

6th set GAUSS assignments Financial Econometrics

1. Conditional estimates ("Managed portfolios")

Write additional procedures to estimate the consumption based model, the CAPM with instruments. In the GAUSS file `instruments.fmt` you find the two instruments used by Cochrane(JPE 1996). In the first column you find the term spread (yield on long term government bonds less yield on 3-month Treasury bills) and in the second column you find the dividend/price ratio of the equally weighted NYSE portfolio. Instead of using the d/p ratio directly, use $1 + 100 \times [(d/p) - 0.04]$ to keep the scale of the moments comparable. The return data are again the ten portfolios used in the previous assignments, while for excess returns you have to subtract the risk free (T-bill) rate provided in `t_bill_c`. The moment conditions using excess returns are:

$$g_T(b) = \begin{bmatrix} E[m_{t+1}R_{t+1}^{e,1}] \\ \vdots \\ E[m_{t+1}R_{t+1}^{e,10}] \\ E[(m_{t+1}R_{t+1}^{e,1})z_t^1] \\ \vdots \\ E[(m_{t+1}R_{t+1}^{e,10})z_t^1] \\ E[(m_{t+1}R_{t+1}^{e,1})z_t^2] \\ \vdots \\ E[(m_{t+1}R_{t+1}^{e,10})z_t^2] \end{bmatrix}$$

where z_t^1 is the term spread and z_t^2 is the dividend/price ratio.

- Since we want to replicate the results by Cochrane (JPE 1996), who uses only four portfolios, we also use only the first, second, fifth and tenth portfolio (column in the return matrix) for estimation:
- Write a procedure that returns the "raw" moment conditions with managed portfolios for the CAPM and the CBM.
- If excess returns are used you need an additional moment restriction to identify the parameters. This moment restriction follows directly from the fact that $E(mR^F) = 1$.
- Estimate the model parameters by GMM and save them into a matrix.

2. Plot the average excess return vs. predicted excess return

Compare the two models by a graph that shows how well the predicted excess returns fit the realized excess returns.

Predicted excess returns can be computed as:

$$E(R^{e,i}) = -\frac{\text{cov}(m, R^{e,i})}{E(m)}$$

First compute the predicted stochastic discount factor to get predicted mean excess returns for each return decile. Further, calculate the realized mean excess returns $\bar{R}^{e,i}$ for each return decile and collect them in a vector. Plot the predicted mean excess returns on the x-axis versus the realized mean returns on the y-axis. Draw an additional 45° line to provide an illustration how well the model fits the data. Use the commands from last week to plot both graphs into one window.

This assignment can be handed in for grading until 16th Dec. 2008.

If you want to hand in this assignment for grading, include a pdf file (beside your program code) that shortly describes the procedures. Interpret the graph. Further explain the meaning of the instruments in the GMM estimation. Why do we call them managed portfolios?

Send your program code and the pdf file to franziska-julia.peter@uni-tuebingen.de