



The study of representation, fundamental to any democratic system, has stumbled due to methodological concerns. Although we know when representation is *present*, the extant analytic tools necessary to *measure variation & evaluate institutional effects* have come under severe criticism. This project demonstrates that the methodological debates are wrongly focused on finding the "true" slope coefficient between constituent opinion and policy, but should instead look to variance as the indicator of representation. The data generating process is modeled, an estimation technique derived, and used for replication & a new analysis spanning thirty years.

Question & Specification

The initiative process, by which voters can bypass their elected officials to directly implement legislation, is widely thought to induce greater legislative responsiveness to their constituents.

The presence of representation is demonstrated by regressing government policy (G) on a preference indicator (P). This is trivial with universal acceptance. That the initiative leads to greater representation was initially demonstrated by interacting the constituent preference (P) with an indicator of the initiative (I).

$$G = \alpha + \beta_i I + \beta_p P + \beta_{ip} IP + \epsilon$$

A greater slope in initiative states putatively indicated that the initiative induced superior representation because the initiative leads to more conservative policy in more conservative states.

Critique & Extant Alternatives

Proving the existence of representation is radically different from comparing the quality of representation. Significant interaction terms demonstrate different slopes, but not which is indicative of superior representation. A bigger coefficient is not better.

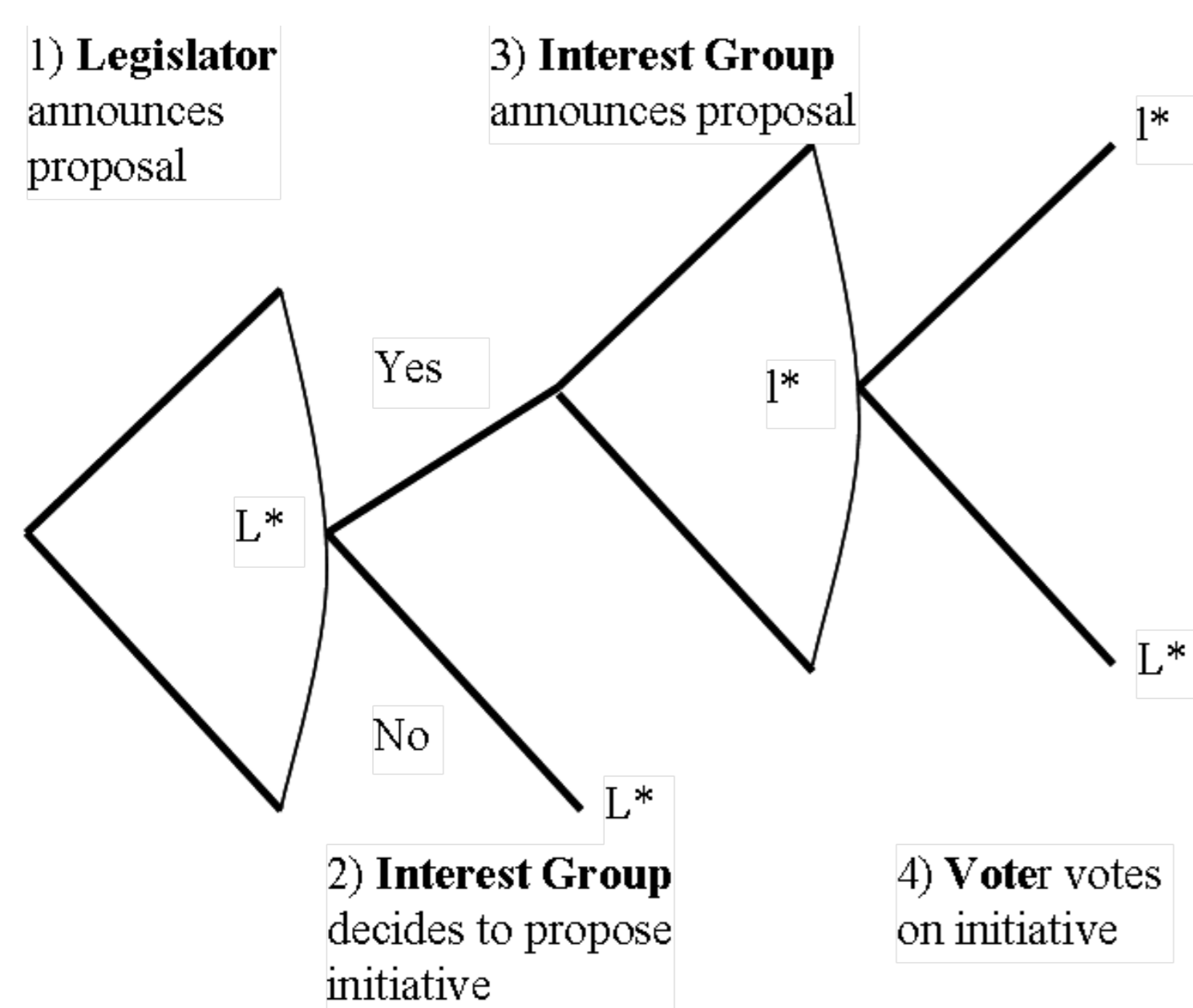
Superior representation is thought to be indicated by which of the slopes is more like the *true* slope. Finding this *true* slope, however, necessitates impossibly exacting knowledge of constituent demand (Matsusaka, 2001). Absent this knowledge, it is impossible to *compare* representation, as we do not know which set of slopes were more like the true slope.

