Summary: Kernel-based estimators such as local polynomial estimators in regression discontinuity designs are often evaluated at multiple bandwidths as a form of sensitivity analysis. However, if in the reported results, a researcher selects the bandwidth based on this analysis, the associated confidence intervals (CIs) may not have correct coverage, even if the estimator is unbiased. This article proposes a simple adjustment that gives correct coverage in such situations: replace the normal quantile with a critical value that depends only on the kernel and ratio of the maximum and minimum bandwidths the researcher has entertained. We tabulate these critical values and quantify the loss in coverage for conventional CIs. For a range of relevant cases, a conventional 95% CI has coverage between 70% and 90%, and our adjustment amounts to replacing the conventional critical value 1.96 with a number between 2.2 and 2.8. Our results also apply to other settings involving trimmed data, such as trimming to ensure overlap in treatment effect estimation. We illustrate our approach with three empirical applications.

MSC:

62G07 Density estimation
62J15 Paired and multiple comparisons; multiple testing
62G15 Nonparametric tolerance and confidence regions

Keywords:
nonparametric estimation; multiple testing; regression discontinuity; bandwidth selection

Full Text: DOI arXiv