Bicameralism Hinges on Legislative Professionalism

Adam R Brown, Brigham Young University
Alex Garlick, University of Vermont

Abstract. Bicameralism is a nearly universal feature of American legislatures, yet its functional impact on legislative outcomes is uncertain. Proponents have claimed that bicameralism would produce better outcomes than unicameralism, as adding a deliberative element prevents the passage of faulty legislation. For bicameralism to work in this fashion, we argue lawmakers must have enough time and resources to meaningfully evaluate legislation produced by the other chamber. We find such behavior is most likely to take place in professionalized state legislatures, evidenced by a lower concurrence rate in the second chamber for bills passed by the first chamber. In state legislatures with less policy capacity, by contrast, the chambers act in a more parallel fashion, dividing the agenda and largely endorsing the other chamber's legislation.

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Bicameralism is common enough in American state legislatures to take it for granted, yet adding a second legislative chamber adds procedural complexity and veto points that make representation more burdensome. In a federal legislature like the US Congress, the House of Representatives is broadly intended to represent the popular will and the Senate is intended to represent the states. But in unitary systems like the American states, bicameralism's "functions are far from obvious" (Dahl 2003, 45).

Defenders of bicameralism expect it to produce different outcomes than unicameralism, as each chamber's veto over the other should promote more deliberation, compromise, and stability than unicameralism. Lijphart (1984) specifies that the ability of bicameralism to produce different results than unicameralism is conditional, requiring that two chambers be equal in authority ("symmetric") but different in composition ("incongruent") (Lijphart 1999, 206-7). The US Congress is almost an ideal case, with coequal chambers whose distinct constituencies regularly produce intercameral conflict.

This focus on symmetry and incongruence overlooks a critical feature necessary for a bicameral legislature to outperform a counterfactual unicameral legislature: institutional capacity. In the modern American states, institutional capacity is usually operationalized as legislative professionalism. Legislative salaries, staffing, and session lengths vary widely across the states, affecting legislators' motivation, information, and time to develop public policy. Compared to their more professionalized peers, poorly resourced legislators must carefully allocate their scarce legislative capacity. For example, legislators who are pressed for time skip more floor votes (Brown and Goodliffe 2017), defer more to lobbyists (Opheim 1991), and cast votes that more closely follow cues from legislative leaders (Curry 2015). By contrast, professionalized legislatures have sufficient resources to innovate from within, expressing legislators' own

preferences into law (Kousser 2005, 20; Polsby 1975, 277) and producing policies more in line with constituent preferences (Lax and Phillips 2012).

Applying the US-centric literature on state legislative professionalism to the cross-national literature on bicameralism produces new insights about the conditions necessary for bicameralism to "work." In professionalized legislatures, bicameralism can operate as Lijphart and others have imagined—we call it "balancing bicameralism," since each chamber checks and balances the other. But poorly resourced legislators lack the capacity to fully scrutinize bills originating in the other chamber, trusting instead that their colleagues in the bill's chamber of origin will do the hard work of vetting their own proposals. Without professionalization, bicameralism risks devolving into two parallel chambers, each sending bills to the governor with minimal oversight from the other. Instead of balancing each other, these legislatures may operate in "parallel bicameralism."

We test this argument using data from over 180,000 bills drawn from 44 states over 10 years. Conceptually, we seek to observe the extent to which one chamber affects the final output of the other, ranging from aggressive checking under "balancing bicameralism" to more deference under "parallel bicameralism." Empirically, our dependent variable is each state-biennium's second chamber concurrence rate—that is, the percentage of statutory bills that pass out of the second chamber, conditional on having previously passed their chamber of origin. The comparative literature's long emphasis on incongruence leads us to expect these concurrence rates to fall as the ideological distance between chambers grows, yet our analysis (surprisingly) yields only modest evidence for this effect. (We do not test symmetry, since all bicameral state legislatures are symmetric.) We do, however, find a strong, persistent relationship between concurrence rates and various indicators of legislative professionalism—especially legislative session length. Chambers check one another more aggressively as professionalism rises,

suggesting that "balancing bicameralism" predominates in states with professionalized legislatures while "parallel bicameralism" predominates elsewhere.

Literature

As American states in the 1770s began crafting the world's first written constitutions (Brown 2023), most modeled their legislatures after the bicameral Parliament they had known as British subjects.[1] Lacking a traditional aristocracy to fill the upper chamber, these early constitution writers expected that "a natural social and intellectual elite … would find their rightful place in the upper houses" (Wood 1969, 209). Madison briefly echoed these sentiments in Federalist 62, explaining that Senators would require "greater … information and stability of character" than mere Representatives (1788a).

Independence and democratization soon challenged this class-based defense of bicameralism, however. In early 1787, Samuel Chase forcefully voiced an emerging view, arguing that "there is no difference between [Maryland's two chambers] but only in the duration of their commission. … Both [chambers] must be equally the representatives, trustees, and servants of the people" (quoted in Wood 1969, 253). State senates were not for aristocrats but merely a coequal check on "too-hasty proceedings" (Wood 1969, 233). Picking up this theme, Madison's defense of a bicameral Congress proceeded on two tracks. First, he noted a distinction between the proportional representation of population in the House and the equal representation of states in the Senate (1788a), which has served as a foundation of the American federal system. Second, echoing Samuel Chase, he assured skeptics that the proposed US Constitution's second chamber would

[1] Pennsylvania's radical 1776 constitution marked a severe departure, vesting almost unchecked power in a unicameral legislature, serving as an influential cautionary tale at the 1787 federal convention (Wood 1969, 226, 236-7, 246-7).

counter "the impulse of sudden and violent passions" (1788a; see also Madison 1788b). Bicameralism, it was increasingly understood, served primarily to improve the quality of legislation by promoting compromise, cooling passions, and reducing legislative error.

Whether bicameralism has met these lofty goals remains difficult to answer. The US Supreme Court's decisions in *Baker v Carr* (1962) and *Reynolds v Sims* (1964) rendered the territorial motivation moot in the American states, cementing them as unitary rather than federal systems (Dahl 2003). As for bicameralism's resilience against "sudden and violent passions," it is difficult to identify bicameralism's effects empirically, since political actors adapt their behavior to their existing environment. Still, comparative studies suggest that bicameralism affects government spending (Chen 2010; Shepsle et al. 2009; Hankins 2020), lobbyist behavior and legislative organization (Diermeier and Meyerson 1999; Gailmard and Hammond 2011), corruption (Testa 2010), cabinet formation and duration (Druckman and Thies 2002; Druckman et al. 2005; Diermeier et al. 2007; Fisk 2011), and party organization (VanDusky-Allen and Heller 2014).

Underlying all this research is a prior question about the necessary conditions for bicameralism to have any effects at all. Lijphart (1984; 1999) articulated what has become the traditional view: Bicameralism produces results most distinct from unicameralism when the two chambers are symmetric (equal in authority and legitimacy) and incongruent (selected by distinct constituencies). Lijphart collapsed this two-dimensional conceptualization into a unidimensional operationalization where symmetry and incongruence jointly produce "strong" bicameralism, asymmetry and congruence produce "weak" bicameralism, and other combinations fall in between. Subsequent scholars have largely followed this approach (e.g. Brady et al 2020; Druckman and Thies 2002; Gerring et al 2005; Henisz 2006; Llanos and Nolte 2003; Tsebelis and Rasch 1995;

VanDusky-Allen and Heller 2014). Findings about bicameralism often assume "strong" bicameralism, though even "weak" bicameralism can have effects (Tsebelis and Money 1997).

Some have challenged Lijphart's definition of incongruence. To Lijphart, incongruence means that different constituencies select each chamber, such as popular representation in one chamber and territorial representation in the other. For American state legislatures, Makse (2022) reformulates incongruence with a measure of "bicameral distinctiveness" that reflects the ratio of house to senate seats, dissimilarity of house and senate constituencies, and the share of voters who are represented by different parties across the two chambers. Cutrone and McCarty (2006) propose a more fundamental reformulation of incongruence, focusing on the ideological distance between chambers—an approach we follow also, since selection by different constituencies affects legislative outcomes only if it produces actual disagreement between chambers.

Others working within Lijphart's tradition have quibbled over the relative importance of symmetry relative to incongruence, which Lijphart characterized as individually necessary and jointly sufficient. Heller and Branduse (2014), for example, argue that even without incongruence, "bicameralism might lend weight to intraparty differences that otherwise might never enter into decision calculations" (2014, 333). Symmetry, they argue, is sufficient to observe bicameralism's effects. Cutrone and McCarty (2006) take the opposite stance, using spatial models to show the sufficiency of ideological incongruence alone. In a unicameral legislature, they argue, status quo policies falling between the floor median and the majority party median lie in an untouchable gridlock interval (Krehbiel 1998). Adding a second chamber adds two critical players to that gridlock interval—the second chamber's floor median and majority party median. Bicameralism produces different policy outcomes from unicameralism only if adding these two players expands the gridlock interval—in short, only if the two chambers are controlled by opposing parties or

otherwise ideologically distant. “Even allowing for idiosyncratic differences in chamber medians, unicameralism and congruent bicameralism should produce nearly identical results” (Cutrone and McCarty 2006, 183).[2]

Setting aside this argument about whether symmetry or incongruence matters more, the comparative literature has emphasized that some mix of symmetry and incongruence produces the strongest bicameralism. Symmetric authority gives each chamber the ability to check the other, while ideological incongruence provides the motivation to do so. Bicameralism differs the most from unicameralism when the chambers are symmetric and incongruent, promoting “consensus” as each chamber serves as a Madisonian check and balance on the other (Lijphart 1984; 1999). Hereafter, we refer to this classic Madison-Lijphart model as “balancing bicameralism.”

As an aside, we note that a legislature practicing balancing bicameralism may not be as productive as peer legislatures. Scholars in American politics have usually defined productivity in this context as the ability of a legislature to substantially amend the status quo. A large literature has studied the factors that affect the productivity of Congress in particular, including whether divided or unified partisan control affects the number of landmark laws that pass (Mayhew 1991; Binder 2003); the relative productivity on different types of issues (Lapinski 2008); or which individual legislators are most effective at guiding sponsored legislation through the process (Volden and Wiseman 2014, 2018).