Extant Alternatives

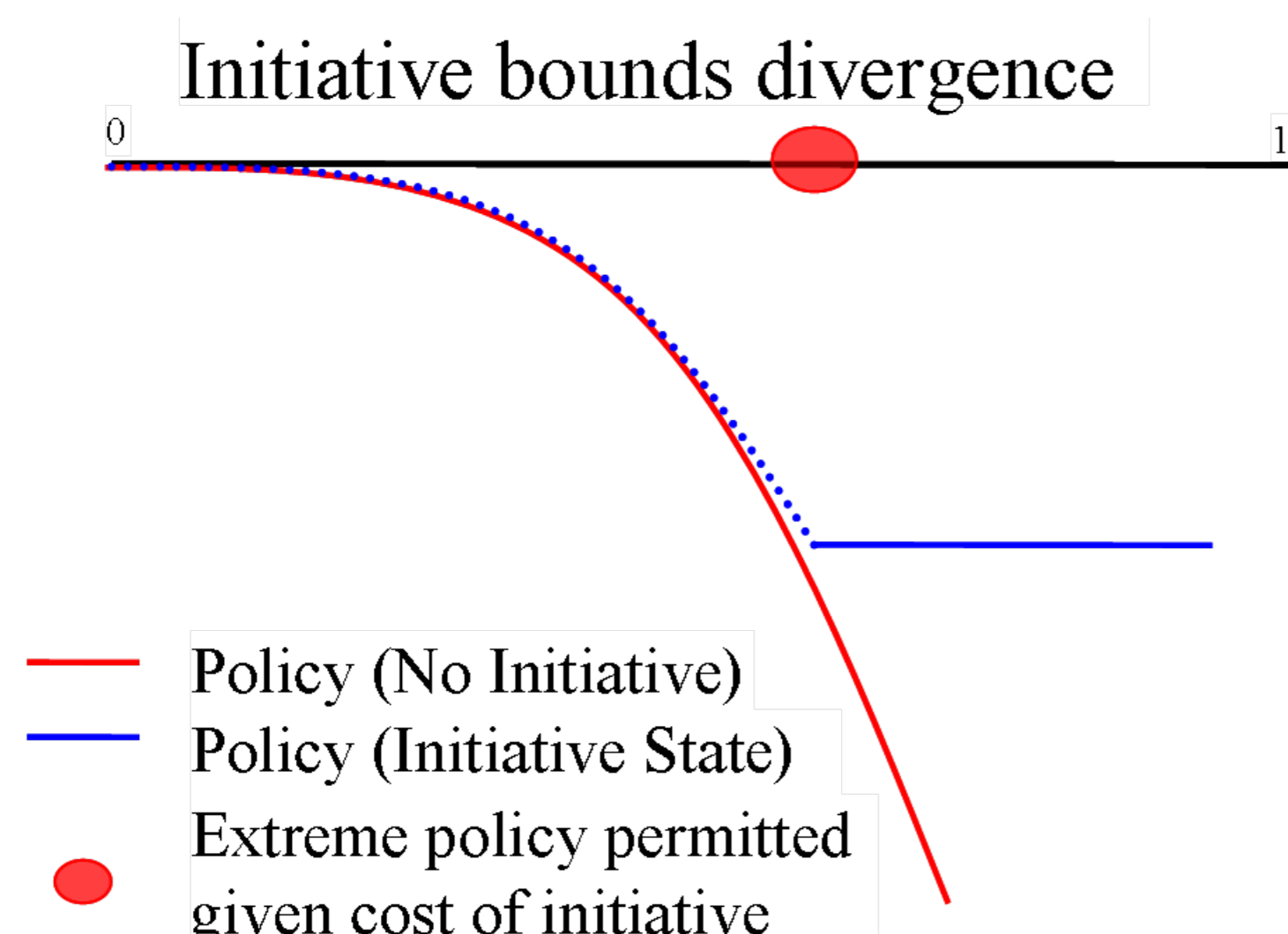
- Restrict analysis to dichotomous policy indicators
- Select cases with universal legislative bias
- Look for situations when representation only exists in initiative states

