R code for

"Estimating Structural Changes in Regression Quantiles"

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The package contains the following files

1. main.r:

   This is the main file that imports the data, calls the subroutines and returns the results.

2. quant-chg.r:

   This is the file that contains subroutines concerning testing and estimation. You should not have to modify them.

3. pabel.dgp.n01.r:

   This is a procedure used to simulate a data set, for illustration only.

4. Table.*:

   The files contains critical values

5. app1-gdp-growth.r and realGDP.txt:

   A code and a data file to replicate the findings from the U.S. GDP growth example in the paper.

6. app2-drunk-driving.r and driver.csv:

   A code and a data file to replicate the findings from the drunk driving example in the paper.

Detailed Information on using main.r

- The purpose of main.r is to:

    - test for structural changes in the regression quantiles;

    - determine the number of structural changes;

    - estimate the dates of structural changes, coefficients, and their confidence intervals.

- To read a data file:

– You can use read.csv and read.table. The option "header" should be set to "TRUE" or "T" if the data file contains names of the variables in the first row; otherwise set to "FALSE" or "F".

• The critical values for the SQ and DQ tests:

– If the interval of quantiles is specified via [w,1-w] with w being some positive constant, then critical values are directly available.

– Otherwise, the critical values need to be simulated on a case by case basis. You need to set $d.Sym = TRUE$ (see the explanation in the main.r). The simulation may take a while (say 20 minutes, depending on your computer).

The output

We have tried to provide as much information as possible. So the output is long and may occupy a few pages.

• It first returns the results from analyzing the conditional quantile functions separately. This includes (1) the numbers of breaks detected, (2) the estimated break dates and their confidence intervals, (3) the estimated coefficients and their standard errors.

When reporting the coefficients, we provide two different format: (1) estimated coefficients for each regime in order, (2) estimated changes in coefficients from the previous regimes. For example, for a model with three regressors (1, x1,x2) and one break, the output will look like

const:	Regime 1 coefficient
x1:	Regime 1 coefficient
x2:	Regime 1 coefficient
const:	Regime 2 coefficient
x1:	Regime 2 coefficient
x2:	Regime 2 coefficient

followed by

const:	difference between Regime 2 and Regime 1
x1:	difference between Regime 2 and Regime 1
x2:	difference between Regime 2 and Regime 1

- It then returns the results from a joint analysis of multiple conditional quantile functions. The structure of the output is the same as the previous case.

Remarks

This program is distributed freely for non-profit academic purposes only. For other uses, please contact Tatsushi Oka and Zhongjun Qu at oka@nus.edu.sg and qu@bu.edu, respectively.

A lot of effort has been put to construct this program and we would appreciate that you acknowledge using this code in your research and cite the relevant papers on which it is based:

- Qu, Zhongjun, (2008): "Testing for structural change in regression quantiles," *Journal of Econometrics*, vol. 146(1), p. 170-184.

- Oka, Tatsushi and Qu, Zhongjun (2011): "Estimating Structural Changes in Regression Quantiles," *Journal of Econometrics*, 162(2), p. 248-267.

Comments about possible improvements and so on are most welcome.

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