnitude of policymakers' *budgeteering* incentives, m, or their strategic capacity to respond to those incentives, s, or the redistributive-*vs.*-distributive nature of those incentives, n. We do, however, have some theories in *C&IPE* that relate $m(\cdot)$, $s(\cdot)$, and $n(\cdot)$ to more-observable features of the strategic, interest-structural, and institutional context (or to yet-other unobservables that yet-other theories relate to observables). For instance: the magnitude of policymakers' office-seeking or policy/outcome-seeking motivations to *budgeteer* depends, *inter alia*, on the expected closeness of elections because that determines the value in terms of seats of a few more votes one might buy by *budgeteering* (see, e.g., Schultz 1995). The strategic capacity of policymakers to respond to these *budgeteering* incentives, in turn, should increase with, for instance, party discipline (see, e.g., McGillivray 1997). Finally, the nature of the *budgeteering* incentives, i.e., whether to distribute narrowly or redistribute broadly, depends, for examples, on electoral-system features such as district magnitude (see, e.g., Persson & Tabellini 2002, ch. 8) and party-system features such as personal relative to party voting (see, e.g., Carey & Shugart 1995). The empirical-estimation strategy rests on applying *C&IPE* theories like these to specify incentive magnitude, $m(\cdot)$, strategic capacity, $s(\cdot)$, and incentive nature, $n(\cdot)$, as functions of observable institutional and strategic contextual conditions like these—label these factors $\mathbf{x}_m$, $\mathbf{x}_s$, $\mathbf{x}_n$—and then relating the product of these functions to the absolute and relative magnitude of (re)distributive policies thusly:

$$B = ... + m(\mathbf{x}_m) \times s(\mathbf{x}_s) \times n(\mathbf{x}_n) + ... \tag{2}$$

Insofar as $m(\mathbf{x}_m)$, $s(\mathbf{x}_s)$, and $n(\mathbf{x}_n)$ are sufficiently distinctly specified, in their functional forms and/or arguments, and insofar as those theories of *budgeteering incentive-magnitude* and *-nature* and policymaker *strategic-capacity*, as specified and measured, *and insofar as* the theory linking them to the observed policy/outcome, in the manner specified, combine to offer sufficient empirical purchase in actual, available data, the model will yield informative estimates not only of the rich context-conditionality of democratic (re)distributive policymaking, i.e., of $B=f(m,s,n)$, but also, within the limits of the empirical purchase offered by the relevant theories in the sample at hand, of the component functions, $m(\cdot)$, $s(\cdot)$, and $n(\cdot)$, and potentially even of some of their of arguments, some $x \in \mathbf{x}_s$ for instance. I.e., some of these factors, say some $\mathbf{x}_1 \subset \{\mathbf{x}_m, \mathbf{x}_s, \mathbf{x}_n\}$, may also be unobservable directly; we may instead have only some theory that relates these $\mathbf{x}_1$ in turn to other observables, $\mathbf{z}_x$, by some function(s) $\mathbf{x}_1(\mathbf{z}_x)$. We could yet estimate these unobserved factors *and* their role in comparative democratic policymaking, both at once, simply by placing the function $\mathbf{x}_1(\mathbf{z}_x)$ to be estimated in the place that $\mathbf{x}_1$ enters the *budgeteering* model to be estimated. For example, the empirical strategy could in this way, as a byproduct of the final grand estimation model, provide country-time varying estimates of the (inherently unobservable) *strategic unity* of political parties, if the functions are specified to afford extraction of this country-time varying information and, as so specified, they combine to yield sufficient and sufficiently distinct empirical purchase on the policy outcome in the sample. Other byproducts of obvious substantive-theoretical interest could include outcome-based estimates of the relative influence of different governmental actors—e.g., the relative power of cabinet ministers (Laver & Shepsle 1996) or of governing- and opposition-party legislators (Powell 2000)—or (re)distributive-policy-based estimates of parties' ideology, again depending on model-specification choices and the actual empirical leverage provided in the actual sample. Models like these may be estimated by nonlinear least-squares (NLS: see Appendix I) or by maximum-likelihood estimation (MLE).[5]

The costs of all this power and potential—to estimate such complexly context-conditional policymaking satisfactorily precisely, even sometimes intuitively, while simultaneously estimating important unobservable components of that policymaking model, and even offering some means to evaluate empirically theories about conditions that explain those unobservable components—arise from the same source as the benefits: namely, the more direct and *structured* imposition of the substantive-theoretical propositions of modern *C&IPE* in the empirical-model specification. This implies the familiar tradeoff of efficiency (ability to estimate more, more precisely) against robustness (relative insensitivity of empirical inferences to violations of maintained assumptions).[6] Approaches that embed less of the structure of the substantive-theoretical propositions into the empirical-model specification would gain in robustness, but could not offer nearly as rich a body of estimation outputs from the limited data actually available to applied researchers.

Relatedly, tests of hypotheses regarding the parameters estimated in more-structural models will weigh the empirical evidence that covariates $\mathbf{x}$ matter *in the way specified* as the alternative against only the null that $\mathbf{x}$ *does not matter*. The more heavily structured the empirical model, the less likely to be nested within the full specification are alternative models of the roles of $\mathbf{x}$ between *"they matter in this particular manner specified"* and *"they do not matter"*. For instance, linear-interactive models with regressors x, z, and $x \times z$ nest the simpler model of linear-additive effects for x and z (see, e.g., Brambor et al. 2006, Kam & Franzese 2007). The convex-combinatorial models of bargaining compromise under *"two hands on the wheel"* policymaking (Franzese 1999) and under *"multiple hands on the wheel"* policymaking (Franzese 2003), or of veto-actor, common-pool, and bargaining-compromise effects on policymaking (Franzese 2010), contrarily, imply complexly

[5] NLS technically assumes continuous, interval-valued outcomes with additively separable stochastic components; application to other outcome-variable types (e.g., binary outcomes) would remain approximately appropriate though.
[6] Another familiar tradeoff, between external and internal validity, will tend to manifest as well.

context-conditional effects of covariates, $\mathbf{x}$, and nest hardly any other manner for $\mathbf{x}$ to affect the outcome. The data could not support simple, linear-additive effects of all regressors instead, for example. Simple restrictions on the coefficients of highly structured models like these, such as that they are zero, would produce other intermediate models (perhaps sensible, perhaps not). However, non-nested testing strategies (see, e.g., Franzese 2002b:ch.3, Greene 2008:137-42, Clarke 2007) could be applied to test the fully specified model against any other alternatives than solely that $\mathbf{x}$ is irrelevant or the intermediate models produced by zero coefficients in that model.

II. Specifying a Model of Comparative Democratic *Budgeteering*

A. *The (Re)Distributive Nature of the Incentive to Budgeteer* (Incentive-Nature: $n(\mathbf{x}_n)$)

Consider first the nature of policymakers' incentives to *budgeteer*; i.e., whether they manipulate policies—among which, budgets and their composition are highly observable—for electoral and partisan ends most effectively (in terms of net political-economic benefits to themselves, of course) via narrowly distributive or broadly redistributive targeting. Let us start there theoretically with the venerable Weingast-Shepsle-Johnsen (*WSJ*: 1981) model of distributive politics. In this model, distributive policies are ones with benefits concentrated within constituencies but costs diffused across them. *WSJ* suggest that legislators enact distributive policies by universalistic log-rolls, so that the district-by-district optimum projects pass. On this basis, *WSJ* derived what is now called the *law of 1/n*, in which such pork-barrel spending rises with the number of constituencies. Under log-rolling, the district-by-district optimums pass, so total spending rises in n proportionately to the rate at which $1/n$, the share of project costs each district bears, declines. Franzese & Nooruddin (2004) and Franzese et al. (2008) showed that, in fact, minimum-winning-coalition (Riker 1962) legislative voting also yields distributive spending that increases with the number of constituencies, although proportionately to the lesser rate at which $(n+1)/2n$ declines in n. Thus, in classic common-pool fashion, *law-of-1/n*-style theories (see more-recently, e.g., Snyder et al. 2005, Chen & Malhotra 2008) conclude that distributive politics and policies generally, and spending in particular, increase with the number of constituencies (at somewhere between those two rates). Distributive emphasis in the nature of *budgeteering* incentives would likewise rise in some proportion to the number of constituencies.

Franzese & Nooruddin (2004) and Franzese et al. (2008) also stressed however that, applied comparatively, a *constituency* in this model would not necessarily equate to an electoral district, as applications in American politics, including *WSJ*, have assumed.[7] The policymaking incentives of representatives depends on whom they represent, i.e., from whom they derive electoral support and on what bases. Systems in which voters in effect[8] choose parties to represent them in policymaking and governance have a different relevant basis of representation than do systems in which voters in effect select individual representatives. The theory should correspondingly count *constituencies* differently. Franzese & Nooruddin (2004) and Franzese et al. (2008) argued that the degree of partisan representation, as opposed to geographic/district representation, would tilt the number of *constituencies* effectively represented (in policymaking) toward the number of parties (in government) from the number of districts/representatives. That is, they conceptualized the *effective constituency* to which policymakers respond as a continuum from geographic representation of electoral districts at most disaggregated to partisan representation of the sets of interests that support each political party at most aggregated, giving the number of effective constituencies, c, as this weighted average of the effective numbers of parties and of districts:

[7] In the *WSJ* model proper, i.e., given universalism, each representative is also *de facto* directly a policymaker. Thus, the numbers of representatives, policymakers, districts, and constituencies are all four equal, to n, because the model equates districts and constituencies conceptually, assumes one representative per district-*cum*-constituency, and in effect accords direct policymaking power to each representative. The four are better held conceptually distinct, however, because common pools (by whatever variant of the *law of 1/n*) may arise amongst each set in distinct ways. Franzese (2010), e.g., stresses the common pool of credit/blame with voters among n representative policymakers.

[8] Whether ballots literally require votes for parties or for candidates influences but does not wholly determine the *in-effect* candidate-based or party-based nature of voting; see, e.g., Carey & Shugart (1995).

$$c = u_r \times p + (1 - u_r) \times d \qquad (3).$$

The term $u_r \in (0..1)$ here reflects the system's *representational unity* of parties—the relative weight of partisan as opposed to district-geographic bases of representation; p is the effective number[9] of parties in government (more precisely, represented in policymaking), and d the effective number of districts (represented in policymaking). Adapting those arguments to (re)distributive policy and *budgeteering*, the propositions here are that the amount of distributive activity should increase in d; the amount of redistributive activity should increase in p; and the relative weight of p and of redistributive activity in budgeting should increase in u_r (and, *vice versa*, the relative weight of d and distributive activity should increase in u_r).

This continuum spans partisan to geographic bases of representation but may omit other possibilities such as functional, identity, or social-cleavage representation. The baseline model (3) intended the partisan endpoint to subsume many others, conceiving partisan representatives as serving the sets of interests that support their party, whether on policy, functional, identity, or any other bases. Researchers may wish to explore the weights of other bases of representation, however, and adequacy of a unidimensional continuum is an empirical matter. Representatives may, e.g., represent certain industrial interests in a way that cross-sects their partisan affiliations. Much comparative-politics research argues that corporatist bases of representation pervade many developed democracies, for instance (Gallagher et al. 1995:ch.14 is textbook review). Extending the effective constituency concept to include a sectoral basis of representation might proceed by, first, gauging the effective number of industries, i, in the usual way, $i=(\sum_j z_j^2)^{-1}$, with z_j the j^{th} industry's share of employment or output. The effective number of constituencies, c, would then be some convex combination p, d, and i. Party representational unity, u_r, could no longer serve as

[9] *Effective numbers* are size-weighted counts; see Franzese (2010) for why size-weighted counts are more appropriate to common-pool considerations than raw counts (which, in turn, are more appropriate to veto-actor considerations).

the sole weight; instead, given some measure of the extent of corporatist representation, cr, the *effective constituency* concept would extend naturally to $c = cr \times i + (1-cr) \times [u_r \times p + (1-u_r) \times d]$. Alternatively, one could estimate country-by-country *NLS* regressions of a (re)distributive policy, y, on effective numbers of constituencies: $y = \ldots + \beta[a \times i + b \times p + (1-a-b) \times d] \ldots$ β here would then be the estimated effect of the effective number of constituencies on y and a, b, and $1-a-b$ would be the degrees to be estimated of corporatist, partisan, and geographic representation, respectively, in that country's constituency structure. Also, $b/(1-a)$ is the estimated degree of party representational unity in the country assuming the causal role attributed to it here is correct.[10] This second approach assumes the degrees to which representation operates in these three forms, and so also the degree of party representational unity, are some country-specific constants.[11] Alternatively, one could model a and b theoretically following a strategy like that outlined above and elaborated below. Such a project remains for future research, but the discussion illustrates the potential for usefully extending the *effective constituency* concept and the proposed empirical-modeling strategy. The arguments of this paper will suggest several other model extensions and refinements related to *effective constituencies* in general and/or the political economy of (re)distributive politics in particular.

Many political-economy models emphasize characteristics of the electoral and party systems as crucial in fostering narrower distributive or broader redistributive politics. One prominent line of argument stresses the distinction among electoral systems between single-member-district (*SMD*) plurality/majority (*P/M*) and multimember-district (*MMD*) proportional-representation (*PR*). For any of various related (but not identical) reasons, the literature argues that *SMD-P/M* favors narrower and *MMD-PR* broader targeting, with targeted-constituency breadth generally widening with district magnitude (the number of representatives per district), *dm*, and/or with

[10] b in the second expression equals $(1-cr)u_r$ in the first; cr in the first is the second's a. So $b=(1-a)u_r$, implying $u_r=b/(1-a)$.
[11] Unfortunately, i, p, and particularly d may well not vary sufficiently within country to pursue this option practically.

proportionality[12] (Persson & Tabellini 2000; Lizzeri & Persico 2001; Milesi-Ferretti et al. 2002; Knutsen 2011; Iversen & Soskice 2006).[13] Another line of argument stresses party- and electoral-system features that foster intraparty competition—for instance, primaries or majority elections in *SMD*; open-list-*PR* and limited- or transferable-vote elections in *MMD*—as spurring personal, as opposed to partisan, politics and so distributive, over redistributive, policy (Ames 1995; Carey & Shugart 1995; Cox & Thies 1998; Cox & McCubbins 2001; Hicken & Simmons 2008). Later work often stresses interaction of district magnitude and intraparty competition, arguing that the effects of each on policy and governance outcomes depend on the extent of the other (e.g., Golden & Chang 2001; Golden 2003; Chang 2005; Chang & Golden 2007; Ariga 2010). Thus, district magnitude, *dm*, intraparty competition, *ipc*, and their interaction relate to the nature of policymakers' *budgeteering* incentives. Specifically, lower *dm* favors personal politics and so distributive policy, especially as *ipc* increases; greater *dm* favors partisan politics and so redistributive policy, although this effect weakens and may even reverse as *ipc* increases.

Researchers have also emphasized other key party- and electoral-system features in shaping representatives' incentives to cultivate a personal vote, which is essentially the converse of partisan representation-unity, u_r, and so would imply greater emphasis on district-oriented distributive politics. Carey & Shugart (1995), for instance, stress four features: (*i*) party-leader control over the ballot, (*ii*) vote pooling, (*iii*) type and number of votes cast (one *v.* multiple votes for candidates *v.* for parties), and (*iv*) district magnitude. As noted above, one could model the u_r term in the *effective-constituency* concept to reflect these arguments directly (Seddon et al. 2003 and McElwain 2011 offer some of the data one would need). In doing so, though, one would need carefully to distinguish party representational-unity, u_r, from party strategic-unity, u_s, i.e., the

[12] As is well known, district magnitude and vote-seat proportionality relate closely empirically.

[13] Rogowski et al. (XXXX) argue somewhat to the contrary that majoritarian systems favor consumer interests, a broader group's interests than the producers' interests which they argue proportional systems favor.

extent to which parties' members can act strategically in the interest of the party as a whole. As explained further below, party strategic-unity would naturally relate to policymakers' *strategic capacity* to respond to their budgeteering incentives whereas party representational-unity would relate to *incentive nature* as argued above. Strategically unified parties would be more capable of pursuing the best interest of the party as a whole, which, under some circumstances, may be to allow its representatives to act more independently. Strategic unity could be summarized aptly as the extent to which parties meet a unitary-actor assumption; representational unity could be summarized instead as the electoral value of the party label, i.e., roughly as the converse of the personal or individual-representative vote. The two are, of course related: voters facing strategically unified parties likely tend to see them representationally—more importantly: support them electorally—as a unit as well. Important for the empirical model to be proposed will be that the functions $u_r(\mathbf{x}_r)$ and $u_s(\mathbf{x}_s)$ be sufficiently distinct in their arguments and form, as well as in the in-sample empirical purchase they provide, as specified in the model, on the outcome.[14] Of these features, (*i*) party-leader control over the ballot—extent to which leadership decides which candidates run in what districts or where in list ordering, e.g.—likely relates more directly to u_s, and Carey and Shugart's (1995) argument regarding (*iv*) district magnitude is essentially the one the discussion above has already encompassed. This leaves vote-pooling, *vp*, and the type and number of votes, *vt*, as the additional contributions to the role of representational unity, u_r, in determining the effective number of constituencies and so the relative emphasis on distribution.

Lastly, consider how party-system polarization may affect the (re)distributive emphases in budgeteering incentives. For concreteness, imagine two hypothetical United Kingdom's, each with *2* parties, *651* single-member districts, and the same *ipc* and u_r, but with UK_1 having more

[14] One could even have u_s an argument to u_r and/or vice versa provided the two functions had enough else different, providing enough distinct empirical purchase, to estimate their distinct roles in the model of budgeteering outcomes.

polarized party-system whereas the policy preferences UK_2's parties are closer together. Without strongly distinct partisan/ideological appeal, the parties of UK_2 must instead compete more with pork-barrel distribution than would the parties in more-polarized UK_1. Representatives and candidates in UK_1 would compete to greater degree on ideological-partisan bases as members of two opposing teams. In less party-polarized UK_2, *per force*, party competition will have less ideological content; lacking much partisan basis for competition, distributive politics would likely come to the fore: the same logic by which intraparty competition increases weight on distributive politics. The Irish party-system may exemplify such a case of relative absence of ideological polarization (on economic dimensions) fostering greater emphasis on distributive politics. Thus, party-system polarization, ρ, relates to the nature of policymakers' *budgeteering* incentives; specifically, greater polarization raises the relative emphasis on broad (i.e., partisan) redistributive policies and lowers that on narrowly targeted distributive (i.e., district-pork) policies.

In sum, for incentive nature, we have so far:

$$n(\mathbf{x}_n) = n\left(d; p; u_r(\bullet, vp, vt); dm; ipc; \rho\right) \tag{4}$$

Later, we will discuss how far theory and substance may allow us to specify precisely how these factors shape the nature of *budgeteering* incentives (i.e., the form of $n(\cdot)$ and how these $\mathbf{x}_n$ enter it).

B. The Magnitude of the Incentive to Budgeteer (Incentive-Magnitude: $m(\mathbf{x}_m)$)

Turning to the magnitude of the incentive to budgeteer, consider first the competitiveness of the electoral districts. Again, to ground matters, start by imagining two UK's, each with all the same features as before, but now UK_1 has *651 competitive* electoral districts while UK_2 has *651 uncompetitive* districts. Suppose, for example, all districts in competitive UK_1 have *Labour* and *Tory* expecting a 50-50 tie whereas in uncompetitive UK_2, *Tory* and *Labour* expect 100-0 victories or 0-100 losses in all districts. If voters reward pork-barrel district projects with votes, both parties will have greater incentives to allow their candidates to promise, and, if in power, their MP's to deliver, district projects and services (distributive policies) in the more competitive UK_1. If voters instead reward partisan redistributive policies, as they would in systems with higher u_r, larger *dm* without strong *ipc*, and/or more polarization—as in the actual UK, excepting its *dm*=1—parties must compete more on partisan than district bases. Even in such highly partisan-based-competition contexts, though, greater electoral-district competitiveness, *ec*, would mean greater value of the votes to be bought by *budgeteering* in this broader redistributive manner.

