## **Financial Econometrics**

## September 17th 2015

Exercise 1 Consider a purchasing power parity (PPP) regression of the type

$$ls = \beta_0 + \beta_1 ld + u$$

where:

- ls is the log of the EUR/USD spot exchange rate and
- *ld* is the log of the price differential between the European Union and the USA.

and assume, for the purpose of this exercise, that the errors u be homoskedastic and serially incorrelated.

You are interested in testing the PPP hypothesis in strict form: i.e., that the elasticity of the spot exchange rate to the price differential be one.

You are required to:

- write down the  $\hat{\beta}_{OLS}$  estimator and the estimator of its variance  $Var(\hat{\beta}_{OLS})$  in matrix form
- describe how the X matrix is formed
- explain how you would estimate the error variance  $\sigma^2$
- describe the testing procedure you would adopt for assessing the hypothesis of interest.

**Exercise 2** Consider the model from Exercise 1. Your sample consists of 70 quarterly data, 30 before and 40 after the Euro was introduced as a real currency (Third Stage of the European Monetary Union) in 1999.

• Explain how you would test for the stability of your model before and after the introduction of the Euro.

**Exercise 3** With respect to the issue of nonstationarity and the risk of spurious regressions,

- define weak-sense stationarity (covariance stationarity) for a stochastic process
- name (or even better describe) a testing procedure you might apply to your data, *ex ante*, to assess stationarity
- describe the warning signs of spurious regression to watch out for *ex post*, in your model output