

MAKING BOUNDARY-SHARE WEIGHT MATRICES FROM SHAPEFILES

- (1) To make a boundary-share weight matrix from a boundary **shape file**, you must first insert a new column in the shape file containing **row numbers** (that will serve as standard identifiers).
 - a. Open the shape file in ARCMAP and then open its attribute table. Add a new field (**Options** → **Add Field**). Name the field as **row** and click OK (leave all else as defaults).
 - b. Right click on the column heading and click **Calculate Values...**
 - c. In the “Field Calculator” window click on the item **FID** in the “Fields” window, and then type “+1”, so that the expression “[FID]+1” appears in the calculation window. Click OK, and the **row** column should now be filled with row numbers.

- (2) Given this modified shape file, you must then convert this file to an appropriate boundary **text file** (**.bnd** file) using Anselin’s DOS conversion program, **shp2bnd.exe**. The procedure is as follows:
 - a. If the shape file name is longer than **eight** letters, you must first **rename** it so that standard DOS programs can read the file.
 - b. To convert a boundary shape file named “boundary” to **.bnd** format, be sure that the three files (**boundary.shp**, **boundary.shx**, **boundary.dbf**) are in the same directory as the program **shp2bnd.exe**.
 - c. Open a DOS window and move to the directory containing these files.
 - d. At the DOS prompt, assuming the shape file name, **boundary**, and identifier field name, **row**, type the command:

shp2bnd boundary row
 - e. The file **boundary.bnd** should now appear in that directory. This file is in **.bnd** format (which is readable as a text file).

- (3) Next open MATLAB and add this file to the workspace. It should appear in the workspace as a matrix called **boundary**. To check the form of this file, type the command » **boundary(1,:)** look to be sure that the first row is of the form “1 n”, where “1” denote the first polygon object and “n” is the number of points defining the polygon.
- (4) To calculate boundary shares for this file use the program **bnd_shares_matrix.m** found in the class MATLAB directory. For the file **boundary**, the appropriate MATLAB command is:

» **W = bnd_share_matrix(boundary);**
- (5) The output **W** is a **row-normalized weight matrix** of boundary shares, which can be used directly in any spatial autoregressive model.