University of Sydney

Business Analytics

QBUS6830: Financial Time Series and Forecasting
Semester 1, 2019

Lab Sheet 8: ARCH Models

Q1 (ARCH model) The dataset `BHP00-17.csv` contains daily prices on BHP stock from 04/01/2000 to 17/04/2017. Use Matlab and the Econometrics toolbox to answer these questions.

(a) Transform the prices to percentage log-returns. Plot the price and return series. Comment.

(b) Calculate some relevant summary statistics and then comment on the performance of BHP stock over the sample period. Perform the JB test for Gaussianity on the return series.

(c) Fit an ARCH(1) model to the return data using ML. Report and interpret the parameter estimates and plot the estimated volatility series. Discuss the estimated series and its' properties.

(d) Compare the unconditional variance estimated from the ARCH model with the sample variance? Are these close?

(e) Compare the unconditional kurtosis estimated from the ARCH model with the sample kurtosis? Are these close?

(f) Find the LS (using the squared errors) estimates for the parameters. Are these close to the ML estimates?

(g) Repeat parts (d) and (e) for the LS estimates.

(h) Are the unconditional variance and kurtosis estimates from the LS and ML estimates close to each other? Are they close to the sample variance and kurtosis? If they are not, why do you think this might be?
