

Should We Measure Professionalism with an Index? A Note on Theory and Practice in State Legislative Professionalism Research

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Abstract

Legislative professionalism has played a prominent role in state politics research for decades. Despite the attention paid to its causes and consequences, recent research has largely set aside questions about professionalism's conceptualization and operationalization. Usually measuring it as an aggregate index, scholars theoretically and empirically treat professionalism as a unidimensional concept. In this article, we argue that exclusive use of aggregate indices can limit state politics research. Using a new dataset with almost 40 years of data on state legislative resources, salary, and session length, we reconsider the validity of using an index to study professionalism across the states. We evaluate the internal consistency of professionalism components over time, the relationship between components and the Squire Index, and the degree to which professionalism components are unidimensional using classical multidimensional scaling. We find enough commonality and enough variation between professionalism components to support a range of measurement strategies like the use of unidimensional indices (such as the Squire Index), disaggregating the components and analyzing their effects individually, or formulating multidimensional measures. Scholars should take care to choose the appropriate measure of the concept that best fits the causal relationships under examination.

Legislative professionalism has occupied a central place in the study of state politics for over four decades. Few concepts in the field have received as much attention as the transformation of some state legislatures from “horse and buggy, 18th century anachronisms” (Mooney 1995, 47) to institutions of high capacity, equipped with financial resources and staff, full-time sessions, and attractive legislative compensation packages. The utility of legislative professionalism for the study of state politics is unquestionable; the process has been associated with a wide range of political outcomes including the degree and quality of legislative representation, public opinions about the legislature, state government spending, and various aspects of legislative careers, to mention only a few effects of the process (e.g. Squire 1992; 1993; Berry, Berkman, and Schneiderman 2000; Maestas 2000; Lax and Phillips 2012).

Despite these advancements, the conceptualization and measurement of professionalism has received less attention from recent scholarship. Following Grumm (1971), scholars have nearly always operationalized professionalism with an aggregate index that combines a number of similar, yet distinct, characteristics. Most professionalism measures rely on three core

components of professionalism: legislative resources measured as staff or expenditures, legislator compensation, and time in session (Grumm 1971; Morehouse 1981; Bowman and Kearney 1988; Squire 1992). While scholars have disagreed on the meaning and construction of professionalism indices (see Mooney 1994; Squire 1992; Moncrief 1988; Rosenthal 1996; Brace and Ward 1999), almost no work examines the implications of measuring professionalism with an aggregate index.

Measuring professionalism using an aggregate index is a unidimensional measurement strategy; we believe this strategy unnecessarily restricts state politics research and comes with important limitations that often go unrecognized. Professionalism is a heterogeneous concept both empirically and theoretically. Empirically, many states have chosen to professionalize in some components more than others, which has led to a diversity of forms that professionalism has taken across the states and over time (Moncrief 1988; Kurtz 1992). Theoretically, professionalism can have varied (and even contradictory) effects on state politics due to the functional independence of the components (Woods and Baranowski 2006; Squire 2007; Kousser 2005; Kousser and Phillips 2009; Gamm and Kousser 2010). Extant professionalism indices ignore much of this variation and instead measure the “common denominator of all the variables” (Grumm 1971, 317). Under certain conditions, scholars may find it beneficial to disaggregate the index into its individual components or to create multidimensional measures of the concept as best suits the needs of the research project at hand.

In this paper, we present a new, publically available dataset on legislative professionalism which measures each professionalism component – expenditures, compensation, and session length – individually, across the states. These data allows us to reevaluate professionalism’s conceptualization and measurement. We measure each component biennially from 1973/4

through 2009/10; this provides us with the opportunity to examine both short term and long term changes in professionalism. We utilize these data to evaluate the measurement of legislative professionalism. Conceptualizing professionalism as set of distinct institutional characteristics of a state legislature, rather than a single latent construct, we evaluate the internal consistency of professionalism components over time, the relationship between components and the Squire Index (Squire 1992; 2007; 2012), and the degree to which professionalism components are unidimensional using classical multidimensional scaling (MDS).

These analyses lead to several important conclusions. First, there is simultaneously enough commonality and enough variation between professionalism components to support a range of measurement strategies like the use of unidimensional indices (such as the Squire Index), disaggregating the components and analyzing their effects individually, or formulating multidimensional measures. Scholars should take care to choose the appropriate measure of the concept that best fits the causal relationships under examination. Second, the Squire Index performs well in our tests and accurately taps the commonality between professionalism components. Thus the Squire Index appears to be a reliable and valid measure of the broad differences between amateur and professional legislatures, matching previous examinations of the index (Malhotra 2006; Squire 2007). Yet, there remains substantial variation in professionalism components not accounted for by unidimensional indices like Squire's. This variation is large enough for the MDS solution to be two-dimensional, with the second dimension representing over 17% of the variation in the dissimilarity between professionalism components across the states and over time. This second dimension appears to match a support-intensive vs. work-intensive dimension as suggested by Rosenthal (1996). We conclude that the evidence in support of a heterogeneous conceptualization and measurement of professionalism

suggests that researchers may benefit from disaggregating the index into its constituent parts. As nearly all work on professionalism has utilized an aggregate index, disaggregation provides an under-utilized and promising avenue for future research.

Professionalism and State Legislative Reform

State politics scholars have referred to professionalism in two distinct ways. First, scholars consider professionalism as one distinct concept, usually as a measure of legislative capacity. Mooney, for example, writes that professionalism “refers to the enhancement of the capacity of the legislature to perform its role in the policy-making process” (1994, 70-71). Alternatively, professionalism has been conceptualized as the specific institutional characteristics used in its measurement (Moncrief 1988), with staff or expenditures for the legislature, legislative compensation, and time in session being the most important components. These two perspectives are not mutually exclusive; scholars commonly use the term to refer to both overall capacity and specific institutional developments, often in the same paragraph (e.g., Squire 2012, 266-267).

