

HOMWORK ASSIGNMENT FOUR

1. [4 points] COINTEGRATION I

Enders, Chapter 6, Problem 4, use data INT_RATES.XLS.

TSP hints:

You can run the ADF tests on residuals using the MacKinnon (1991) critical values. You can also use the critical values generated with the command CDF in the TSP code: CDF(DICKEYF, NLAGS=the number of lagged differences included in your regression, NOB=the number of observations, NVAR=1 for simple ADF tests 2 for cointegration test, CONSTANT or NOCONSTANT, TREND or NOTREND).

2. [3 points] GMM

This question follows Hansen and Singleton (1982). You will need the data from St Louis FED web page for the period January, 1959-December, 2007 in monthly frequency. The data in the wk1 format are in the file HW4_Pr2_data.wk1 and can be open in TSP through the Looking Glass program. The data set consists of the following series: real personal consumption expenditures on services (*cs*), non-durables (*cmd*), 1-year treasury bond interest rate (*rf*, risk free rate), the return on a value-weighted portfolios of the S&P 500 Universe (*vwretd*, includes the dividend distribution), and a population *pop*. As a consumption measure, use per capita consumption of non-durables and services. As a return on equity *re* use *vwretd*.

a. Follow the GMM_manual.pdf to estimate β and γ by GMM in the the Euler equation $E_t [(1 + re_t)\beta(c_t/c_{t-1})^{-\gamma}] = 1$ using heteroskedasticity and autocorrelation consistent options with instruments consisting of a constant, c_{t-1}/c_{t-2} , c_{t-2}/c_{t-3} , re_{t-1} , re_{t-2} . Report parameter estimates with corresponding standard errors and p-values plus the Hansen J-statistic.

b. Estimate a two-return model using a mask option in TSP. The system of equations in this case is $E_t [(1 + re_t)\beta(c_t/c_{t-1})^{-\gamma}] = 1$ and $E_t [(1 + rf_t)\beta(c_t/c_{t-1})^{-\gamma}] = 1$ with instruments consisting of a constant, c_{t-1}/c_{t-2} , c_{t-2}/c_{t-3} , re_{t-1} , re_{t-2} , rf_{t-1} , rf_{t-2} . Report parameter estimates with corresponding standard errors and p-values plus the Hansen J-statistic.

c. Compare results from a and b. How do they differ and why? Considering your results from b, is there is still an equity premium puzzle?

3. [3 points] COINTEGRATION II

Enders, Ch. 6., Problem 5.