

# Ill-Conditioned Problems and Fisher Information

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## **Abstract**

The existence of a uniformly consistent estimator for a particular parameter is well-known to depend on the uniform continuity of the functional that defines the parameter in terms of the model. Recently, Pötscher (*Econometrica*, 70, pp 1035 - 1065) showed that estimator risk may be bounded below by a term that depends on the oscillation (*osc*) of the functional, thus making the connection between continuity and risk quite explicit. However, *osc* has no direct statistical interpretation. In this paper we slightly modify the definition of *osc* so that it reflects a (generalized) derivative (*der*) of the functional. The quantity *der* can be directly related to the familiar statistical concepts of Fisher information and identification, and also to the condition numbers that are used to measure 'distance from an ill-posed problem' in other branches of applied mathematics.