However, as bicameralism is an almost universal feature of modern American legislatures, the impact of the institutional design has received little empirical evaluation. Volden and Wiseman

[2] Incongruence can also arise through legislative rules that create different gridlock intervals in otherwise congruent chambers—for example, a 60% cloture rule, which adds the pivotal cloture voter to the gridlock interval. State legislatures generally operate under simple majority, so we do not consider this complication here.

(2018) do compare the effectiveness of members in the two Congressional chambers to show that US Senate is more egalitarian in member effectiveness than the US House, but they do not entertain a counterfactual of legislators in a unicameral setting.[3] Researchers have studied the differences between the Nebraska unicameral legislature and otherwise similar bicameral state legislatures, but more often in the context of the lack of partisan affiliations of Nebraska legislators (Wright and Schaffner 2002; Masket and Shor 2015), which presents a bundled treatment difficult to untangle. In general, this expansive literature has been concerned with a legislature's ability to produce legislation and change the status quo, instead of each chamber's contribution to that effort.

Theory

Returning to Lijphart's now-traditional argument about symmetry and incongruence, this literature overlooks a critical feature of modern legislatures that is equally necessary for bicameralism to serve a balancing role: Each chamber's ability to vet legislation, often understood as policy capacity or professionalization (Mooney 1995; Hertel-Fernandez 2014). Even with symmetric authority and incongruent ideology, neither chamber can check the other if it lacks the time, expertise, and motivation to do so. A rich literature on American state legislatures has demonstrated the importance of legislative professionalism—that is, "the enhancement of the legislature's capacity to perform its role in the policy-making process with an expertise, seriousness, and effort comparable to other actors" (Mooney 1995, 48). Professionalism rises with higher legislator salaries, increased staff support, lengthier legislative sessions (Squire 2007;

[3] On a methodological note, the Volden and Wiseman effectiveness scores are normalized within each chamber so cross-sectional comparisons are precluded.

Bowen and Greene 2014b), and lengthier legislative careers (Kousser 2005; Woods and Baranowski 2006).

At one extreme, the California, New York, and Pennsylvania state legislatures look almost like the US Congress with year-round sessions, generous salaries, and ample staff support. Given symmetry and incongruence, chambers in these states certainly have the capacity to check one another. Meanwhile, legislators in Wyoming, New Mexico, North and South Dakota, and Utah meet for only a few weeks per year, receive little or no compensation, and have little or no personal staff. Legislative professionalism affects policy responsiveness (Maestas 2000; Lax and Phillips 2012), leadership structures (Clucas 2007), legislator careers (Squire 1988; Lazarus 2006), legislator regulation of lobbyists (Opheim 1991), legislative budget independence (Kousser and Phillips 2009), and much more. Most relevant here, professionalized legislatures can vet proposed policies more carefully than poorly resourced legislatures. Just as professional legislatures can better monitor bureaucratic agencies (Huber, Shipan, and Pfahler 2001), chambers within a professional legislature can better monitor one another.

To illustrate how professionalism can intersect with bicameralism, consider the Utah Legislature, one of the nation's least professionalized, ranking 49th for session length, 44th for legislator salary, and 44th for staff support (Brown 2018). Over a recent 10-year span, the Utah Legislature passed an average of 462 statutory bills in each year's 7-week General Session.[4] With only 33 workdays per session, legislators have little time per bill—especially since low salaries

[4] Statistics about Utah calculated using 4,619 statutory bills passed in the 2012 through 2021 General Sessions. "Statutory" means a bill changes statutory code or is a general appropriations bill, thereby excluding resolutions, memorials, proposed constitutional amendments, and so on. "Passed" or "enacted" means the bill passed the Legislature and was referred to the governor for a signature or veto, regardless of the governor's eventual action. Compiled by authors. Further details at adambrown.info/s/utleg

mean many legislators must find time during the session to mind their outside jobs. Nor do legislators have any personal staff to advise them.

Each Utah chamber adapts by devoting primary attention to its own bills, passing the other chamber's bills with far less scrutiny. We observe this behavior in three ways. First, the median enacted bill aged 15 calendar days between introduction and its first floor vote (in the chamber of origin) but only 10 additional days before its first floor vote in the second chamber. This difference implies at least 50% more time in the original chamber for Rules Committee processing, committee hearings, caucus discussion, and other deliberation.[5] Second, the median enacted bill spends 43% more time on the floor of its chamber of origin (6.7 minutes) than in the second chamber (4.7 minutes); after subtracting an estimate of time spent voting, the median enacted bill spends almost twice as much time on the floor of its chamber of origin (4.2 minutes) than in the second chamber (2.2 minutes).[6] Third, senate rules require each bill to survive two floor votes to pass, held at least 24 hours apart. (House rules require only one vote.) Utah senators routinely suspend this rule on a bill-by-bill basis, especially toward the end of each session.[7] Over the past 10 years, only 54% of enacted bills received both "required" senate floor votes—but the senate waived this rule 76%

[5] Since some of those latter 10 days are spent continuing to process the bill in its chamber of origin, the difference is even starker. Both chambers have essentially the same procedures, including separate Rules Committees that review bills before their referral to standing committees.

[6] Legislative staff post floor videos tagged with bookmarks allowing viewers to jump to a particular bill. We scrape these bookmarks and their associated timestamps, then sum all a bill's various floor appearances. Unfortunately, these timestamps include the bill's entire time on the floor, including time spent voting. Spot checks indicate that the typical floor vote takes 2-3 minutes, so the 91% difference reported in the text is based on an estimate that 2.5 minutes of a typical bill's time in each chamber is spent voting.

[7] Skirting the senate's two-vote rule does not always require suspension; bills that receive unanimous support in a senate committee may, at the committee's unanimous recommendation, be passed with a single floor vote under the senate's Consent Calendar process. We classify bills by whether they received one or two senate floor votes, regardless of the process invoked.

more often for house bills than for its own.[8] Though high-profile bills provoke occasional intercameral disputes, most legislation flies through the second chamber with minimal scrutiny.

In professionalized legislatures, however, bicameral negotiations are anything but perfunctory. Massachusetts is one of the five most professionalized legislatures (Bowen and Greene 2014). Each chamber checks the other so aggressively that interchamber negotiations often run to the last minute of biennial legislative sessions. For example, in 2018 the state temporarily banned horseracing after the Massachusetts Senate failed to concur with a bill approved by the House six days earlier. The Senate's inaction was no innocent oversight; the Senate President held the horseracing bill to retaliate against the Speaker of the House, whose district had the state's largest horseracing venue, for inaction on a Senate priority (Mohl 2018). The Massachusetts House and Senate also have long-standing policy disagreements on more substantial matters, such as the House pushing for a mandate for employers to offer health insurance, which the Senate resisted for decades before finally resolving their differences with a landmark 2006 health care law (McDonough et al 2006).

In this way, the Massachusetts legislatures lives up to Madison's (1787b) belief that a second chamber could slow the legislative process, providing a "cool and deliberate" defense against "temporary errors and delusions." Bicameralism cannot serve its expected balancing role unless each chamber has adequate resources to check the other. Instead, in Utah each chamber scrutinizes the other's bills so little that the house and senate operate almost like two separate unicameral legislatures, each sending proposed legislation to the governor without meaningful oversight from the other. Rather than slow the legislative process, this "parallel bicameralism"

[8] That is, 58% of enacted house bills received a single senate vote, compared to 33% of senate bills, a ratio of 1.76:1.

speeds it up. Lacking the resources of professionalism, legislators divide the workload across two bodies, and enabling a poorly resourced bicameral legislature to handle as much legislation as a better-resourced unicameral legislature.[9]

The bicameralism literature has largely overlooked legislative professionalism, perhaps because it has mostly focused on cross-national analysis whereas the professionalism literature has mostly focused on the states. Makse (2022) considered professionalism directly in the context of bicameralism, but only as a passing control variable. Rogers (2001) came close to bringing professionalism into the bicameralism literature with his theoretical model showing that bicameralism can improve policy outcomes by increasing the information available to legislators. Even when both chambers are perfectly ideologically congruent, Rogers showed, an additional chamber provides an extra layer of review that can aid legislators in avoiding errors and selecting the policy that comes closer to their preferred outcome (see also Cutrone and McCarty 2006). This informational argument has a certain appeal: It helps explain why so many state and national legislatures accept the expense and complexity of bicameralism even when both chambers have a similar composition. However, lurking behind this informational argument is a critical but unstated assumption: That each chamber has sufficient resources to fully vet proposals originating in the other chamber. It is this logic that motivates this article's interest in legislative professionalism.

The preceding theoretical discussion implies three testable hypotheses—the first two drawn from existing comparative literature, and the third developed above. First, a bill passed out of one chamber should be less likely to win final passage when there is symmetric authority—that

[9] Rather than pass the other chamber's bills uncritically, there is a second way legislators could adapt to inadequate resources: By approving only as many of the other chamber's bills as they have the capacity to vet. If so, our dependent variable would decrease rather than increase with professionalism. The positive coefficients we report below suggest that, at least on average, legislators behave consistent with our theory, but this average may mask exceptional states. We thank an anonymous reviewer for this insight.

is, when both chambers are equal in authority. Since the analysis below considers only state legislatures—all symmetric—this article does not evaluate this hypothesis. Second, a bill passed out of one chamber should be less likely to win final passage when there is ideological incongruence (**H1**), defined here as greater partisan or ideological distance between the chambers. Third, a bill passed out of one chamber should be less likely to win final passage when legislators have access to more resources—that is, when the legislature is more professionalized in terms of salary, staff, and session length (**H2**). H1 reflects Madison-Lijphart expectations about balancing bicameralism. H2 proposes a continuum between balancing and parallel bicameralism related to each state's level of professionalism.

