

# MISQ Archivist

## A Multicollinearity and Measurement Error Statistical Blind Spot: Correcting for Excessive False Positives in Regression and PLS

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### Abstract

Multiple regression has a previously unrecognized “statistical blind spot” because when multicollinearity and measurement error are present, both path estimates and variance inflation factors are biased. This can result in overestimated t-statistics, and excessive false positives. PLS has the same weakness, but CB-SEM’s estimation process accounts for measurement error, avoiding the problem. Bringing together partial insights from a range of disciplines to provide a more comprehensive treatment of the problem, we derive equations showing false positives will increase with greater multicollinearity, lower reliability, greater effect size in the dominant correlated construct, and, surprisingly, with higher sample size. Using Monte Carlo simulations, we show that false positives increase as predicted. We also provide a correction for the problem. A literature search found that of IS research papers using regression or PLS for path analysis, 33% were operating in this danger zone. Our findings are important not only for IS, but for all fields using regression or PLS in path analysis.

**Keywords:** Multicollinearity, measurement error, M+ME, multiple regression, partial least squares, PLS, CB-SEM, false positives, Type I error, statistical power, variance inflation factor, VIF, path estimate bias