Next, still given the nature of *budgeteering* incentives, and holding constant now also the extent of *electoral* competitiveness, *ec*, which contributes to the magnitude of those incentives, consider how national-level governmental-competitiveness, *gc*, would likely magnify these incentives to *budgeteer*. Again, think of two hypothetical UK's alike in all the above respects and now also that both parties expect, say, a 52-48 split in each district. In UK_1, though, all the 52-48 splits favor *Labour*, and, in UK_2, half favor *Labour* and half *Tory*. The marginal value to the parties of district projects is much greater in UK_2. The expected number of districts that given amounts of *budgeteering* may swing is the same, but swinging the same number of districts is much more critical to capturing government in UK_2. Accordingly, one would expect more *budgeteering* in UK_2.

These arguments extend a point Tufte (1978) made years ago, that tighter elections should induce more *electioneering*, an effect which Schultz (1995) demonstrated in the actual UK, finding that pre-electoral transfer-payment manipulation occurs in magnitude proportionate to the degree the coming election is expected to be close. Thus, for incentive magnitude, we have so far:

$$m(\mathbf{x}_m) = m(ec, gc) \qquad (5).$$

Again, later discussion will explore how, exactly, the theory and substance of this *comparative-democratic-budgeteering* context suggests this model of *incentive magnitude* should be specifies, but other extensions at this level of abstraction are also easy to imagine. The *budgeteering incentive-magnitude* as given in (5) focuses exclusively on closeness of the contests for districts and for government, but it neglects possible variation (*i*) in the *returns* to *budgeteering* policy-manipulations in terms of their efficacy in shifting votes and (*ii*) in the values of the offices and governments at *stake*. The strength of party identification and structural voting more generally, as opposed to individualistic voting, among voters—both suggesting lesser abilities of *budgeteering* policies to sway votes—could form the basis of a model of the *returns*.[15] Constitutional features related to power-concentration in parliaments and central government and party-systemic features related to polarization across governments—both suggesting greater *stakes* in winning power—could form the basis of a model of the latter.[16] Exploring such ideas further remains for future work, but again this discussion serves perhaps to illustrate the potentialities of the proposed empirical-modeling strategy.

C. Policymakers' Strategic Capacity to Respond to their Budgeteering Incentives (Strategic-Capacity: $s(\mathbf{x}_s)$)

Finally, the *strategic capacity* of policymakers to respond to their incentives to *budgeteer* should depend, *inter alia*, on party discipline, i.e., the degree to which parties can act as strategic units. In other words, *strategic party-unity*, u_s, gauges the aptness of a unitary-actor assumption regarding parties. Importantly, as noted above, the strategic unity of parties, i.e., their ability to act with discipline in the interests of the party as a whole—be that to target narrowly (to districts) or broadly (to partisan constituencies)—must be distinguished from their representational unity, i.e., the degree to which party representatives gain their votes by virtue of the party label as opposed to by individual characteristics, reputation, or deliveries. Greater partisan representational unity, u_r, induces a broader redistributive emphasis to policy manipulation; individual- or candidate-based voting, i.e., lower u_r, favors a narrower distributive emphasis. In short, party strategic-unity, u_s, relates to the strategic capacity of policymakers to respond to their budgeteering incentives;

[15] Again, notice that these factors partially overlap the representational party-unity that already enters the *budgeteering* model in shaping the nature of the incentive. The terms would not be identical and do not enter the model in the same forms and places, so sufficient appropriate empirical variation could distinctly estimate their related parameters.

[16] And these factors would analogously retain some distinctive role in this part of the model despite the overlap with their roles, or correlation to other factors with important roles, in determining the policymakers' *strategic capacity* to respond to their budgeteering incentives.

party representational-unity, u_s, instead relates to the direction or nature of those incentives.

Obviously, one would wish a model here of the strategic capacity of the "government", which would clearly depend on constitutional and institutional features of the democracy like its presidentialism or parliamentarism, the strength of prime, finance, or portfolio ministers in budgetary policy, and the number, seat distribution, and (economic-)ideological polarization of government and opposition parties, etc. For now, however, for strategic capacity we have only:

$$s(\mathbf{x}_s) = s(u_s) \qquad (6);$$

The strategic capacity of policymakers to respond to their *budgeteering* incentives depends on the strategic unity of the parties. In essence, this is a model of parties making policy, directly.[17]

As mentioned previously, party strategic-unity cannot be observed directly—certainly not simply by observing the extent of party-block voting for instance—not without a model of how party strategic-unity should shape legislative-voting behavior under different conditions because unity could imply much or little block-voting depending on circumstances and conditions. We will look later, however, to what observable characteristics of party and electoral systems, and internal party organization, theory suggests should induce stronger leadership control of parties' candidates and representatives strategies and behaviors. That is, we can model strategic party-unity as a function of observables and, by inserting that function in the proper place in the *budgeteering* model, perhaps gain both an estimate of how party strategic-unity affects *budgeteering* behavior and an estimate of strategic unity and of how those observable conditions shape it.

As yet, unfortunately, even at merely this abstract conceptual level, the model of *policymakers'* capacity to respond to their *budgeteering* incentives is only a model of *parties'* strategic capacity. I.e., as a model of the policymaking process, (6) in essence assumes parties make policy directly, which is obviously inadequate. A richer model in which these varyingly strategically unified parties

[17] Ironically, this parallels the *WSJ* implicit assumption of direct district/representative-policymaking.

would assemble as differently institutionalized (potentially multiple-party sets of) policymakers could fruitfully build from, e.g., Franzese's (2010) model of the veto-actor, common-pool, and bargaining-compromise effects of *"policymaking with multiple policymakers"* wherein *"veto-actors bargain in common pools."* The convex-combinatorial bargaining-compromise strategy part of this could weigh these varyingly unified parties' influence on the policy outcomes by various bargaining-power-indices, e.g.[18] Such a merger/extension remains purely aspirational at present, however.

In conclusion, summarizing this conceptual elaborative tour through a model of comparative democratic *budgeteering*: strategic party-unity, u_s, should influence policymakers' strategic capacity to respond to their *budgeteering* incentives, $s(u_s)$; electoral and governmental competitiveness, ec and gc, should affect the *magnitude* of their incentives to *budgeteer*: $m(ec,gc)$; and the numbers of districts and parties, d and p, the degrees of party-system polarization, ρ, representational party-unity, u_r, and intraparty competition and district magnitude, ipc and dm, should determine the *nature* of the *budgeteering* that serves policymakers' goals of gaining and retaining power and of producing their desired policies and outcomes: $n(d,p,\rho,u_r,ipc,dm)$. The multiplicative combination of incentive *magnitude* and *nature* and policymaker *strategic capacity* should determine the extents and relative shares of *budgeteering* in public-good, partisan-redistributive, geographic-distributive, and rent-seeking activities reflected in the policies observed across countries over time:

$$B = \ldots + s(u_s) \times m(ec, gc) \times n\left(d; p; \rho; u_r(\bullet, vp, vt); ipc; dm\right) + \ldots \qquad (7).$$

D. Specifying an Estimable Empirical Model of Budgeteering

Focusing on the partisan-redistributive *vs.* geographic-distributive mix in public policies, we may now be able to leverage theory & substance heavily enough to specify an estimable empirical

[18] Heller's (2013) outside-options modified Shapley-Shubik index, for example, or any of (following Bräuninger & König 2005): the Shapley-Shubik (Shapley/Shubik 1954), inclusiveness (Bräuninger 1996, König/Bräuninger 1997a, 1997b, 1998, 2001), non-normalized- and normalized-Banzhaf (Banzhaf 1965, Dubey/Shapley 1979), public-good (Holler 1982), member-bargaining-power (Brams/Fishburn 1995), Deegan-Packel (Deegan/Packel 1978), or decision-probability (Coleman 1971) indices.

model of the processes described in (7). For left-hand-side policy-outcome, most convenient would be some single policy measure, *B*, on which larger values imply greater amounts and shares of distributive or of redistributive policy.[19] One readily available (OECD databases) possibility is budget share of *social security and welfare* (*SSW*), i.e., pensions, health, social insurance, and welfare, which are widely held quintessential and most-prominent redistributive categories (e.g., Wilensky 1974; Pierson 1996; Huber & Stephens 2001; Swank 2002; Hicks & Swank 1992).

On the right-hand side, we begin with our *effective-constituency* augmentation of the *law of 1/n* class of arguments regarding (re)distributive politics and spending. Here, our expectation is that the level and effective number of effective constituencies lie on a (single) continuum from *d*, the number of electoral districts, at narrowest and most numerous end to *p*, the number of parties (in government, i.e., more exactly, the effective number represented in policymaking), at broadest and fewest end. The weight on geographic representation and distributive policy as opposed to partisan representation and redistributive policy, i.e., on *d* as opposed to *p*, depends on representational party-unity, u_r, party-system polarization, ρ, and district magnitude and intraparty competition, *dm* and *ipc*:

$$\begin{aligned} n\left(u_r(\bullet, vp, vt), \rho, dm, ipc, d, p\right) &= f\left(u_r(\bullet, vp, vt), \rho, dm, ipc^{-1}\right) \times p + \left[1 - f\left(u_r(\bullet, vp, vt), \rho, dm, ipc^{-1}\right)\right] \times d \\ &= \Lambda\left(u_r(\bullet, vp, vt), \rho, dm, ipc^{-1}\right) \times p + \left[1 - \Lambda\left(u_r(\bullet, vp, vt), \rho, dm, ipc^{-1}\right)\right] \times d \end{aligned} \quad (8),$$

where $f(\cdot)$, being a weight, is bound *0-1*, which is assured empirically here by specifying a logistic function, $\Lambda(\cdot)$, in the last line.[20] The arguments to $\Lambda(\cdot)$ all enter so as to have positive coefficient, i.e., to augment the weight on *p*, which should itself get positive coefficient for the redistributive-*share* outcome, *SSW*, whereas *d* should receive negative coefficient. Theory suggests *dm* and *ipc*

[19] Ultimately, more efficient will be to try to model in separate equations estimated jointly the effects as argued of the explanatory factors for each of (*i*) distributive and (*ii*) redistributive policy-levels and of (*iii*) their relative emphases.

[20] A cumulative-normal, $\Phi(\cdot)$, or probit, function would work as well, as would complementary log-log or any of a number of other, less restrictive sigmoidal 0-1 functions, but logit is most-easily implemented by *NLS*.

should interact within this $\Lambda(\cdot)$ function, and *dm* should have log-proportionate effects (because the effects follow the electoral threshold, which declines log-proportionately in *dm*), but strong theoretical-substantive guidance on how arguments should enter $\Lambda(\cdot)$ is otherwise lacking. Absent other theoretical-substantive guidance, I will assume the standard default of linear-additivity. Thus, parameterized, the empirical specification of incentive-nature, $n(\cdot)$, is:

$$n\left(u_r(\bullet, vp, vt), \rho, dm, ipc, d, p\right) = \Lambda(\mathbf{x}'\boldsymbol{\beta}) \times \beta_p p + \left[1 - \Lambda(\mathbf{x}'\boldsymbol{\beta})\right] \times \beta_d d,$$
$$\text{where } \Lambda(\mathbf{x}'\boldsymbol{\beta}) \equiv \frac{e^{\mathbf{x}'\boldsymbol{\beta}}}{1+e^{\mathbf{x}'\boldsymbol{\beta}}} \text{ , and where} \qquad (9).$$
$$\mathbf{x}'\boldsymbol{\beta} = \left(\beta_{ur1} + \beta_{ur2} vp + \beta_{ur3} vt\right) + \beta_\rho \rho + \beta_{dm} \ln(dm) + \beta_{ipc} ipc^{-1} + \beta_{dmipc} \ln(dm) \times ipc^{-1}$$

Next, we unpack the *magnitude* of policymakers' *budgeteering incentives*, $m(\cdot)$, which we have argued to depend on the degree of (district-level) electoral-competitiveness and (national-level) governmental-competitiveness, *ec* and *gc*. When policymakers expect more-competitive districts (higher *ec*), they expect any given extent of *budgeteering* to buy them greater increases in their probabilities of winning more seats and therefore of attaining greater policy and outcome influence. The policy-and-outcome effect of winning a few seats, in turn, increases with national-level governmental-competitiveness (higher *gc*). Therefore, for any given *ec*, greater *gc* sharpens these *budgeteering* incentives more and *vice versa*, implying an interactive model of *budgeteering* incentive-magnitude, which we could parameterize thusly:

$$m(ec, gc) = \beta_{ec} ec + \beta_{gc} gc + \beta_{egc} ec \times gc \qquad (10).$$

Pushing harder on the theoretical substance of these propositions, notice that, whereas the effect of governmental competitiveness should be zero when district-level competitiveness is zero, i.e., $\beta_{gc}=0$, because policymakers could not *budgeteer* any more seats regardless of those seats' greater importance, the effect of district-level competitiveness could be nonzero even with no competition for national government competitiveness, $\beta_{ec}\neq 0$, because *budgeteering* could win some seats, serving policymakers' office-retention if not (or much less-so) their policy/outcome goals. If the data agree, or do not dissent too strongly (see Kam & Franzese 2007), constraining $\hat{\beta}_{gc}$ to zero would be well-justified and would reduce estimation demands considerably:

$$m(ec,gc)=\beta_{ec}ec+\beta_{egc}ec\times gc \qquad (11).$$

Lastly, we argued that strategic (incumbent) party-unity, $u_s(\cdot)$, should set the degree to which policymakers can act effectively upon their *budgeteering* incentives, giving this complete model:

$$\begin{gathered}B=...+\beta_{us1}u_s(\cdot)+\beta_{us2}u_s(\cdot)\times\Big[\big(\beta_{ec}ec+\beta_{egc}ec\times gc\big)\big\{\Lambda(\mathbf{x}'\boldsymbol{\beta})\times\beta_p p+\big[1-\Lambda(\mathbf{x}'\boldsymbol{\beta})\big]\times\beta_d d\big\}\Big]...,\\ \text{where } \Lambda(\mathbf{x}'\boldsymbol{\beta})\equiv\frac{e^{\mathbf{x}'\boldsymbol{\beta}}}{1+e^{\mathbf{x}'\boldsymbol{\beta}}}\text{ , and where} \qquad (12).\\ \mathbf{x}'\boldsymbol{\beta}=\big(\beta_{ur1}+\beta_{ur2}vp+\beta_{ur3}vt\big)+\beta_\rho\rho+\beta_{dm}\ln(dm)+\beta_{ipc}ipc^{-1}+\beta_{dmipc}\ln(dm)\times ipc^{-1}\end{gathered}$$

Similar to the argument just made regarding $\hat{\beta}_{gc}$, we expect $\hat{\beta}_{us1}$ to be zero because the *capacity* to *budgeteer* is irrelevant if there is no *incentive*. By the (reverse side of the) same token, the incentive magnitude and nature are irrelevant if there is no capacity to respond, so the expressions inside of the brackets and the braces, reflecting $m(\cdot)$ and $n(\cdot)$ respectively, also appear only in the three-way multiplicative term. Given the massive efficiency gains, none of the constituent two-way multiplicative or additive component terms appear in the estimation model because, substantive-theoretically, they should all be zero (again, assuming the data do not object too strenuously: see Kam & Franzese 2007). This gives this simpler final expression:[21]

$$\begin{gathered}B=...+\underbrace{\beta_{us_2}u_s(\mathbf{x}_s)}_{\text{strategic capacity}}\underbrace{\big[\beta_{ec}ec+\beta_{egc}ec\times gc\big]}_{\text{incentive magnitude}}\underbrace{\big\{\Lambda(\mathbf{x}_n'\boldsymbol{\beta})\times\beta_p p+\big[1-\Lambda(\mathbf{x}_n'\boldsymbol{\beta})\big]\times\beta_d d\big\}}_{\text{incentive nature}}+...,\\ \text{where } \Lambda(\mathbf{x}_n'\boldsymbol{\beta})\equiv\frac{e^{\mathbf{x}_n'\boldsymbol{\beta}}}{1+e^{\mathbf{x}_n'\boldsymbol{\beta}}}\text{ , and where} \qquad (13).\\ \mathbf{x}_n'\boldsymbol{\beta}=\big(\beta_{ur1}+\beta_{ur2}vp+\beta_{ur3}vt\big)+\beta_\rho\rho+\beta_{dm}\ln(dm)+\beta_{ipc}ipc^{-1}+\beta_{dmipc}\ln(dm)\times ipc^{-1}\end{gathered}$$

[21] One way to verify that the parameters of model (13) are separately identified is to expand the multiplications and then gather parameters as coefficients on products of variables. This reveals four unique coefficients, one component of each of which is the nonlinear function $\Lambda(\mathbf{x}'\boldsymbol{\beta})$, on four unique combinations (products) of variables. With four unique (complex) coefficients on four unique (combinations of) variables, (13) is, as claimed, estimable.

The expression in braces is our model of the relative geographic-distributive as opposed to partisan-redistributive *nature* of policymakers' *budgeteering incentives*; the expression in brackets is our model of the *magnitude* of these *budgeteering incentives*; and the first term is our model, such as it is, of the policymakers' *strategic capacity* to respond to these *budgeteering incentives*.[22] At this point, I can only offer a progress report on how I have so far operationalized and measured the right-hand-side terms of this model, and some ideas about how we might further those efforts in the future.

III. Data & Operationalization for a ***Comparative-Democratic-Budgeteering*** Model

Sample: We[23] have been striving to collect data for as many of the developed democracies over as much of the postwar period as possible, generally succeeding, where we have had any success, with annual data for 18-24 developed democracies (OECD full members as of 1993, minus Turkey) and 1960 through at least the early 2000's.

Dependent Variable – (Re)Distributive Policy: From OECD Social Benefits and Public Health datasets, plus total spending from general OECD databases, we can cover 20 countries[24] and 1960-2002 with a measure of Social Benefits as a share of Total Government Spending: *SBshTGS*.

Right-Hand-Side Variables:

Incentive-nature variables:

For most postwar elections to the lower house in 23 OECD democracies, we have d, the number of electoral districts in that election, and the date of the election. On that basis, we calculate d_{it} as the number of districts in the lower house in the election before year t if there is no election that year. In years with election(s), d_{it} is the average of all the d that applied that year (i.e., the d from the previous election and the d from this one, if they differ) weighted by the fraction of

[22] Each of these, I should say, are the models *so far*; this being a preliminary sketch of intentions, and the data not having spoken yet, I reserve the option of extending or otherwise modifying each.

[23] See acknowledgments note at start of the paper.

[24] Greece, Iceland, Luxembourg, and Spain drop from the OECD-less-Turkey count of 24.

the year that districting applied. All subsequent time-serial measures are similarly weighted by the share of the year that base measures apply. Ideally, district-counts would be the effective number of districts, weighing each district by the share of legislators it comprises. We do not have that data (i.e., the set of district magnitudes of all the districts, each year) yet, however, so our district counts are for now raw counts, not size weighted.

For the effective (size-weighted) number of policymaking parties, *p*, ideally, the measure should reflect governments' majority *versus* minority status, and otherwise include or exclude oppositions proportionately to their influence, as well as weigh any other relevant policymaking entities (such as central banks in the case of monetary policy). At present, the *GFrag* measure from Franzese & Hays (2008) offers an available measure reasonably close to this ideal:

> "Our government fragmentation, *GFrag*, … ind[ex] derive[s] from Thomas Cusack's rich, thorough, and usefully designed PGL ("Parties, Governments, and Legislatures") dataset.[25] Using *GSppt*, the percentage legislative seat-share of the governing (cabinet) parties,[26] we obtain *GFrag* for majority governments ($GSppt>\frac{1}{2}$) as the raw number of governing parties (counting non-partisans as half a party)… If $GSppt<\frac{1}{2}$ (minority government), *GFrag* is a *GSppt*-weighted count of the raw number of governing parties and the effective number of opposition parties. A minority coalition need not add all other parties to build a majority to change policy, so using raw numbers of opposition parties would exaggerate. Short of analyzing each parliamentary context at length, we construct a convenient proxy for the number of [policy-making] parties by weighing their counts by size (i.e., using effective numbers), reflecting the notion that larger parties are more often likely to be necessary partners in building legislative majorities."