Data

Our operational dependent variable is the second chamber congruence rate, with state-biennia as the unit of analysis. That is, for all bills in a particular state-biennium that passed out of their chamber of origin and were introduced into the second chamber, we calculate the percentage that received a favorable final vote in the second chamber.[10] (We do not consider whether the bill survived any subsequent actions, such as conference committee action or gubernatorial vetoes.) A lower concurrence rate implies balancing bicameralism, with each chamber checking the other; a

[10] Other authors have measured the impact of bicameralism on legislative outcomes by observing the number of amendments made in the second chamber (Makse 2022). This measure is less suited to our approach as some amendments are friendly, making technical improvements or bridging ideological squabbles to help a bill toward passage, while other amendments are hostile, abandoning the sponsor's goals or dooming the bill with poison pills. Failure to separate friendly from hostile amendments would undermine our analysis—especially with respect to H2, since ideological incongruence would presumably have a strong relationship with the ratio of hostile to friendly amendments. We therefore choose a dependent variable that separates friendly from hostile activity in a way that an amendment-based variable cannot. That said, we note that Makse (2022, Table 3) found that professionalism (treated only as a control variable) correlates with increased amendment activity in the second chamber, a result consistent with our argument and analysis.

higher rate implies parallel bicameralism, with each chamber rubber stamping the other chamber's bills.[11]

We construct this measure using the legislative histories of 186,453 bills considered between 2009 and 2018 as collected by the Open States project. The actions taken on individual bills were used to code the progress of each bill along a 23-point scale. The supplement lists these stages and provides additional details. To ensure the validity of the coding process, a second coder reviewed each state. This analysis sets aside most points on the scale, considering only whether each bill passed in the second chamber conditional on passing out of its chamber of origin.

We aggregate these bills to odd-even biennia for states holding even-year legislative elections and even-odd biennia for the handful of remaining states. We omit Nebraska, which has the nation's only unicameral state legislature. Our interest is in statutory legislation considered in regular sessions, which leads to a few additional exclusions. First, we consider only statutory bills, omitting resolutions, memorials, proposed constitutional amendments, and so on. Bill prefixes are sufficient to separate statutory from non-statutory bills in all but three states, which we omit.[12] Second, we omit bills passed in special sessions. States vary in how they label sessions as "special," "extraordinary," "regular," "budget," or "general." Rather than rely on this shifting terminology, we instead adopt an empirical cutoff: We omit bills from sessions in which fewer than 10 house bills were referred to the senate or fewer than 10 senate bills were referred to the

[11] It is possible that professionalism enables originating chambers to propose higher quality bills—though less professional legislatures may compensate partway by outsourcing bill development to lobbyists and multistate interests (Jansa, Hansen, and Gray 2019). However, this possibility would cause second chamber concurrence rates to rise with professionalism, contra H2. That is, this possibility biases our analysis against a significant result, making any findings we do obtain even more compelling.

[12] Statutory prefixes are H (or A) and S in ID, NJ, NY, and VT; HF and SF in IA and MN; and HB (or AB) and SB elsewhere, except MA, ME, and SC. Since these latter three states use the same prefixes for statutory bills as for non-statutory items, we omit them from the analysis.

house. This cutoff eliminates genuinely "special" sessions focused on a narrow range of urgent topics, since emergency legislation may produce unusual patterns of cross-chamber collaboration. In the178 state-biennia in our largest model, the mean for our dependent variable is 73.4 with a standard deviation of 14.2, meaning that an average of 73.4 percent of bills that passed out of their chamber of origin subsequently passed the second chamber. (The standard deviation is 13.4 cross-sectionally and 5.4 longitudinally.)[13]

Our analysis demands reliable measurement of legislative professionalism. To boost confidence in our results, we use three different measurement approaches. Comparative analysis of state legislatures has often relied on Squire's additive index of legislative professionalism, which sums three components into a single measure (Squire 1992; 2007). These components are total days in session per biennium, annual salary per legislator (in $1000s), and staffing per legislator (proxied here by non-salary expenditures per legislator, in $1000s). Our first measurement approach is to include these three components as separate variables, as collected by Bowen and Greene through 2019 (2014a; 2014b).[14] Second, we use an index derived from these three components. Instead of Squire's well-known additive index, which is available only sporadically for certain years, we use a biennial "first dimension of professionalism" developed by Bowen and Greene from the same three component variables.[15]

[13] These statistics do not vary meaningfully by chamber of origin, with means of 73.9 (house bills) and 73.7 (senate bills) and standard deviations of 15.7 (house bills) and 14.4 (senate bills).

[14] The citations lead to a data source extending only through 2014. Dan Bowen generously shared draft scores extending through 2019, which we use here.

[15] Using multidimensional scaling, Bowen and Greene calculate a first and second dimension of legislative professionalism for each state-year. Bowen and Greene report a strong correlation (r=0.92) between their first dimension and Squire's additive index in years where both measures are available (Bowen and Greene 2014b). Their second dimension is residual and therefore omitted from our analysis. All references to the Bowen and Greene measure are to their first dimension only unless explicitly stated.

We run additional models using a third, more general measure of professionalism: Each state's total expenditures per legislator (in $1000s). We compile this variable from the US Census Bureau's Annual Survey of State Government Finances, summing annual data into biennia. (We call this variable "total expenditures per legislator," differing from Bowen and Greene's "non-salary expenditures per legislator.") Like the Bowen-Greene and Squire indices, this measure loses the nuance of considering salary, staff, and session length as separate components. Unlike them, however, it is readily available over many years and easily updated in the future. Moreover, this measure avoids the guesswork and judgment calls inherent in estimating each state's salary, staff, and session length (see Bowen and Greene 2014, 283-4). This variable correlates with Bowen and Greene's first dimension strongly (r=0.79; see supplement).

We measure all financial variables in constant 2019 dollars. Session length, non-salary expenditures per legislator, and total expenditures per legislator are all skewed, so we increment and natural log them; legislator salary is more normally distributed, so we do not transform it (see supplement). Term limits can work against professionalism (Kousser 2005; Woods and Baranowski 2006), so we include a dichotomous indicator for legislatures subject to them.

Cross-national research has placed heavy emphasis on intercameral incongruence. Fortunately, it is easier to test for ideological or partisan effects when comparing state legislatures than in cross-national research. After all, in our "increasingly United States," the same Republican-Democratic cleavage divides every state (Hopkins 2018), even reaching into local politics (Tausanovitch and Warshaw 2014; Garlick 2015, 2017), with the parties increasingly distinct (Mason 2018). Ideological distance between a state's two chambers should therefore produce effects at least as strong as in any national legislature. We measure the ideological distance between a state's chambers using Shor-McCarty common space scores, which place legislators

from all 50 states on a single ideological scale (Shor and McCarty 2011; Shor 2020). We calculate the absolute value of the difference in chamber medians, so that a greater value implies greater intercameral disagreement. Shor-McCarty scores are annual, but our other variables are biennial; we use their scores from the second year of each state's biennium.

In addition to this measure of ideological distance, we use a dichotomous "partisan incongruence" variable indicating whether different parties control each chamber, also derived from Shor-McCarty data. Our ideological distance variable continuously captures the difference between floor medians, but this variable dichotomously indicates a (presumably) large difference between chamber majority medians, implying a great increase in the gridlock interval (Cutrone and McCarty 2006). These two variables correlate so strongly ($r=0.80$, $p<0.01$) that we model them separately to avoid multicollinearity.

We include a handful of atheoretical controls. To account for different workloads, , we control for the (logged) number of bills that pass their chamber of origin and are introduced into the second chamber.[16] Some chambers limit the number of bills each legislator may introduce, which increases the likelihood that any one bill will be enacted into law, as legislators are less likely to introduce "messaging" legislation that is not intended to pass (Gelman 2017). Bill introduction limits range from five bills for Colorado assembly members to 65 for California senators, however there are often exceptions available, and the limits can change over time, so we control dichotomously for the presence of a limit (in either chamber). The supplement lists the limits, as well as descriptive statistics and charts for all variables.

[16] Though we might expect professionalized legislatures to consider a larger number of bills, correlations between our professionalism measures and logged bill counts are weak, ranging from $r=0.22$ (measuring professionalism as logged session length) to $r=0.37$ (measuring professionalism as logged total expenditures per legislator).

Each data source introduces some missingness, but coverage is good overall, with 178 state-biennia observations compiled from 44 states in our largest model.[17] Though our observations span several years, our dependent variable and professionalism variables change minimally within states from one biennium to the next (see supplement). We therefore cluster correct our standard errors and protect our degrees of freedom as cautiously as if we had only one observation per state. With so few states for analysis, we are selective in the inclusion of state specific measures, choosing to include only those which have the potential to bias our results by correlating with both our independent and dependent variables.[18]

Results

Table 1 reports results from six cluster-corrected ordinary least squares regressions. Combining our three approaches to measuring professionalism with our two approaches to measuring incongruence yields six models. Each model finds a strong relationship between second chamber concurrence rates and our various indicators of professionalism. Whether we measure professionalism using legislative session length in models (a) and (b), Bowen and Greene's first dimension of professionalism in models (c) and (d), or (logged) total expenditures per legislator in models (e) and (f), we find that increased professionalism is significantly associated with

[17] In models that use Bowen-Greene indicators of professionalism, the data span 5 biennia for 10 states, 4 biennia for 25 states, 3 biennia for 6 states, 2 biennia for 2 states, and 1 biennium for 1 state, for 173 total observations from 44 states. In models using our total expenditures variable as an indicator of professionalism, the data span 5 biennia for 11 states; 4 biennia for 27 states; 3 biennia for 4 states, 2 biennia for 1 state, and 1 biennium for 1 state, for 178 total observations from 44 states.

[18] Among variables we tested but do not include here are Makse's (2022) measure of bicameral distinctiveness and a measure of how many joint committees each legislature has (derived from Table 3.23 in the Council of State Governments' *Book of the States*). (To preserve degrees of freedom, we first used the Bayesian model selection discussed below to drop variables that did not contribute to our models.) These variables do not attain statistical significance in any model, nor does their inclusion change the estimates reported below. We also tested for an interaction between professionalism and Makse's measure, finding nothing. We also tested an indicator for divided government—that is, a unified legislature facing an out-party governor—with no impact on our results.

decreased bicameral concurrence.[19] In models (a) and (b), which disaggregate the components of professionalism, we find a relationship for session length but not for staffing (non-salary expenditures) or legislator salary. These results suggest that the significant results for the blunter measures of professionalism used in other models are driven by differences in legislative session lengths. Consistent with H2, we reject the null hypothesis that professionalism has no relationship with second chamber concurrence rates.

[19] Bowen and Greene's measure of professionalism also has a second dimension, which they characterize as largely residual, and which mostly serves as a dummy-by-proxy for California. We obtain a significant estimate when adding Bowen and Greene's second dimension to models (c) or (d), but the effect loses significance when California is omitted; including the second dimension does not meaningfully affect other estimates.