Such a dual-perspective makes sense given the history of legislative professionalism. The study of legislative professionalism grew out of a reform movement intent on modernizing state legislatures for the challenges of post-WWII America, most notably the expansion of the role of both the federal and state governments and the development of the welfare state. State legislatures, now released from decades of malapportionment following *Baker v. Carr* and *Reynolds v. Sims*, were called upon by reformers to be a primary agent in the new, active state (Bowman and Kearney 1988; Mooney 1994; Squire 2007).¹ Reformers recommended numerous institutional changes to modernize legislatures, from increasing pay and removing constitutional

restrictions on session lengths to shrinking the number of legislative seats, converting from bicameralism to unicameralism, and streamlining committee systems (APSA 1969; CED 1967; CCSL 1971). The states' professionalism, then, could be measured either as an overall level of legislative capacity or in terms of specific sets of reform policies adopted.

The development of the professionalism index for scientific use arose out of this reform movement. Grumm (1971) first developed the concept by listing characteristics which could be used to distinguish "professional" from "amateur" legislatures. Professional legislatures are "well staffed; good informational services are available to them; a variety of services and aids, such as bill drafting and statutory revision, are maintained and well supported; the legislators themselves are well paid, tend to think of their legislative jobs as full time or close to it, and regard their legislative role as a professional one" (Grumm 1971, 309). Amateur legislatures lack these features.

Scholars created early professionalism indices using factor analysis. The indices differed mostly in which components are included as input variables (Grumm 1971; CCSL 1971; Morehouse 1981; Bowman and Kearney 1988).² The most important development of the professionalism index is Squire's (1992) modification. Squire jettisons some components from previous indices and for theoretical reasons focuses on three core variables: legislative staff, base salary, and time in session. He abandons factor analysis and instead measures each state's components relative to those of Congress and then averages the three ratios to arrive at a single professionalism score.

Existing professionalism indices share an implicit latent variable conceptualization of professionalism with the underlying concept measured by the shared variation between the components. This approach is unidimensional; each state legislature is placed somewhere on a

continuum with a “professional” or “capable” legislature like Congress at one end and an “amateur” or “citizen” legislature like New Hampshire’s at the other (Squire 2007).³ The implications of this approach, rather than a component-centric view of professionalism, are large. By explicitly measuring the commonalities in the professionalism components, factor analysis-based indices ignore each component’s unique variation. This decision makes sense under certain conditions. For example, if only one dimension exists across the professional components, then unique variation separate from the overall commonality might be safely ignored; any observed variance is then derived from measurement error or perhaps from some other aspect of the component that is conceptually distinct from professionalism. It is also possible that all three components so closely covary that they cannot be accurately utilized separately in regression analysis. In such situations, it is prudent to combine information from all three components rather than to rely on data from only one.

Yet, these conditions often do not hold. As we show below, the correlation between the three components is only moderate; inter-item Pearson’s r correlation coefficients since the early 1970s rarely reach .7 and often fall substantially lower. Further, there are substantive differences in how states professionalize. States can (and do) professionalize in some areas and not others (Moncrief 1988). Whether such deviations are politically relevant is an empirical question that will depend on the relationships being studied. When that unique variation is relevant to the political phenomenon being examined, using unidimensional indices can lead to incorrect inferences about the causes and consequences of professionalism. Additive indices like the Squire Index (1992; 2007; 2012; King 2000) have a similar problem. While they do not ignore unique variation (each change in a component score influences the overall index value), these indices are indeterminate; multiple different combinations of professionalism component scores

can result in the same Squire Index score, which could lead to ambiguity about the specific causal mechanisms connecting professionalism with other aspects of state politics.

We illustrate this problem in Table 1, which shows professionalism components and Squire Index scores (raw values and grand mean values).⁴ Table 1 shows clearly the indeterminacy of the aggregate indices. Similar index scores can mask substantively interesting differences in combinations of professionalism component values. For example, Florida combines high staffing and expenditures per legislator with short sessions and modest pay. In fact, Florida almost triples Minnesota and Arizona's staffing totals, and nearly quadruples those states' expenditures, but the state limits legislative sessions to only 60 calendar days and offers salaries of under \$35,000 a year. In contrast to Florida, Arizona has modest staffing levels and resources for the legislature and low salary, but long legislative sessions. The individual components illustrate substantially greater variation between Arizona and Florida than the modest differences in their Squire Index scores would suggest; the nature of professionalism and the types of resources available to legislators in these states are quite different. Florida invests in financial resources and staff whereas Arizona provides more time in session for legislators to work.

Depending on the theoretical mechanisms (for example, constituent service, research capacity or legislative experience) that link professionalism to other political phenomena, such differences may matter for appropriate testing of professionalism's causes and consequences. The problem is broader; unidimensional indices cannot capture differences like those between Florida and Arizona and simultaneously measure general differences in legislative capacity between citizen and professional legislatures. The states have varied both in *how much* they have professionalized and in what ways they have chosen to do so.

It is difficult to know the substantive importance of these measurement concerns. Even if the states vary in how they professionalize, the effects of professionalism may still be driven by the broad, largely unidimensional difference between citizen and professional chambers. Further, it could be that components tend to have similar effects. In such situations it would not matter if professionalism is measured as three separate components or if as a single index.

Fortunately, while the majority of studies on professionalism have utilized professionalism indices, several studies operationalized the concept in different ways. This research generally shows that professionalism components often have differential effects on key aspects of state politics, and sometimes these effects are contradictory. For example, Ophiel (1991) separates staffing from session length and compensation and finds that the components had different effects on the independence of the legislature from lobbyist influence. Staffing is associated with stricter definitions of lobbying and more required reporting while salary and session length were associated with greater state oversight of lobby regulations. Woods and Baranowski's (2006) analysis of legislative oversight of the bureaucracy in 15 states finds that staff and expenditures are positively and significantly associated with legislative influence on state agencies while compensation is negatively and significantly associated with legislative influence. In other words, legislative resources and compensation have contradicting effects on legislative influence. Likewise, Kousser (2005) finds contradictory effects of professionalism components on the power of legislative leaders and on the presence of restrictive rules for legislative committees and thus their agenda-setting powers.

Other work has identified relationships driven by one component rather than the common variance in all components. Long session lengths appear to be the driving force behind professionalism's enhancement of the legislature's power in budget battles with the governor

(Kousser and Phillips 2009)⁵ and also are the reason why more professional states have greater congruence between public opinion and policy (Lax and Phillips 2012). Legislative salary is associated with the introduction of district-focused bills at the expense of state bills, while session length has no such relationship (Gamm and Kousser 2010).

