1.21 The file **consumption.data** contains data on real personal disposable income and consumption expenditures in Canada, seasonally adjusted in 1986 dollars, from the first quarter of 1947 until the last quarter of 1996. The simplest imaginable model of the Canadian consumption function would have consumption expenditures as the dependent variable, and a constant and personal disposable income as explanatory variables. Run this regression for the period 1953:1 to 1996:4. What is your estimate of the marginal propensity to consume out of disposable income?

Plot a graph of the OLS residuals for the consumption function regression against time. All modern regression packages will generate these residuals for you on request. Does the appearance of the residuals suggest that this model of the consumption function is well specified?

1.22 Simulate the consumption function model you have just estimated in exercise 1.21 for the same sample period, using the actual data on disposable income. For the parameters, use the OLS estimates obtained in exercise 1.21. For the error terms, use drawings from the $N(0, s^2)$ distribution, where s^2 is the estimate of the error variance produced by the regression package.

Next, run a regression using the simulated consumption data as the dependent variable and the constant and disposable income as explanatory variables. Are the parameter estimates the same as those obtained using the real data? Why or why not?

Plot the residuals from the regression with simulated data. Does the plot look substantially different from the one obtained using the real data? It should!