Data Generating Process

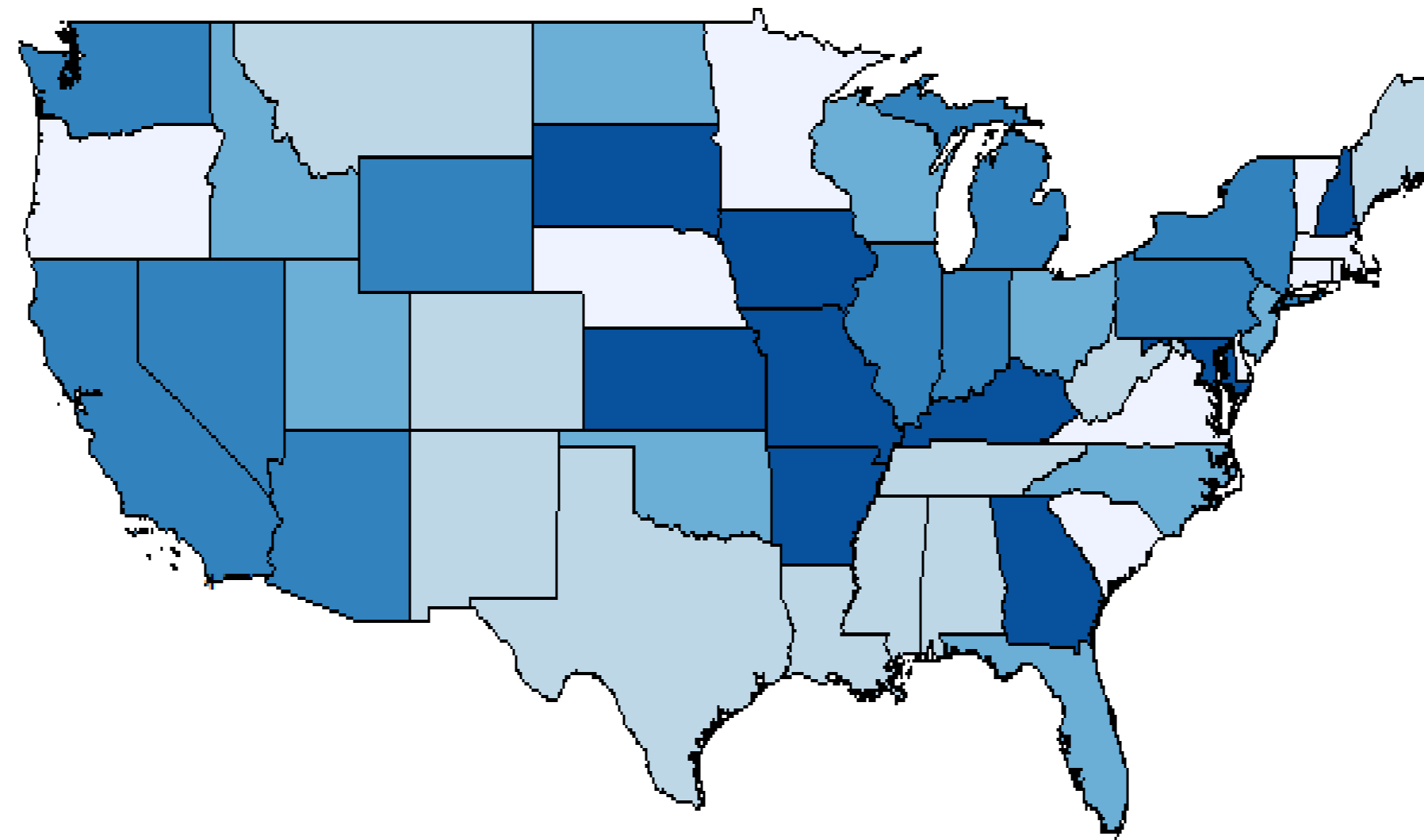
Gerber (1996) provides the formal model.