This research does not demonstrate that measuring professionalism as an index is always incorrect, or even usually incorrect. In fact, Woods and Baranowski (2006) show that the combined effect of resources and careerism is similar to the estimated effect of professionalism measured only as an index. Instead, these works show that disaggregating the index can help bring theoretical and empirical clarity which can be missing *when components of professionalism have divergent theoretical expectations*. As Gamm and Kousser note, “it is crucial to consider the individual effects that [professionalism’s] constituent parts might exert. Each aspect of professionalism can alter a legislator’s incentives and resources in a distinct manner” (2010, 156). The implication of this research is that separating professionalism back into its constituent parts may be a fruitful avenue for state legislative research. In the following section, we describe our new data set and discuss our approach to analyzing the professionalism’s internal consistency and dimensionality.

Measurement and Data Collection

We collected biennial data on state governments from the 1973-74 legislative biennium through the 2009-2010 biennium, measuring each of the primary components of Squire’s (1992) index separately. We follow Squire’s coding rules for the legislator salary and session length as much as possible. We measure legislative salary as the base amount paid to legislators in a given year and session length as the number of days the legislature met in the two year period

following the beginning of the biennial session. Both items are derived from data published in the Book of the States (BOS). Contrasting Squire's (1992) measure of session length slightly, we include the days from the regular sessions *and* special sessions because some states use special sessions to circumvent statutory and constitutional limits on the number of days the legislature can meet during a regular session (Council of State Governments 1974-2011).⁶

We use state expenditures for the legislature not paid toward legislative salaries to tap the staff/resources component of professionalism because staffing data are only available in years when NCSL has conducted a survey of legislative staff (Squire 2007). Expenditure data come from the U.S. Census Bureau's Annual Survey of State Government Finances.⁷ We divide expenditures by the number of state legislators in each state to get a per-legislator expenditure amount. Expenditures per legislator data are summed over the biennium and measured in constant (2010) dollars. This is the same process King (2000) uses as his replacement for Squire's staff measure. In his review of the index, Squire (2007) notes that the operations budget is conceptually similar to the amount of staff available for each legislator and produces similar results.⁸

Other recent examinations of professionalism (King 2000; Malhotra 2006; Squire 2007; Squire 2012) have used versions of the Squire Index measured only once a decade; our dataset is the first to measure the process in every session over an extensive time period. The data allow for the identification of short-term (as well as long-term) causes and consequences of the process. Collecting almost 40 years of data was a time-intensive process, particularly since only the most recent years of the BOS are available online.

Our measurement strategy does have some drawbacks. In order to consistently measure professionalism components biennially over our long time series, we only utilized information

from the BOS for salary and session length. Unfortunately, the BOS coding of session length can be problematic. First, the BOS does not consistently report session length data and will switch between calendar and legislative days for some states during the time series. Calendar days, even when converted to legislative days by multiplying them by five-sevenths, appear to over-estimate the actual number of legislative days in session. Second, some session length data are missing for some state-years, particularly in the mid-1990s. When possible, we calculate calendar days from the formal starting and ending dates and then convert calendar days to legislative dates using the same formula as above. In instances when these calculation deviate drastically from typical legislative sessions, we code the observation as missing. Lastly, following Squire (1992; 2007), we do not include per diem living expenses (vouchered or unvouchered) in our calculations of salary, nor do we include any other non-salary benefits (like pensions or health insurance). Our measure of salary thus underestimates actual compensation for legislators (Squire and Moncrief 2010).⁹ In total, we have 889 completed observations ranging across 19 bienniums.¹⁰

Using these data, Figure 1 displays the median and mean values of the professionalism components by legislative session.¹¹ Legislative expenditures grew almost constantly through the period of study, with inflation-adjusted median per-legislator expenditures in 2009-10 more than double median expenditures in 1973-4. Expenditures growth abated only during the first sessions of the 80s, 90s, and 2000s, matching periods of contraction in the U.S. economy.¹² We show changes in compensation levels in the second panel of Figure 1. The trends clearly differ from those in expenditures. The median per-legislator salary fell in the 1970s and 1990s, but grew in the 1980s. Session length also (in the third panel) differs from the other two components, showing few patterns and much noise during the nearly 40 year period. These trends generally match King's (2000) examination of professionalism change.

[FIGURE 1 HERE]

A Test of Internal Consistency

How closely do professionalism components relate to each other, and do the relationships between components change over time? In other words, is a scale based on expenditures, salary, and session length internally consistent? Here we use Cronbach's alpha (Cronbach 1951; Cortina 1993) which evaluates consistency by examining the interrelatedness of items in a scale (Netemeyer, Bearden, and Sharma 2003; Cortina 1993). Overall, professionalism components perform well; the coefficient alpha based on pooling all the years in the study is .81. Since standard rules-of-thumb suggest that alpha scores between .7 and .8 or higher denote consistent scales, professionalism performs well. Figure 2 shows alpha values across each biennium along with inter-item correlations between components. Cronbach's alpha scores are quite stable over time.¹³

[FIGURE 2 HERE]

However, the magnitude of the contribution of each component to the index varies. Figure 2 also shows the inter-item correlation coefficients over time. Salary correlates highly with both expenditures per legislator and session length (regular and special sessions) through the period of study, with correlations at .63 (salary and session length) and .65 (salary and expenditures) when we pool all observations. However, expenditures and session length only weakly correlate as Pearson's r correlation coefficients frequently fall below .5. The inter-item correlation between these two components pooled over the time series is only .49 and drops to .40 if California is excluded.¹⁴

These results highlight the role that salary plays in professionalism indices. The shared variation between expenditures and session length matches very closely with legislator salary,

but aspects of both expenditures and session length diverge from one another and from salary. For example, the additive scale produced when calculating Cronbach's alpha correlates more highly with salary ($r=.89$) than with expenditures ($r=.84$) or session length ($r=.83$). Likewise, salary correlates highly with an additive scale of standardized expenditures and session length values ($r=.75$), but expenditures and a scale of salary and session length correlate at only .65 and session length and a scale of salary and expenditures correlate at only .62.

[FIGURE 3 HERE]

Scatterplots between professionalism components and the Squire Index scores help elaborate upon these findings. We show these scatterplots in Figure 3. To illustrate the average relationship between Squire Index scores and each component, the figure also displays the trend lines between the Squire Index and each component created through locally weighted regressions. Points above the trend lines represent observations which receive higher component scores than is typical given the state's Squire Index value whereas points below the trend lines show observations which have low component values given their Squire scores.

