Gubernatorial and Presidential Coattails in Brazil

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Introduction

In 'Understanding Interaction Models: Improving Empirical Analyses', we report the results of several replications that we conducted of analyses examining electoral institutions and party systems. One of these replications was of David Samuels' article 'The Gubernatorial Coattails Effect: Federalism and Congressional Elections in Brazil' which appeared in the *Journal of Politics* in 2000. In our article, we said that:

> In an article in the *Journal of Politics*, Samuels (2000) examines the relative impact of presidential and gubernatorial coattails on the composition of the Brazilian party system. Theory would suggest that temporally-proximate presidential and gubernatorial elections should exert a reductive effect on the number of electoral lists in legislative elections. However, this reductive effect should decline (and may become positive) as the number of presidential and gubernatorial candidates increases. Samuels argues that the unusual importance of the governor for office-seeking candidates in Brazilian legislative elections means that we should observe a gubernatorial coattails effect but not a presidential coattails effect in Brazil. This would help to explain why the party system at the national level is highly fragmented (6.3 effective parties), while the party system at the state level is more concentrated (only 3.3 effective parties). The results

from three models seem to support his conjecture. However, Samuels draws conclusions from an interaction model that omits constitutive terms. Once these omitted terms are included, none of the coefficients on the variables of interest are significant at the 90% level. Plots of the marginal effect of gubernatorial elections on the number of electoral lists across the observed range of the modifying variable from all three models indicate that gubernatorial elections never exert a coattails effect. While two of the three models indicate that there is no presidential coattails effect either, one suggests that temporally-proximate presidential elections will increase the number of electoral lists if the number of presidential candidates is sufficiently high. Thus, contrary to the conclusions reached by Samuels, the evidence from a fully-specified model indicates that if there is a coattails effect in Brazilian elections then it is a presidential one and not a gubernatorial one. This indicates that gubernatorial coattails cannot explain why the state party system in Brazil is so much less fragmented than the national party system.

The replication that justifies the description given above is described below. At this point, we would like to thank David Samuels for providing his data and for the assistance he gave during the replication process.

Replication

Model

The model as specified by Samuels in his article is the following:[1]

$$
\begin{aligned}
ENEL = \alpha + \beta_1 \quad &+ \quad \beta_2 Proxgov + \beta_3 Engov * Proxgov \\
&+ \quad \beta_4 Proxpres + \beta_5 Enpres * Proxpres \\
&+ \quad \beta_6 Logmag + \beta_7 YearDummies + \beta_8 StateDummies + \epsilon \qquad (1)
\end{aligned}
$$

where $ENEL$ is the effective number of electoral lists, $Proxpres$ measures the temporal proximity of presidential and legislative elections, $Enpres$ is the effective number of presidential candidates, $Proxgov$ is the temporal proximity of gubernatorial and legislative elections, $Engov$ is the effective

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[1]We have no idea why there is an α specified here.

number of gubernatorial candidates, *Logmag* captures the log of average district magnitude, and *YearDummies* and *StateDummies* are self-explanatory.

As we note in our article, 'Understanding Interaction Models', scholars employing interaction models should include all of the constitutive terms. However, it is easy to see that Samuels omits two constitutive terms in his specification shown above. These are *Engov* and *Enpres*. The correct and fully-specified model is shown below:

$$
\begin{aligned}
ENEL = \gamma_0 \quad + \quad & \gamma_1 Proxgov + \gamma_2 Engov + \gamma_3 Engov * Proxgov \\
+ \quad & \gamma_4 Proxpres + \gamma_5 Enpres + \gamma_6 Enpres * Proxpres \\
+ \quad & \gamma_7 Logmag + \gamma_8 YearDummies + \gamma_9 StateDummies + \epsilon \quad (2)
\end{aligned}
$$

Hypotheses

Although Samuels never explicitly lays out a set of hypotheses, the hypotheses shown below seem to be what he is intending to test.

Gubernatorial Coattails Hypothesis: Temporally-proximate gubernatorial elections should reduce the number of electoral lists, but this reductive effect should decline as the number of gubernatorial candidates increases.

Presidential Coattails Hypothesis: Temporally-proximate presidential elections should reduce the number of electoral lists, but this reductive effect should decline as the number of presidential candidates increases.

Main Hypothesis: We will find evidence for gubernatorial coattails but not for presidential coattails.

