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Andrew Chesher

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ACCEPTED MANUSCRIPT

Understanding the Effect of Measurement Error on Quantile Regressions

Andrew Chesher*

University College London and CeMMAP

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Abstract. The impact of measurement error in explanatory variables on quantile regression functions is investigated using a small variance approximation. The approximation shows how the error contaminated and error free quantile regression functions are related. A key factor is the distribution of the error free explanatory variable. Exact calculations probe the accuracy of the approximation. The order of the approximation error is unchanged if the density of the error free explanatory variable is replaced by the density of the error contaminated explanatory variable which is easily estimated. It is then possible to use the approximation to investigate the sensitivity of estimates to varying amounts of measurement error.

Keywords: measurement error, parameter approximations, quantile regression.

JEL Classification: C13, C14, C21

1. Introduction

Since the seminal paper of Koenker and Bassett (1978) there has been substantial development of estimation methods and algorithms for quantile regression functions (QRF), and gains in understanding of the properties of QRF estimators. With increasing interest in econometrics in variation in response amongst individuals, and with the way in which the distribution of responses is affected by covariates, the

*Department of Economics, University College London, Gower Street, London WC1E 6BT, UK. Tel +442076795857. Email andrew.chesher@ucl.ac.uk

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