Figure 3 matches nicely with the Cronbach's alpha analysis. All three components are positively correlated with Squire Index scores. It is thus not surprising that alpha shows high levels of consistency across the items. Salary shows a particularly close relationship to the Squire Index, with divergence from the trend line only appearing among highly professionalized states. However, no such close relationship is found between the Squire Index scores and the other two components. Points in the scatterplots fan out quickly as the Squire Index increases, showing heterogeneity in the components at each level of the index. This is shown most clearly in the expenditures graph (first panel). Expenditure values for states with Squire scores of approximately .2 range from \$103,000 per legislator in Maine (1979/80) to just under \$2,148,000

per legislator in Florida (2003/2004). Similar (although somewhat less drastic) variation is shown in the session length plot, particularly among states with high Squire Index scores.

One possible interpretation of Figure 3 is that states diverge as they professionalize, particularly on their allocation of legislative resources and the length of their sessions. Many of the states with the high expenditures per legislator have relatively short sessions, while states the longest sessions tend to support only moderate levels of legislative expenditures. Of course, such relationships occur within the broader context of generally increasing professionalism components noted by the strong positive relationships between the Squire Index and each of the three components.

The Dimensionality of Legislative Professionalism

The analysis up to this point has shown that professionalism components boast both commonality and variation. Professionalism components since the early 1970s have followed divergent trends, with only expenditures showing regular growth. Our internal consistency analysis matches with other conceptualizations of professionalism (Moncrief 1988; Kurtz 1992; Kousser 2005) by showing both evidence that the components can be adequately combined into a reliable and consistent additive scale (like the Squire Index) and that the inter-item correlations between components are not particularly high. In fact, while the professionalism components *tend* to move together across states, they do not *necessarily* do so. The scatterplots displayed in Figure 3 show substantial variation in component values as Squire Index scores increase, suggesting the states may choose among divergent forms of professionalism.

Is there a multidimensional structure to this heterogeneity?¹⁵ Empirically identifying the number of underlying dimensions in a set of variables is a complicated task. Dimensionality is “the number of separate and interesting sources of variation” among a set of objects (Jacoby

1991, 27). But there is likely no “correct” number of dimensions of professionalism; rather, dimensionality depends on the context and purposes of data measurement, with a unidimensional perspective performing well in certain research situations and a multidimensional one in others (Jacoby 1991). The questions regarding professionalism, then, are: how many sources of variation exist across professionalism components and is that variation interesting and relevant to research on state legislatures?

As a more rigorous analysis of the data, we use multidimensional scaling (MDS) to determine the number of dimensions present in the components. Metric (or classical) MDS is a data reduction technique used to spatially represent differences between observations on a number of variables in a small number of dimensions. Distances between points in MDS note dissimilarity between the observations on the input variables. We convert the professionalism components of expenditures per legislator, salary, and session length to dissimilarity data and analyze the data using MDS.¹⁶

The MDS results show a primary dimension that accounts for 72.8% of the dissimilarity between observations. However, the MDS solution also includes a substantial second dimension representing 17.1% of the dissimilarity between observations. Approximately 90% of the dissimilarity between state-year data on professionalism components can be accounted for by these two dimensions.¹⁷

Figure 4 plots the MDS configuration. The x and y axes on the graph are scaled to represent the proportion of the variation in the dissimilarities accounted for by each dimension. The dominant dimension is easily recognizable as the classic citizen-professional dimension identified in previous scholarship. At the left side of the graph are the citizen legislatures of New

Hampshire, Wyoming, and North Dakota. On the right side of the graph are the professional, full-time legislatures of Massachusetts, Michigan, New York, and California.

This first dimension matches very closely with previous measures of state professionalism. Figure 5 shows a scatterplot between the MDS scores and Squire Index values (when Squire Index values are available). While there is some variation, particularly in more professional states, there is a clear, strong linear relationship between the two scores. In fact, the MDS scores and the Squire Index values very highly correlated ($r=.92$, $p=.000$). This is all the more impressive given that we measure expenditures instead of staff and include special session length in our measure of session length. The Squire Index taps nearly the exact same variation as the first MDS dimension. We take this as evidence of the construct validity of the Squire Index as a measure of professionalism's primary dimension.

However, the vertical dimension in Figure 2 is a little more interesting. This dimension grows larger as the values on the first dimension increase; the greatest distances between states on the second dimension occur among the most professionalized states. Further, the second MDS dimension is positively correlated with expenditures ($r = .49$, $p<.001$), negatively correlated with session length ($r = -.56$, $p<.001$), and uncorrelated with base salary ($r = .02$, $p=.42$). These results are consistent with the results from the Cronbach's alpha tests and the scatterplots shown in Figure 3. Salary is the central professionalism component and expenditures and session length correlate more highly with salary than with each other. The first dimension, then, represents primarily salary *and* the shared variance between all three components. The second dimension, however, shows how states' professionalization has deviated from this standard. Expenditures and session length do not correlate highly with each other because some states have chosen to professionalize primarily through staff and resources and other states professionalized by

allowing more time for legislative work. States with positive scores on the second dimension have high resources and those with negative values have long sessions, relative to their general level of professionalism.¹⁸

This interpretation matches Rosenthal's (1996) conceptualization of professionalism. Rosenthal argues for a legislature-(rather than legislator) centered definition of professionalism and suggests focusing on only staff and time in session. Using this typology, states could be grouped into 4 categories: high staff support and long sessions ("professional"), high staff support and short sessions ("support-intensive"), low staff support and long sessions ("work-intensive"), and low staff and short sessions ("amateur") legislatures. Likewise, one could think of the second MDS dimension as a support-intensive vs. work-intensive dimension representing differences between professionalized states while the first is shows the broad differences between amateur and professional legislatures.