The data sources providing the numbers of districts in each election also give the numbers of representatives, so average district-magnitude, *dm*, is straightforward. Median *dm* or other cross-districts distributional moments would be more difficult and have not yet been obtained.

Again borrowing from Franzese & Hays (2008), we have the following crude measure of *ipc*:

> Our intra-party competition index, *ipc*, is crude, as it merely sums indicators for plurality, majority, and transferable-vote [TV] electoral systems (from Golder 2005). We code the German mixed system, and the similar new ones in Italy, Japan, and New Zealand as 0.5, reflecting their part-plurality nature (although in Japan, the other part is [TV], so *ipc* is 1).

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[25] http://www.wz-berlin.de/mp/ism/people/misc/cusack/d_sets.en.htm

[26] For the U.S. case, the president's party is the *cabinet party* in all the following discussion. Also, *legislature* here always refers to the lower (more powerful) chamber in cases of bicameralism.

Party-system polarization, ρ, could also be measured nicely using Cusack's PGL database (see above). Ideally, the polarization measured would regard the electoral party-system, i.e., use vote-weighted standard-deviations of party-location scores, but the readily available measure (from Franzese & Hays 2008) is for government parties, cabinet-seat weighted, which renders the measure quite crude for present purposes, and only as follows at that:

> […ρ…uses…] party ideological-ranges (size-unweighted) rather than standard-deviations or variances (size-weighted); […it] measures leftmost to rightmost governing party if *GSppt*>½ and across the whole legislature in the case of minority government.[27]

Representational party-unity, u_r, recall, refers to the degree to which candidates (particularly incumbents) compete for and receive votes as a party unit, *i.e.*, by virtue of partisan reputation. A sufficient summary measure would therefore be the coefficient on party-label in an appropriately specified vote-choice equation*, comparable across electoral systems*. Ariga (2010) has constructed such a set of empirical models and estimators, and has estimates for u_r, calling it the electoral value of the party label, or for its inverse, the value to the party of individual candidates' reputations with voters, for about ten democracies. At present, therefore, I could only offer a highly subjective qualitative index (i.e., my own guess) for u_r to supplement the estimates available from Ariga (2010), or leave u_r a country fixed-effect to estimate, or, as suggested in model (9) above and thereafter, as a constant and linear-additive function of data measuring Carey & Shugart's (1995) vote pooling and vote type and number, as operationalized for example by Seddon et al. (2003).

Regarding expected national-level governmental-competitiveness, *gc*, perhaps a simple model might generalize with sufficient empirical accuracy across the dizzying array of possible policy-influence relations that may apply. Constraining attention to governments, we might generalize that parties' competition for policy-control increases (likely increasingly) as the incumbent-parties'

[27] *GPol* exaggerates by thus implicitly assuming all legislative parties are veto actors. As with *GFrag*, *GPol* would do better to find some convenient generalization reflecting the greater likelihood of larger opposition parties being in veto-acting positions. Cusack's data provide several useful indicators of government and opposition fragmentation and key-party ideological locations that could improve our *GPol* measure, and also enhance our *GFrag* simplification.

control of parliamentary seats approaches 50%. Allowing a simple ARIMA seat-forecast model to suffice to represent expectations formation then suggests these steps. First, estimate an AR(1) model for each party $j = \{1 \ldots \mathcal{J}\}$ of its seat share (0..1) at the n^{th} election:

$$PTYSS_{j,n} = \alpha_{0,j} + \alpha_{1,j} PTYSS_{j,n-1} + \varepsilon_{j,n} \quad (14).$$

Then, predict the expected seat share for each party j in the $(n+1)^{\text{st}}$ election:

$$E(PTYSS_{j,n+1}) = \hat{\alpha}_{0,j} + \hat{\alpha}_{1,j} PTYSS_{j,n} \quad (15).$$

Then, for all governments formed between the n^{th} and $n+1^{\text{st}}$ elections (each denoted by k), let

$$E(GSS_k) = \sum_{j \in kGovt} E(PTYSS_{j,n+1}) \quad (16),$$

where *kGovt* is the set of parties in the k^{th} government. Then, *gc* for the k^{th} government is:

$$gc_k = E(GSS_k) \times \left[1 - E(GSS_k)\right] \quad (17).$$

In two-bloc contests for government, which the proposed measure *de facto* assumes, *gc* reaches its maximum at expected seat-shares of .5 for each bloc, where it equals $.5^2 = .25$. Appendix II documents generation of this *gc* measure, with confidence intervals, in 23 developed democracies over most of the postwar period. How this measure of governmental competitiveness *by government* should map to *gc* by year remains ambiguous. Some smooth function increasing as the (expected) date of the next election nears would seem most reasonable. For now, we assume *gc* fixed at gc_k between the k^{th} and $(k+1)^{\text{th}}$ government, and averaged across governments proportionately to the share of the year each held office in years of government change. See Appendix II for details of the calculations and for exposition of the data (all due to Kenichi Ariga 2010 [2007]).

Similarly, but *much* more tediously, district-level electoral competitiveness, ec_d, would refer to how close the average candidate in the average party was to gaining representation in a district. For SMD systems, one could apply the analogous to (14)-(17), replacing expected *government-seat*-share with expected *(2-party) vote*-share, but MMD systems complicate matters. There, we suggest considering, first, how close a competing party is to gaining another seat, i.e., how close a party is to its next threshold. Using the upper threshold,[28] another seat for a party is assured at each point where the expected vote-share crosses a $1/dm$ interval starting from $1/(2dm)$: e.g., at 5%, 15%, 25%, etc. in a dm=10 and at 10%, 30%, 50%, etc., in a dm=5 system. Competitiveness for that marginal seat peaks at those points and hits nadir at the halfway marks between. A formula that captures this oscillating competitiveness generically divides the expected vote-share by $1/dm$, with each value expressed in percentage points as whole numbers, and multiplies the residual fraction from this by one minus that residual fraction. This measure oscillates from 0 at lowest competitiveness for that next seat to 0.5 at highest, and so could be used as *GCC* is in (17) to generate a party's competitiveness for its next seat in a district. E.g., a vote share of 45% in a dm=10 system yields 45/10=4.5, and so hits the .5(1-.5)=.25 maximum score, as would 5%, 15%, …, 95%. The same 45% vote-share in a dm=20 system yields, 45/5=9.0, and so the 0(1-0) nadir of marginal-seat competitiveness. Then dampen that measure of competitiveness for *one-more* seat in a district by the number of seats at stake in the district: i.e., multiply by $1/dm$. Finally, average the resulting measure of a party's district competitiveness across districts and across parties for the electoral competitiveness of that system that year: ec_{it}.[29] For simple, pure parliamentary systems, this all could operationalize thus. From districts' party vote-shares, estimate an AR(1) model for each party $j=\{1\ldots J\}$ of its $d=\{1\ldots D\}$ vote-shares at the m^{th} election:

$$VS_{j,d,m} = \alpha_{0,j} + \alpha_{1,j} VS_{j,d,m-1} + \varepsilon_{j,d,m} \qquad (18).$$

Then, predict the expected vote share for each party j in district d the $m+1^{\text{st}}$ election:

[28] Electoral thresholds are the minimum vote-shares at which a party wins a seat. Two thresholds exist, an upper and lower. The lower is the minimum vote-share at which a party may win a seat; the upper is the minimum vote-share that assures a party a seat. The lower threshold depends on district magnitude and the number of candidates; the upper depends only on the district magnitude and so is used here.

[29] I retain concerns about how well this proposed measure may generalize electoral competitiveness across different electoral and party systems. It may, e.g., exhibit arbitrary dependence on the numbers of parties, districts, or seats.

$$E(VS_{j,d,m+1}) = \hat{\alpha}_{0,j} + \hat{\alpha}_{1,j} VS_{j,d,m} E(VS_{j,d,m+1}) = \hat{\alpha}_{0,j} + \hat{\alpha}_{1,j} VS_{j,d,m} \quad (19).$$

Then, *ec* between the m^{th} and $m+1^{\text{st}}$ elections is:

$$ec_m = \frac{1}{J}\sum_{j=1}^{J}\left(\frac{1}{D}\sum_{d=1}^{D}\left\{\frac{1}{dm_d}\left[\text{remainder}\left(\frac{E(VS_{j,d,m+1})\times 100}{\frac{1}{dm_d}\times 100}\right)\left(1-\text{remainder}\left\{\frac{E(VS_{j,d,m+1})\times 100}{\frac{1}{dm_d}\times 100}\right\}\right)\right]\right\}\right) \quad (20).$$

Finally, consider how we might gauge the degree of *party strategic-unity*, u_s, which determines the *capacity* of policymakers to respond effectively to *budgeteering incentives* whose *magnitude* and *nature* as modeled and operationalized above. One cannot use parties' legislative-voting unity to gauge u_s directly for two reasons. First, legislative-voting unity might not reflect the degree to which parties can act in the strategically optimal manner for the unit because optimal behavior may be disparate or unified voting.[30] Second, legislative-voting behavior is endogenous to other factors in the model, notably governmental competitiveness (measured by seat balance), which at minimum would complicate further our interpretation of those coefficients. Moreover, measures of legislative voting-unity scores are not practically available in many democracies over much time and, indeed, could not exist in some over extended periods (in Italy, e.g., legislative votes were secret and unrecorded until a 1988 law). As already presaged, the approach here, like that used throughout the paper, is to replace u_s with an estimable model of party strategic-unity:[31] $u_s = u_s(\mathbf{x}_s)$.

For example, Carey & Shugart (1995) argue that party-leadership control over campaign funds, backbencher careers, and the ballot itself (who gets to run, in what districts or where on lists), as well as various forms of vote pooling, types and numbers of multiple votes, *etc.*, shape the

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[30] In fact, Franzese & Nooruddin (2004) and Franzese et al. (2008) use legislative-voting unity instead in a role that would here reflect *party reputational-unity*.

[31] As noted, we may also attempt to model representational party unity, u_r, (instead of or in addition to the *coefficient-from-a-vote-choice-model* or *country-effect-model* options also mentioned). Empirical leverage on any attempt to model both u_r and u_s would rest on the degree to which their models differ theoretically and empirically. The likely challenge in this regard seems great: u_s and u_r likely share many of the same explanators, even before entertaining their likely mutual dependence, which would require embedding u_s (u_r) in the model of u_r (u_s). Even solving to the reduced form, the overlap and correlation of the remaining exogenous explanators would likely remain very substantial.

incentives for representatives, in their terms, to cultivate a personal vote.[32] In our terms, at least some such factors (see notes 30-32) relate more directly to the degree to which the party can act strategically in its unitary interest—its strategic unity, u_s—which is closely related to the extent of its hierarchy. Empirical measures of some of these institutional features of parties and electoral systems are available (e.g., Katz & Mair 1994, Lijphart 1999, Powell 2000)[33,34]. Embedding them in the proposed, estimable empirical model has the side benefits of (a) offering an estimate of a concept, u_s, that is inherently unobservable, and (b) offering a test, albeit an indirect one, of comparative-democratic theories of the conditions that contribute to this unobservable, but theoretically important, concept. Of course, as elaborated in the introductory section, these side benefits will accrue correctly only to the degree the models from which they derive, i.e., the model of policymaking (y=...) and those of strategic (and representational) party unity $u_s=u_s(\mathbf{x}_s)$ (and $u_r=u_r(\mathbf{x}_r)$) are empirically accurate, distinct, and powerful.

IV. Some Very Crude, Preliminary & Suggestively Supportive Estimates Related to *Comparative Democratic Budgeteering*

> **[As noted in the Fair Warning on the title page: "I am hoping, but not promising, that I might have furthered the empirical implementation some by the presentation." Any such progress would replace this section.]**

Some questions demand answers even at this highly preliminary stage in project development before proceeding. Does what stands to be gained theoretically, empirically, and/or substantively

32 Some of the factors to follow relate to voting behavior primarily and, therefore, for our purposes, more directly to u_r as opposed to u_s (see also note 31). Similarly, other factors that may determine the degree of representational and/or strategic party-unity may include some variables, such as district magnitude and electoral and governmental competitiveness, which enter the overall model elsewhere. If these appearances reflect differing arguments, and provided the functions differ, such multiple appearances are theoretically appropriate and would be separately estimable, but the empirical difficulty of distinguishing the factors rises dramatically with the extent of overlap.

33 Timm Betz has assembled some data from some parties' internal features including information, where applicable and where it exists to be retrieved, on the number of party leaders over specified periods of time, the leaders' internal vote-share in leadership elections, the number of persons in party-leadership positions, whether the party's chief party-leader and chief elected-official are the same person, method of candidate selection/positioning on lists, local-party officials' shares of central-party leadership positions, locus of control of campaign funding and staffing.

34 Ken McElwain has assembled a large amount of data on candidate-selection mechanisms across the developed democracies that could also prove extremely useful here.

from this project warrant the complexity of the model being constructed? If so, can we compartmentalize that complexity into understandable theoretical components and, if so, will that comprehensible theoretical construct travel to other contexts beyond this sample and beyond this application to pork-barrel and redistributive spending?

That the model being constructed may offer even a first stage in the development of a single, unified theory of comparative democratic political economy of *budgeteering*, i.e., of the relative shares of public-good provision, redistribution, distribution, and rent seeking in public policy-making seems promise enough to warrant further effort. Likewise, the possibilities to estimate by this empirical-modeling approach previously inestimable key concepts and to test theories of their generation, even if only indirectly and conditional upon other theoretical propositions, seem well worth some effort also. I would also argue that the conceptualization of the comprehensive model, compartmentalized into the connected models of policymaking *strategic-capacity*, *incentive-magnitude*, and *incentive nature*, is manageable (i.e., comprehensible) and portable across substantive context.[35] But, finally, even if I am granted all of this, to warrant continued effort, I think we need some indication of whether the theories will work well enough empirically, and whether sufficient quantity and quality of data is available or within reach of feasible effort, and then whether these data will cooperate sufficiently to yield some of these hoped-for estimates. I.e., at this point, we need some empirical encouragement, so to speak, that these trees (*thickets!*) may eventually bear fruit. On those crucial questions, I have only the following suggestive hopeful signs at present.

What follows are some quick glances at some hopefully at least tangentially relevant empirics; these results merely suggest that the empirical purchase sought *may* exist and the substantive findings to be had *may* prove interesting and important. Still, even at this early stage, some

[35] Indeed, if a book eventually materialized from this project, as presaged by this paper, it would build the overall model through chapters following just this compartmentalization.

preliminary answer to these questions is crucial because, while Franzese (1999, 2002, 2003) found strong empirical results and much theoretical and substantive fruit from econometric models of this sort in monetary policies and outcomes, nothing guarantees any empirical success from such models applied in this different, more full-hearted way in so different, and demanding, a context.

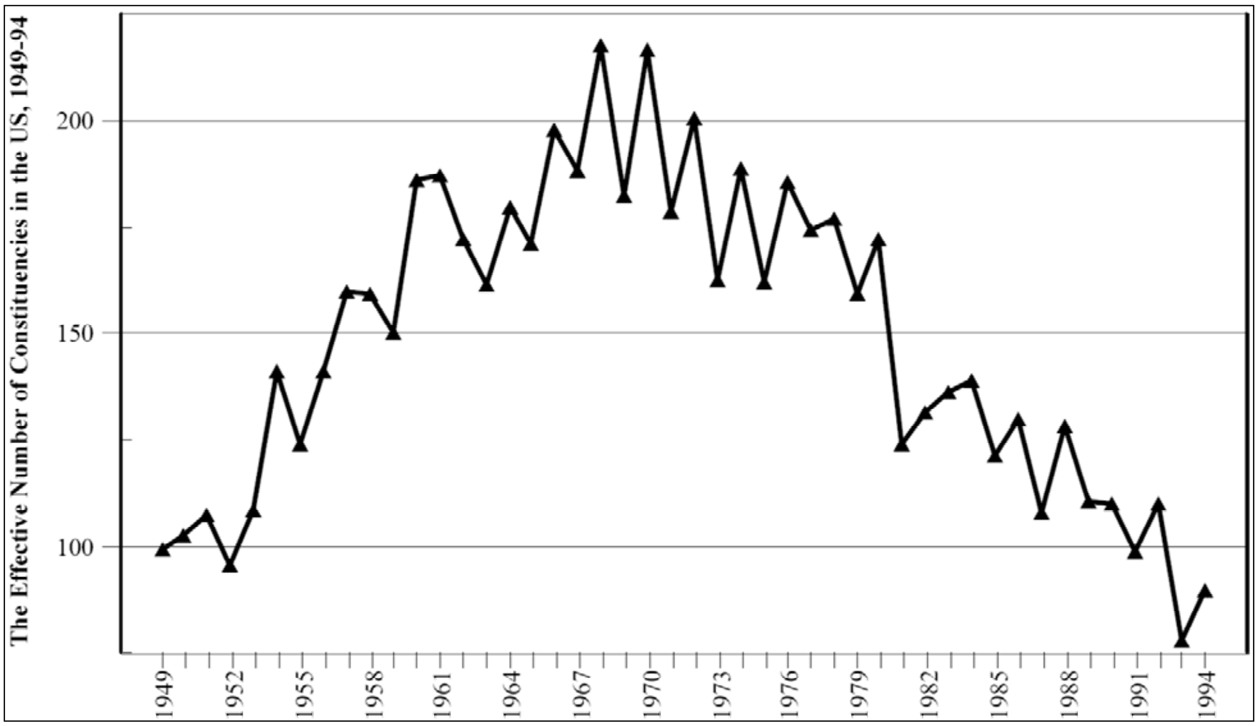

Figure 1: The *Effective Number of Constituencies* in the United States, 1949-1994

Franzese & Nooruddin (2004) and Franzese et al. (2008) offered evidence from distributive spending in the U.S. that suggested the utility of the *effective-constituency* concept. I repeat those next as background, and then I extend those suggestions with some new results that seem to indicate that the numbers of governing parties and of electoral districts relate to a redistributive-spending variable and to a distributive-spending variable in a pattern that offers some promise that estimation of the convex-combinatorial (13) might actually bear fruit worth the effort. First, the background on the *effective number of constituencies*: they measured this with party legislative-voting-unity as the weight on the number of governing parties, which is 1 or 2 in the US case, and one minus that voting unity as the weight on the number of districts, which is a combination of the House's 435 and the Senate's and President's 50. The rise then fall in Figure 1 of the effective number of constituencies mirrors a fall then rise in party legislative-voting unity.

