Name…….

Time Series Econometrics

The Final Exam Data Analysis Problems

Download the data sets ExamData1.wf1 and ExamData2.wf1 from Moodle.

Please explain clearly what you are doing and why. In EViews store your estimation reports, graphs, tables or text objects freezing the view and saving the workfile. In your explanations please refer to the named freezed objects in the EViews workfile. At the end of the exam upload the both EViews workfiles in Moodle.

Problem 1 ExamData1.wf1

1. Identify the number of AR and/or MA terms in an ARMA model of *y*, using correlograms and information criteria.

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2. Perform the ARCH LM test to detect ARCH effects.

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3. Estimate the GARCH model, using the previously identified model for conditional mean. What is the best model: GARCH(0,1), GARCH(1,1) or GARCH(1,2)? Why?

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For the chosen GARCH model

4. Is there remaining serial correlation in the mean equation?

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5. Is there remaining ARCH in the variance equation?

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6. Perform the ARCH LM test to test whether the standardized residuals exhibit additional ARCH.

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7. Write down the estimated GARCH model

Equation for conditional mean ……

Equation for conditional variance ……

8. Use the appropriate model to analyse, is there an asymmetric volatility phenomenon (leverage effect).

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Problem 2 ExamData2.wf1

The Phillips curve is a single-equation empirical model, describing a relationship between rates of unemployment and corresponding rates of inflation. In linear form

$$\Delta\pi_t = -\alpha(U_t - U_{nat})$$

where $\Delta\pi_t$ is the inflation rate, U_t is the unemployment rate and U_{nat} is the natural rate of unemployment. Corresponding econometric model is

$$\Delta\pi_t = b_1 + b_2 U_t + \varepsilon_t, \quad (1)$$

where

$$b_1 = \alpha U_{nat}, \quad b_2 = -\alpha. \quad (2)$$

Database consists the US inflation rate (INFLRATE, %) and unemployment rate (UNRATE, %) 1960-1998.

1. Estimate the Phillips curve (1), using the OLS.

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2. Perform CUSUM test for structural changes.

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3. Estimate regression model (1) with varying parameters, using state space model.

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4. Calculate the the natural rate of unemployment for year 1970.

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