Does this second dimension matter? We can use goodness-of-fit statistics to get a sense of when and where the two-dimensional solution offers improvements over the one-dimensional solution, although a full accounting of this question is beyond the scope of this paper. Following Kruskal and Wish (1978), we calculate Kruskal's stress scores both for the entire dataset and for each observation using both the first dimension alone and the first and second dimensions. Kruskal's stress scores are a type of residual that measures the difference between the dissimilarities (data points) and the fitted MDS distances between observations. Stress scores range between 0 and 1; 0 represents a MDS solution that perfectly matches the input data and 1 shows MDS scores which do not represent the dissimilarity data at all. The aggregate Kruskal stress score using just the first dimension is .19. Including the second dimension cuts the stress score in half to .09, a much better-fitting MDS solution.¹⁹ These scores indicate a moderate

improvement by including the second dimension, and that the final two-dimensional plot fits the underlying data well.

Another way of examining goodness-of-fit is to calculate Kruskal's stress scores for each observation and then see among which state-years the two-dimensional MDS solution improves upon the one-dimensional solution. We present these results in Figure 6. The height of each bar shows the improvement in stress scores caused by including the second dimension. The figure makes several interesting points apparent. Nearly every state in every session shows improved fit when we use the two-dimensional MDS solution (which is expected, a two-dimensional solution should not fit the data worse than a one-dimensional solution); the degree of improvement, however, varies greatly across states and over time. For many states, particularly those that with citizen legislatures, the second dimension offers little improvement. Even some of the most professional states like CA, NY, and MI show relatively little improvement from the addition of the second dimension.

Two groups of states, however, show marked improvement: states with low expenditures, but relatively long sessions like MA, VT, and CO and states with high expenditures and staff but short sessions like FL, NJ, TX, and NV.²⁰ The improved fit for FL, TX and NV is particularly noticeable and the benefits of including the second dimension increase steadily over time. All three states have seen dramatic population growth and have followed a similar professionalization trajectory by sharply increasing expenditures and staff, decreasing base salary, but maintaining static session lengths.²¹

Discussion

We believe these findings have several important implications for the study of legislative professionalism. First, the Cronbach's alpha analysis shows that, both over the entire time series

and in individual bienniums, an additive scale of expenditures, base salary, and session length can form a reliable measure of professionalism. Second, the Squire Index, the most prominent professionalism index, essentially captures the same variation as shown in the first dimension of the MDS solution, which accounts for about 72% of the dissimilarity between observations in our dataset. Thus, the Squire Index, while not accounting for all variation in professionalism components over time, does accurately capture the core conceptual differences between citizen and professional legislatures.

However, the results presented here show professionalism to be more heterogeneous than is typically presented in the literature. Correlations between components are only moderately strong. This is particularly true for the relationship between expenditures and session length. Further, a substantial second dimension can be extracted from the MDS solution. Previous research relying on unidimensional indices have thus ignored a substantial portion of the components' variation across states and over time. Such variation provides a fruitful avenue for future research, as the few scholars to utilize a disaggregated or multidimensional approach to professionalism have identified divergent effects of the components (Ophiem 1991; Woods and Baranowski 2006; Kousser 2005; Kousser and Phillips 2009; Gamm and Kousser 2010).

These results suggest conceptualizing and measuring professionalism as one unified characteristic of state legislatures is an over-simplification. Rather, professionalism represents a *set* of related characteristics that fluctuate both across states and over time, as state actors tailor their institutions to respond to the needs of their state and match their own views of what representative government should entail (Rosenthal 1996). This variation is substantial, and should not be ignored when possible. Such a view fits both the raw components and the MDS two-dimensional solution. We find that citizen legislatures tend to be quite similar, with short

sessions, minimal compensation, and limited support from staff. As states professionalize, and choose to invest resources into the legislature, the exact form professionalism takes varies.

Ultimately, there is likely no “one-size-fits-all” measurement of legislative professionalism. For some studies, a parsimonious, unidimensional operationalization of professionalism (like the Squire Index), will suitably measure the concept, particularly if the causal theory is indifferent to the types of resources legislators have available to them. Other studies may benefit from a multidimensional operationalization by using the raw component data presented here or by creating multidimensional measures through a scaling method such as MDS. While expenditures and staff, salary, and session length may go together in “syndromes of professionalism or amateurism” (Grumm 1971, 309), scholars have also pointed to the diversity of professionalism components (Kurtz 1992). These two perspectives foster not only a range of potential causal relationships, but also a range of potential measurement strategies. Our understanding of a central concept of American state legislatures is advanced when careful scholarship matches the measurement strategy of professionalism with its expected causal mechanisms.

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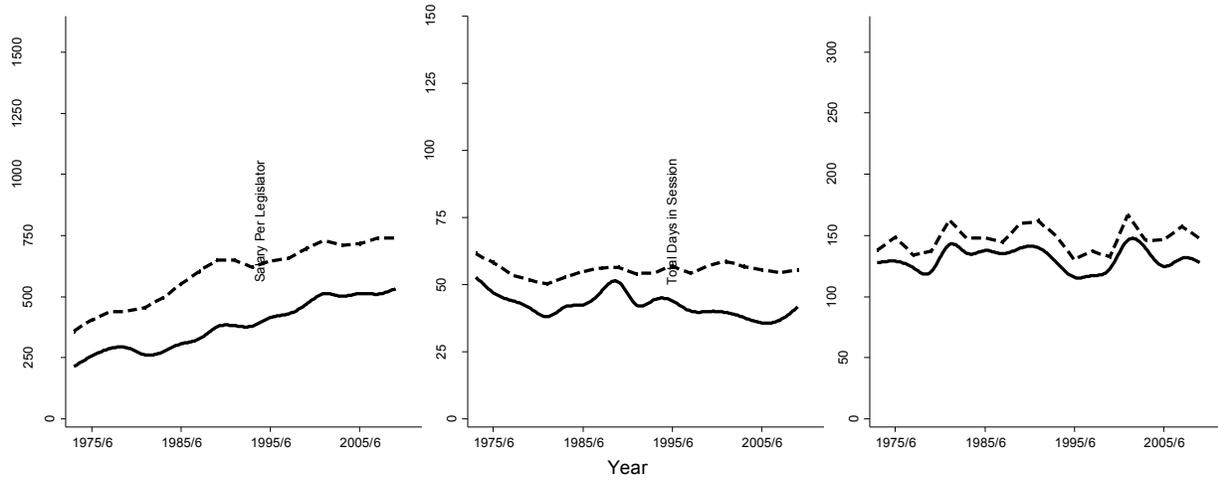
Table 1. Professionalism Components and Indices Scores in 2003/4 in Six States

<i>State</i>	<i>Total Staff</i>	<i>Expenditures per Legislator</i>	<i>Salary</i>	<i>Session Length</i>	<i>Squire Index</i>	<i>Squire Index Grand Mean</i>
South Dakota	75	119.3	13.9	77	0.06	0.08
Minnesota	684	520.0	72.3	145.2	0.17	0.19
Washington	826	948.8	76.9	139.9	0.20	0.21
Florida	1803	2147.9	67.1	123.5	0.22	0.23
Arizona	682	512.8	55.7	252.8	0.23	0.26
Ohio	506	629.6	123.7	260	0.30	0.35

Note: Staff data are from the NCSL and include both permanent and session-only staff. Data are available online at <http://www.ncsl.org/research/about-state-legislatures/staff-change-chart-1979-1988-1996-2003-2009.aspx>.