DEP. VAR. —> INDEP. VAR. ↓	Model 1 Δ (FC/TS)	Model 2 Δ (FC/GDP)	Model 3 Δ (NT/TS)	Model 4 Δ (NT/GDP)
Constant	**-0.322** *(.129)*$^{.014}$	**+0.472** *(.188)*$^{.014}$	**+1.484** *(.810)*$^{.070}$	**+1.925** *(.434)*$^{.000}$
Δ DepVar $_{t-1}$	**+0.039** *(.115)*$^{.733}$	**+0.248** *(.090)*$^{.007}$	**+0.196** *(.076)*$^{.012}$	**+0.157** *(.061)*$^{.011}$
DepVar $_{t-1}$	**-0.207** *(.076)*$^{.733}$	**-0.382** *(.091)*$^{.0001}$	**-0.133** *(.080)*$^{.101}$	**-0.371** *(.076)*$^{.000}$
Δ GDPpc Growth	**-0.089** *(.183)*$^{.631}$	**-0.758** *(.200)*$^{.0003}$	**-1.962** *(.667)*$^{.004}$	**-1.091** *(.317)*$^{.0009}$
GDPpc Growth $_{t-1}$	**-0.067** *(.215)*$^{.756}$	**-0.804** *(.230)*$^{.001}$	**-1.800** *(.789)*$^{.025}$	**-1.280** *(.377)*$^{.001}$
GDPpc $_{t-2}$	**+0.054** *(.014)*$^{.0005}$	**-0.036** *(.017)*$^{.047}$	**-0.160** *(.082)*$^{.053}$	**-0.189** *(.043)*$^{.0000}$
Δ CPI Inflation	**-8.53e^{-4}** *(.001)*$^{.463}$	**–0.003** *(.001)*$^{.023}$	**–0.011** *(.004)*$^{.009}$	**–0.006** *(.002)*$^{.003}$
CPI Inflation $_{t-1}$	**-6.93e^{-4}** *(.001)*$^{.545}$	**-0.003** *(.001)*$^{.010}$	**-0.004** *(.004)*$^{.323}$	**-0.005** *(.002)*$^{.011}$
Δ Unemployment	**-1.84e^{-3}** *(.004)*$^{.664}$	**-0.009** *(.004)*$^{.046}$	**-0.059** *(.016)*$^{.0003}$	**-0.029** *(.007)*$^{.0001}$
Unemployment $_{t-1}$	**-2.67e^{-3}** *(.002)*$^{.158}$	**-1.23e^{-4}** *(.002)*$^{.955}$	**+0.004** *(.008)*$^{.639}$	**-0.006** *(.004)*$^{.142}$
Δ Partisan CoG	**+1.10e^{-3}** *(.005)*$^{.823}$	**+0.009** *(.006)*$^{.105}$	**+0.022** *(.019)*$^{.208}$	**+0.011** *(.009)*$^{.220}$
Partisan CoG $_{t-1}$	**-4.73e^{-3}** *(.004)*$^{.214}$	**-0.004** *(.004)*$^{.400}$	**-0.004** *(.012)*$^{.736}$	**-0.007** *(.006)*$^{.263}$
Δ Pre-Election-Year Indicator	**+0.014** *(.009)*$^{.124}$	**-0.008** *(.010)*$^{.402}$	**-0.042** *(.034)*$^{.220}$	**-0.018** *(.016)*$^{.272}$
Pre-Election-Year Indicator $_{t-1}$	**+0.025** *(.015)*$^{.103}$	**-0.006** *(.016)*$^{.719}$	**-0.051** *(.054)*$^{.348}$	**-0.025** *(.026)*$^{.339}$
Δ Effective Number of Constituencies	**+6.55e^{-5}** *(.0001)*$^{.544}$	**+2.80e^{-4}** *(.0001)*$^{.020}$	**+4.86e^{-4}** *(.0004)*$^{.224}$	**+1.85e^{-4}** *(.0002)*$^{.330}$
Effective Number of Constituencies $_{t-1}$	**+1.91e^{-4}** *(.0001)*$^{.068}$	**+3.54e^{-4}** *(.0001)*$^{.003}$	**+7.73e^{-4}** *(.0004)*$^{0.048}$	**+3.21e^{-4}** *(.0002)*$^{.069}$
Adj. R^2 (Std. Err.)	.0527 (.0103)	.3299 (.0115)	.3789 (.0383)	.2736 (.0183)
Durbin-Watson	2.2586	1.3577	1.722	1.4041

NOTES: Equations estimated by seemingly unrelated regressions (SURE) in E-Views ©QMS version 2.0. Each has 39 observations and 16 independent variables. Coefficients in **bold**, and standard errors in (*italics*) with p-levels from 2-sided t-tests ^{superscripted}.

Null Hypothesis	Equation 1	2	3	4	1 & 2	3 & 4	All
$\beta_{14}=\beta_{15}=0$	p ≈ .1818	p ≈ .0037	p ≈ .1155	p ≈ .1726	p ≈ .0031	p ≈ .3534	p ≈ .0003

Figure 2: Partial Association of the *Effective Number of Constituencies* with Distributive Spending, U.S. 1956-94

Then they showed, as copied in Figure 2, that this *effective number of constituencies* seemed, controlling temporal dynamics, macroeconomic conditions, government partisanship, and possible electoral cycles, to trace final consumption and also non-transfers spending (both intended to represent non-broad/redistributive spending). They illustrated the substantive implications of these estimates as copied in Figure 3.

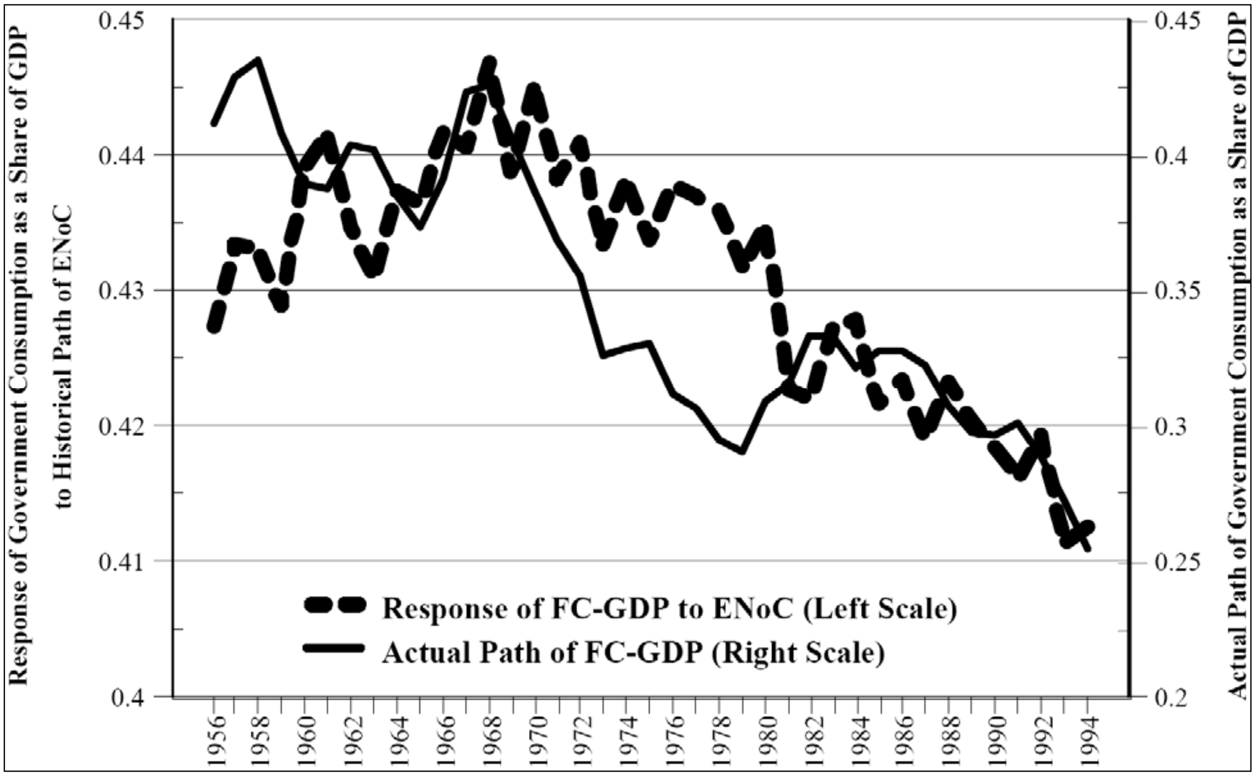

Figure 3: Estimated Response of Government Final Consumption to the Actual Path in the U.S. 1956-94 of the *Effective Number of Constituencies* (left scale) *versus* the Actual Path of Government Final Consumption (right scale).

In Franzese et al. (2008), they turned to more disaggregated spending categories that classical works on the subject held as *porkier*, such as, for instance, water resources as seen in Figure 4…

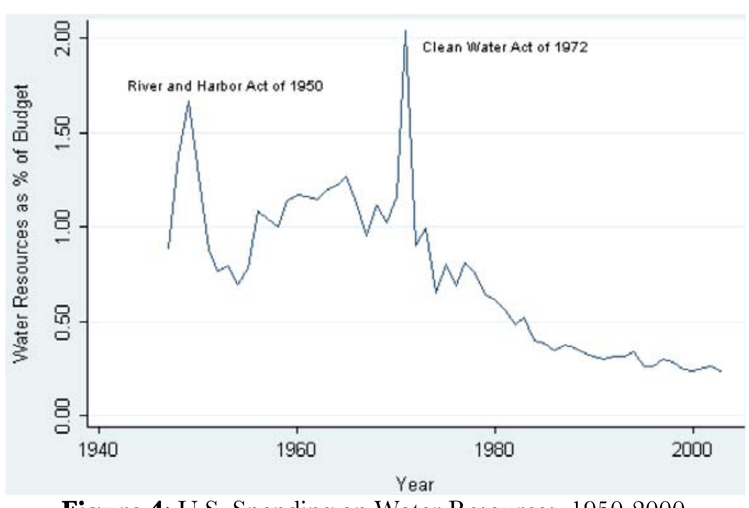

Figure 4: U.S. Spending on Water Resources, 1950-2000

…and four other budget categories usually considered highly *porky* as graphed in Figure 5.

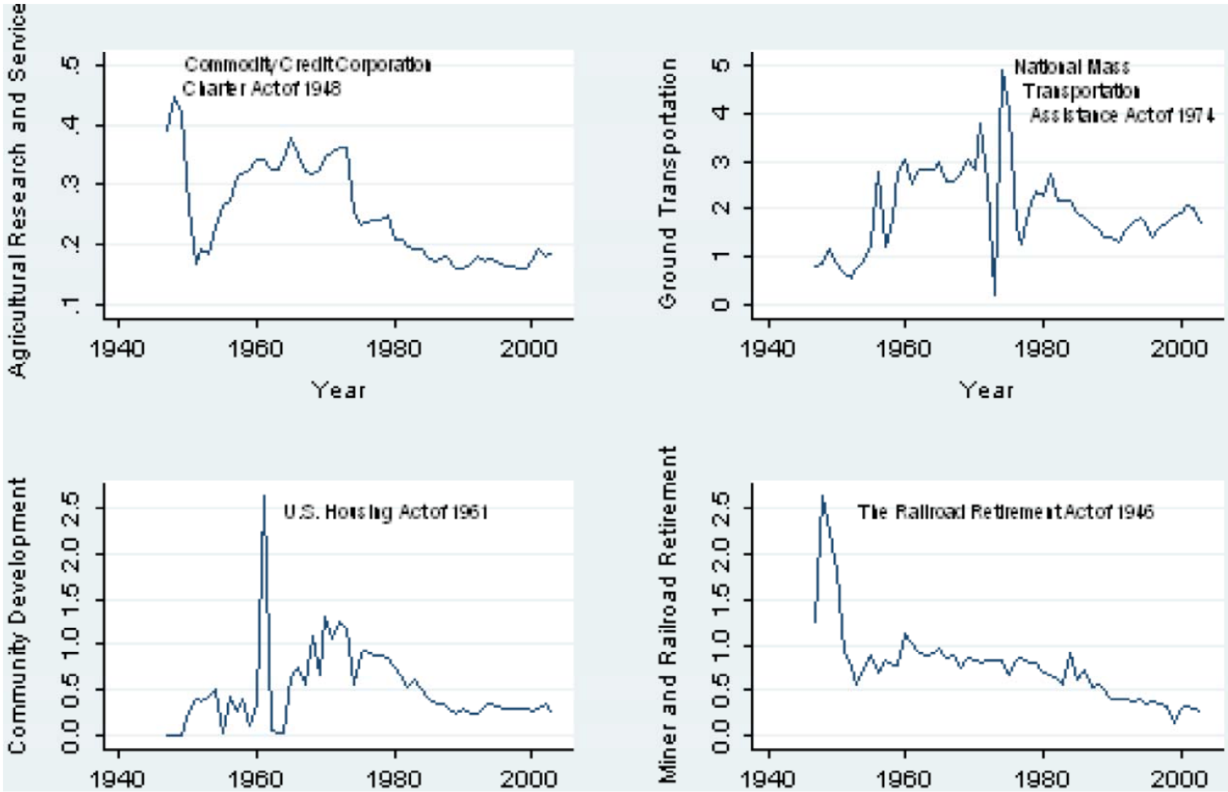

Figure 5: Four Distributive-Spending Categories in the U.S. Budget, 1950-2000.

Our *effective-constituencies* measure did an even better job of tracking these changes as illustrated for agricultural-research spending as a share of the U.S. budget in Figure 6.

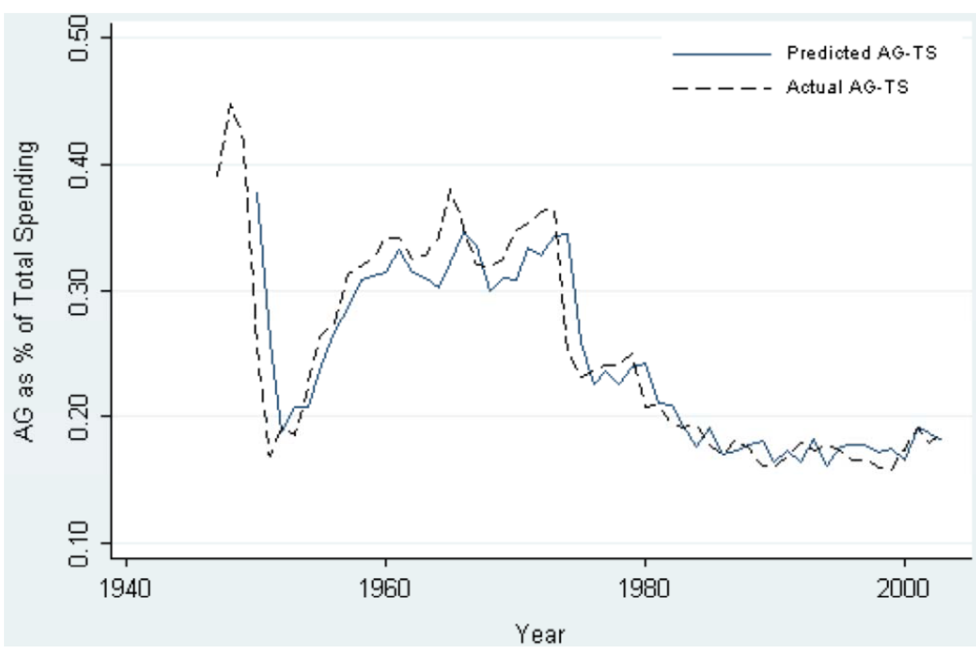

Figure 6: Estimated Response of Agricultural-Research Spending Share of U.S. Budget (AG-TS) to the Actual Path of the *Effective Number of Constituencies* versus the Actual Path of AG-TS in the U.S., 1951-2003

Of course, the strong 'predictive' performance is surely mostly due to the slow time-dynamics with lagged-dependent variables being in the regression model, but again the *effective number of constituencies* offers some additional explanatory power on dynamics and other standard controls. The details of the empirical results supporting this claim follow, copied as Tables 1-3 below.

Table 1: Government Spending in the U.S. 1952–2001 (Reduced Model)

Spending Category	NEC_{t-1}	Lagged DV	Constant	Adj. R^2	RMSE
Share of Total Budget Allocations					
1 Water	**0.007**	**0.532**	-0.161	0.746	0.204
	(**.001**)$^{.00}$	(**.041**)$^{.00}$	(.095)$^{.09}$		
2 AgRe	**0.001**	**0.582**	0.018	0.832	0.030
	(**.000**)$^{.00}$	(**.034**)$^{.00}$	(.014)$^{.20}$		
3 Ground	**0.015**	**0.311**	0.421	0.292	0.757
	(**.005**)$^{.01}$	(**.060**)$^{.00}$	(.359)$^{.24}$		
4 CDev	**0.009**	**0.281**	-0.259	0.261	0.374
	(**.002**)$^{.00}$	(**.075**)$^{.00}$	(.170)$^{.13}$		
5 MinR	**0.004**	**0.532**	0.042	0.769	0.137
	(**.000**)$^{.00}$	(**.063**)$^{.00}$	(.031)$^{.50}$		
Share of GDP					
6 Water	**0.142**	**0.568**	-2.821	0.717	4.331
	(**.032**)$^{.00}$	(**.042**)$^{.00}$	(2.046)$^{.17}$		
7 AgRe	**0.022**	**0.637**	**0.445**	0.887	0.450
	(**.003**)$^{.00}$	(**.039**)$^{.00}$	(**.218**)$^{.04}$		
8 Ground	**0.319**	**0.343**	8.644	0.301	16.525
	(**.118**)$^{.01}$	(**.058**)$^{.00}$	(7.864)$^{.27}$		
9 CDev	**0.208**	**0.289**	-5.235	0.282	7.743
	(**.054**)$^{.00}$	(**.074**)$^{.00}$	(3.547)$^{.14}$		
10 MinR	**0.066**	**0.614**	1.134	0.769	2.836
	(**.019**)$^{.00}$	(**.035**)$^{.00}$	(1.306)$^{.37}$		

NOTES. 1. Water: Water Resources; AgRe: Agricultural Research and Services; Ground: Ground Transportation; CDev: Community Development; MinR: Miner and Railroad Workers Retirement; 2. Equations estimated by seemingly unrelated regressions (SURE) in Stata 8.2; 3. Each equation has 49 observations and 1 independent variables; 4. Standard errors reported in (parentheses) with p-levels from 2-sided t-tests ^{superscripted}

Table 2: Government Spending in the U.S. 1952–2001 (Complete Model)

	Share of Total Budget Allocations					*Share of GDP*				
	1	2	3	4	5	6	7	8	9	10
	Water	AgRe	Ground	CDev	MinR	Water	AgRe	Ground	CDev	MinR
NEC_{t-1}	**0.008**	**0.001**	**0.003**	**0.123**	**0.004**	**0.154**	**0.027**	**0.436**	**0.388**	**0.083**
	(**.003**)$^{.00}$	(**.0003**)$^{.00}$	(**.012**)$^{.04}$	(**.006**)$^{.00}$	(**.002**)$^{.01}$	(**0.059**)$^{.01}$	(**0.006**)$^{.00}$	(**0.255**)$^{.09}$	(**0.119**)$^{.00}$	(**0.033**)$^{.01}$
GDP Growth	0.032	0.001	-0.141	0.063	-0.020	**0.983**	0.068	-1.97	1.49	-0.308
	(.024)$^{.18}$	(.003)$^{.58}$	(.097)$^{.15}$	(.049)$^{.20}$	(.013)$^{.11}$	(**0.495**)$^{.05}$	(0.044)$^{.12}$	(2.16)$^{.36}$	(0.996)$^{.14}$	(0.276)$^{.27}$
$GDPpc_{t-1}$	**-0.421**	**-0.046**	0.586	**0.605**	**-0.309**	**-5.72**	-0.115	18.729	**13.105**	**-3.57**
	(**.139**)$^{.00}$	(**.015**)$^{.00}$	(.557)$^{.29}$	(**.284**)$^{.03}$	(**.074**)$^{.00}$	(**2.88**)$^{.05}$	(0.251)$^{.65}$	(12.314)$^{.13}$	(**5.73**)$^{.02}$	(**1.59**)$^{.03}$
$Inflation_{t-1}$	-0.012	-0.002	0.017	**-0.095**	0.001	-0.114	-0.034	0.968	**-1.67**	0.093
	(.024)$^{.61}$	(.003)$^{.37}$	(.099)$^{.86}$	(**.051**)$^{.06}$	(.013)$^{.96}$	(0.502)$^{.82}$	(0.044)$^{.42}$	(2.21)$^{.66}$	(**1.03**)$^{.10}$	(0.279)$^{.74}$
$Deficit_{t-1}$	-0.001	**-0.0001**	**-0.004**	0.00004	-0.0003	**-0.013**	**-0.003**	**-0.083**	0.0004	**-0.001**
	(.0004)$^{.12}$	(**.00004**)$^{.01}$	(**.002**)$^{.01}$	(.001)$^{.96}$	(.0002)$^{.13}$	(**0.001**)$^{.10}$	(**0.001**)$^{.00}$	(**0.034**)$^{.02}$	(0.016)$^{.98}$	(**0.004**)$^{.06}$
ΔUE_t	0.055	-0.001	-0.132	**0.249**	**-0.053**	**2.165**	**0.197**	0.942	**5.669**	-0.564
	(.053)$^{.30}$	(.006)$^{.91}$	(.218)$^{.55}$	(**.249**)$^{.03}$	(**.028**)$^{.06}$	(**1.10**)$^{.05}$	(**0.010**)$^{.05}$	(4.84)$^{.85}$	(**2.25**)$^{.01}$	(0.620)$^{.36}$
UE_{t-1}	-0.016	0.001	0.153	0.017	**0.038**	-0.255	0.006	3.78	0.502	**0.956**
	(.027)$^{.56}$	(.003)$^{.83}$	(.109)$^{.16}$	(.055)$^{.76}$	(**.014**)$^{.01}$	(0.555)$^{.65}$	(0.049)$^{.23}$	(2.41)$^{.12}$	(1.12)$^{.66}$	(**0.309**)$^{.00}$
$HseMajor_{t-1}$	0.075	-0.009	0.006	0.186	-0.065	3.19	0.308	3.97	4.35	0.042
	(.106)$^{.48}$	(.012)$^{.42}$	(.434)$^{.99}$	(.222)$^{.40}$	(.057)$^{.26}$	(2.21)$^{.15}$	(0.197)$^{.12}$	(9.59)$^{.68}$	(4.48)$^{.33}$	(1.26)$^{.97}$
$Divided_{t-1}$	0.014	-0.004	-0.316	0.147	-0.030	-0.008	-0.116	-7.89	2.69	-0.664
	(.055)$^{.80}$	(.006)$^{.52}$	(.225)$^{.16}$	(.115)$^{.20}$	(.029)$^{.30}$	(1.14)$^{.99}$	(0.102)$^{.25}$	(4.98)$^{.11}$	(2.32)$^{.25}$	(0.643)$^{.30}$
$Mood_{t-1}$	**0.013**	**0.003**	**0.079**	**-0.032**	0.005	0.244	**0.062**	**1.54**	**-0.676**	0.112
	(**.008**)$^{.09}$	(**.001**)$^{.00}$	(**.032**)$^{.01}$	(**.016**)$^{.04}$	(.004)$^{.18}$	(0.158)$^{.12}$	(**0.014**)$^{.00}$	(**0.695**)$^{.03}$	(**0.319**)$^{.04}$	(0.009)$^{.20}$
ELE_t	0.003	0.004	0.195	0.118	**0.065**	-0.261	0.046	2.834	2.172	**1.407**
	(.049)$^{.95}$	(.006)$^{.44}$	(.201)$^{.33}$	(.102)$^{.25}$	(**.026**)$^{.01}$	(1.026)$^{.80}$	(0.092)$^{.62}$	(4.439)$^{.523}$	(2.067)$^{.294}$	(**0.567**)$^{.014}$
Lagged DV	**0.161**	**0.444**	0.033	**0.123**	**0.317**	**0.196**	**0.456**	0.024	**0.114**	**0.372**
	(**.054**)$^{.00}$	(**.045**)$^{.00}$	(.056)$^{.95}$	(**.065**)$^{.06}$	(**.058**)$^{.00}$	(.053)$^{.00}$	(**.047**)$^{.00}$	(.056)$^{.67}$	(**.065**)$^{.08}$	(**.052**)$^{.00}$
Constant	**3.456**	**0.337**	**-10.389**	**-5.076**	**2.786**	41.755	-2.02	**-280.023**	**-111.097**	**26.985**
	(**1.401**)$^{.01}$	(**.153**)$^{.03}$	(**5.652**)$^{.07}$	(**2.872**)$^{.08}$	(.749)$^{.000}$	(29.046)$^{.15}$	(2.54)$^{.43}$	(**125.016**)$^{.03}$	(**58.072**)$^{.06}$	(**16.189**)$^{.10}$
Adj. R^2 (RMSE)	.84 (0.18)	.94 (.02)	.43 (.75)	.45 (.38)	.86 (.10)	.82 (3.84)	.95 (0.34)	.43 (16.56)	.49 (7.70)	.84 (2.13)

