

Mgmt 239c: Problem Set 3 *

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This third problem set is due Friday, February 13. You can work in groups of 4. It is sufficient to hand in one problem set per group. You are encouraged to submit your matlab code together with the write-up of your answers. This problem set estimates the canonical consumption-based asset pricing model on US data using the Generalized Method of Moments.

1. Download quarterly data for the US risk-free rate and stocks from CRSP. For the risk-free rate, use the Fama risk-free rate series on CRSP. For stock returns, use the CRSP value-weighted stock market return. Use the inflation series provided by CRSP to deflate stock returns. Download quarterly real non-durable per capita consumption data from NIPA. Always use the longest sample available.

- (a) Use real stock return and real bond return data to estimate the parameters (β, γ) of the Consumption-CAPM from the following moment conditions:

$$E \left[\mathbf{R}_{t+1} \beta \left(\frac{C_{t+1}}{C_t} \right)^{-\gamma} \right] = \mathbf{1}$$

where the vector of returns \mathbf{R} include the real return on the 6 Fama-French portfolios and the real risk-free rate. Use a 2-stage GMM procedure. Start with the identity weighting matrix in the first stage.

- i. Report the parameter estimates and the standard errors.
 - ii. Can the model be rejected?
- (b) Use excess stock returns to estimate the parameters (γ) of the Consumption-CAPM from the following moment conditions:

$$E \left[\mathbf{R}_{t+1}^e \beta \left(\frac{C_{t+1}}{C_t} \right)^{-\gamma} \right] = \mathbf{0}$$

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where the vector of excess returns \mathbf{R}^e include the excess returns on the 6 Fama-French portfolios. Use a 2-stage GMM procedure. Start with the identity weighting matrix in the first stage. You can set $\beta=.99$.

- i. Report the parameter estimates and the standard errors.
 - ii. Can the model be rejected?
- (c) On the basis of these estimates, derive a beta representation of expected excess returns.
- (d) Plot the predicted excess return against the realized excess returns in a scatter diagram. Also plot the 45-degree line. Comment. Report the model's R^2 and the mean absolute pricing error.
- (e) Use excess stock returns to estimate the parameters (γ) of the Consumption-CAPM from the following moment conditions:

$$E \left[\mathbf{R}_{t+1}^e \beta \left(\frac{C_{t+1}}{C_t} \right)^{-\gamma} \right] = \mathbf{0}$$

where the vector of excess returns \mathbf{R}^e include the excess returns on the 6 Fama-French portfolios. Use a 2-stage GMM procedure. Start with the identity weighting matrix in the first stage. You can set $\beta=.99$. Use Lettau and Ludvigson's *cay* as an instrument by creating managed portfolios.

- i. Report the parameter estimates and the standard errors.
- ii. Report the model's R^2 and the mean absolute pricing error.
- iii. Can the model be rejected?