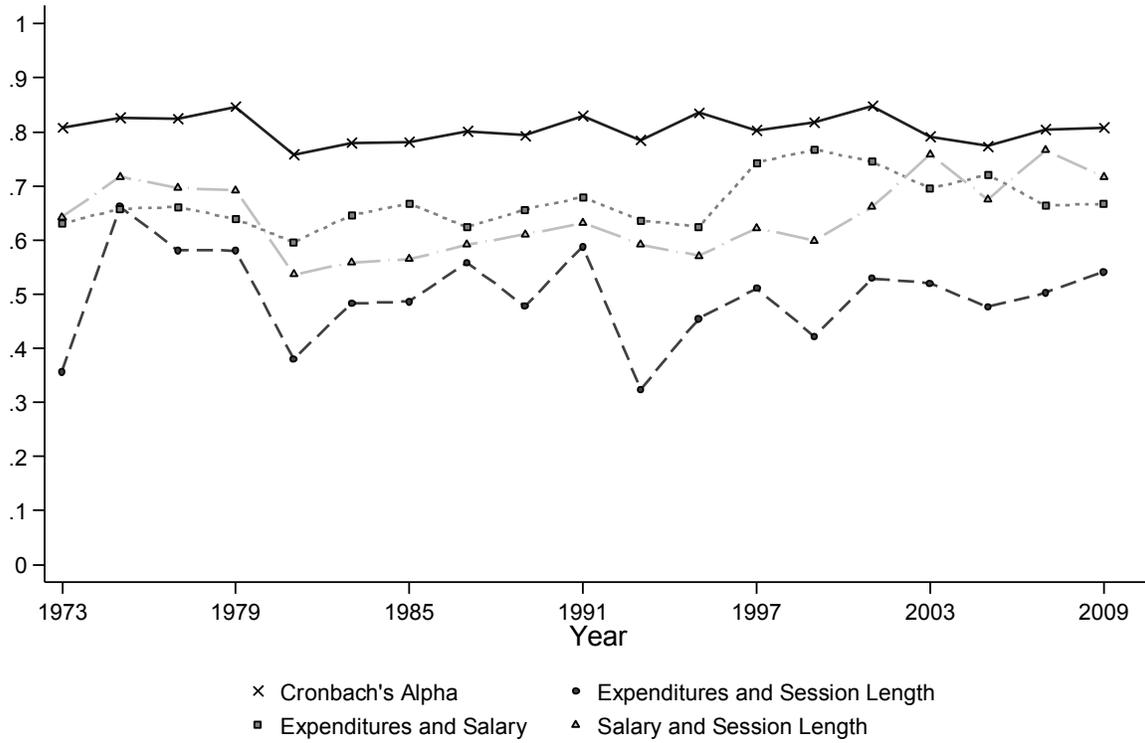
Expenditures per legislator and salary are in thousands of constant (2010) dollars. Professionalism components represent total values in the 2003-04 biennium. Squire Index scores were taken from Squire (2012), while the grand mean scores are from Squire (2007).

Figure 1. Trends in Legislative Professionalism, 1973-2010



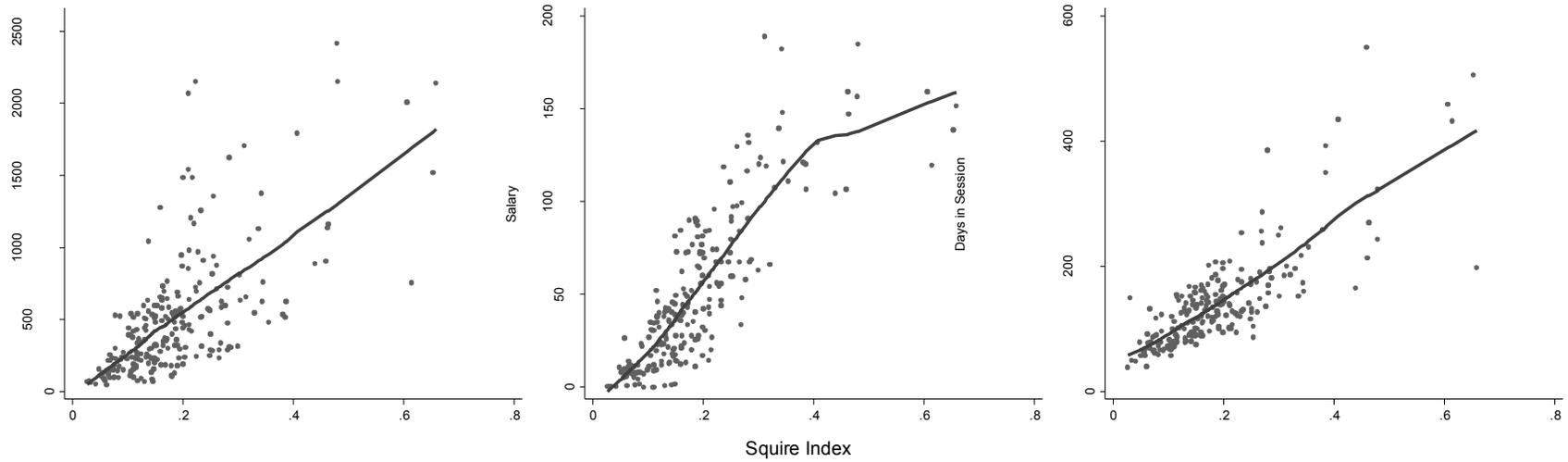
Note: Data collected by the authors from the U.S. Census Bureau and the Book of the States, 1973-2011. Expenditures per legislator are measured in thousands of real 2010 dollars. Salary is measured in thousands of real 2010 dollars. Dashed lines show mean values over time; solid lines show median values. Expenditures have grown steadily throughout the time period of study, both in terms of average and median spending per legislator. Salaries have been flat or declining since the late 1980s, depending on the measure of central tendency used. Session length shows more year-to-year noise but no over-time trends. Y-axis for each graph shows the range of values for the bottom 95% of observations for presentation purposes.