The result is that the initiative bounds the distribution of possible divergence from the median voter.

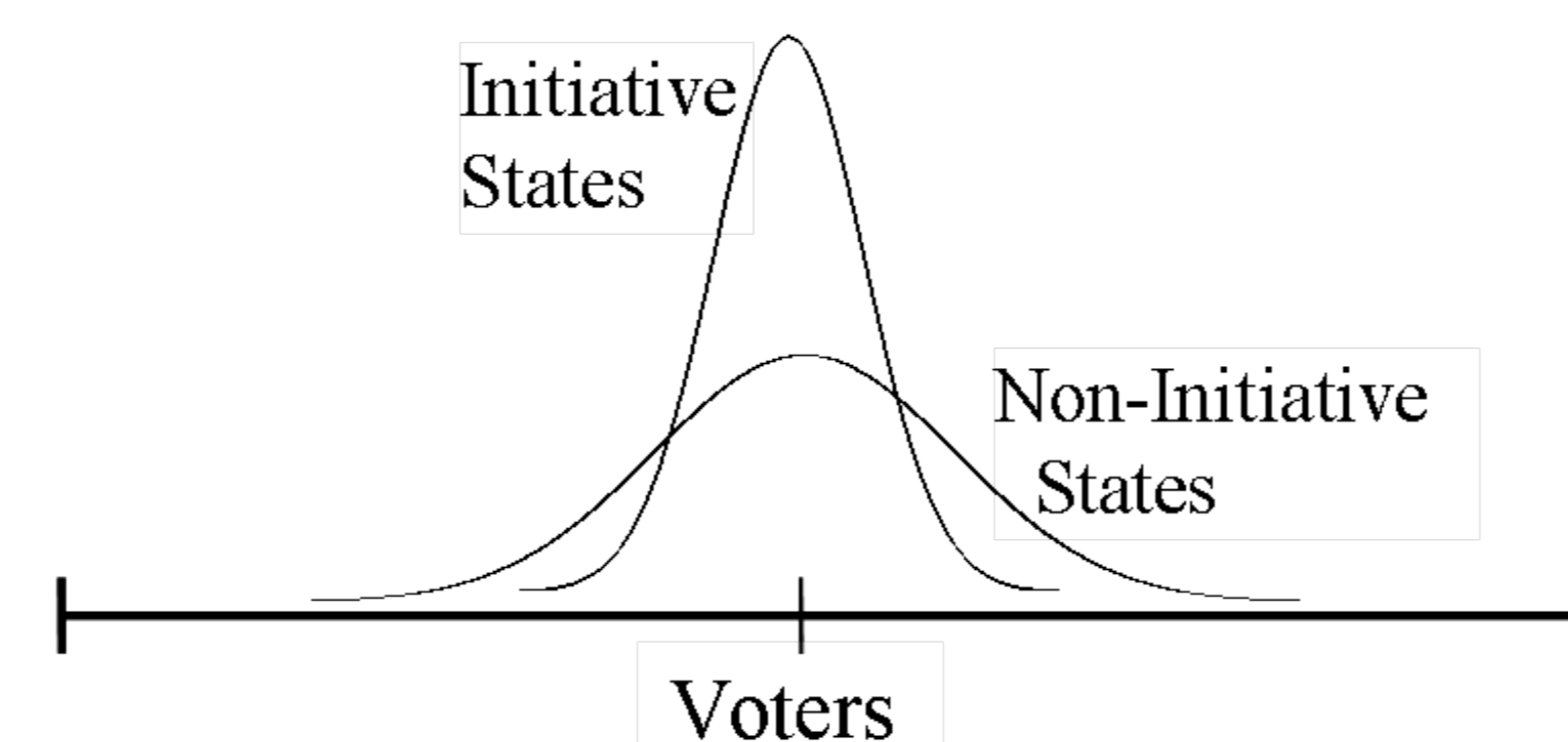


Ideological Divergence: Constituents and Representatives



- States with high divergence between legislatures and constituents are dark blue.
- Divergence is the squared residuals when regressing government ideology on citizen ideology.

Estimation



From (Johnson, Kotz, & Balakrishnan, 1994):

$$E(X | a < X < b) = \mu + \frac{\phi(\frac{a-\mu}{\sigma}) - \phi(\frac{b-\mu}{\sigma})}{\Phi(\frac{b-\mu}{\sigma}) - \Phi(\frac{a-\mu}{\sigma})} \sigma$$

$$Var(X | a < X < b) = \sigma^2 \left[1 + \frac{\frac{a-\mu}{\sigma} \phi(\frac{a-\mu}{\sigma}) - \frac{b-\mu}{\sigma} \phi(\frac{b-\mu}{\sigma})}{\Phi(\frac{b-\mu}{\sigma}) - \Phi(\frac{a-\mu}{\sigma})} - \left(\frac{\phi(\frac{a-\mu}{\sigma}) - \phi(\frac{b-\mu}{\sigma})}{\Phi(\frac{b-\mu}{\sigma}) - \Phi(\frac{a-\mu}{\sigma})} \right)^2 \right]$$

Note that when $a - \mu = -(b - \mu)$, i.e. a and b are symmetric around μ , then the truncation parameter can be reduced to $-\gamma\sigma$. Therefore, $E(X | a < X < b) = \mu$. $Var(X | a < X < b)$, however, reduces to:

$$\left(1 - \frac{2\gamma\phi(\gamma)}{2\Phi(\gamma) - 1} \right) \sigma^2$$

This variance constriction can be estimated by parametrizing σ in OLS.

$$y_i \sim \frac{1}{\sqrt{2\pi}e^{z_i\gamma}} e^{\frac{(y_i - x_i\beta)^2}{2e^{z_i\gamma}}}$$