NOTES. 1. Water: Water Resources; AgRe: Agricultural Research and Services; Ground: Ground Transportation; CDev: Community Development; MinR: Miner and Railroad Workers Retirement; 2. Equations estimated by seemingly unrelated regressions (SURE) in Stata 8.2; 3. Each equation has 49 observations and 12 independent variables; 4. Standard errors reported in (parentheses) with p-levels from 2-sided t-tests $^{\text{superscripted}}$

Table 3: Joint Hypothesis Tests of the Significance of NEC

	Null Hypothesis: $\beta_{nec} = 0$									
Model No.	1	2	3	4	5	6	7	8	9	10
1	.004									
2	.000	.001								
3	.007	.000	.042							
4	.001	.000	.000	.001						
5	.001	.001	.003	.001	.006					
6	.004	.001	.015	.000	.001	.009				
7	.004	.001	.042	.001	.006	.009	.000			
8	.008	.000	.021	.001	.005	.020	.088	.088		
9	.000	.000	.001	.001	.001	.000	.001	.001	.001	
10	.001	.000	.007	.001	.006	.0020	.012	.013	.001	.012

NOTES. 1. Models correspond to those in Table 2. See the note to that table for information about the relevant dependent variable in each model; 2. Diagonal elements are p-values from t-tests from each equation in Table 1; 3. Off-diagonal cell entries are p-values from joint hypothesis tests for corresponding pair of equations.

In short, at least from the evidence of the U.S. federal-government budgets historically, there appears to be a lot of promise in, at least, the *effective-constituencies* notion, which underlies the proposed model of the *nature of budgeteering incentives*, whether policymakers optimally manipulate budgets for political effect by targeting broadly with redistribution or narrowly with distribution.

Exploratory empirical analyses also turned toward trying to establish whether pursuing the far more complex convex-combinatorial model described above might likewise bear fruit. To start, the analyses used annual, 1962-95, budgetary data from 19 developed democracies–U.S., Japan, Germany, France, Italy, U.K., Canada, Austria, Belgium, Denmark, Finland, Greece, Ireland, Netherlands, Norway, Portugal, Sweden, Australia, and New Zealand–giving 566 usable observations. We model, in error-correction format, with country indicators, *Social Benefits and Other Transfers* (***SB$_o$***), as a reasonably defensible measure of redistributive spending, and *Property Income Paid by Government* (***PIPG***), as a perhaps defensible proxy for distributive spending,[9] each as a share of GDP. These data are from *OECD National Accounts: Volume II, Detailed Tables (2002 online edition)*. The independent variables (all from and as described in Franzese 2002) include controls for temporal dynamics; government-party polarization and its product with the lagged dependent variable (*veto actors*: see Franzese 2002, ch. 3); government partisanship (***CoG***); election-year indicators (***ELE***); unemployment (***UE***); real GDP growth (***dY***) and levels (***Y***: Wagner's Law); terms of trade (***ToT***), trade openness (***OPEN***), and their product; income inequality (***RW***); and percent of the population aged 65 or older (***POP65o***). The independent variables of interest are the number of governmental parties, ***NoP***, and the number of electoral districts, natural logged, adjusted district spatial size, ***NED***. Table 3 gives the key results.

[9] *PIPG* includes government-debt interest, which, as an indicator of distributive spending, perhaps it should exclude, which is possible to do. The distributive nature of the rest of *PIPG* is also debatable, though, as is whether such spending is an appreciable share of total distributive spending even if it is largely distributive.

INDEPENDENT VARS. ⇒ DEPENDENT VARS. ⇩	NoP	NED
	Full Sample of 19 Democracies	
Social Benefits (Redist.)	+.001251 (.000471)	-.001272 (.001313)
Property Inc. Paid (Dist.)	+.000407 (.000367)	+.000123 (.000453)
Sample of 8 Democracies with Strong Geographic/District Representation: US, Jap, Fra, UK, Can, IR, Austral, NZ		
Social Benefits (Redist.)	+.001190 (.000980)	+.001608 (.002901)
Property Inc. Paid (Dist.)	+8.09e^{-5} (.000577)	+.001577 (.001702)
Sample of 11 Democracies with Strong Interest/Partisan Representation: Ger, Ita, Aus, Bel, Den, Fin, Gre, Net, Nor, Por, Swe		
Social Benefits (Redist.)	+.001372 (.000592)	-.002718 (.001552)
Property Inc. Paid (Dist.)	+.000280 (.000518)	+6.73e^{-5} (.000602)

Among democracies whose electoral systems and other aspects tend to foster (by our read, considering factors discussed above) geographic representation, the number of districts is positive but insignificant in predicting social benefits and other transfers (redistributive spending), whereas that number is negative and approaches significance among countries whose political systems foster more interest representation. Meanwhile, the number of governmental parties has positive and significant effect on social-benefits/transfers spending in interest-representation countries, but only insignificantly positive effects in geographic-representation countries. Conversely, the number of governing parties has no effect at all on property income paid by government in geographic/district-representation countries while it *may* (highly insignificant, though) have some positive effect in partisan/interest-representation countries. Essentially the opposite holds regarding the number of electoral districts: it may have positive effect, perhaps appreciably so, in geographic/district-representation countries while it more certainly has quite-near zero effect in partisan/interest-representation countries. Although these are certainly not the empirical specifications in mind ultimately for evaluating our theory, this pattern of coefficient magnitude and significance bodes well for the potential of those more-sophisticated specifications.

Finally, a linear-additive regression-model of (*Social Benefits / Total Government Disbursement*) on the arguments to model (13) for which I have some empirical measures so far yields this…

	b	se(b)	t	p(t)			b	se(b)	t	p(t)
SB(t-1)	1.014	0.062	16.329	0.000		SB(t-1)	1.014	0.056	18.031	0.000
SB(t-2)	-0.162	0.059	-2.752	0.006		SB(t-2)	-0.162	0.055	-2.947	0.003
UE	0.018	0.024	0.753	0.452		UE	0.018	0.023	0.793	0.428
POP14	0.015	0.044	0.339	0.735		POP14	0.015	0.047	0.318	0.751
POP65	0.261	0.081	3.241	0.001		POP65	0.261	0.098	2.666	0.008
EleYr	0.069	0.137	0.506	0.613		EleYr	0.069	0.128	0.542	0.588
GPart	-0.007	0.004	-1.748	0.082		GPart	-0.007	0.003	-2.109	0.036
VPool	0.259	0.253	1.023	0.307		VPool	0.259	0.357	0.725	0.469
VType	1.253	0.807	1.553	0.122		VType	1.253	0.930	1.347	0.179
GPolar	0.002	0.003	0.690	0.491		GPolar	0.002	0.003	0.625	0.533
LnDMag	-0.260	0.160	-1.627	0.105		LnDMag	-0.260	0.248	-1.048	0.296
IPC	-0.505	0.741	-0.682	0.496		IPC	-0.505	1.171	-0.432	0.666
LnDM*IPC	0.118	0.198	0.595	0.552		LnDM*IPC	0.118	0.307	0.385	0.701
Districts	0.000	0.001	0.030	0.976		Districts	0.000	0.002	0.018	0.986
GFrag	-0.035	0.075	-0.472	0.637		GFrag	-0.035	0.083	-0.427	0.670
GComp	3.997	1.430	2.796	0.006		GComp	3.997	1.926	2.076	0.039
Ballot	-2.936	1.663	-1.765	0.079		Ballot	-2.936	1.922	-1.527	0.128

…which is not especially encouraging, but I do contrarily have strong indication that this sort of EMTI strategy has worked in other contexts. Franzese (RISP 2010) finds support and distinctly estimates the multiple implications for policy outcomes of the dispersal of policymaking-authority across diverse actors, separating veto-actor effects (Tsebelis 2002) from common-pool effects (WSJ 1981), from bargaining & delegation compromise effects, in an estimable nonlinear model of these multiple effects of multiple policymakers. Franzese (AJPS 1999) finds that the monetary-policy effects of CBI depend on everything to which banks & governments would respond differently, employing a convex-combinatorial model that structured these multiple interactions into one factor of proportionality by which CBI reduces monetary-policy responsiveness to political-economic conditions toward zero (unresponsive). Franzese (2003) extended this to open & institutionalized political-economies, in which the monetary-policy effects of financial openness (i.e., capital mobility & small-economy), exchange-rate regime, & CBI depend on everything to which foreign & domestic banks & governments would respond differently, again with theory and substance reducing this complex context-conditionality to a set of factors of proportionality by which those institutions dampened policy toward what would obtain under that combination of mobility, exchange-regime, and domestic-institutional conditions.

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Appendix I: Nonlinear Least-Squares (NLS)

Nonlinear regression is simple to describe, given an understanding of linear regression. The empirical implications of positive theory will usually amount to some statement that an outcome, y, depends on random chance, ε, and some explanatory factors, $\mathbf{x}$, perhaps including multiplicative interactions or other complex terms, according to some function, $y=f(\mathbf{x},\boldsymbol{\beta},\varepsilon)$, involving parameters $\boldsymbol{\beta}$ that relate $\mathbf{x}$ to y. In linear regression, we assume the function is linear-additive and separable, with $\boldsymbol{\beta}$ being simple coefficients on $\mathbf{x}$, giving $y=\mathbf{x}'\boldsymbol{\beta}+\varepsilon$. The ordinary linear-regression (OLS) problem and solution is thus:

$$
\begin{aligned}
&Min_{\boldsymbol{\beta}} \sum_{\mathrm{i}=1}^{\mathrm{n}} \left(y_i - \mathbf{x}_i\boldsymbol{\beta}\right)^2 = Min_{\boldsymbol{\beta}} \left(\mathbf{y}-\mathbf{X}\boldsymbol{\beta}\right)'\left(\mathbf{y}-\mathbf{X}\boldsymbol{\beta}\right) \\
&= Min_{\boldsymbol{\beta}}\ \mathbf{y}'\mathbf{y} - \mathbf{y}'\mathbf{X}\boldsymbol{\beta} - \boldsymbol{\beta}'\mathbf{X}'\mathbf{y} + \boldsymbol{\beta}'\mathbf{X}'\mathbf{X}\boldsymbol{\beta} \equiv Min_{\boldsymbol{\beta}}\ S \\
&\frac{\partial S}{\partial \boldsymbol{\beta}} = \mathbf{0} \Rightarrow -2\mathbf{X}'\mathbf{y} + 2\mathbf{X}'\mathbf{X}\boldsymbol{\beta} = 0 \\
&\Rightarrow \mathbf{X}'\mathbf{y} = \mathbf{X}'\mathbf{X}\boldsymbol{\beta} \\
&\Rightarrow \hat{\boldsymbol{\beta}}_{OLS} = \left(\mathbf{X}'\mathbf{X}\right)^{-1}\mathbf{X}'\mathbf{y}
\end{aligned}
\tag{21}
$$

If we instead continue to assume the random component is additively separable but allow explanatory factors, $\mathbf{x}$, and associated parameters, $\boldsymbol{\beta}$, to determine the systematic component of y according to some nonlinear function, $E(y)=f(\mathbf{x},\boldsymbol{\beta})$, specified by theory, with additively separable stochastic component, ε, so $y=f(\mathbf{x},\boldsymbol{\beta})+\varepsilon$, we have this nonlinear-regression problem and solution:

$$
\begin{aligned}
&Min_{\boldsymbol{\beta}} \left(\mathbf{y} - f(\mathbf{X},\boldsymbol{\beta})\right)'\left(\mathbf{y} - f(\mathbf{X},\boldsymbol{\beta})\right) \\
&= Min_{\boldsymbol{\beta}}\ \mathrm{S} \equiv \mathbf{y}'\mathbf{y} - \mathbf{y}'f(\mathbf{X},\boldsymbol{\beta}) - f(\mathbf{X},\boldsymbol{\beta})'\mathbf{y} + f(\mathbf{X},\boldsymbol{\beta})'f(\mathbf{X},\boldsymbol{\beta}) \\
&\frac{\partial S}{\partial \boldsymbol{\beta}} = \mathbf{0} \Rightarrow -2\left(\frac{\partial f(\mathbf{X},\boldsymbol{\beta})}{\partial \boldsymbol{\beta}}\right)'\mathbf{y} + 2\left(\frac{\partial f(\mathbf{X},\boldsymbol{\beta})}{\partial \boldsymbol{\beta}}\right)' f(\mathbf{X},\boldsymbol{\beta}) = \mathbf{0} \\
&\Rightarrow \left(\frac{\partial f(\mathbf{X},\boldsymbol{\beta})}{\partial \boldsymbol{\beta}}\right)'\mathbf{y} = \left(\frac{\partial f(\mathbf{X},\boldsymbol{\beta})}{\partial \boldsymbol{\beta}}\right)' f(\mathbf{X},\boldsymbol{\beta})
\end{aligned}
\tag{22}
$$

If $f(\mathbf{x},\boldsymbol{\beta})$ were the linear-additive $\mathbf{x}'\boldsymbol{\beta}$ as in the ordinary regression problem, then the last expression solves analytically to the familiar OLS formula in (21). However, with $f(\mathbf{x},\boldsymbol{\beta})$ nonlinear in parameters $\boldsymbol{\beta}$, the last expression in (22) cannot in general be simplified further. $\hat{\boldsymbol{\beta}}_{NLS}$ may be found numerically (i.e., computer search) though, either by finding the values for $\boldsymbol{\beta}$ that satisfy that last expression or by finding the values that minimize the sum of squared errors, S, given the data, $\mathbf{y}$ and $\mathbf{X}$. Effectively, the *derivatives*[36] of $f(\mathbf{x},\boldsymbol{\beta})$ with respect to $\boldsymbol{\beta}$, which would be simply $\mathbf{x}$ if $f(\mathbf{x},\boldsymbol{\beta}) = \mathbf{x}'\boldsymbol{\beta}$ as in the linear-additive case, serve as the regressors (and play like role in estimating the variance of the estimated parameters). In short, our basic understandings about ordinary least-squares regression, its necessary assumptions and its properties under those assumptions, apply also to nonlinear regression with the *derivatives* of $f(\mathbf{x},\boldsymbol{\beta})$ replacing $\mathbf{x}$.[37]

The crucial change lies in interpretation and is the one that comes with any move beyond strictly linear-additive models—even just to simple linear-interaction models, dynamic models (i.e., models with time or spatial lags of the dependent variable in them), or the familiar logit or probit models of (probabilities of) binary outcomes—namely, that *coefficients* are not *effects*. The effect of x on y is, always and everywhere, the derivative or difference of (change in) y with respect to (over the difference or change in) x, $\mathrm{d}y/\mathrm{d}x$, but only in purely linear-additive-separable models are these effects, these derivatives, equal to the coefficient on the variable in question. In other models, effects of one variable generally depend on other variables' values and usually more than one coefficient—that is, the effects of x are context-conditional. The important point here is that, if we can theorize how y depends on x, then we can write a function that describes that relationship, i.e., some $f(\mathbf{x},\boldsymbol{\beta})$, as in (13) for instance, and then we can specify our empirical model by that function. Finally, provided the specified equation is identified and has positive degrees of freedom so that inference from data is logically possible, and if the comparative history that is our database has actually provided sufficient useful variation, we can estimate, evaluate, and interpret that model. Happily, the statistical software packages that political scientists commonly use now possess user-friendly NLS procedures.[38]

[36] Actually, the correct term is *gradient* because $\boldsymbol{\beta}$ is a vector, so the slope is multidimensional.

[37] All the usual additional complications of numerical optimization as opposed to analytical solution—such as possibility of local maxima, flat areas or ridges, or "nasty" surfaces to search and the concomitant need to explore multiple starting values and search sensitivities and procedures—apply also.

[38] The `E-Views` least-squares command, LS, accepts any $f(\mathbf{x},\boldsymbol{\beta})$, linear-additive or otherwise, or see *nl.ado* in `Stata`.

<u>Appendix II</u>: Government-Competitiveness Measure

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1. Operationalization / Point Estimate

(1) Estimate the AR(1) model for each party j = {1…J} of its seat share at the n-th election (denoted by $PSS_{j,n}$) in its logit form ($LPSS_{j,n} = \ln\{ PSS_{j,n} / (1 - PSS_{j,n})\}$): [39]

$$LPSS_{j,n} = \alpha_{0,j} + \alpha_{1,j} LPSS_{j,n-1} + \varepsilon_{j,n}$$

(2) Then, predict the expected seat share in the logit form for each party j in the n+1-th election:

$$\hat{E}(LPSS_{j,n+1}) = \hat{\alpha}_{0,j} + \hat{\alpha}_{1,j} LPSS_{j,n}$$

(3) Transform $\hat{E}(LPSS_{j,n+1})$ back to $\hat{E}(PSS_{j,n+1})$.

$$\hat{E}(PSS_{j,n+1}) = \exp\{\hat{E}(LPSS_{j,n+1})\}/[1 + \exp\{\hat{E}(LPSS_{j,n+1})\}]$$

(4) For all governments formed between the n-th and n+1-th elections (each government is denoted by k), the expected government seat share (GSS^k) is given by:

$$\hat{E}(GSS^k) = \sum_{j \in kGovt} \hat{E}(PSS_{j,n+1})$$

where *kGovt* is the set of parties in the k-th government.