Results

The results from the replication are shown in Table 1.

Table 1: Table 1: The Choice of Electoral Rules in the Interwar Period

Regressor	Model 1 reported	Model 1 replication	Model 1 full	Model 2 reported	Model 2 replication	Model 2 full	Model 3 reported	Model 3 replication	Model 3 full
Logmag	0.92	0.93	0.91	0.92	0.93	0.91	0.92	0.93	0.91
	(0.53)	(0.52)	(0.53)	(0.53)	(0.52)	(0.53)	(0.53)	(0.52)	(0.53)
Proxgov	-1.17**	-1.16**	-0.83	-1.17**	-1.16**	-0.83	-1.17**	-1.16**	-0.83
	(0.38)	(0.38)	(0.81)	(0.38)	(0.38)	(0.81)	(0.38)	(0.38)	(0.81)
Engov			0.14			0.14			0.14
			(0.30)			(0.30)			(0.30)
Proxgov*Engov	0.51***	0.51***	0.35	0.51***	0.51***	0.35	0.51***	0.51***	0.35
	(0.13)	(0.13)	(0.36)	(0.13)	(0.13)	(0.36)	(0.13)	(0.13)	(0.36)
Proxpres	-0.53	0.62	-0.16	-1.07	-0.46	-1.18	-0.80	0.07	-0.67
	(0.73)	(0.60)	(1.09)	(0.80)	(0.52)	(1.01)	(0.81)	(0.52)	(1.02)
Enpres			-0.22			-0.22			-0.22
			(0.23)			(0.23)			(0.23)
Proxpres*Enpres	0.20	0.20	0.46	0.20	0.20	0.46	0.20	0.20	0.46
	(0.14)	(0.14)	(0.32)	(0.14)	(0.14)	(0.32)	(0.14)	(0.14)	(0.32)
Constant	2.24	1.14		2.07		2.09	2.93	1.48	1.78
		(0.86)				(1.27)		(0.77)	(1.26)
Observations	179	179	179		179	179		179	179
R^2	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69

* $p < 0.05$; ** $p < 0.01$ *** $p < 0.001$ (two-tailed); Standard errors in parentheses
Model 1 excludes 1950; Model 2 excludes 1994; Model 3 excludes 1998

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Unfortunately, we were unable to replicate the results presented in Table 1 of Samuel's article exactly. The reader can see how close we came to replicating Samuels' results because we present Samuels' original results first (reported), our replication results using his flawed specification second (replication), and the results when the model was fully-specified third (full). We do this for each of the three models that Samuels employs (Model 1 excludes 1950, Model 2 excludes 1994, and Model 3 excludes 1998).

We made several attempts to replicate Samuels' results exactly. First, we checked that we did indeed have the same data as used in the original article. Fortunately, Samuels provided summary statistics on several of his variables - *ENEL*, *Enpres*, and *Engov* - in footnote 4 of his article. We obtained identical statistics when we summarized the data. Thus, we can only assume that we had the same data. Second, we contacted Samuels who had kindly provided us with the data in the first place. He did not have a do-file containing replication code for the article. We sent him the do-files we were using to replicate his results. He did not point out any errors and informed us that our results were close enough - he claimed that any differences were probably due to the different statistical packages being used.

Although we were unable to replicate Samuels' results perfectly, we did get very similar estimates on almost all of the coefficients reported in the original analysis. This was the case for the coefficients on *Logmag*, *Proxgov*, *Proxgov*Engov*, *Proxpres*Enpres*. We also obtained identical R^2s. However our constants differ and the coefficient for *Proxpres* is not only different but the wrong sign (though still insignificant). Since our concern in our article, 'Understanding Interaction Models' was not primarily with the ability to replicate Samuels' results, we leave this issue now. What we really want to know is if the results and inferences that Samuels' made change when we add the missing constitutive terms.

Interpretation

Samuels notes that the coefficient on *Proxgov* is negative and that the coefficient on *Proxgov*Engov* is positive. From this, he infers that there is strong evidence for the gubernatorial coattails story. In contrast, he notes that the equivalent coefficients are not significant for *Proxpres* and *Proxpres*Enpres*. From this, he infers that there is no evidence for a presidential coattails effect.

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Together these results are taken as strong support for his argument that gubernatorial elections are more important for the Brazilian party system as a whole than presidential elections. This, in turn, is used to explain why the Brazilian party system is highly fragmented at the national level, but less so at the district level.

