

ROPS 619: Spatial Analysis
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Replication 70.1 B (GWR)

Publication	Clemens, Crespin, and Finocchiaro in <i>Legislative Studies Quarterly</i> 2015
Software	<p>You can execute GWR in R and other environments. However, it can be very useful to learn to use a standalone program designed solely for GWR, called GWR4. Download and install from GeoDa Center at ASU here: https://geodacenter.asu.edu/software/downloads/gwr_downloads</p> <p>*** Be sure to download both (1) software and (2) manual. Manual has a clear practical guide for executing the analysis</p>
Variables	<p>Dependent Variable:</p> <ul style="list-style-type: none"> • PORK10: Earmarks from 110 Congress (2007-2009) <p>Independent Variables:</p> <ul style="list-style-type: none"> • IDEOLOGY = first dimension of NOMINATE score (-1 to 1, where negative values indicate liberal and positive values indicate conservative) • SENIORITY = seniority • INCPRES = share of vote for presidential candidate of incumbent's party in 2004 election • DEMAND = local demand for project • POWER = appropriations power index; combination of variables that capture one's power to influence appropriations process
Replication Items	
1	<p>Figure 1 Quintile map of PORK10.</p> <ul style="list-style-type: none"> • Examine shapefile, familiarize yourself with data, and reproduce a similar map. <p>Examine distribution of other variables to become familiar with data</p>
2	<p>Construct Spatial References</p> <ul style="list-style-type: none"> • What spatial references do you need to generate to execute GWR? • What kernel type and bandwidth do authors use? • How do they justify this choice? • What is clear or unclear about method?
3	<p>Table 1 Generate OLS results, GWR results, and compare the two</p> <p>What are results in GWR4?</p>

	<p>What are results in R?</p> <p>How do results compare with those reported in original article?</p> <p>How would you interpret your results?</p> <p>How does your own interpretation compare with the discussion by authors in original article?</p>
4	<p>Figure 2: What do maps tell us about variation (magnitude, direction, significance) of local effect of: Ideology Demand Seniority Power Index Presidential Vote Share Local R²</p> <p>How do results compare (contrast?) with those reported in paper? Are core results in published paper supported?</p>

Questions for Discussion:

- 1) What were original research questions and hypotheses?
- 2) Does empirical strategy (research design) answer these questions and test these hypotheses?
- 3) Regarding data and time span:
 - a) How are key variables measured?
 - b) When are DVs measured and when are IVs measured?
- 4) In plain English, how would you explain the substantive meaning of:
 - a) Table 1?
 - b) Figure 2?
- 5) What is the added value of spatial analysis? That is, why not stop with the simple percentile map in Figures 2 and a simple OLS regression including the identified covariates? What is value added by the GWR, or any other spatial model for that matter? Aside from spatial analysis, discuss other options (e.g., model specification, functional form, etc.)?
- 6) Regarding spatial weights?
 - a) How were they constructed?
 - b) How might results differ with different weights?
 - c) Can you test this?
- 7) Regarding unit and level of analysis?
 - a) Why was province selected as unit and level of analysis?
 - b) Is terrorism a bound or unbound phenomenon? Economic growth?
 - c) What do authors say about MAUP?
 - d) How might you address critiques associated with MAUP or ecological inference?
- 8) Regarding model selection/specification:

- a) What spatial diagnostics were conducted? What motivated the GWR? How do you know how particular specification of spatial model was selected?
 - b) What about other spatial models?
 - i) What other spatial diagnostics could you run to motivate a spatial model?
 - c) How much spatial autocorrelation was there in residuals of OLS model? How do you know?
 - d) Would you have selected a different model specification? Why or why not?
- 9) What are implications for theory?
- a) Of spatial dependence?
 - b) Of the spatial error process?
- 10) What are implications for policy?
- a) Of spatial dependence?
 - b) Of error process?
- 11) What else would you want to do with this research question and the data?