

# TESTING OF THE SPECIFICATION OF ECONOMETRIC MODEL

Orel D. G.

National University of Pharmacy, Kharkiv, Ukraine.

dasha.orel.1996@mail.ru

**Introduction.** Economic theory, the provisions of which are used in the selection of regressors, is not perfect. So often in the econometric model includes factors that should not be there, and do not turn on the factors that must be present there.

Proper specification of the econometric model indicates that

- choose the right function for the relationship between the independent and dependent variables;

- excluded from the model covariates insignificant and unimportant;

- the model includes all relevant and significant covariates.

Violation of the last of these conditions leads to very unpleasant consequences:

- estimation of the regression parameters are biased and unfounded;

- checking the quality of the model hypotheses and the construct confidence intervals for the parameter estimates are incorrect.

**Aim.** We will consider the Ramsey test (RESET test), one of the few ways of testing specified violations specification model and its implementation in a software environment R.

**Materials and methods.** The test is based on the auxiliary regression of the dependent variable on factors  $x_1, x_2$  of the original model and power functions of the estimated values variable  $\hat{y}$ :

$$y = b_0 + b_1x_1 + b_2x_2 + a_1\hat{y}^2 + a_2\hat{y}^3 + \dots + a_m\hat{y}^m + e$$

Further, it is necessary to check a hypothesis by the corresponding F-test:

$$H_0: a_1 = a_2 = \dots = a_m = 0$$

If value of statistics is more critical, then the zero hypothesis is rejected, and the specification of model is recognized incorrect. Otherwise, the initial set of factors is considered accepted.

**Results and discussion.** The considered scheme of testing of the specification of econometric model is realized in many software products, in particular in the program environment R.

R is a programming language and software environment that is used to perform statistical calculations and construction of graphical objects. R is open source software that is freely distributed under GNU license. GNU license agreement gives you a right to make a free copy, modify, and distribute the code. The main ideas of R CRAN (Comprehensive R Archive Network, <http://cran.r-project.org>) system are constant expansion, collective testing and prompt distribution of applied data processing tools. R is distributed free of charge, and now it is the de facto standard for statistical computing.

Ramsey's test is realized in a package `lmtest` (Testing Linear Regression Models).

Usage:

```
resettest(formula, power = 2:3, type = c("fitted", "regressor", "princomp"), data = list())
```

Arguments:

<i>formula</i>	A symbolic description for the model to be tested (or a fitted "lm" object).
<i>power</i>	Integers. A vector of positive integers indicating the powers of the variables that should be included. By default, the test is for quadratic or cubic influence of the fitted response.
<i>type</i>	A string indicating whether powers of the fitted response, the regressor variables (factors are left out), or the first principal component of the regressor matrix should be included in the extended model.
<i>data</i>	An optional data frame containing the variables in the model. By default the variables are taken from the environment which <code>resettest</code> is called from.

**Conclusions.** In the present message Ramsey's test and his realization in the program environment R is considered.