Figure 2. Internal Consistency of Professionalism Components Over Time



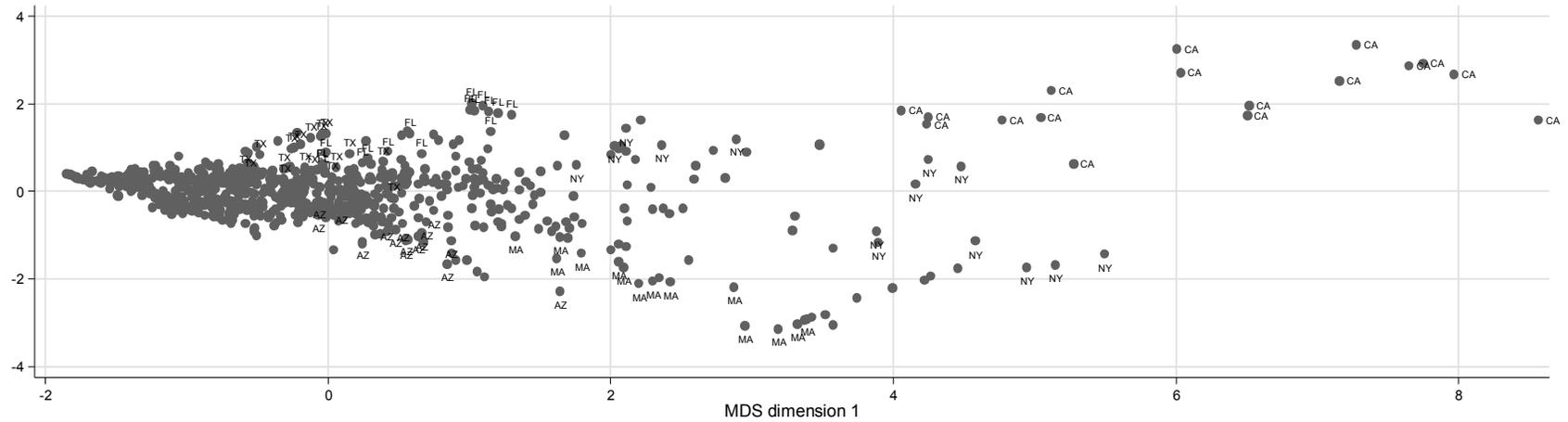
Note: Alpha scores and correlation coefficients calculated by the authors for each biennium, and show the level of stability of the cross-sectional relationships over time. Cronbach's alpha was using standardized professionalism components.

Figure 3. Professionalism Components and Squire Index Scores



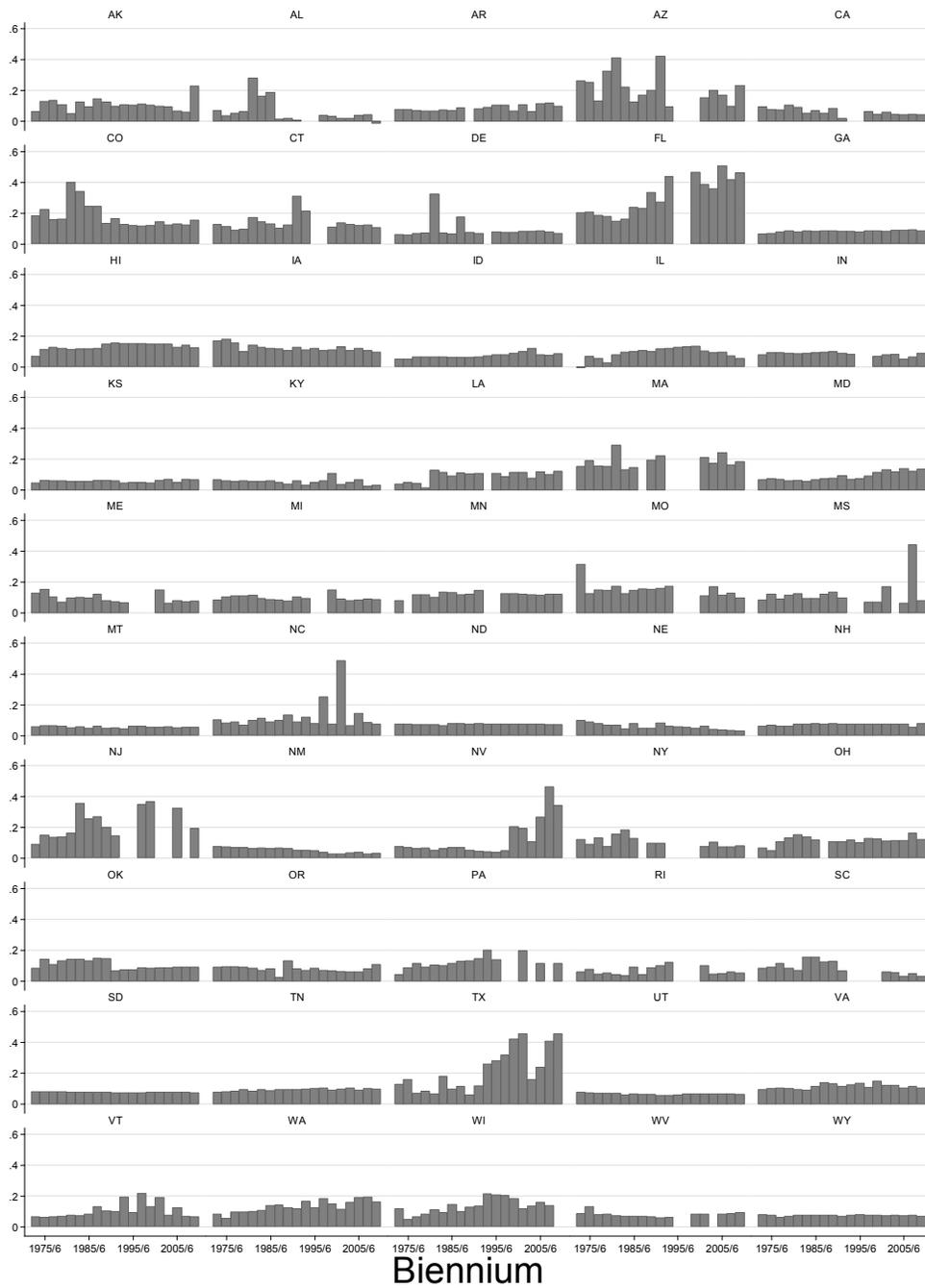
Note: Plots show the relationship between Squire Index scores and professionalism components for the years when Squire Index scores are available (1979, 1986, 1996, 2003, and 2009). Squire Index values are from Squire (2012), Table 7.6. Dark line displays smoothed trend line between the variables using locally weighted regressions. California is omitted due to its status as an extreme outlier on expenditures.