Replications

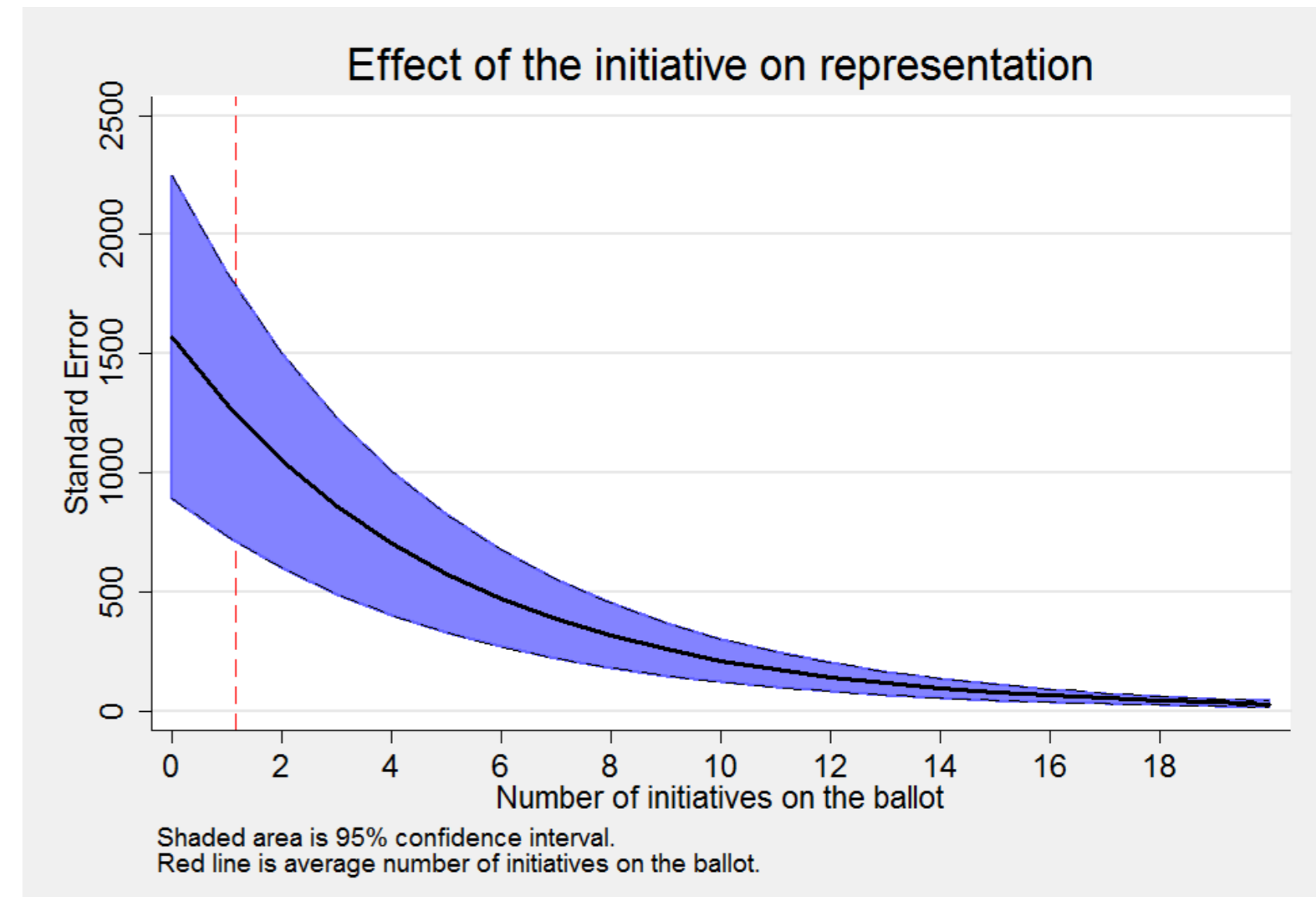
Replicating previous studies by adding a variance equation provides alternative confirmation for Arceneaux (2002) (p-value=.039) that the initiative makes legislators more responsive to their constituents with regard to abortion policies. In replicating the canonical critics of this initiative-responsiveness connection, this method implies the opposite conclusion of Lascher et. al (1996). These critics find that the initiative makes legislators *less* responsive regarding educational spending (through a smaller slope coefficient), but the initiative shrinks the variance (p-value=.081) around that estimate.