Table 1: Models of second chamber concurrence rates

	(a)	(b)	(c)	(d)	(e)	(f)
Session days (log)	-11.0*	-10.8*				
	(3.77)	(3.78)				
Salary ($1000s)	0.0043	0.0019				
	(0.046)	(0.047)				
Non-salary expenditures (log)	-1.76	-1.64				
	(2.31)	(2.32)				
Bowen-Greene 1st dimension			-3.35*	-3.29*		
			(1.43)	(1.44)		
Total expenditures (log)					-4.97*	-4.83*
					(2.04)	(2.09)
Term limits	1.86	2.07	2.19	2.32	0.76	0.90
	(4.41)	(4.38)	(4.51)	(4.48)	(4.68)	(4.67)
Partisan incongruence	-5.08		-5.87*		-6.30*	
	(3.38)		(3.00)		(2.87)	
Ideological distance		-3.29		-4.91		-5.67
		(4.14)		(3.88)		(4.31)
Number of bills (log)	2.07	2.19	2.38	2.56	1.55	1.71
	(2.66)	(2.64)	(2.85)	(2.82)	(3.25)	(3.16)
Bill introduction limits	8.53*	8.41*	8.54*	8.51*	10.5*	10.4*
	(3.78)	(3.77)	(3.75)	(3.74)	(3.84)	(3.84)
Constant	122	120	55.5	54.8	92.2	90.8
	(23.8)	(23.9)	(19.5)	(19.5)	(20.4)	(19.7)
Observations	173	173	173	173	178	178

*$p \leq 0.05$ (one-tailed). OLS coefficients with cluster-corrected standard errors.

Perhaps most surprisingly, our measures of incongruence have only modest estimated effects. Our dichotomous partisan incongruence indicator attains one-tailed p-values of 0.07, 0.03, and 0.02 in models (a), (c), and (e), respectively. Meanwhile, our continuous ideological distance indicator attains one-tailed p-values of 0.22, 0.11, and 0.10 in models (b), (d), and (f), respectively. Both variables have so little substantive impact that Bayesian model selection (Schwarz 1978;

Raftery 1995) supports dropping them entirely.[20] Regarding H1, we fail to reject the null hypothesis that ideological or partisan incongruence has no effect on second chamber concurrence rates.

We also tested for an interaction between incongruence and professionalism but did not find one. Though Lijphart (1999) expects (balancing) bicameralism to require incongruence, parallel bicameralism may require the opposite. We therefore tested for an interaction between each model's measures of professionalism and incongruence. In no case did the interaction approach significance. This non-finding implies that parallel bicameralism arises not because the chambers trust one another but out of desperation from lack of resources.

To ease interpretation, we calculated the predicted effect of increasing each variable from one standard deviation below its mean to one standard deviation above it, holding other variables at their medians. The results appear in Table 2, which contains predictions for all variables flagged as significant ($p<0.05$ one-tailed) in Table 1, as well as for all measures of ideological or partisan incongruence. In models (a) and (b), this increase in (logged) session length reduces concurrence by roughly 11 percentage points; in models (c) and (d), this increase in Bowen and Greene's first dimension reduces predicted second chamber concurrence rates by 11 to 12 percentage points; and in models (e) and (f), this increase in (logged) total expenditures per legislator reduces concurrence by roughly 9 percentage points. Similar movement in partisan incongruence or ideological distance yields much smaller substantive effects.[21] The comparative literature's long interest in

[20] In all models, BIC selection supports keeping all other variables flagged in Table 1 as statistically significant, while supporting dropping all insignificant variables—except, in models (b) and (d), the logged number of statutes.

[21] Gelman (2008) observes that changing a continuous variable from one standard deviation below its mean to one standard deviation above it is comparable to toggling a perfectly balanced dichotomous variable. For a perfectly balanced dichotomous variable, after all, a move from 0 to 1 is a two standard deviation shift. For unbalanced dichotomous variables, however, a move from 0 to 1 is greater than two standard deviations—sometimes much greater.

incongruence finds only modest support among state legislatures. (Bill introduction limits have a large effect but are of no theoretical interest here.)

Table 2: Predicted changes in concurrence rates

	(a)	(b)	(c)	(d)	(e)	(f)
Session days (log)	-11.1	-10.9				
Bowen-Greene 1st dimension			-11.6	-11.3		
Total expenditures (log)					-9.0	-8.7
Partisan incongruence	-2.8		-3.3		-3.6	
Ideological distance		-2.0		-3.0		-3.5
Bill introduction limits	8.2	8.1	8.3	8.1	10.0	10.0

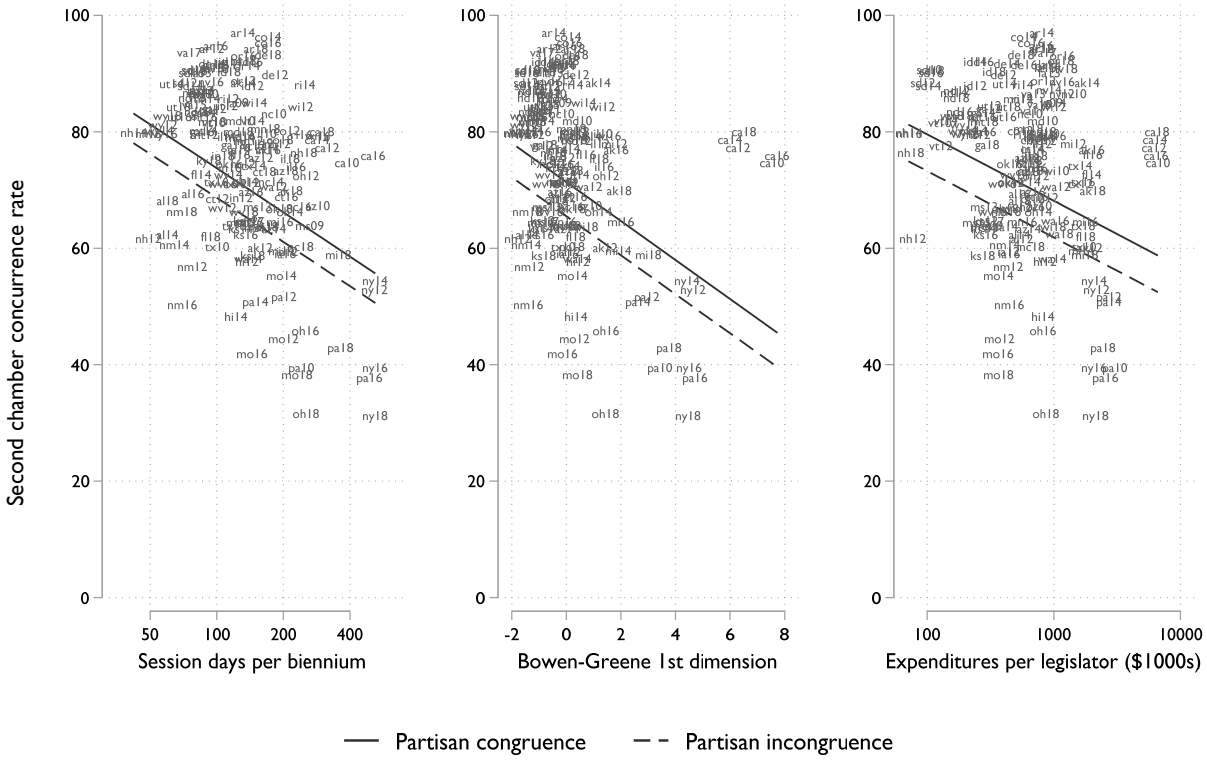
Predicted change in the dependent variable when the indicated variable changes from one standard deviation below its mean to one standard deviation above it, with other variables held at medians.

To further aid interpretation, Figure 1 plots predicted values from models (a), (c), and (e) over a scatterplot of the underlying observations, with separate lines depending on whether the two chambers are controlled by the same party. There are no outliers driving these results; to the contrary, the most visible outliers—California's cluster at the upper right—work against the results for professionalism reported here. Recalculating without California results in a similar or even strengthened estimated effect of professionalism in all models—but, in a further knock against H1,

Partisan incongruence is very unbalanced, present in only 9% of our observations, so a shift from 0 to 1 is equal to 3.6 standard deviations. To provide for simple comparisons of substantive effects, Table 2 uses a shift of two standard deviations around the mean even for dichotomous variables, even though this procedure implies a nonsensical shift from −0.19 to 0.37 for partisan incongruence and from −0.16 to 0.76 for bill introduction limits.

the estimated effects of partisan incongruence and ideological distance grow even weaker. (See the supplement for full results.)

Figure 1: Predicted relationships



Our data vary so little within each state (longitudinally) that we treat the data as essentially cross-sectional in these models, clustering standard errors rather than employing more complicated time-series cross-sectional techniques. As it happens, time-series cross-sectional approaches yield similar results to those reported here, as shown in the supplement.

Conclusion

Bicameralism is a curious feature of American legislatures, found in the US Congress and 49 states, yet it is unclear what purpose a second chamber serves when both represent the same

body politic. Proponents of bicameralism have seen it as a way to improve legislation, with one chamber tempering the behavior of the other, which we call "balancing bicameralism." Our analysis identifies a necessary condition for balancing to take place, separate from the literature's emphasis on symmetry and incongruence: each chamber must have sufficient policy capacity to vet the other's legislation. We operationalize policy capacity as legislative professionalism—session length, legislator salary, and staff support. In professionalized legislatures, bills that pass one chamber are less likely to pass the second. Reduced bill passage may seem like a negative outcome, as it would lower the overall productivity of a legislative session, but it reflects genuine interaction between chambers, akin to the "balancing" behavior anticipated by Madison and Lijphart.

In less professionalized legislatures, we observe behavior more consistent with "parallel bicameralism," where the chambers operate almost as two independent legislatures, each sending legislation to the governor with minimal oversight from the other. To be sure, balancing and parallel bicameralism are Weberian ideal types; we would not suggest that poorly resourced chambers never disagree or check one another. However, we do observe wide variation in how often state chambers check one another, and these differences correlate reliably with indicators of legislative professionalism.

Surprisingly, legislative professionalism does more than ideological distance or partisan incongruence to shape the role of bicameralism in the states. The cross-national literature has spoken much of intercameral incongruence, yet when tested in a setting where measurement is most straightforward and where effects should be easiest to observe, we find only marginally significant, substantively modest, outlier-sensitive relationships between incongruence and bicameral concurrence rates. It is hard to overstate how unexpected this non-finding is. While we

hesitate to extrapolate too much from a single study, perhaps this result suggests a disciplinary need to attend to institutional design alongside spatial models of legislator ideology.

