

UNIVERSITY OF ROCHESTER

William E. Simon Graduate School of Business Administration

FIN 533
Special Topics in Finance

Professor G. William Schwert
Fall 2000

Homework Assignment #3 Due: November 8, 2000

Fama and Schwert (“Asset returns and inflation,” *Journal of Financial Economics*, 1977) argue that economic theory predicts different reactions of asset returns to the anticipated and unanticipated parts of inflation. They estimate regressions of the form:

$$R_{it} = \alpha + \beta E[\rho_t | \phi_{t-1}] + \gamma \{ \rho_t - E[\rho_t | \phi_{t-1}] \} + \epsilon_t$$

where $E[\rho_t | \phi_{t-1}]$ represents the expected inflation rate conditional on information available to the market at time $t-1$, and $\{ \rho_t - E[\rho_t | \phi_{t-1}] \}$ represents unexpected inflation. In the Fama-Schwert paper, they use Fama’s “constant real rate of interest” model $E[\rho_t | \phi_{t-1}] = TB_t - E(r)$ for expected inflation for 1953:01 through 1971:07. They find that for the CRSP value-weighted portfolio return, the estimate of the expected inflation coefficient is substantially negative and the coefficient of the unexpected inflation coefficient is less negative.

The Excel spreadsheet F533HW3.XLS contains data on monthly stock returns [Stock] from 1885:01 through 1998:08. It also contains short-term interest rates [Int], a recession indicator [bc], aggregate dividend yield [D/P] and earnings yield [E/P] data, two measures of inflation [CPI and PPI], two measures of money growth rates [MB and M2], industrial production growth [IP], and long-term corporate bond yields [LTCorp]. You may use these data to complete this assignment. These data are also available in an Eviews file F533HW3.WF1.

Replicate the Fama-Schwert tests for the 1953:01-1971:07 period using the following methods:

- (a) the constant expected real rate assumption;
- (b) fit a univariate ARIMA model to CPI inflation and insert the predicted values and residuals from this model into the regression model to represent expected and unexpected inflation;

- (c) repeat (b), using estimates of the ARIMA model from a period before 1953:01 (so the predictions and errors are out-of-sample);
- (d) set up a two equation system, where the second equation is an autoregression for CPI inflation, then test the “cross-equation restrictions” using a likelihood ratio test and/or a Wald test;
- (e) repeat (d), but include other variables in the model for predicting inflation in addition to lagged inflation.

Do your conclusions vary (much) across these different methods? Why? Under what circumstances would each be the best choice [i.e., what tradeoffs would you make in choosing among methods?]

Repeat the analysis for another sample period (your choice, but you should explain why you chose it).