Empirics

- Ideology measures of the state government and constituents are from Berry (1998).
- Typical slope coefficients map one into the other along with a second equation estimating the variance of that first relationship.
- Both equations are estimated with controls.
- The first two columns are interaction models, the latter two are one equation.

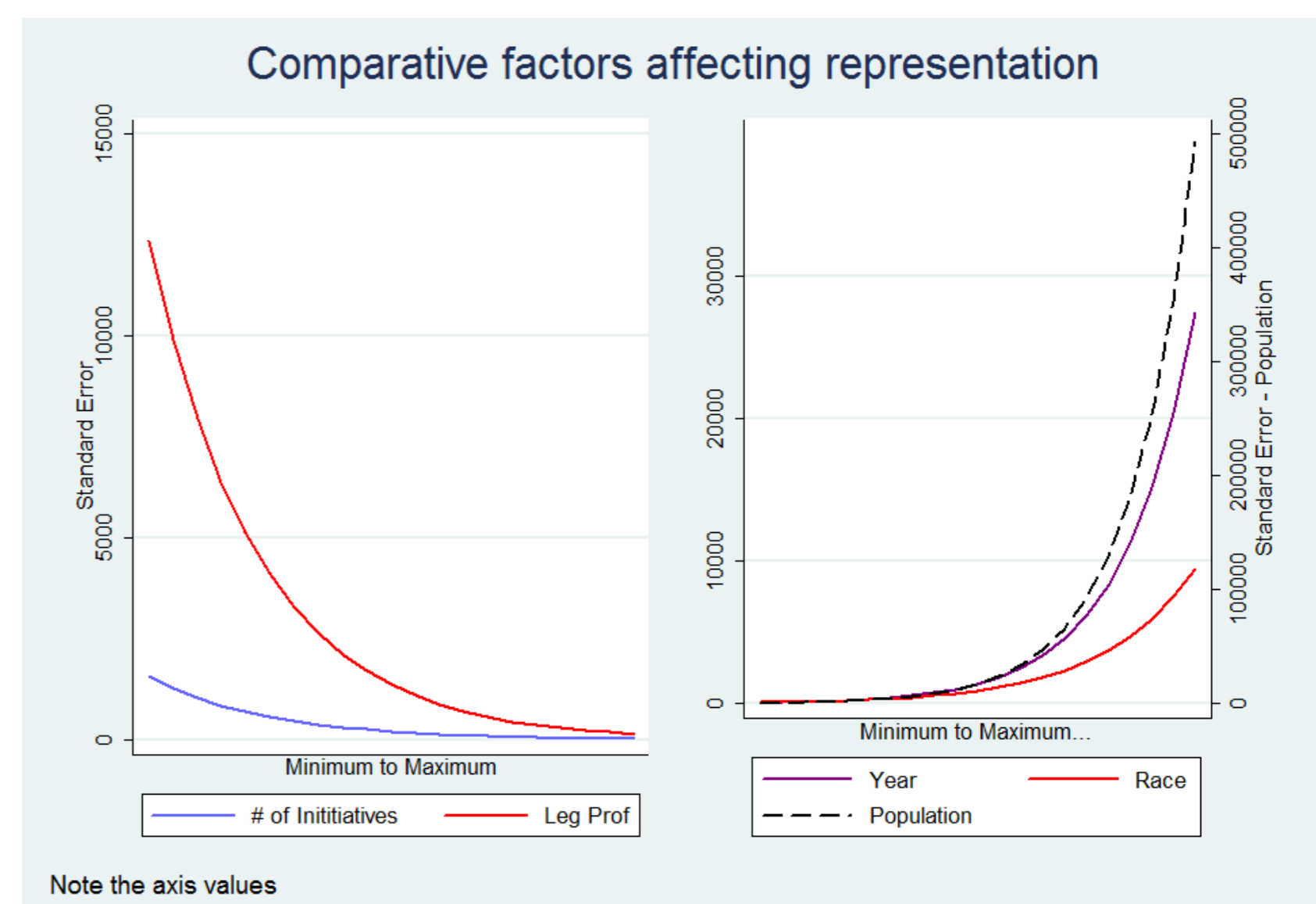
Dependent Variable: Institutional Ideology (Berry)				
	Ballot Inter	Init Inter	Slope	Variance
Citizen Ideology (Berry)	1.600*** (0.392)	1.755*** (0.393)	1.815*** (0.303)	
Citizen Ideology Squared	-0.0105 (0.00848)	-0.0133 (0.00852)	-0.0155** (0.00690)	
Citizen Ideology Cubed	8.04e-05 (5.72e-05)	9.89e-05* (5.74e-05)	0.000110** (4.80e-05)	
Initiative		3.336 (2.866)	-0.213 (1.010)	-0.380 (0.817)
Number of Ballot Issues	0.549 (1.358)		-0.434* (0.250)	-0.446** (0.220)
Citizen Ideology X Initiative			-0.126** (0.0552)	
Citizen Ideology X Ballot	-0.0158 (0.0254)			
Year	-0.204*** (0.0499)	-0.199*** (0.0502)	-0.0655 (0.0510)	0.243*** (0.0428)
Population	-1.77e-07 (1.17e-07)	-1.81e-07 (1.16e-07)	-9.03e-08 (1.10e-07)	3.66e-07*** (8.97e-08)
Legislative Professionalism	6.151 (5.276)	9.470* (5.433)	0.881 (4.724)	-9.242** (4.269)
Herfindahl Race Index	-6.122 (3.916)	-4.152 (4.002)	-10.40*** (3.966)	13.95*** (2.842)
Recall	1.315 (0.966)	1.414 (0.963)	0.892 (0.912)	0.359 (0.826)
South	16.66*** (1.333)	16.55*** (1.329)	13.29*** (1.310)	-2.828*** (0.831)
West	7.240*** (1.254)	7.812*** (1.311)	7.658*** (1.332)	0.613 (1.050)
Constant	390.6*** (100.1)	376.2*** (100.7)	118.6 (102.3)	-477.1*** (86.35)
Observations	1600	1600	1600	1600
R-squared	0.515	0.518	0.518	0.51