However, it is important to remember that these inferences are drawn from a model that omits two constitutive terms. This means that the results are potentially biased. What happens when we include the missing constitutive terms? Once the model is fully specified, it turns out that none of the coefficients in any of the three fully-specified models (Models 1, 2 and 3) are significant at the 95% level or higher. Not too much information can be drawn from these results at this point, though. In fact, the only inference that can be drawn from the results of the fully-specified model in Table 1 is that temporally-proximate presidential and gubernatorial elections have no significant effect on the number of electoral lists when there are no presidential candidates or no gubernatorial candidates i.e. the coefficients on *Proxgov* and *Proxpres* are insignificant. Since there are never any situations where there are no presidential candidates or no gubernatorial candidates, these inferences are substantively meaningless. Note also that just because the coefficients on the interaction terms are not significant does not mean that the impact of presidential and/or gubernatorial elections on the number of electoral lists is not conditional on the number of candidates. As we show in our article 'Understanding Interaction Models', we cannot necessarily infer whether there is a substantively meaningful conditional relationship by simply looking at the sign and significance of the coefficient on the interaction term. All in all, the information that can be drawn from the results of the fully-specified model in Table 1 is quite limited.

Again, as we argue in our article, 'Understanding Interaction Models' the analyst has to go beyond the traditional table of results to test conditional hypotheses. In this case, it is necessary to examine the marginal effect of temporally-proximate presidential and gubernatorial elections when there actually are presidential and gubernatorial candidates. The marginal effect of temporally-proximate gubernatorial elections is

$$\frac{\partial ENEL}{\partial Proxgov} = \gamma_1 + \gamma_3 Engov \tag{3}$$

The marginal effect of temporally-proximate presidential elections is

$$\frac{\partial ENEL}{\partial Proxpres} = \gamma_4 + \gamma_6 Enpres \tag{4}$$

Figures 1 through 3 plot the marginal effect of temporally-proximate gubernatorial elections for each of the three models reported in Table 1. It is clear that temporally-proximate gubernatorial elections never have any significant effect on the effective number of electoral lists. There is no evidence for gubernatorial coat-tails. This is in direct contrast to the claims made by Samuels.

Figure 1: Marginal Effect of Temporally-Proximate Gubernatorial Elections on the Effective Number of Electoral Lists (Model 1)
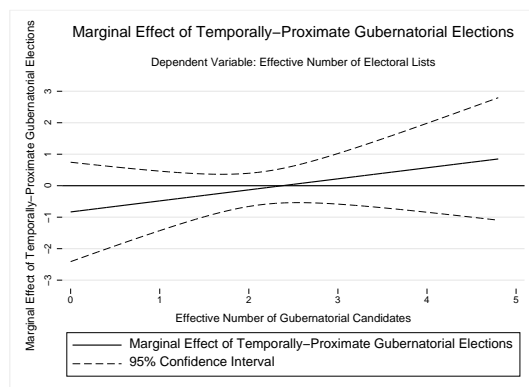
Figure 2: Marginal Effect of Temporally-Proximate Gubernatorial Elections on the Effective Number of Electoral Lists (Model 2)
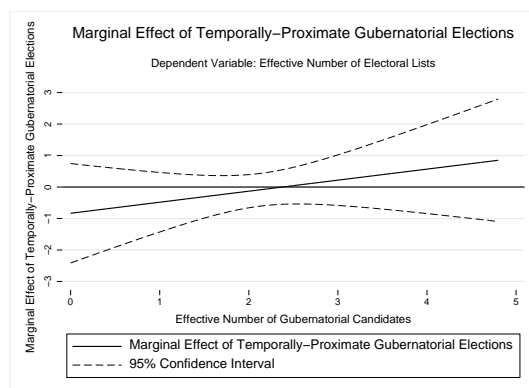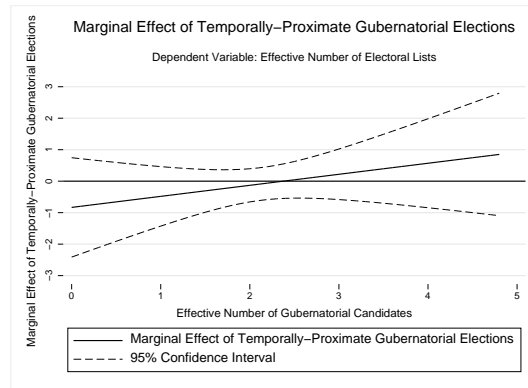
Figure 3: Marginal Effect of Temporally-Proximate Gubernatorial Elections on the Effective Number of Electoral Lists (Model 3)

