Theory of Regulatory Compliance: Quadratic Regressions

Richard Fiene, Ph.D.
Research Institute for Key Indicators & Penn State University

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The Theory of Regulatory Compliance has been described mathematically as a quadratic formula which captured the non-linear, U-shaped curve relating regulatory compliance and program quality. The form of the equation followed the typical quadratic:

$$Y = ax2 + bx + c$$

The problem in the use of the quadratic formula was that it was not particularly sensitive to false positives and negatives which in the regulatory compliance decision making was very problematic. Most recently, an alternative mathematical approach has been introduced by Simonsohn (2018) in his article: *Two Lines: A Valid Alternative to the Invalid Testing of U-Shaped Relationships With Quadratic Regressions:*

$$y = a + bx_{low} + cx_{high} + d * high + ZBZ, (1)$$

where xlow = x – xc if x < xc and 0 otherwise, xhigh = x – xc if x ≥ xc and 0 otherwise, and high = 1 if x ≥ xc and 0 otherwise.

Z is the (optional) matrix with covariates, and BZ is its vector of coefficients.

This article appeared in ***Advances in Methods and Practices in Psychological Science, Vol.1(4) 538–555, DOI: 10.1177/2515245918805755, www.psychologicalscience.org/AMPPS.*** This alternative approach is provided to better explain and detail the Theory of Regulatory Compliance. This very brief RIKIIIc technical research note is provided for licensing and regulatory science researchers to consider as they make comparisons with their regulatory compliance data. Additional details will be provided as this alternative to quadratic regressions is applied to the ECPQI2M – Early Childhood Program Quality Improvement and Indicator Model International Data Base maintained at the Research Institute for Key Indicators (RIKIIIc).

Richard Fiene, Ph.D., Psychologist, Research Institute for Key Indicators (RIKIIIc); Professor of Psychology (ret), Penn State University; and Senior Research Consultant, National Association for Regulatory Administration (NARA).
ORCID: 0000-0001-6095-5085.

For additional information about the Theory of Regulatory Compliance and the Early Childhood Program Quality Improvement and Indicator Model, please go to http://RIKInstitute.com