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DISCUSSION

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Once again Peter Hall has given us an interesting definitive paper concerned with asymptotic expansions and bootstrapping. These comments are directed toward issues that have arisen in our own work on the bootstrap. In particular, we offer comments regarding hyperefficiency of bootstrap-based critical points and probabilities, not for confidence intervals, but for the related problem of prediction intervals. The questions arose in conjunction with a somewhat complicated random coefficient trigonometric regression model [Olshen, Biden, Wyatt and Sutherland (1988)], but our points can be made in a very simple context. Also, our study relates only to a percentile-t-like method.

We assume that we have iid random variables $X_1, \dots, X_n, Z$ with distribution F. The X's are thought of as a *learning sample* and Z a *test case*. The common standard deviation is denoted by σ, and it will be clear that without loss we may take the common mean value to be 0. Our arguments depend on two assumptions: (A) $E\{Z^4\} < \infty$ and (B) F'' exists and is bounded.

[1]Visiting the Department of Statistics and the Department of Health Research and Policy, Stanford University. Supported in part by NSF Grant DMS-85-05609.

[2]Supported in part by Grant PHS CA41628, the John Simon Guggenheim Memorial Foundation, and the American Cancer Society.