Now, let's examine the evidence for presidential coat-tails. Figures 4 through 6 plot the marginal effect of temporally-proximate presidential elections for each of the three models reported in Table 1. Figures 5 and 6 (Models 2 and 3) show no evidence that temporally-proximate presidential elections ever have a significant effect on the effective number of electoral lists as well. However, Figure 4 (Model 1) suggests that there may be a presidential coat-tails effect in Brazil so long as the effective number of presidential candidates is greater than 3.4. It seems that temporally-proximate presidential elections significantly increase the effective number of electoral lists when the effective number of presidential candidates is greater than 3.4. 16 (9%) observations have an effective number of presidential candidates greater than this.

Figure 4: Marginal Effect of Temporally-Proximate Presidential Elections on the Effective Number of Electoral Lists (Model 1)
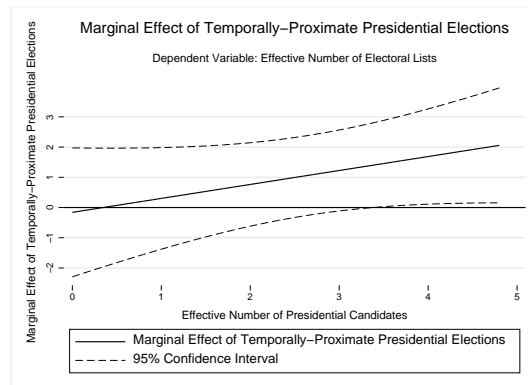

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Figure 5: Marginal Effect of Temporally-Proximate Presidential Elections on the Effective Number of Electoral Lists (Model 2)
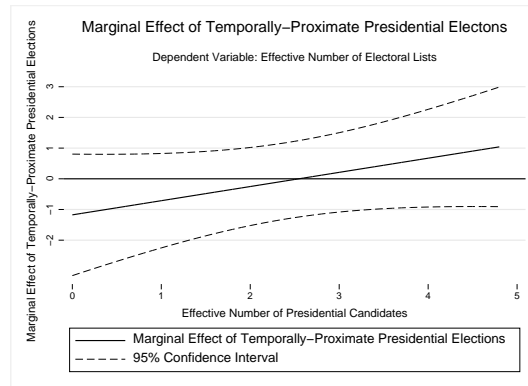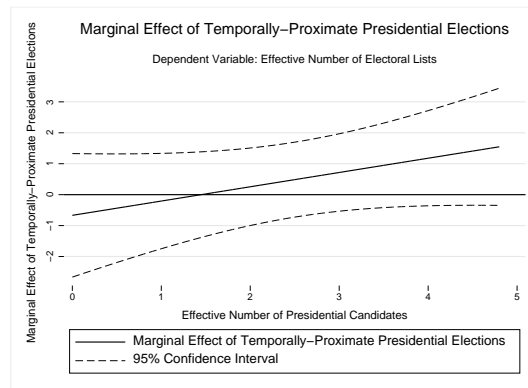

Figure 6: Marginal Effect of Temporally-Proximate Presidential Elections on the Effective Number of Electoral Lists (Model 3)

Conclusion

As we state in our article, 'Understanding Interaction Models', the inferences that can be drawn from a fully-specified model are the exact opposite of those reported by Samuels. There is never any evidence that gubernatorial elections exert a coat-tails effect. Moreover, there seems to be some evidence that presidential elections exert a coat-tails effect when the effective number of presidential candidates is very high in one model. This suggests that if there is a coat-tails effect in Brazil, then it is a presidential one and not a gubernatorial one. This further implies that presidential elections are more important than gubernatorial elections in Brazil in terms of party system structure. Not only this, but we now have to look for an alternative explanation to that posed by Samuels for why

the party system in Brazil is fragmented at the national level but not at the district level.

STATA Code

The STATA do-file to replicate these results is called samuels.do

References

Samuels, David. 2000. "The Gubernatorial Coattails Effect: Federalism and Congressional Elections in Brazil." *Journal of Politics* 62:240–253.