

## Appendix A

### Matching Procedure (Mahalanobis Distance Matching)

Below are the matching-procedure steps.

1. Property type:
  - a) Residential property with building: building code is residential, and building gross area is more than zero square feet.
  - b) Property without building: building gross area is not more than zero square feet.

Matching procedure

- a) Define treatment and control:
  - i) First step is to look for control within the buffer of polygons in the county. If control observations are fewer than 5 times the number of treatment observations or the number of control observations is fewer than 100, then we look for control in step (ii).
  - ii) Second step is to look for control within the county. Again, we use the same criteria. If it fulfills the rejection criteria, we go to step (iii).
  - iii) We look for control in neighboring counties.
- b) Matching algorithm:
  - i) Number of match (M): 2 [one to two matching]
  - ii) Treatment variable for matching: *‘polygon’*
  - iii) Covariates used for matching:
    - a. bld\_n\_rooms (sold house’s numbers of rooms as of the last modification / renovation);
    - b. bld\_n\_baths (sold house’s numbers of bathrooms as of the last modification / renovation);
    - c. bld\_yr\_combined (sold date of last modification/renovation)
    - d. bld\_gross\_area (sold house’s square footage as of the last modification/renovation)
    - e. lake (water (lake, river, and reservoir) frontage for each parcel as of 2017);
    - f. ha (size of sold parcel);
    - g. slope (slope of sold parcel);
    - h. elev (elevation of sold parcel);
    - i. rd\_dist\_hwy (sold parcel’s distance to nearest highway according to US Census Bureau’s 2019 TIGER/Line Shapefiles);
    - j. rd\_dist\_pvd (sold parcel’s distance to nearest paved road according to US Census Bureau’s 2019 TIGER/Line Shapefiles);
    - k. p\_bld\_fp\_5000 (the density of building footprints within 5 km of sold parcel’s centroid circa 2012);
    - l. p\_wet (percentage of each parcel’s area in wetlands as of 2018 );
    - m. cst\_2500 (sold parcel’s distance to nearest highway);

- n. p\_prot\_2010\_1000 (percentage area within 1 km of sold parcel that is protected via fee simple ownership or an easement as of 2010); and
- o. property\_type (was sold parcel developed or undeveloped?)
- iv) Exact variable: property\_type
- v) Ties: TRUE
- vi) Replace: FALSE
- vii) Weight: 2 [Mahalanobis distance]