44-6873-00L- **Econometrics for Business and Economics**	Dr Amr Algarhi (Miro) Department of Management Sheffield Hallam University
Exercise sheet **10. Stationary time series** Week 33	

Question 1 (Stata). Autoregressive model

Download the data set "***growth.dta***". This data set contains quarterly observations on the percentage in GDP for the USA from 1985q2 to 2009q3.

(a) Create a column for the relevant dates in the data set, and then declare the data to be time series.

Hint:

```
gen date = tq(1985q2) + _n-1
format %tq date
tsset date
```

(b) Plot the percentage change in GDP. Then, detect autocorrelation by producing a scatter graph of g and Lg, and by looking at the computed sample autocorrelation.

Hint:

```
tsline g, yline(0)
summarize g L.g
scatter g L.g, xline(0) yline(0)
ac g, lags(12) generate(ac_g)
list ac_g in 1/12
```

(c) Estimate an autoregressive model for the GDP growth and examine the correlogram of the residuals for the first 12 lags.

Hint:

```
reg g L(1/2).g
predict ehat, res
ac ehat, lags(12)
```

(d) Based on the AIC and the BIC, what is the preferred *AR* model that you will select?

Hint:

```
estat ic
varsoc g, maxlag(10)
```

(e) Use the *AR(2)* model to forecast GDP growth in 2009q4.

Hint:

```
reg g L(1/2).g
scalar ghat = _b[_cons]+_b[L1.g]*g[98]+ _b[L2.g]*g[97]
scalar list ghat
```

(f) Use the *AR(2)* model to forecast GDP growth in 2010q1.

Hint:

```
scalar ghat1 = _b[_cons]+_b[L1.g]*ghat+ _b[L2.g]*g[98]
scalar list ghat1
```

Question 2 (Stata).

Download the data set "***FTSE.xls***". This data set contains monthly observations on FTSE all share price index from January 1965 to October 2002.

Create a column for the relevant dates, and then apply the same analysis in question 1 to the series of the price return of the FTSE all share.

Hint:

```
gen date = tm(1965m1) + _n-1
format %tm date
tsset date

gen lnFTSE = ln(FTSE)
gen r = D.lnFTSE
```

(END)