(5) Then, government competitiveness (gc) for the k-th government is:

$$gc^k = \hat{E}(GSS^k) \cdot [1 - \hat{E}(GSS^k)]$$

(6) TSCS observation for country c in year t is:

$$gc^{c,t} = \sum_{k \in year(t)} \delta^k_{c,t}\, gc^k$$

where year(t) = the set of governments which exist in year t, $\delta_{c,t}^{k}$ = the duration of government k of country c in year t divided by the sum of the duration of all governments of country c in year t.

2. Two Versions of Governmental Competitiveness

(a) *Expected* Government Competitiveness

The first version uses all elections n = 1…N in the dataset to estimate the AR(1) model of party seat share (equation (1)) and make *in-sample* forecast of $E(LPSS_{j,n})$. I call the seat shares (SS) and government competitiveness (GC) based on this *in-sample* forecast the *expected* SS and GC.

(b) *Forecasted* Government Competitiveness

The second version uses data up to election n to estimate the AR(1) model of party seat share (equation (1)), and make *out-sample* forecast of $E(LPSS_{j,n+1})$ for the next election at n+1 (i.e., the forecast model in a usual sense). I call SS and GC estimated based on this *out-sample* forecast the *forecasted* SS and GC.

3. Standard Errors

After deriving standard errors of $\hat{E}(LPSS_{j,n+1})$, standard errors of $\hat{E}(PSS_{j,n+1})$, $\hat{E}(GSS^k)$, and gc^k are

[39] I used a logt form because, for some countries, the predicted vote share was unreasonable (i.e., greater than 1) without the transformation.

calculated by the Delta method as follows:

(1) Standard Error for $\hat{E}(LPSS_{j,n+1})$

$$SE(\hat{E}(LPSS_{j,n+1})) = \sqrt{V(\hat{\alpha}_{0,j}) + V(\hat{\alpha}_{1,j}) \cdot (LPSS_{j,n+1})^2 + 2 \cdot LPSS_{j,n+1} \cdot Cov(\hat{\alpha}_{0,j}, \hat{\alpha}_{1,j})}$$

(2) Standard Error for $\hat{E}(PSS_{j,n+1})$

$$SE(\hat{E}(PSS_{j,n+1})) \approx \frac{\exp\{\hat{E}(LPSS_{j,n+1})\}}{1+\exp\{\hat{E}(LPSS_{j,n+1})\}} \cdot \left[1 - \frac{\exp\{\hat{E}(LPSS_{j,n+1})\}}{1+\exp\{\hat{E}(LPSS_{j,n+1})\}}\right] \cdot SE(\hat{E}(LPSS_{j,n+1}))$$

(3) Standard Error for $\hat{E}(GSS^k)$

<u>Assuming independence of $\hat{E}(PSS_{j,n+1})$ across parties</u>,

$$SE(\hat{E}(GSS^k)) = \sum_{j \in kGovt} SE(\hat{E}(PSS_{j,n+1}))$$

(4) Standard Error for gc^k

$$SE(\mathrm{gc}^k) \approx (1 - 2 \cdot \hat{E}(GSS^k)) \cdot SE(\hat{E}(GSS^k))$$

4. Measurement Results: 23 Developed Democracies

Figures for each country which show the estimation results of both the expected and forecasted GSS and GC for each government are presented at the end of this memo. Note that the range of the vertical axis of GC in these figures is different from country to country.

5. Notes on the Estimation Results

Some notes on the measurement results are given below:

General

(1) The measurement results are not transformed into TSCS data yet. Figures show the expected/forecasted GSS/GC *for each government* (assigned specific number).
(2) The data used are Thomas Cusack's PGL file collection (wish9.sav) with several errors corrected. For election data, some recent election results which are not included in Cusack's data are added whenever possible in order to make possible the estimation of AR(1) model of seat share of some relatively new parties. Government data beyond Cusack's data are not updated, however.
(3) Figures show, for each government *k*, its actual GSS/GC at election *n* (the election prior to the government) and its expected/forecasted GSS/GC at election *n+1* (the election after the government) based on its actual ones at election *n*.
(4) For governments formed under the first 3 elections, no forecasted GSS and GC are given. This is because we need the first 4 elections to estimate the AR(1) model of seat share (4 elections = 3 observations with a lagged dependent variable being the only covariate).
(5) For GC, uncompetitive governments have large standard errors due to its analytical formula. That is, standard errors involve $(1 - 2 \cdot \hat{E}(GSS^k))$ which becomes greater when the government is more uncompetitive.
(6) GC must be in (0, 0.25) and GSS must be in (0, 1); however, measurement results sometimes go beyond these reasonable ranges. This is partly due to the approximation errors of standard errors by the delta method. This type of unreasonable result can be avoided using simulation to estimate standard

errors. Another source of unreasonable results is that, although the estimation of each party's vote share is confined in (0, 1) by logit transformation, the sum of all parties' vote shares is not confined in (0, 1). In principle, this type of unreasonable result can be avoided by using the compositional data model, but it is not practical in the present case because parties participated in elections vary often in most countries. As a result, even after correcting the errors due to the delta method via simulations, there will remain some unreasonable values especially for oversized coalitions.

Australia
Nothing in particular.

Austria
Nothing in particular.

Belgium
(1) The Socialist Party (BSP/PSB) split into two regional socialist parties in 1978. Since these two parties has entered coalition governments together thereafter, these parties are treated as a single one in estimating AR(1) model of seat share.
(2) The same is applied to the Christian Democrats (CVP/PSC).
(3) The Liberals also split into regional parties, but there is one government in which the only Flemish liberal party joined. For this government, the estimation of AR(1) model of seat share is conducted for the Flemish liberals only. For other governments, AR(1) model is estimated for both the Flemish and Francophone liberals altogether.
(4) Except for governments under the first 3 elections, there are 3 governments for which the forecasted GSS/GC cannot be estimated because there are sufficient observations to forecast AR(1) model for at least one party participating in these governments.

Canada
During the 1990's, many Progressive Conservative representatives defected to join the Reform Party (later renamed to the Alliance), but they eventually merged into the new Conservative Party. All of them are treated as a single party in estimating the AR(1) model of their seat share.

Denmark
Nothing in particular.

Finland
As for two governments which the TPSL participated (govt 25 & 16), the seat shares of the SDP and the TPSL are combined to estimate AR(1) model of their combined seat share, because the TPSL split from SDP, ran for three elections only (which makes impossible to estimate the forecasted SS for the TPSL), and merged back to the SDP.

France
(1) For governments in which both the Gaullist party and the Independent Republicans (RI) participated, the seat shares of the Gaullists and the RI are combined to estimate the AR(1) model of their seat share, because they participated in all these coalitions together and there are not sufficient observations for RI for a separate estimation.
(2) For a few governments in which the Gaullists, the RI, and the Center, Democracy and Progress (CDP) participated, their seat shares are combined to estimate the AR(1) model of their seat share, because there is only a single observation for the CDP.
(3) For one government in which the Left Radicals (MRG), the Reform Movement (MR), and the CDP participated, the seat shares of these three parties and their predecessors in previous elections are combined as a single series to estimate the AR(1) model of their seat share, because there is only a single observation for the MR and these three parties were reorganizations of two predecessor parties.

(4) For the Union for French Democracy (UDF) formed in 1978, its seat share thereafter and the seat shares of their predecessors in previous elections are combined as a single series to estimate the AR(1) model of the UDF's seat share.
(5) For the Greens, there are not sufficient observations to estimate the AR(1) model, and therefore, neither expected nor forecasted GSS/GC are estimated for a government with the Greens.
(6) There are several governments for which either expected or forecasted GSS/GCC cannot be estimated. For the expected GSS/GCC, the reason is that at least one party participated in that government ceased to exist before the next election; since the expected seat share here is an in-sample forecast, it cannot be estimated for that party.[40] For the forecasted GSS/GCC, the reason is that there are not sufficient observations for at least one party in the government to forecast its seat share.

Germany
(1) For a few governments which the German Party (DP) participated in, the seat shares of CDU/CSU and the DP are combined to estimate AR(1) model of their seat shares, because both participated in these governments together and they formed a pre-electoral coalition in two elections.
(2) Since the All-German Bloc/League of Expellees and Disenfranchised (GB/BHE) was elected to the parliament only once, its seat share cannot be estimated by AR(1) model. Accordingly, neither forecasted nor expected GSS/GC is provided for the government which GB/BHE participated.

Greece
The Communist Party (KKE) formed an electoral alliance with smaller parties called Coalition of the left and Progress (SYN) in three consecutive elections in 1989 and 1990. The KKE defected from the coalition while the SYN remained in the race thereafter. Seat share of the KKE before and after its participation in the SYN and that of the SYN in 1989 &1990 elections only are combined as a single series to estimate the AR(1) model used to forecast the seat share of the SYN which participated in government in 1989 and 1990.

Iceland
(1) There was a small leftist party defected from the People's Alliance (PA; formerly the Socialist Party) — Union of Liberals and Leftists (ULL). They were elected to the parliament only twice so that we cannot estimate AR(1) model of its seat share, but they participated in government once. Since PA also participated in this government, the seat shares of the PA and the ULL are combined to estimate AR(1) model of their seat shares for this government only.
(2) There was also a small conservative party defected from the Independence Party (IP) — Citizens' Party (CP). They were elected to the parliament only once, but participated in government once, too. Unlike the case of the ULL-involved government above, the IP did not participate in this government. Therefore, the CP's seat share cannot be estimated, and therefore neither expected nor forecasted GSS/GC is provided for the government which the CP participated.

Ireland
(1) Seat shares of the Workers Party (WP) before the 1989 election and the Democratic Left (DL) after the 1992 election are combined as a single series to estimate the AR(1) model of their seat share because all but one representative of the WP left the party to form the DL in 1992.
(2) For three governments which Fianna Fáil (FF) and the Progressive Democrats (PD) both joined, their seat shares are combined as a single series to estimate the AR(1) model of their seat share because the PD split from the FF and there are not enough observations to forecast the PD's seat share alone.

Italy

[40] These seat shares can be obtained by allowing out-sample forecast for the expected GSS/GCC. I have not done it at this point, as it requires additional programming otherwise unnecessary.

(1) The Socialist Party (PS) and the Italian Democratic Socialist Party (PSDI) once formed a pre- and post-electoral coalition — the Unified Socialist Party (PSU) for the 1968 election. For four governments which PSU participated in, total seat shares of PS and PSDI prior to the 1968 election and the seat share of PSU in the 1968 election are used as a single series for estimating the AR(1) model of PSU's seat share. On the other hand, the estimation of individual AR(1) model of PS and PSDI respectively does not include PSU's seat share in the 1968 election.
(2) Before the 1992 election, the Communist Party (CPI) split into two parties, of which a larger one is the Democratic Party of the Left (PDS). For a short-lived government in 1993 which PDS participated in, the AR(1) model of PDS's seat share is estimated using the seat share of CPI before 1992 and PDS's seat share in the following two elections (PDS merged with PSI thereafter) together as a single series.
(3) For the first Olive Tree government in 1996 — in which the Italian People's Party (PPI; later became Democracy is Freedom – Daisy [DL]), the Greens (VERDI), the Italian Renewal (RI), and PDS participated —, the seat shares of PPI, RI, and PDS in four elections between 1996 and 2006 are combined as a single series to estimate the AR(1) model of their seat shares.
(4) There are several governments for which either expected or forecasted GSS/GCC cannot be estimated. For the expected GSS/GCC, the reason is that at least one party participated in that government ceased to exist before the next election; since the expected seat share here is an in-sample forecast, it cannot be estimated for that party (see foot note 2). For the forecasted GSS/GCC, the reason is that there are not sufficient observations for at least one party in the government to forecast its seat share.

Japan
(1) For two governments in which the Liberal Democratic Party (LDP) and Sakigake Party both participated, their seat shares are combined as a single series to estimate the AR(1) model of their seat share because the Sakigake split from the LDP and there are not enough observations to forecast the Sakigake's seat share alone.
(2) For one government in which the Liberal Democratic Party (LDP) and the New Conservative Party (NCP) both participated, their seat shares are combined as a single series to estimate the AR(1) model of their seat share because the members of the NCP are originally from the LDP and there are not enough observations to forecast the NCP's seat share alone.
(3) For two non-LDP governments in1993 and 1994, neither expected nor forecasted GSS/GCC can be estimated because there are a few parties in this government which ran in one election only.

Luxembourg
Nothing in particular.

Netherlands
(1) For a government which the DS70 (a short-lived splinter from the PvdA), neither expected nor forecasted GSS/GCC can be estimated because there are not sufficient observations for the DS70 to estimate either expected or forecasted seat share.
(2) There is one more government for which neither expected nor forecasted GSS/GCC is estimated. For the expected GSS/GCC, the reason is that two parties participated in that government merged to form a new party (together with one more party) in the election right after that government; since the expected seat share here is an in-sample forecast, it cannot be estimated for these two parties (see footnote 2). For the forecasted GSS/GCC, the reason is that there are not sufficient observations for D66 at that point to estimate the forecasted seat share.
(3) Three Christian democratic parties merged into the Christian Democratic Appeal (CDA) in 1977. AR(1) models of seat shares of these three parties before 1977 are estimated separately since these parties did not necessarily participate in the same government. The AR(1) model of the seat share of the CDA used for governments after 1977 is estimated using both total seat share of these three parties before 1977 and the CDA's seat share thereafter as a single series.

Norway
Nothing in particular.

Portugal
For three governments formed by the pre- and post-electoral coalition of the Democratic Alliance (AD) which consisted of the Democratic Social Center/People's Party (CDS/PP), the Social Democratic Party (PSD), and the Popular Monarchist Party (PPM), total seat share of these three parties is used as a single series to estimate the AR(1) model of its seat share.

Spain
Three conservative parties merged into the People's Party (PP) in 1989. AR(1) model of seat share of PP used for one government which was formed solely by PP in 1996 is estimated using both total seat share of these three parties before 1989 and PP's seat share thereafter as a single series.

Sweden
Forecasted GSS/GC cannot be estimated for one government (#21) formed in 1991 which Christian Democrats (kd) participated in, because there are not sufficient observations to forecast the seat share of kd.

Switzerland
Nothing in particular.

United Kingdom
Nothing in particular.

United States
(1) A government party for the US is defined as the party of the President.
(2) Seat share of the House of Representative is used for estimation.
(3) The length of each government is defined as a 2-year term of each House.

6. Discussion

GC of government *k* is derived in terms of the forecasted seat shares at the next election based on the seat shares at the previous election using AR(1) models of seat share of government parties. Alternatively, GC may be simply derived in terms of the actual seat shares of government *k* at the previous election (reported as "Actual GSS/GC" in the figures). In the latter case, it is simply assumed that the previous election results reflect the competitiveness felt by the current government. In the previous case, the competitiveness felt by the current government is estimated from the previous election results by a little more sophisticated way.
My concern is whether there is sufficient gain from deriving GC by a sophisticated method of AR(1) model in comparison to simply using the actual results in the previous election. First, the estimated GC is quite uncertain. In many cases, the range of ± 1 s.e. of either expected or forecasted GC covers the actual GC. Second, the variation shown in the estimated GC is not very different from the actual GC in most cases. Third, some strong assumptions were made when deriving the estimated GC such as the independence of seat shares among parties in the same election. There are also country-specific assumptions detailed above. Fourth, the estimation will produce some unreasonable value even after correcting the errors due to the delta method via simulation. Fifth, there are some governments for which either expected or forecasted GC (or both) cannot be estimated. Sixth, estimating GC through AR(1) model is far more cumbersome than using the actual GC.

Figures:
Government Seat Share (GSS) & Government Competitiveness (GC) in 23 Developed Democracies

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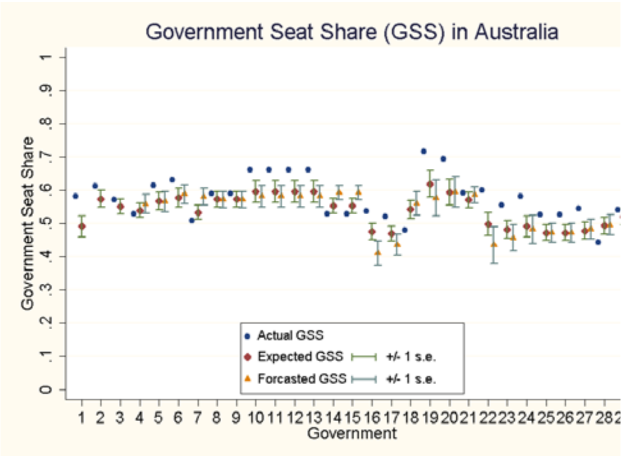

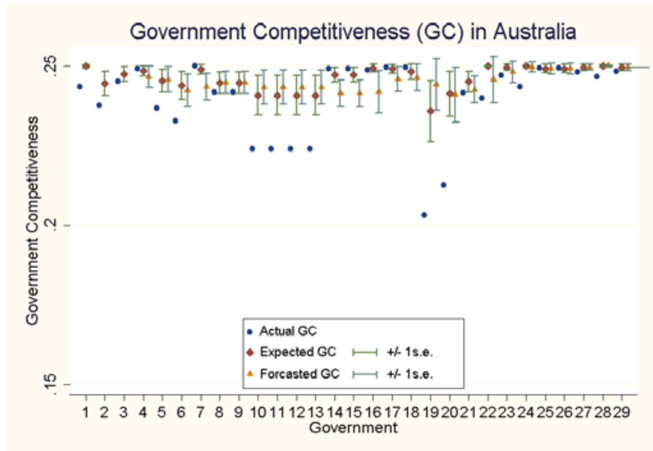

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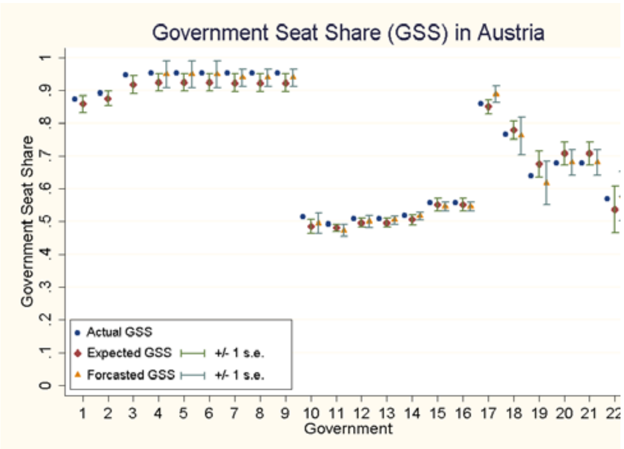

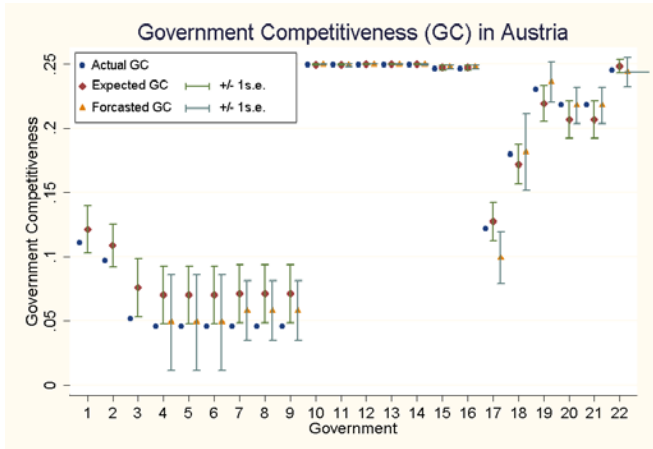

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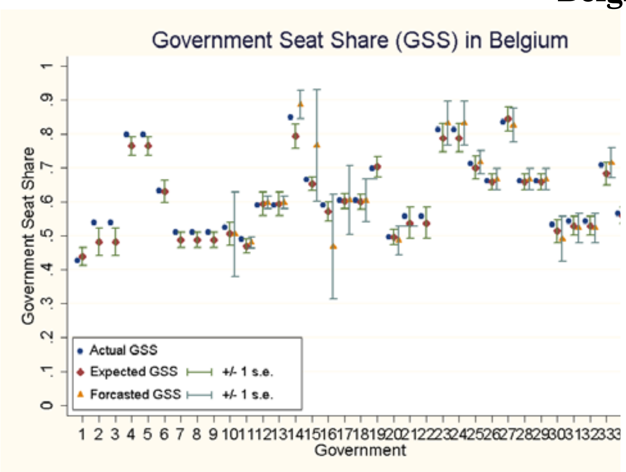

