# **Exercises**

EITM Week 2

Macro-Politics

July 2, 2002

**Question 1)** In the Alesina, Londregan, and Rosenthal model of the political economy of the US (ALR) we can calculate the "steady state" voteshare for the midterm equation as:

$$V^{SM} = \beta_1 + \beta_2 V^{SM} \quad (1)$$

This is the voteshare to which the midterm equation tends to revert when $|\beta_2| < 1$.

Likewise we can calculate the "steady state" onyear voteshare with presidential coattails set equal to zero) as:

$$V^{SO} = \gamma_1 + \gamma_2 V^{SO} \quad (2)$$

the voteshare to which the on year equation tends when $|\gamma_2| < 1$.

(a) What does the "surge and decline" theory of Erikson and others (emphasizing the importance of mean-reverting behavior) predict about the relationship between $V^{SO}$ and $V^{SM}$?

(b) What does the Alesina and Rosenthal theory of partisan balancing predict about the relationship between $V^{SO}$ and $V^{SM}$?

(c) Test the null hypothesis you derived in (a) using the data from ALR contained in the dataset *pbc_exp*. To estimate the parameters of equation (2) regress hvote on lhvote and the residual from the presidential voting equation (using only the "on year" elections) to proxy for presidential coattails.

(d) Now test the null hypothesis from (b) using the same estimation procedure you implemented in (c).

(e) What conclusions do you reach about "surge and decline" *vs.* "partisan balancing"?

(f) What data would you like to gather (assuming you had extensive research support and plenty of time) to resolve any remaining ambiguities about the relative merits of the two theories?

**Question 2)** In the Alesina, Londregan, and Rosenthal (ALR) model it is assumed that competing shocks take on the form:

$$\eta_t^R = \xi_t + \mu_t^R + \rho\mu_{t-1}^R \tag{3}$$

and:

$$\eta_t^D = \xi_t + \mu_t^D + \rho\mu_{t-1}^D \tag{4}$$

Suppose instead that our model for the growth shocks was:

$$\eta_t^R = \xi_t + \mu_t^R + \rho\eta_{t-1}^R \tag{5}$$

and:

$$\eta_t^D = \xi_t + \mu_t^D + \rho\eta_{t-1}^D \tag{6}$$

(a) Write down the log-likelihood function for the growth equation if this new specification of the error process is correct.

(b) What effect will the new model have on the way voters assess the competence of the government?

(c) Macro-economists are not able to discriminate decisively between the MA(1) and AR(1) models for the growth errors (though they estimate these models assuming the $\mu_t^R$ and $\mu_t^D$ shocks are perfectly correlated) using time series on growth. What light can politics shed on this question? Is there a way that you could use the voting equations (plus the rational expectations hypothesis applied to voters) to discriminate between the model in equations (3) and (4), and the model in equations (5) and (6)? If so, what is it?

**Question 3)** Suppose that in the Rogoff-Sibert model we have:

$$W(\Delta) = \frac{-1}{2}\Delta^2 \tag{7}$$

and

$$U(E_t\{\alpha_t^R\}) = \Phi(E_t\{\alpha_t^R\}) \tag{8}$$

Here $\Phi(z)$ is the standard normal cumulative density function with mean $\hat{\alpha}$ and variance 1.

Suppose further that there are but two types of incumbent, one with low transitory competency; $\alpha_L$, the other type with high competency; $\alpha_R$.

(a) What is the spatial equilibrium with the lowest level of seignorage in which $\Delta = 0$ for the L-types?

(b) What is the spatial equilibrium with the highest level of seignorage in which $\Delta = 0$ for the L-types?

(c) Suppose that incumbents pool, with $\Delta = 0$ for both types. What is the expected level of competence in a randomly chose period? Recall that in the Rogoff-Sibert model elections are held every other period.

(d) Compare the voters' welfare under the equilibria in (a) and (c).

(e) Compare the voters' welfare under the equilibria in (b) and (c).

(f) What conclusions do your answers suggest about the welfare consequences of election year signaling?

**Question 4)** (a) Using the historical data from Persson and Tabellini in the dataset *pt_hist* try to replicate the results reported in Tables 2 and 3 (pages 608 and 609) of Persson and Tabellini's 1994 AER paper.

(b) Still using the data in *pt_hist* see whether the statistical significance of the inequality measure persists when you include a dummy variable for post 1950 observations (corresponding to the last two "time periods" in their analysis).

(c) Can you think of a causal model that would produce a post-1950 effect on growth?

(d) Using the post war data in *ptdata* try to replicate Persson and Tabellini's Table 5. Test the overall joint significance of the variables that involve their "democracy" measure.

(e) Still working with the *ptdata* dataset, now use $tgt60$, a measure of government type that captures finer gradations in the level of "democracy", with higher values corresponding to more democratic outcomes, in place of "DEMOCRACY" in the Persson and Tabellini regression model of Table 5 column (iv). You can likewise generate interactions with $tgt60$ as they did with "DEMOCRACY". Test for the joint significance of the government type variable and the interaction variables, similarly to the test you conducted in part (b). How do your answers compare with what you obtained in part (b)?

(f) What data would you like to gather (assuming you had extensive research support and plenty of time) to resolve any remaining ambiguities about the merit of Persson and Tabellinni's theory of the interactions among growth, inequality, and democracy?