Standard errors in parentheses *** p ≤ 0.01, ** p < 0.05, * p < 0.1



Although the initiatives do result in better representation, the effect is considerably less than professional legislators.

Compared to "natural" factors diminishing representation, such as racial diversity population size, it is questionable if institutional design can have much of a compensatory effect.



Key Advantages

- Uniquely allows multivariate controls for the issue of substantive interest
- Does not need impossibly precise data on public opinion
- Links the estimation process to the underlying theory

Key Citations

Gerber, E. R. (1996). Legislative response to the threat of popular initiatives. *American Journal of Political Science*, 40(1), 99-128.
 Lascher Jr, E. L., Hagen, M. G., Rochlin, S. A. (1996). Gun behind the door? Ballot initiatives, state policies and public opinion. *Journal of Politics*, 58(3), 760-775.
 Arceneaux, K. (2002). Direct democracy and the link between public opinion and state abortion policy. *State Politics and Policy Quarterly*, 2(4), 372-387.
 Matsusaka, J. G. (2001). Problems with a methodology used to evaluate the voter initiative. *The Journal of Politics*, 63(4), 1250-1256.
 Johnson, N.L., Kotz, S., and Balakrishnan, N. 1994. *Continuous Univariate Distributions*, vol. 1, 2nd ed. Wiley, New York.