Figure 4. Two-Dimensional Configuration Plot From Multidimensional Scaling Analysis



Note: Configuration plot displays the two-dimensional MDS solution. Input variables are standardized professionalism components converted to dissimilarity data using Stata’s mds command. Horizontal and vertical axes are presented relative to the proportion of variation in dissimilarities attributable to each dimension.

Figure 6. Improvements in Fit Due to Inclusion of Second MDS Dimension



Note: Values are the difference between Kruskal's Stress score using only the first dimension and the stress score using the two-dimensional solution. Higher values show better fitting solution due the inclusion of the second MDS dimension.

¹ The American Political Science Association's Committee on the American Legislature report, first published in 1954, exemplified such calls for reform. Legislatures were in dire need of modernization, argued the Committee, since the "increase in the number and scope and complexity of government services at all three levels of government – national, state, and local – has imposed vast new burdens and responsibilities upon legislatures that are bound up by old and traditional concepts of organization and procedure" (APSA 1969).

² See Mooney (1994) for an excellent discussion and comparison of various measures of legislative professionalism.

³ It should be noted that the National Conference of State Legislatures (NCSL) collects and presents professionalism data by component. NCSL uses these data to group states into categories of professional, hybrid and citizen legislatures and refers to these groups as red, white, and blue states. For more, see <http://www.ncsl.org/research/about-state-legislatures/full-and-part-time-legislatures.aspx>.

⁴ The Squire Index is calculated by dividing each component for each state by Congress' value in the previous session on the component and averaging the three ratios. Grand mean scores replace the values for Congress by the average component values between 1979 and 2003, thus making the denominators of the ratios invariant over time. See Squire (2007) for further details.

⁵ Kousser and Phillips (2009) provide a blueprint for future research on professionalism. First, they show that professionalism weakens the governor's position in budget stand-offs using the Squire Index and dummy variables for professional, semi-professional, and citizen legislature. Then they demonstrate that this effect is driven by session length and not salary (through influencing tenure and experience of legislators) or staff (through increases in information) by estimating the models with the professionalism components entered individually and one model with all three components included. Since the substantive results do not change across the models (i.e., salary is insignificant even when session length is not included as a covariate), the authors provide excellent evidence for their causal story.

⁶ For many state governments, one of the houses will stay in session longer than the other. Under this circumstance, we use the longer session length to better capture the potential legislative capacity.

⁷ Finance data are available online at <http://www.census.gov/govs/state/>. 2011 is the most recent year available at the time of writing, which means our last full biennium for most states is 2009-2010.

⁸ In our data, staff per legislator and expenditures per legislator correlate at $r=.88$. Staff data are only available from NCSL in 1979, 1988, 1996, 2003 and 2009. When calculated by biennium, each correlation coefficient falls between .87 and .93.

⁹ Squire (2007) suggests that for most states, base salary is a good approximation for total compensation.

¹⁰ Biennium data for most states run from 1973 session to the 2010 session. Since VA, NJ, LA, MS, and KY (before 1984) hold off-year elections, these states' first biennium starts at the 1974 session and the nineteenth ends in 2011.

¹¹ The dark lines in the figure show median spline smoothing for display purposes.

¹² Squire (2012) shows that staff over time trends have diverged, with professional states like CA and NY shrinking staff sizes and amateur legislatures continuing to increase staff.

¹³ Standardized professionalism components were used instead of the components' raw values when calculating alpha due wide differences in the variance of each component.

¹⁴ We calculate these correlations and alpha scores using regular and special sessions to measure session length. Using only days in regular sessions reduces all three inter-item correlations and the overall alpha score drops to .79.

¹⁵ While Cronbach's alpha is a useful tool to evaluate consistency, it is important to note that it is not a test of dimensionality. It is possible to receive high alpha scores with multiple latent dimensions if the items have low unique variances (Cortina 1993).

¹⁶ Since the three components are measured on different scales, and therefore have unequal variances, the variables were standardized prior to converting to dissimilarities. Classical MDS using standardized input variables is equivalent to principal components analysis.

¹⁷ These values do not change much over time. When MDS solutions are calculated by biennium, the second dimension percentage of the variation in dissimilarities ranges from just under 12% to over 22%. Yet both the median and the mean percentages across all bienniums is approximately 17%. No clear over time trends present themselves when these data are plotted by biennium.

¹⁸ It should be noted that the MDS results are not due to our use of expenditures instead of staff. When we replace expenditures per legislator with staff per legislator or overall staffing numbers, the percent of variability in the dissimilarity data due to the second dimension rises to 18.6.

¹⁹ Kruskal and Wish (1978) recommend adding dimensions until the overall stress score is $< .15$ or $.1$. The one-dimensional MDS solution falls just outside that range, suggesting the two-dimensional solution is preferred.

²⁰ Rosenthal (1996) lists Florida and New Jersey as examples of support-intensive legislatures, matching nicely with our conceptualizing of the second dimension here.

²¹ Nevada quadrupled its expenditures and staff from 1980 to 2010, and Texas more than doubled its expenditures per legislator while increasing its number of staff by almost 60%. Florida shows a slightly different pattern. Its expenditures more than doubled during the period of study, but total staffing levels have fallen by a couple of hundred persons since the mid-1980s and 1990s.