Whether bicameralism produces different outcomes than unicameralism is orthogonal to whether those outcomes are good or bad. Bicameralism is a spectrum that can differ from unicameralism in more than one way. Balancing bicameralism differs from unicameralism by slowing the pace and promoting deliberation; parallel bicameralism differs by enabling the legislature to divide the workload and consider a larger number of bills. The emergence of parallel bicameralism in poorly resourced legislatures reveals a certain institutional creativity among lawmakers. Lacking the resources needed to fully scrutinize every bill, legislators in these states have instead adapted bicameralism to their needs. Just as legislatures everywhere may defer to standing committees that hear bills prior to floor votes, parallel bicameralism casts each chamber as something of a supercommittee to which the other chamber defers. Of course, there is another possible interpretation: Perhaps legislatures would get more bang for their buck from professionalized unicameralism than bargain-basement bicameralism.

Politics is an arena of innovation. Political institutions are endogenous, and policymakers shape them where possible to meet their goals. Our increasingly complex society demands increasingly complex policy responses. State legislatures have come a long way from the "horse and buggy, 18th century anachronisms" of a former day (Mooney 1995, 47), and advocates have called for changes to a wide range of legislative design features, from the size of legislative constituencies (Bowen 2022) to electoral reforms to encourage more parties (Drutman 2020). Our analysis implies two practical suggestions: If legislatures are going to be bicameral, states should invest sufficiently in policy capacity to make that design meaningful. Alternatively, if the

chambers in a state are going to behave in a parallel fashion, that process could be streamlined into a single professionalized chamber to more transparently represent the will of the people.

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Supplemental appendix

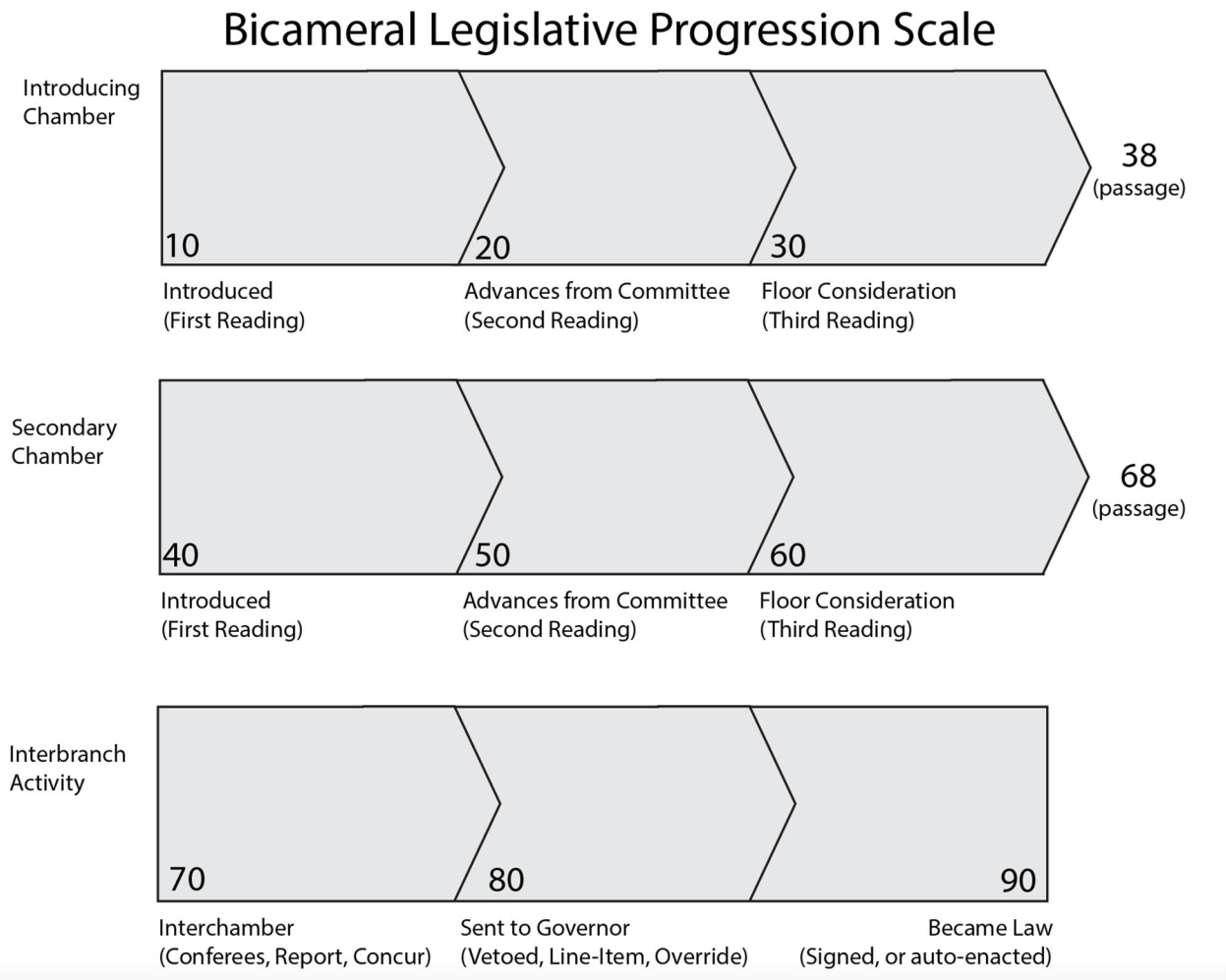
This supplement begins with descriptive statistics and measurement issues. Material addressing modeling approaches and alternative specifications follows.

Measuring legislative progression

Information about the 50 state legislatures is not collected by a central agency, so it is necessary to create a standard measure of legislative progress across the states. To create such a measure, we first had to establish the common structures of these varied institutions. Conceptually, the American state legislatures share a number of similarities. Most use a system based on a "three readings" approach, where the "first reading" occurs when a bill is introduced, the "second reading" occurs when the body considers committee recommendations, and the "third reading" occurs when the finalized bill is considered by the chamber for passage.[22] 49 of the 50 US state legislatures (apart from Nebraska) are bicameral, so these steps are duplicated in the second chamber. For statutory bills there may be inter-chamber steps (where the two chambers reconcile their differences on the bill, sometimes using a conference committee), and then interbranch steps (where a governor signs or vetoes a bill, including line-item vetoes, and legislative overrides).

[22] See the National Conference of State Legislatures guide for legislatures on legislative procedure for more detail: https://www.ncsl.org/research/about-state-legislatures/parliamentary-procedure-a-legislators-guide.aspx

Figure S1: Bicameral Legislative Progression Scale Template



To align the processes across the states, coders used text describing the actions taken on every bill by the Open States project. The coding team downloaded the "bill actions" for every state legislature from Open States, which collects the legislative histories directly from state legislatures. Each action on a bill was assessed according to the scale in Figure S1. While the scale runs from 0 to 90 to allow for unforeseen possible steps, in practice there were 23 different points a statutory bill could reach from introduction to passage. After a first coder adjusted a state's "bill actions" to fit the legislative progression scale, at least one other coder evaluated the state to make sure that the proper actions were being recognized.

See Table S1 for an example of the bill actions for a bill from Montana. This bill did not advance from committee, therefore it is considered to have failed on its first reading. The nomenclature for these actions differs from state to state, so coders would align each action with a numeric value from the Bicameral Legislative Progression Scale, observed in Figure XX.

Table S1: Excerpt for the bill actions for Montana's HB 109 from the 2011 session.

Session	Action	Date
2011	Introduced	12/14/10
2011	Referred to Committee	12/20/10
2011	First Reading	1/3/11
2011	Hearing Canceled	1/12/11
2011	Hearing	1/21/11
2011	Tabled in Committee	1/25/11
2011	Died in Standing Committee	4/28/11

Table S2 shows the number of bills in the sample that proceeded to each stage. The modal bill fails in the first chamber, specifically at the "first reading" stage, which is consistent with the US Congress. The second most common outcome is bills passing into law. The table shows some unusual outcomes in the data, such as three bills which were signed by the Governor, but did not become law, which includes Ohio's 2011 SB 5, a controversial bill to limit public sector collective bargaining, and which was rescinded by Ohio voters in a veto referendum.

Table S2: The number of bills in the sample that ended at each legislative stage

Chamber	Code	Stage	Bills terminating	Share
Origin	10	Bill introduced	21,548	0.03
	12	First Reading	311,487	0.46
	16	Bill fails in committee	23,772	0.04
	20	Second Reading	90,120	0.13
	30	Third Reading	14,926	0.02

Chamber	Code	Stage	Bills terminating	Share
	38	Passed	1,252	0.00
Secondary	40	Bill introduced	3,748	0.01
	42	First Reading	27,269	0.04
	46	Bill fails in committee	2,845	0.00
	50	Second Reading	13,733	0.02
	60	Third Reading	1,793	0.00
	68	Passed	2,164	0.00
Interchamber	70	Origin chamber acts on bill	4,675	0.01
	72	Conf. comm. convened	4,364	0.01
	74	Bill passes conf. comm.	1,424	0.00
	76	One chamber passes revised bill	459	0.00
	78	Both chambers pass revised bill	3,385	0.01
Interbranch	80	Bill sent to Governor	1,792	0.00
	82	Governor vetoes bill	5,464	0.01
	83	Governor line-item veto	127	0.00
	86	Legislature attempts veto override	152	0.00
	88	Governor signs bill	3	0.00
	90	Bill becomes law	138,992	0.21
		Total:	675,494	

Functional forms of professionalism measures

Figure S2 explores skewness in the three major components of professionalism: Session length (first row), biennial legislator salary (second row), and biennial non-salary expenditures per legislator (third row). The three plots at left use raw data; the three at right use logged versions of each variable. (Throughout the manuscript and this supplement, "logged" means incremented and natural logged.) Dashed lines depict a normal distribution for reference. Skewness and kurtosis statistics appear below each plot. (A normal distribution has skewness of 0 and kurtosis of 3.) Session length and non-salary expenditures are severely skewed prior to logging; logging brings both variables close to a normal distribution, reducing the influence of outlying observations. Legislator salary is only modestly skewed prior to logging; logging makes

it worse. The analysis therefore uses logged session length and logged non-salary expenditures but level (unlogged) salary.