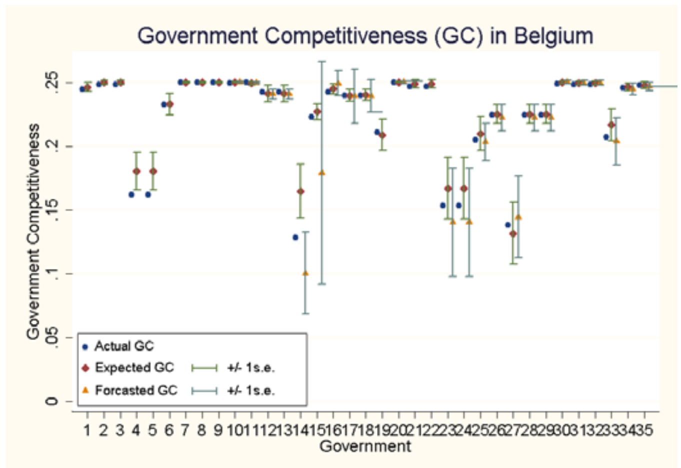

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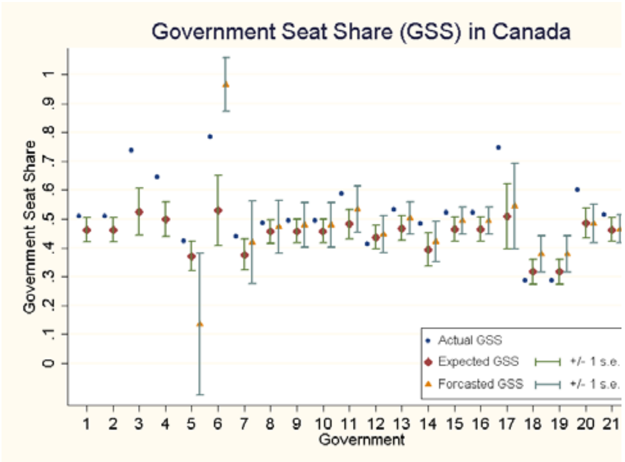

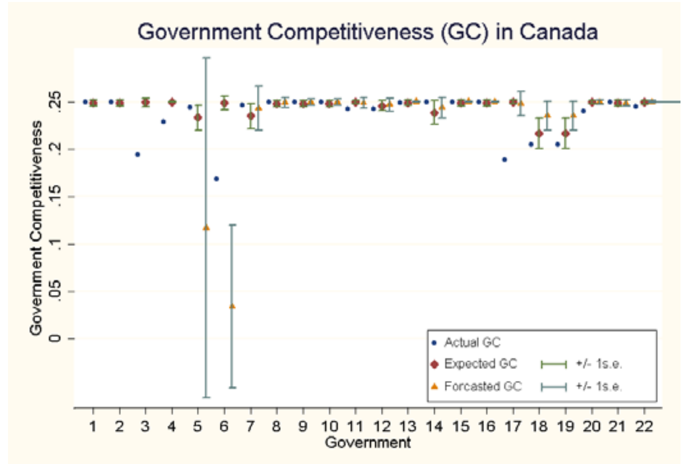

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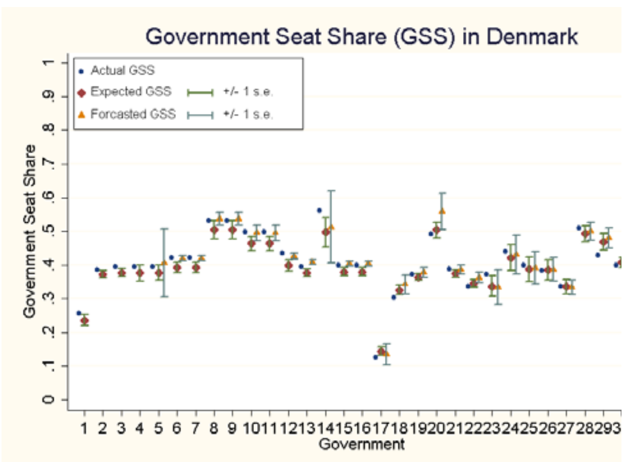

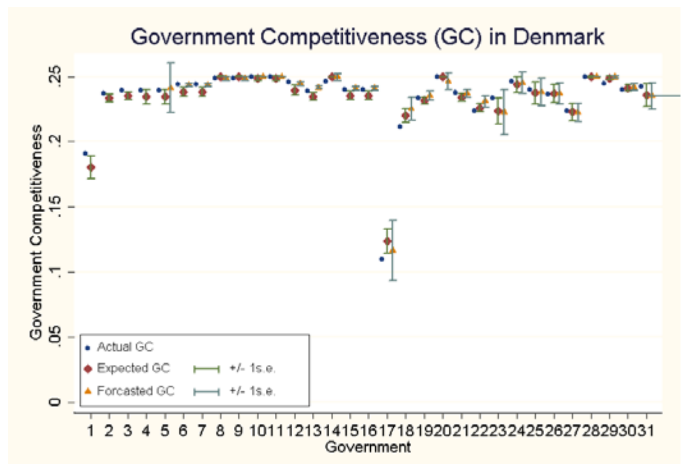

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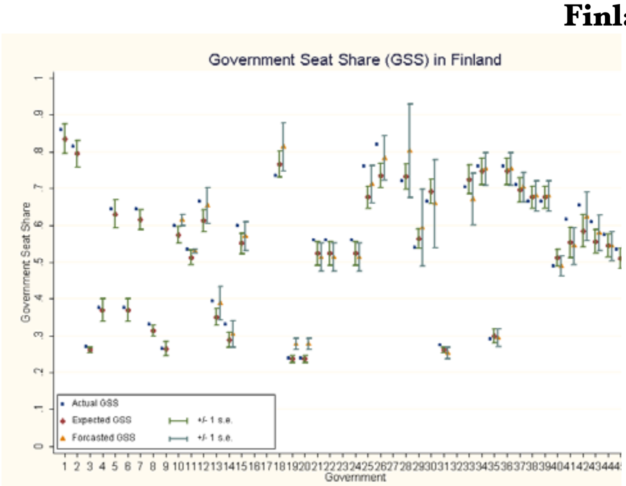

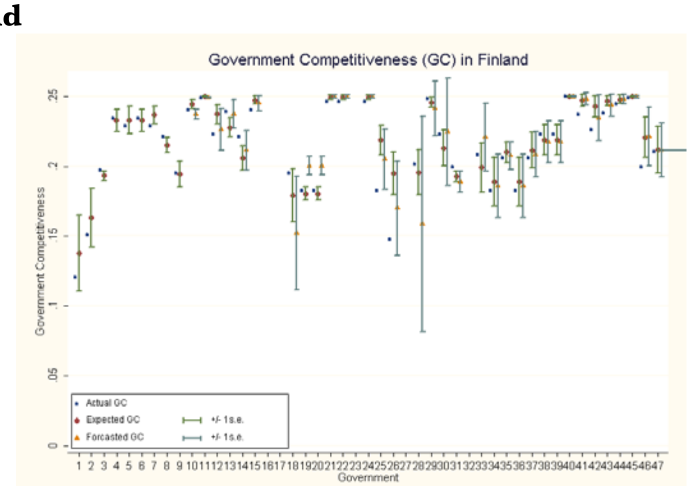

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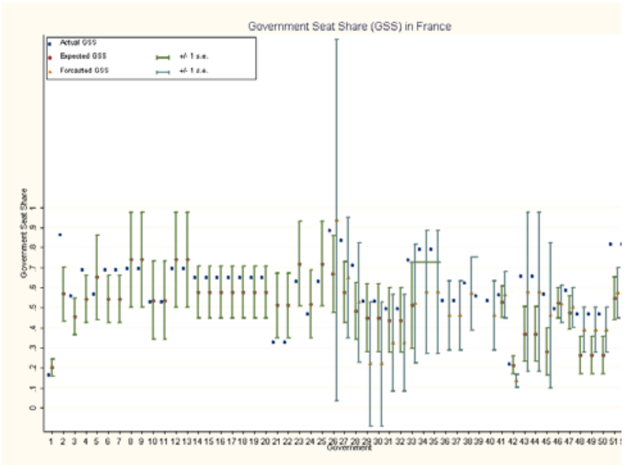

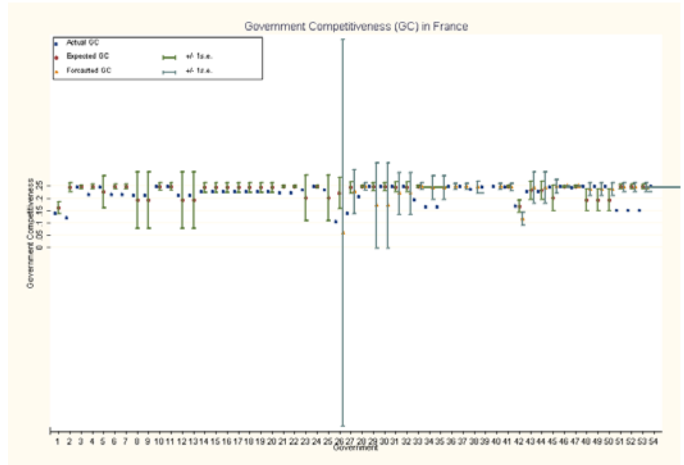

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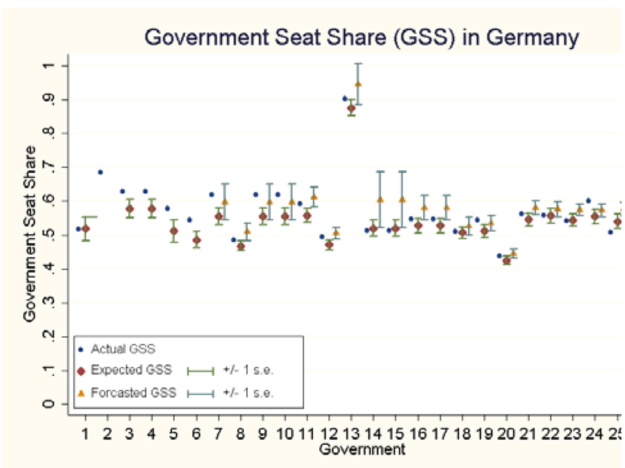

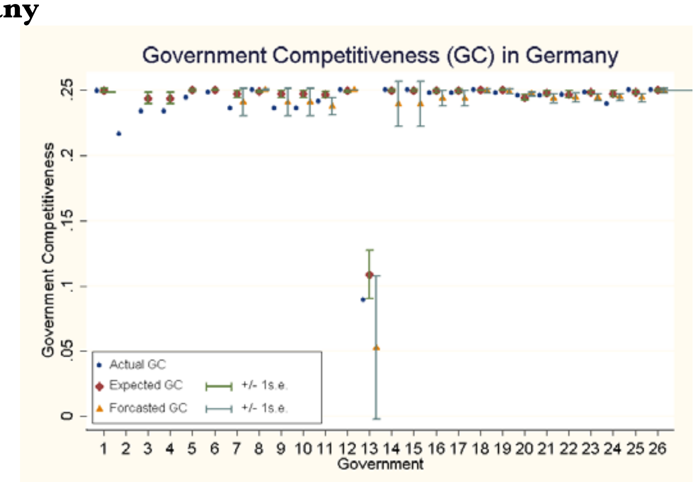

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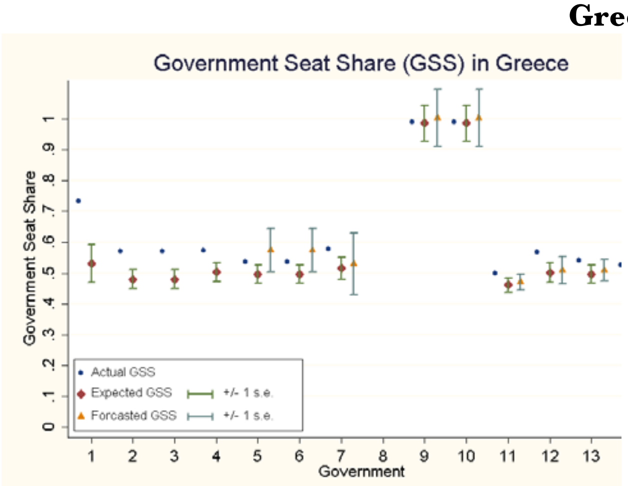

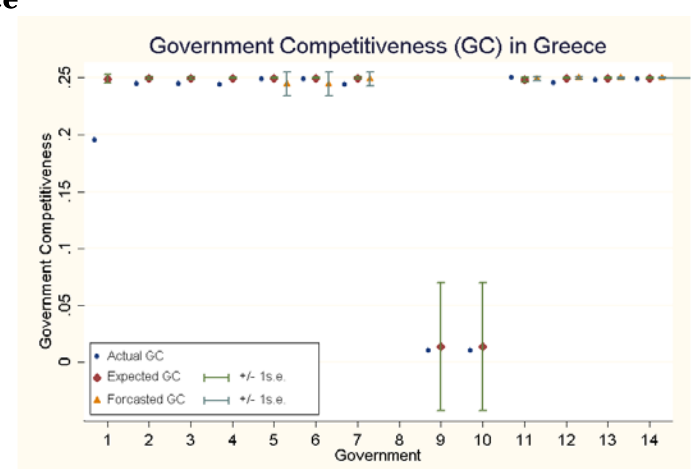

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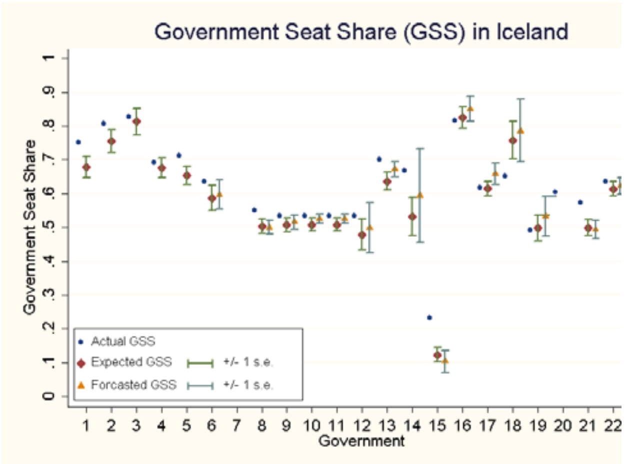

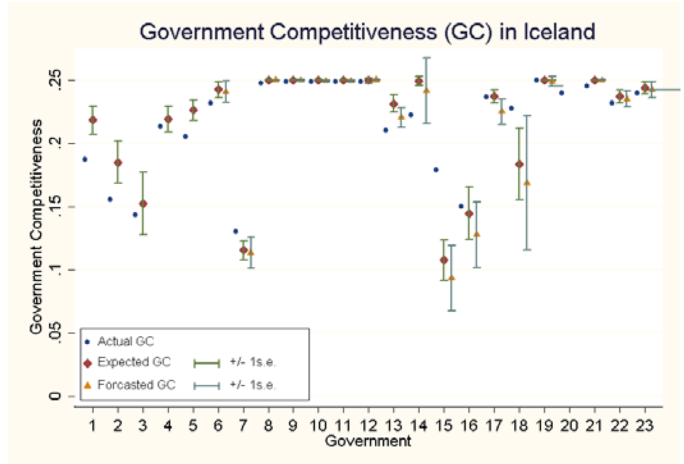

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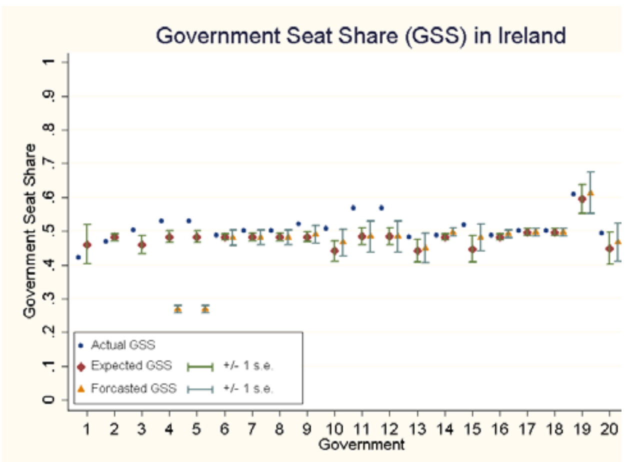

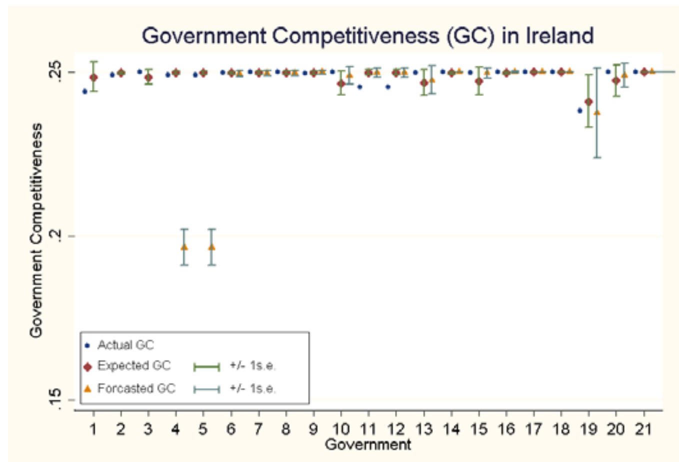

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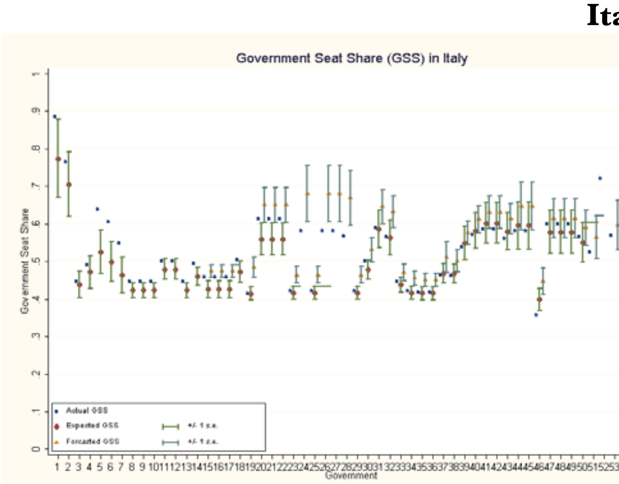

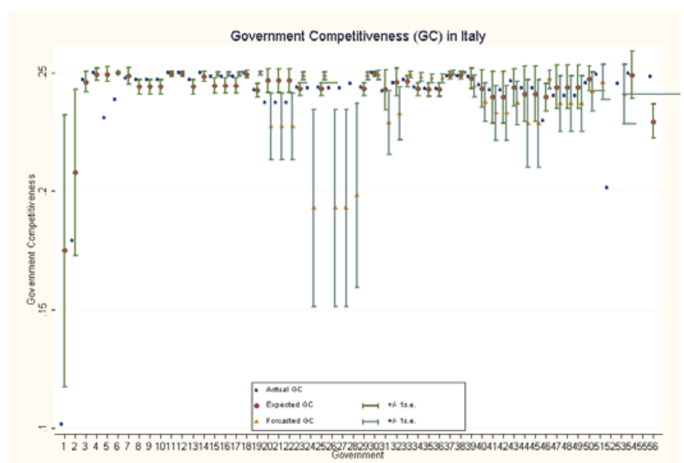

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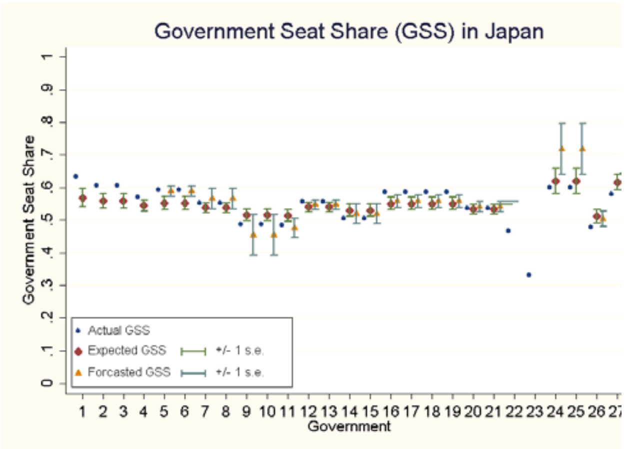

