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## The Numerical Delta Method \*

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**Abstract**

This paper provides a numerical derivative based Delta method that complements the recent work by [Fang and Santos \(2014\)](#) and also generalizes a previous insight by [Song \(2014\)](#). We show that for an appropriately chosen sequence of step sizes, the numerical derivative based Delta method provides consistent inference for functions of parameters that are only directionally differentiable. Additionally, it provides uniformly valid inference for certain convex and Lipschitz functions which include all the examples mentioned in [Fang and Santos \(2014\)](#). We extend our results to the second order Delta method and illustrate its applicability to inference for moment inequality models.

Keywords: Delta Method, Numerical Differentiation, Directional Differentiability

JEL Classification: C12; C13; C50

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