Figure S3 presents various ways of handling total legislative expenditures. Variables are once again level at left and logged at right. The first row shows total legislative expenditures without adjustment for chamber size; the second row shows total expenditures per legislator; and the third row shows total expenditures per logged legislator, to separate the fixed costs of running a legislature from the diminishing costs of adding additional members. We consider total expenditures per legislator (second row) most intuitive. To reduce the influence of outlying observations, the analysis uses the logged version, shown in the middle-right chart.

The main manuscript proposes total expenditures per legislator as a simpler general measure of professionalism than traditional measures like Squire's or Bowen and Greene's indices. For years in which both variables overlap, Figure S4 plots Bowen and Greene's first dimension of professionalism against total expenditures per legislator. Each point represents one state-biennium. The solid line shows results from a cluster-corrected ordinary least squares regression, with a shaded 95% confidence interval; relevant statistics appear below each chart. The left panel includes all observations; the right panel omits outlying California from both the chart and the underlying regression. These two variables correlate strongly, whether including California ($r=0.88$) or omitting it ($r=0.80$). We are therefore confident that this simple measure serves as a valid indicator of a legislature's general level of professionalism.

Figure S2: Functional forms of professionalism components

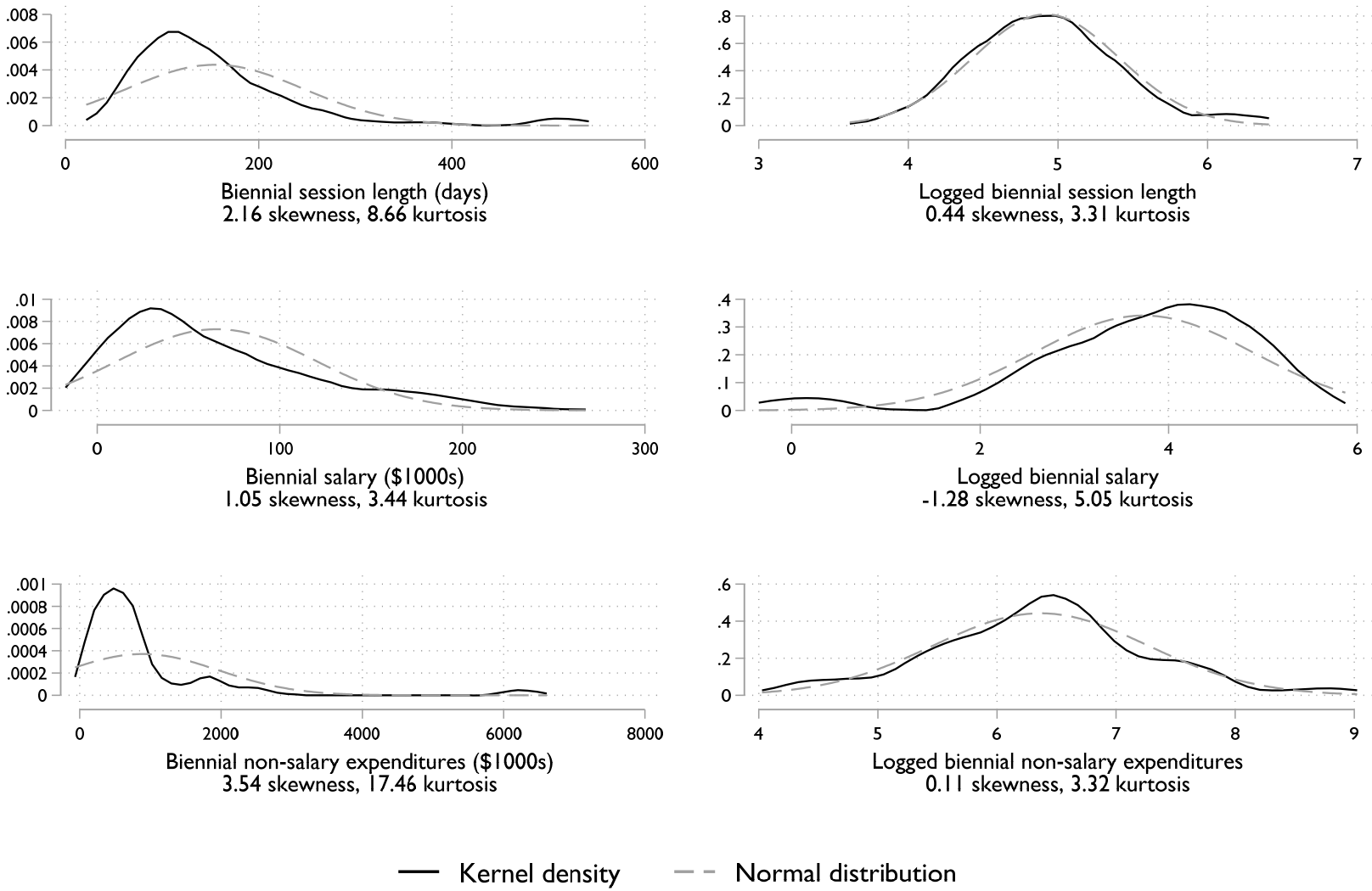


Figure S3: Functional forms of total legislative expenditures

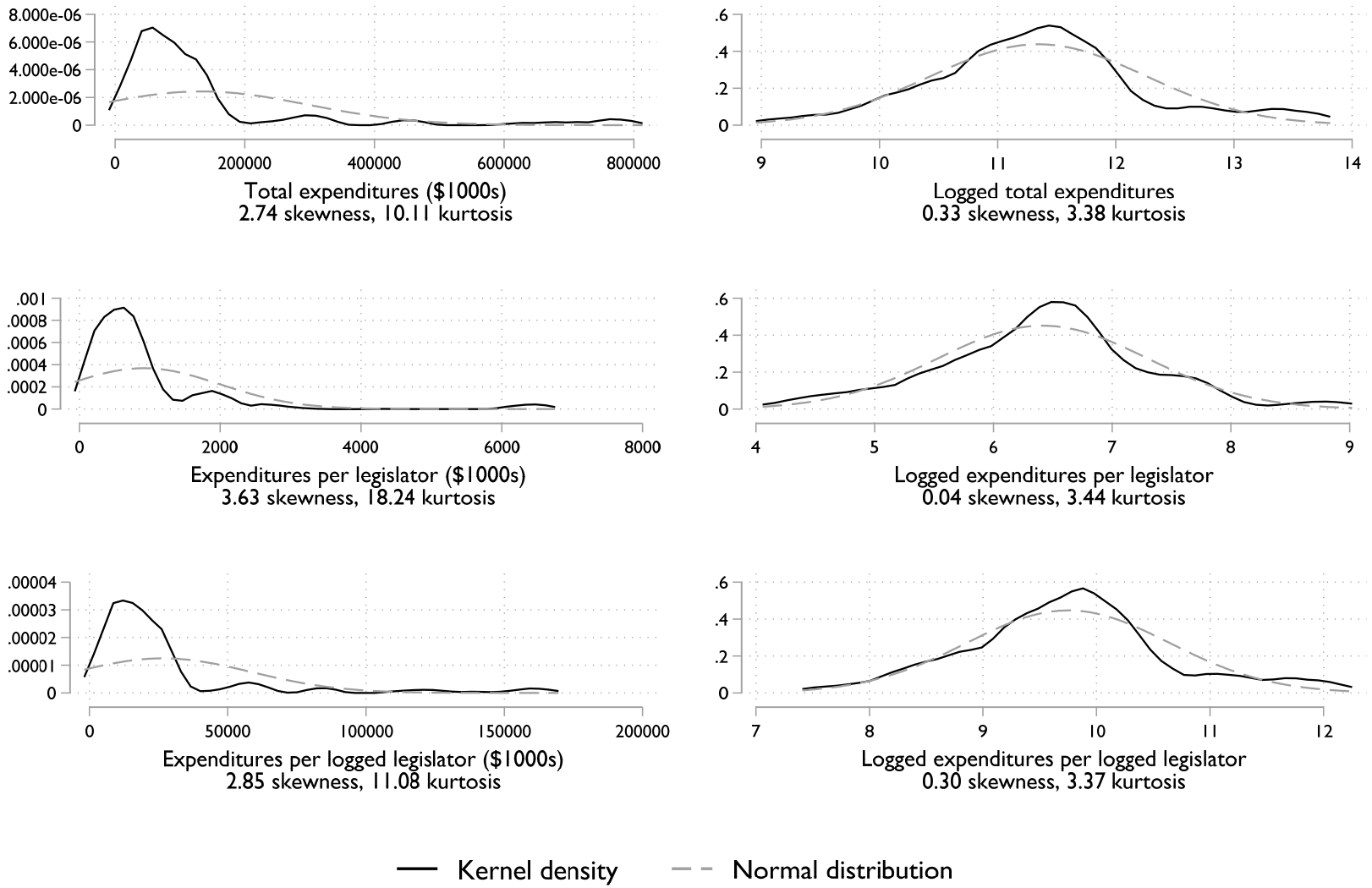
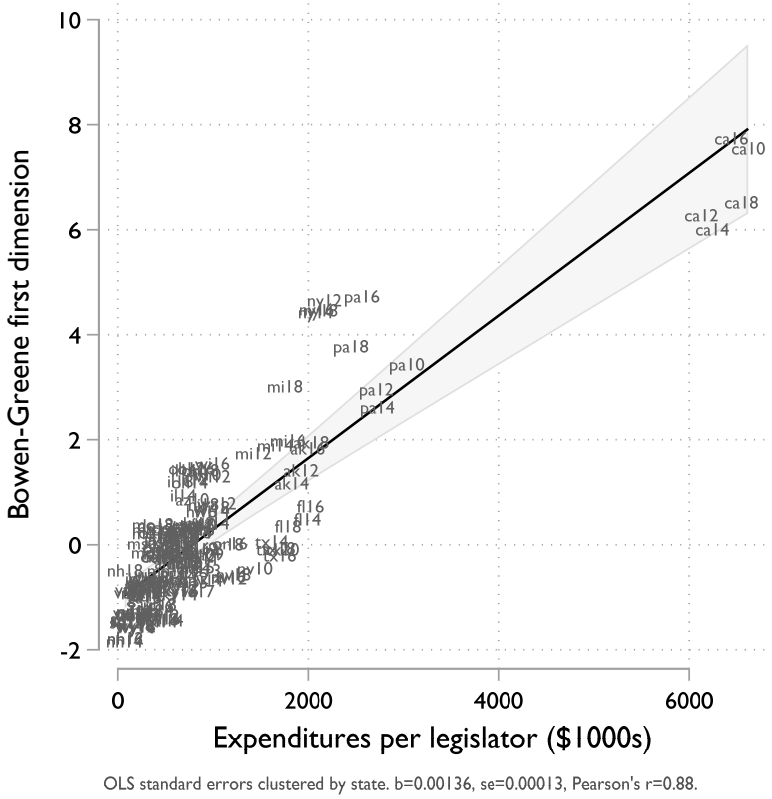
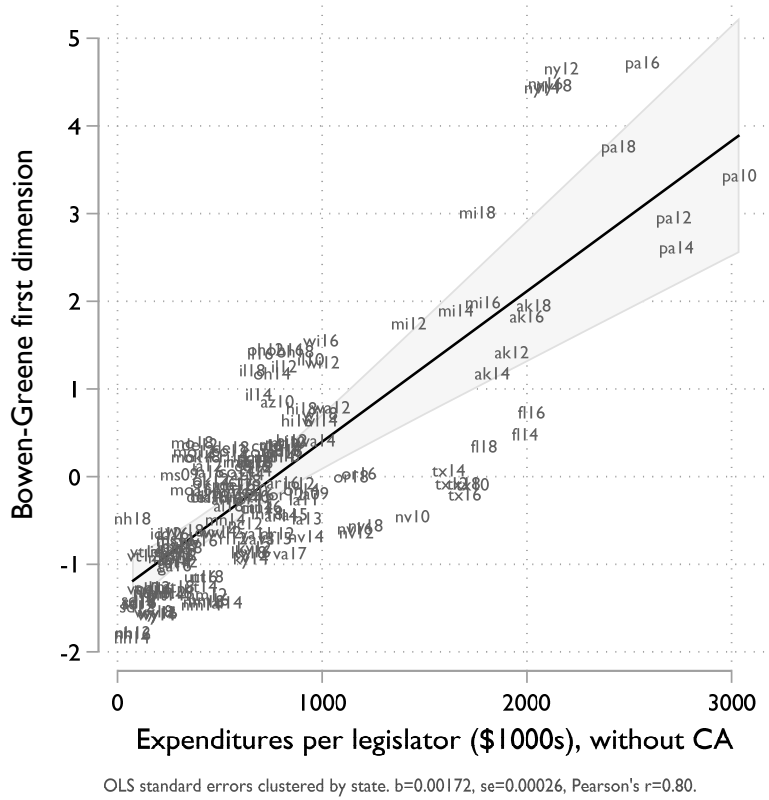