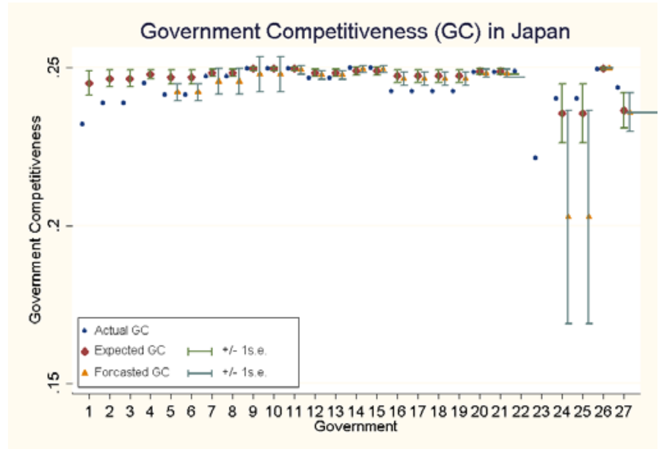

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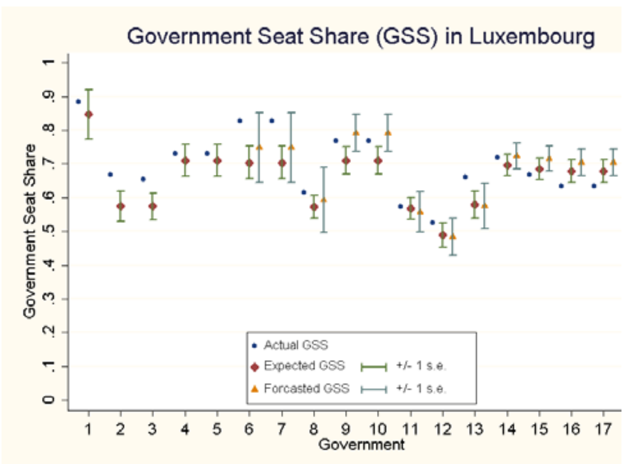

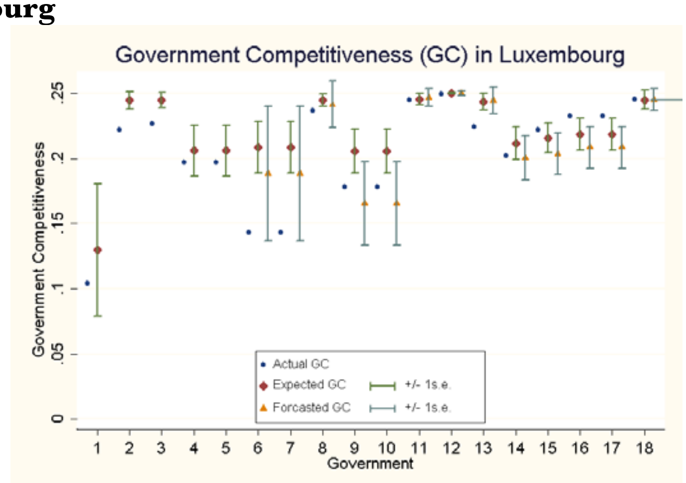

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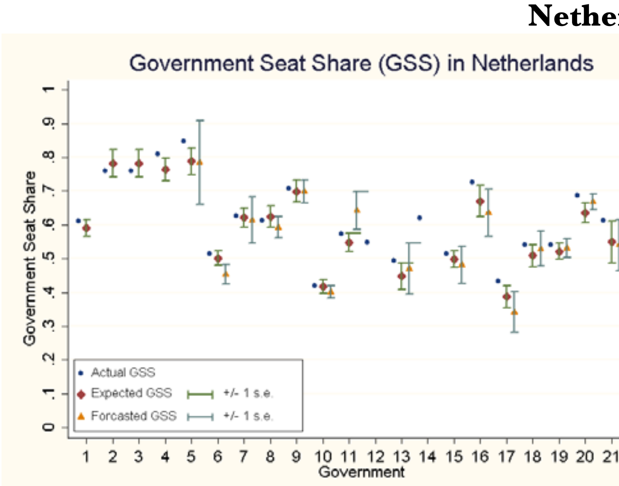

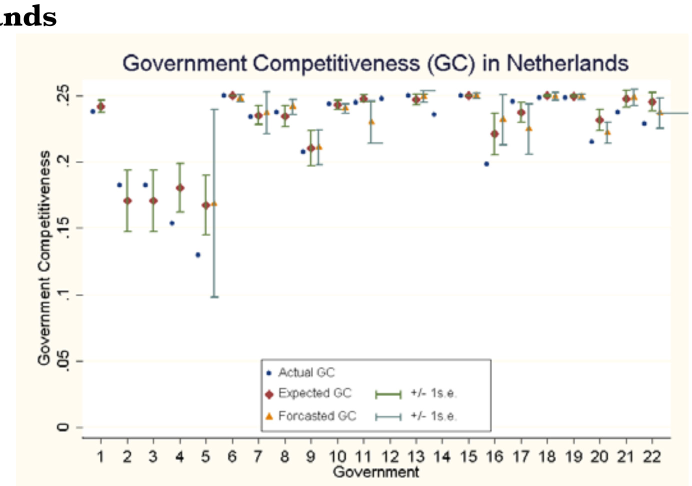

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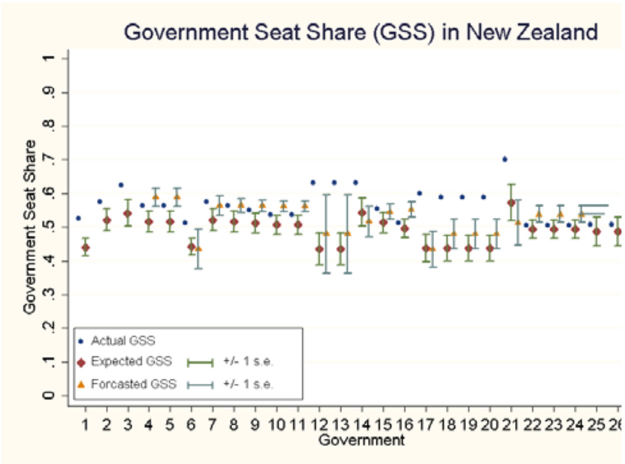

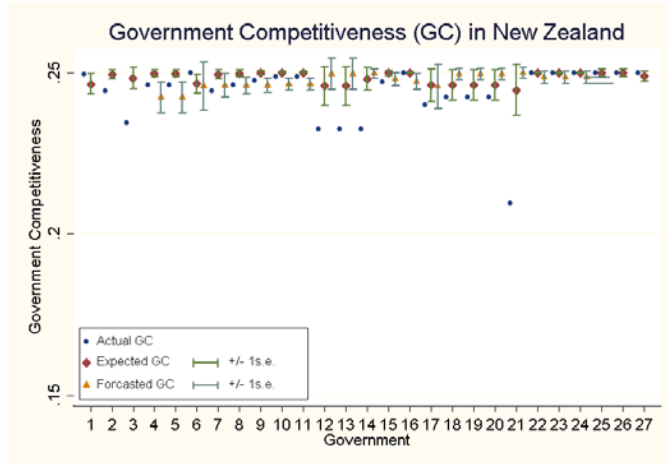

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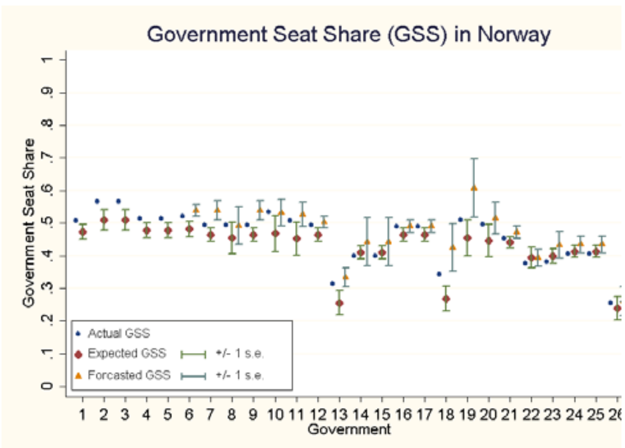

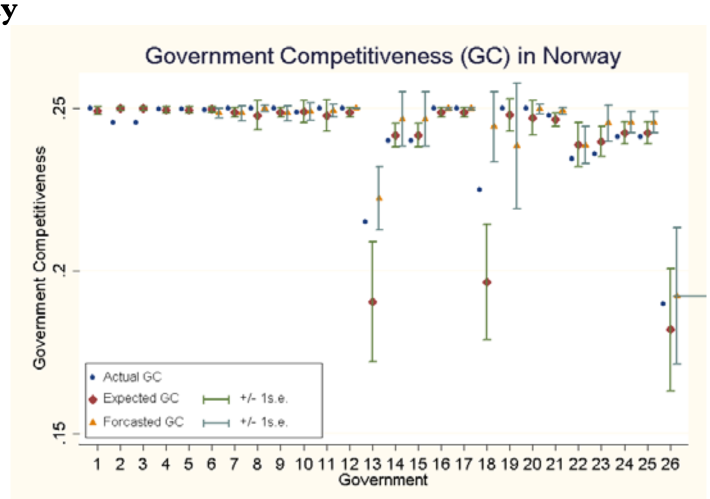

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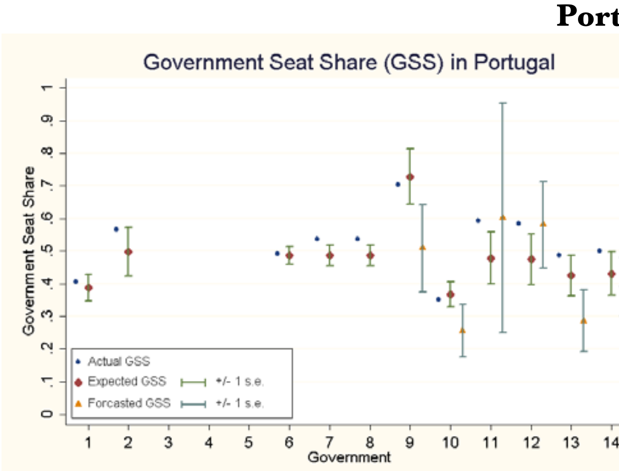

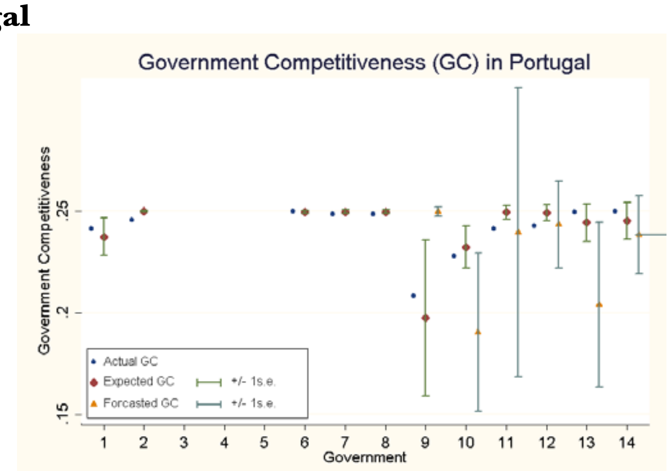

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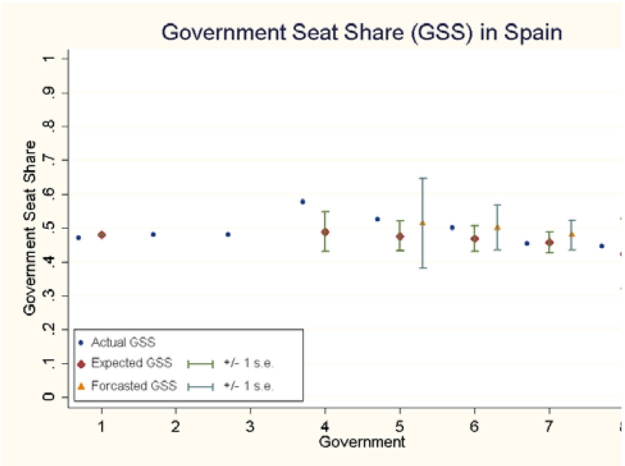

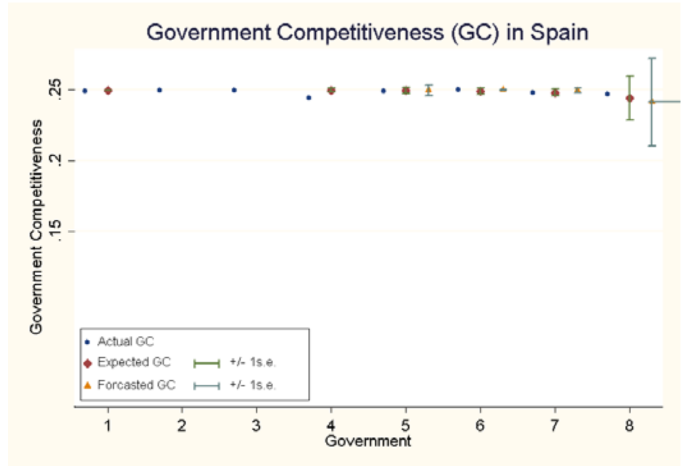

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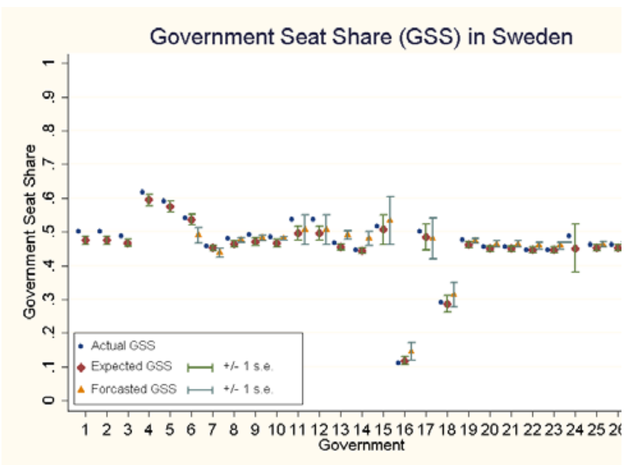

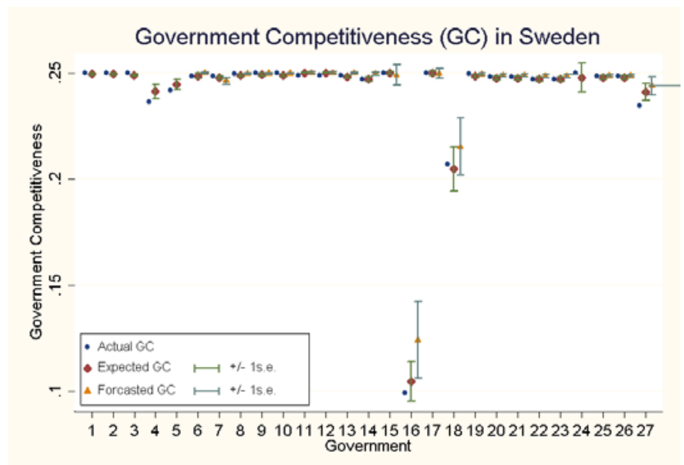

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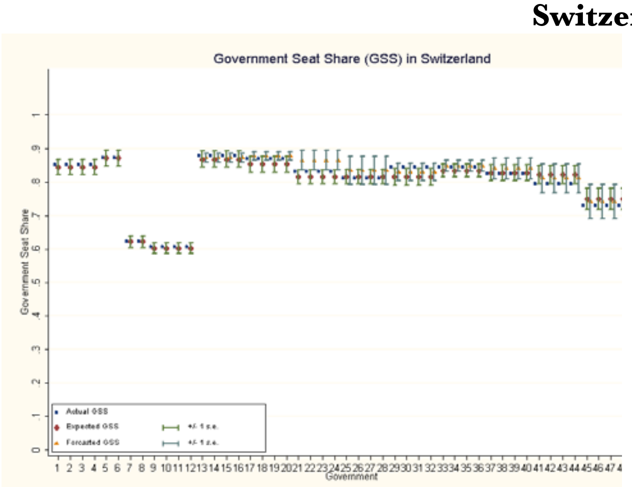

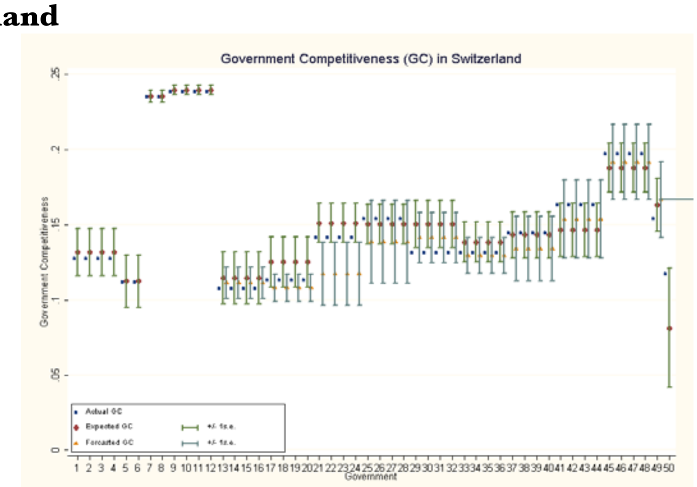

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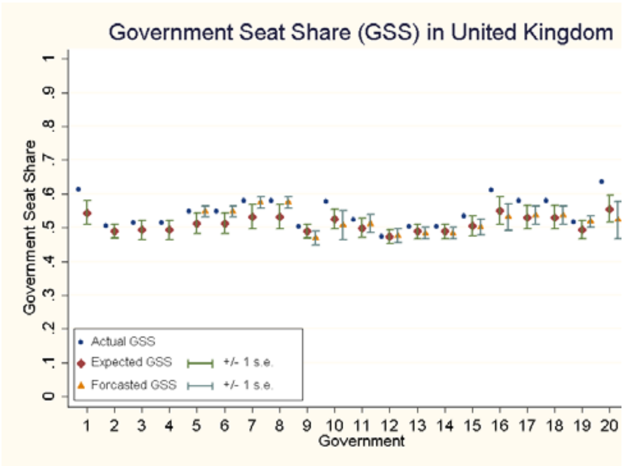

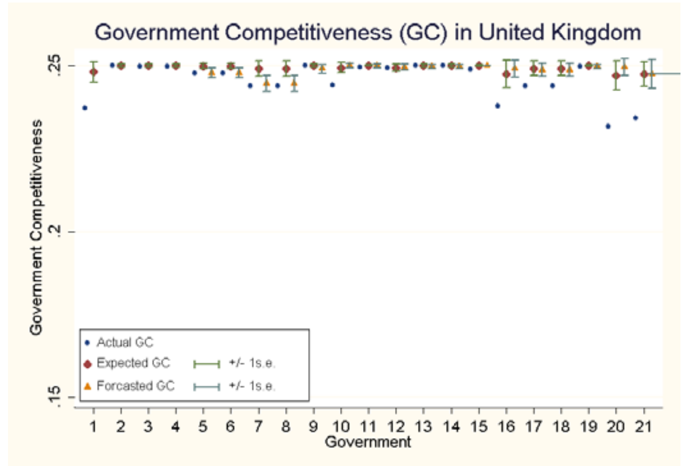

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