Figure S4: Bowen-Greene index vs total expenditures per capita





Bill introduction limits

Legislatures often set rules that limit the number of bills that individual members are allowed to introduce in a given session. These limits are dynamic, both in that they change over time and that there are often exceptions for party leaders or budgetary matters. Owing to the dynamic nature of bill introduction limits, our main analysis uses an indicator for chambers that had a bill introduction limit during our sample period.

Table S3 lists our estimates of states with bill introduction limits during our sample period. Unless noted, the source is a guide to state introduction limits published by the National Conference of State Legislatures in 2017.[23] In April 2020, research assistants verified the limits identified by NCSL in 14 states, but also canvassed the other 36 states, identifying additional limits in Indiana, Nebraska and Oregon.[24]

Table S3: Estimates of bill introduction limits 2017-2020

State	Limit per legislator[25]	Documentation
Arizona (lower)	5	House Rule 8(c)
California (lower)	50	Assembly Rule 49
California (upper)	40	Senate Rule 22.5
Colorado (lower)	5,5	Joint Rule 24(b)
Colorado (upper)	5,5	Joint Rule 24(b)
Florida (lower)	6	House Rule 5.3
Indiana (lower)	10, 5	House Rule 108
Indiana (upper)	10	Senate Rule 48 (2022)
Louisiana (lower)	Prefiled + 5	Constitution Article 3, Sec. 2(A)

[23] See Erickson, Brenda. 2017. "Limiting Bill Introductions." National Conference of State Legislatures. https://archive.ph/E3LuU

[24] For Oregon, see Radnovich, Connor. 2019. "Lawmakers looking to limit bill introductions to streamline workload." *Oregon Statesman*. https://archive.ph/hWXYV

[25] For states with two annual sessions per biennium, each session is separated by a comma (e.g. first year, second year). "Prefiled" refers to bills that are filed in advance of an opening to a regular session, or in the first several days of a regular session.

State	Limit per legislator[25]	Documentation
Louisiana (upper)	Prefiled + 5	Constitution Article 3, Sec. 2(A)
Montana (lower)	Prefiled + 7	Joint Rule 40-40
Montana (upper)	Prefiled + 7	Joint Rule 40-40
Nebraska unicameral	Unlimited[26]	Rule 4(d) (2021)
Nevada (lower)	Prefiled + 2[27]	Rule 218D.150
Nevada (upper)	Prefiled + 2[28]	Rule 218D.150
North Carolina (lower)	15	House Rule 31.1
North Dakota (lower)	Prefiled + 5	House Rule 402
North Dakota (upper)	Prefiled + 3	Senate Rule 402
Oklahoma (lower)	15	House custom
Oregon (lower)	Prefiled + 5	House Rule 12.20, 12.35 (2018)
Oregon (upper)	Prefiled + 5	Senate Rule 13.15.2(a) (2018),
Rhode Island (lower)	Prefiled + 3	House Rule 7(d)
Rhode Island (upper)	25	Senate Rule 4.13
Tennessee (lower)	15,15	House Rule 44
Tennessee (upper)	Prefiled + 9, prefiled + 9	Senate Rule 25
Virginia (lower)	20	Went to 7 during 2020
Virginia (upper)		Went to 12 during 2020
Wyoming (upper)	7,7	Senate Rule 4-3

Descriptive statistics

Table S4 provides descriptive statistics for each variable. Our primary variables derive nearly all their variance from "between" (cross-sectional) variation, with minimal "within" (longitudinal) variation. The analysis in the main manuscript therefore uses cluster-corrected

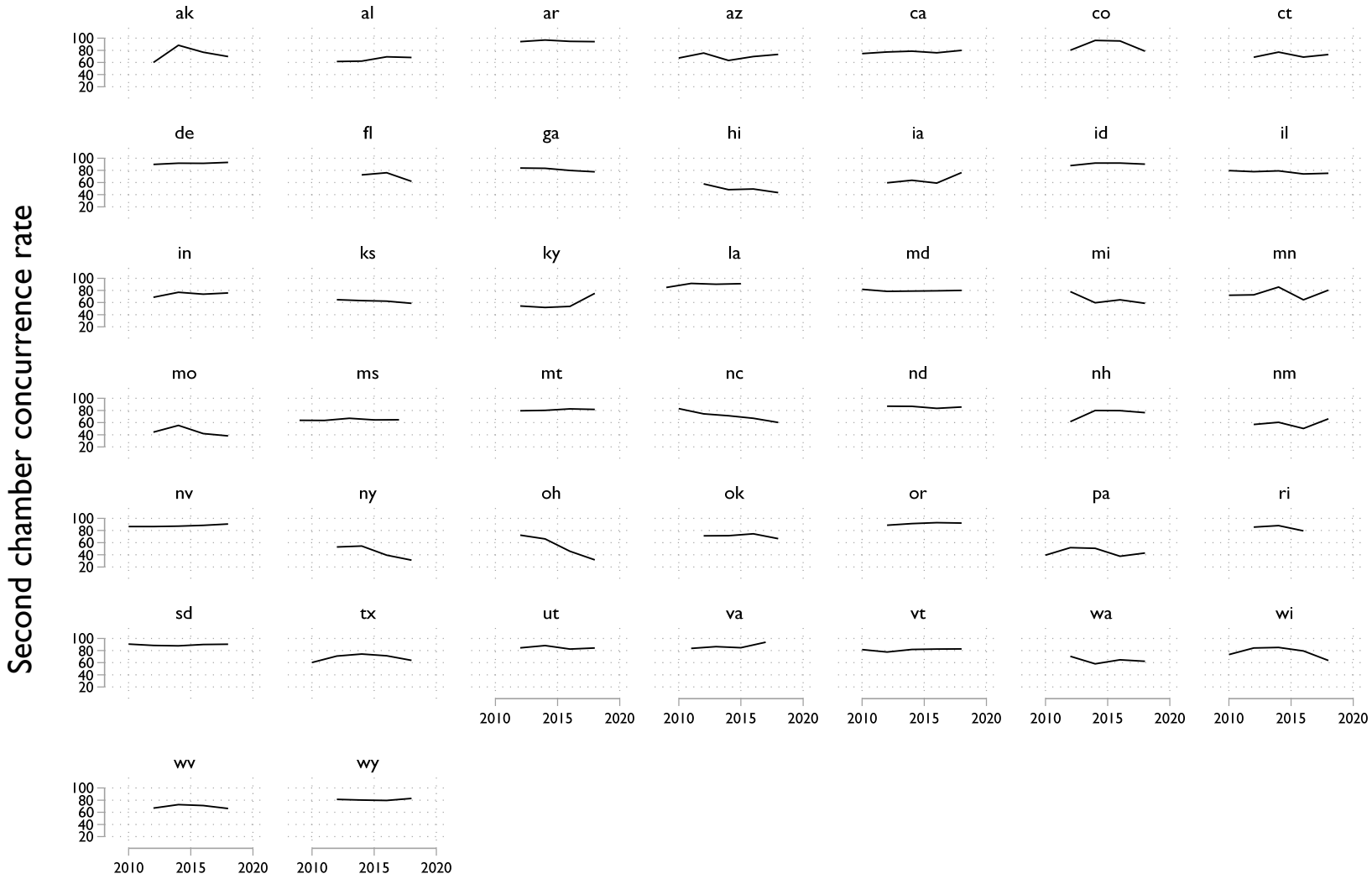
[26] Committees are limited to 8 introductions each.
[27] For newly elected members. Incumbent members are only allowed 1 bill drafting request of the legislative counsel office once the session begins. Prefiled bill drafting requests are limited to approximately 9 for incumbent members, and 5 for newly elected members, with exceptions for committee chairs.
[28] Prefiled bill drafting requests are limited to approximately 20 for incumbent members, and 12 for newly elected members.

standard errors and interprets the findings as effectively cross-sectional. Additionally, Figure S5 plots our dependent variable by state and year.

Table S4: Descriptive statistics

	N	Mean	Std dev	Std dev between	Std dev within
Concurrence rate	178	74.0	14.0	13.1	5.3
Bowen-Greene 1st dimension	173	0.21	1.7	1.6	0.28
Bowen-Greene 2nd dimension	173	0.10	0.81	0.71	0.35
Session days (log)	173	4.9	0.50	0.45	0.21
Salary ($1000s)	173	65.3	55.1	52.2	8.0
Non-salary expenditures (log)	173	6.4	0.92	0.89	0.10
Total expenditures (log)	178	6.4	0.90	0.87	0.08
Term limits	178	0.34	0.47	0.47	0
Ideological distance	178	0.22	0.31	0.27	0.18
Partisan incongruence	178	0.09	0.29	0.21	0.21
Number of bills (log)	178	6.7	0.66	0.65	0.15
Bill introduction limits	178	0.35	0.48	0.48	0

Figure S5: Distribution of dependent variable



Outliers

The main manuscript notes that California's observations are potential outliers. California has unusually high levels of professionalism by every measure; that said, it sits above the mean on the dependent variable, working against our hypothesized negative effect of professionalism. Where California differs most from other states is in Bowen and Greene's second dimension, a residual dimension that mostly serves to separate California from other professionalized states. Table S5 presents models omitting California. Consistent with expectations, omitting these observations results in similar or stronger coefficients for our professionalism indicators, though measures of incongruence lose significance.

Table S5: Replication without California

	(a)	(b)	(c)	(d)	(e)	(f)
Session days (log)	-10.9*	-10.7*				
	(3.74)	(3.78)				
Salary ($1000s)	-0.013	-0.015				
	(0.051)	(0.052)				
Non-salary expenditures (log)	-1.90	-1.78				
	(2.32)	(2.33)				
Bowen-Greene 1st dimension			-5.38*	-5.33*		
			(1.23)	(1.26)		
Total expenditures (log)					-5.46*	-5.32*
					(2.21)	(2.27)
Term limits	1.74	1.93	1.91	2.04	0.45	0.59
	(4.35)	(4.32)	(4.23)	(4.21)	(4.73)	(4.72)
Partisan incongruence	-4.74		-4.74		-6.12*	
	(3.59)		(3.44)		(2.97)	
Ideological distance		-3.03		-3.50		-5.49
		(4.30)		(3.92)		(4.36)
Number of bills (log)	1.70	1.81	2.09	2.23	1.30	1.46
	(2.61)	(2.58)	(2.69)	(2.67)	(3.29)	(3.20)
Bill introduction limits	7.40*	7.28*	6.04	6.01	10.1*	10.1*
	(4.02)	(4.01)	(3.70)	(3.69)	(3.87)	(3.88)
Constant	126	124	57.9	57.2	97.0	95.6
	(23.4)	(23.6)	(18.6)	(18.5)	(22.6)	(21.8)
Observations	168	168	168	168	173	173

*p≤0.05 (one-tailed). OLS coefficients with cluster-corrected standard errors.

Modeling

Time-series cross-sectional approaches yield similar results as those reported in the main manuscript. Hausman tests lead us to use random effects rather than fixed effects for our time-

series cross-sectional analysis.[29] Table S6 presents GLS random effects models; Table S7 presents MLE random effects models; both use the same variables as the main manuscript. As an extra precaution, we continue to cluster standard errors by state. A few controls attain statistical significance, but the general pattern for our critical variables remains similar as in the main manuscript.

Table S8 presents models that add two variables. With an eye on our limited degrees of freedom, we first reduce our models using the Bayesian information criterion, as discussed in the article. Models (a), (c), and (e) correspond to the same columns in Table 1 from the article (after BIC reduction). Models (b), (d), and (f) add Makse's indicator of "bicameral distinctiveness," as well as the number of joint committees found in each legislature. Neither attains statistical significance, nor does their inclusion change other coefficients. Results are similar when each variable is added separately to the model rather than jointly.

Table S9 replicates the first, third, and fifth models from the main manuscript, but treating each chamber separately. Though it appears superficially that professionalism has greater effects on house bills—with the implication that state senates, the chambers of interest for these bills, are more sensitive to professionalism—the differences between chambers are not statistically meaningful.

[29] The Hausman test compares a consistent model (here, one with spatial fixed effects) to an efficient one whose consistency is in question (here, random effects), with the null hypothesis that the efficient model is also consistent. Rejecting that null (ie $p<0.05$) would lead us to use fixed effects rather than random effects. We fail to reject the null in each case.

Table S6: Random effects models (GLS)

	(a)	(b)	(c)	(d)	(e)	(f)
Session days (log)	-6.18*	-5.26*				
	(2.01)	(1.94)				
Salary ($1000s)	0.028	0.019				
	(0.035)	(0.035)				
Non-salary expenditures (log)	-4.73*	-4.20*				
	(2.13)	(2.18)				
Bowen-Greene 1st dimension			-3.71*	-3.42*		
			(1.15)	(1.16)		
Total expenditures (log)					-5.68*	-5.32*
					(1.99)	(1.96)
Term limits	0.054	0.097	1.56	1.34	0.19	0.079
	(4.78)	(4.81)	(4.34)	(4.40)	(4.61)	(4.62)
Partisan incongruence	-5.95*		-5.67*		-5.07*	
	(2.71)		(2.83)		(2.61)	
Ideological distance		-8.57*		-8.81*		-9.05*
		(2.42)		(2.55)		(2.56)
Number of bills (log)	4.60*	4.84*	5.00*	5.22*	4.43*	4.67*
	(2.41)	(2.47)	(2.39)	(2.46)	(2.48)	(2.52)
Bill introduction limits	10.6*	10.2*	8.48*	8.44*	10.6*	10.4*
	(3.80)	(3.84)	(3.54)	(3.56)	(3.67)	(3.72)
Constant	98.4	91.0	38.0	38.0	77.3	75.0
	(19.2)	(18.3)	(16.3)	(16.9)	(16.3)	(15.9)
Observations	173	173	173	173	178	178

*p≤0.05 (one-tailed). Random effects coefficients with cluster-corrected standard errors.

Table S7: Random effects models (MLE)

	(a)	(b)	(c)	(d)	(e)	(f)
Session days (log)	-6.24*	-5.30*				
	(1.99)	(1.90)				
Salary ($1000s)	0.026	0.017				
	(0.033)	(0.033)				
Non-salary expenditures (log)	-4.61*	-4.14*				
	(1.93)	(2.02)				
Bowen-Greene 1st dimension			-3.70*	-3.42*		
			(1.14)	(1.15)		
Total expenditures (log)					-5.65*	-5.30*
					(1.93)	(1.91)
Term limits	0.14	0.15	1.57	1.36	0.20	0.089
	(4.67)	(4.69)	(4.29)	(4.34)	(4.56)	(4.56)
Partisan incongruence	-5.94*		-5.67*		-5.08*	
	(2.63)		(2.77)		(2.55)	
Ideological distance		-8.52*		-8.76*		-9.00*
		(2.39)		(2.52)		(2.54)
Number of bills (log)	4.44*	4.74*	4.83*	5.10*	4.27*	4.54*
	(2.34)	(2.35)	(2.30)	(2.33)	(2.43)	(2.42)
Bill introduction limits	10.5*	10.2*	8.50*	8.45*	10.6*	10.4*
	(3.66)	(3.72)	(3.50)	(3.51)	(3.63)	(3.68)
Constant	99.2	91.6	39.1	38.8	78.1	75.8
	(19.3)	(18.0)	(15.6)	(16.0)	(16.6)	(15.9)
Observations	173	173	173	173	178	178

*$p \leq 0.05$ (one-tailed). Random effects coefficients with cluster-corrected standard errors.

Table S8: Testing additional variables

	(a)	(b)	(c)	(d)	(e)	(f)
Session days (log)	-10.9*	-11.8*				
	(3.19)	(3.07)				
Bowen-Greene 1st dimension			-2.84*	-3.14*		
			(1.34)	(1.37)		
Total expenditures (log)					-4.81*	-5.26*
					(1.83)	(1.85)
Bill introduction limits	9.62*	9.36*	10.5*	9.53*	11.6*	11.3*
	(3.03)	(3.53)	(3.34)	(3.67)	(3.32)	(3.65)
Bicameral distinctiveness		-15.8		-28.5		-18.2
		(20.1)		(20.3)		(17.3)
Joint committees		0.34		0.26		0.31
		(0.27)		(0.29)		(0.31)
Constant	124	132	70.4	80.2	100	109
	(15.9)	(18.3)	(2.40)	(8.62)	(11.5)	(13.8)
Observations	186	129	181	125	187	129

*p≤0.05 (one-tailed). OLS coefficients with cluster-corrected standard errors.

Table S9: Models by chamber of origin

	(a)	(b)	(c)	(d)	(e)	(f)
Chamber of origin	House	Senate	House	Senate	House	Senate
Session days (log)	-11.7*	-8.21*				
	(4.37)	(3.60)				
Salary ($1000s)	0.0097	-0.0066				
	(0.054)	(0.044)				
Non-salary expenditures (log)	-1.99	-1.64				
	(2.73)	(2.10)				
Bowen-Greene 1st dimension			-3.61*	-2.76*		
			(1.42)	(1.40)		
Total expenditures (log)					-5.27*	-4.36*
					(2.28)	(1.90)
Term limits	1.60	2.20	2.13	2.25	0.69	0.98
	(5.06)	(3.95)	(5.16)	(3.95)	(5.37)	(4.03)
Partisan incongruence	-4.61	-6.23	-5.41*	-6.84*	-5.89*	-7.20*
	(3.45)	(3.81)	(2.81)	(3.74)	(2.69)	(3.59)
Number of bills (log)	3.72	-0.12	4.16	-0.030	3.28	-0.67
	(2.77)	(2.86)	(2.97)	(2.94)	(3.37)	(3.27)
Bill introduction limits	9.64*	7.48*	9.45*	7.65*	11.7*	9.13*
	(4.35)	(3.75)	(4.28)	(3.50)	(4.41)	(3.49)
Constant	115*	124*	43.7*	72.3*	82.3*	104*
	(26.4)	(23.6)	(20.6)	(20.0)	(21.0)	(20.2)
Observations	173	173	173	173	178	178

*p≤0.05 (one-tailed). OLS coefficients with cluster-corrected standard errors.