

Four Variables Interest Rates, Growth, Unemployment, and Inflation

Data set

The files

Data_views_four_macro_variables.wf1 (Eviews)

contain the following basic data series.

:

U	=	Unemployment rate (percent)
GDP	=	Gross Domestic Product (\$ billions, SAAR)
GDP_PRICE	=	GDP price deflator(2000=100)
R	=	interest rate on 3-month Treasury Bill s(annualized %)
RGDP=real GDP	=	100*GDP/GDP_PRICE
G =growth rate	=	(100*(RGDP/RGDP(-1))^4) - 100
I=inflation	=	100*(GDP_PRICE/GDP_PRICE(-1))^4 - 100

Problem 1: Describe in words each of these seven variables. Use words that illuminate, not obfuscate. Don't copy your answer from Wikipedia! One sentence should suffice.

Data Displays

Problem 2: Create data displays that help to answer each of the following questions:

- Is it unusual to have growth exceeding 4%?
 - How often is the US economy in recession?
 - Is the real rate of interest very stable?
 - How far back in time do we need to go to find a period with unemployment like it is today?
 - When was inflation high?
- The best answer is a free standing graph that has: 1) a title that answers the question; 2) well labeled axis; 3) shows and appropriate range of date over time or in the variable of interest; and 4) could not be misinterpreted by one of your classmates.

Time Series Regressions

The Eviews and Excel data files include the following regressions that are intended to capture the "time series" properties of the series. These regressions may be found by clicking on the eq1_* lines in the workfile. (Keep in mind that "C" represents a constant in the regression.)

<u>Dependent Variable</u>	<u>Predictor Variables</u>
G	C G(-1) G(-2)
I	C I(-1) I(-2) I(-3)
R	C R(-1) R(-1)-R(-2)
U	C U(-1) U(-1)-U(-2)

Problem 3: Describe in words what each of these regressions means. Don't just say the coefficient is 3 with a standard error of 2. Explain what it all means. Use some memorable words. Tell a story. In particular, notice that the R equation uses the predictor variables

R(-1) and R(-1)-R(-2), not R(-1) and R(-2). Likewise for the U equation. What is the meaning of that? How does it matter? **WORDS MATTER.** The best answers say nothing about R², t-stats, coefficients, statistical significance, etc. Rather the best answer could be understood by your grandmother (who we are assuming is not an expert statistician like you). Again one or two sentence should suffice.

Multiple Regressions

Under the labeling eq2_*** the data files include the following regressions that capture the “time series” properties of the series but also allow the macro variables to affect each other, with a one-quarter lag.

Dep. Var.	Predictor Variables
G	C G(-1) G(-2) I(-1) I(-2) R(-1) R(-1)-R(-2) U(-1) U(-1)-U(-2)
I	C G(-1) G(-2) I(-1) I(-2) R(-1) R(-1)-R(-2) U(-1) U(-1)-U(-2)
R	C G(-1) G(-2) I(-1) I(-2) R(-1) R(-1)-R(-2) U(-1) U(-1)-U(-2)
U	C G(-1) G(-2) I(-1) I(-2) R(-1) R(-1)-R(-2) U(-1) U(-1)-U(-2)

Problem 4: Based on these regressions, answer each of the following questions:

- What makes growth slow down?
- When is inflation high?
- When does the Federal Reserve raise interest rates?
- What causes/predicts high unemployment?

Again like above the best answers say nothing about R², t-stats, coefficients, statistical significance, etc. Rather the best answer could be understood by your grandmother (who we are assuming is not an expert statistician like you). Tell a simple story. Again one or two sentence should suffice. Remember the question asks what predicts/causes a certain action, so we don’t need to know everything that doesn’t predict or cause the result.

Your turn

Your answers to Problem 4 were based on the whole data set, but it seems quite possible that the economy today is behaving differently than the economy of yesteryear. To explore this possibility, for each of the four equations estimate two regressions, one with the data before Greenspan began his term as the Chairman of the Federal Reserve Board in August 1987 (1947Q1 1987Q3) and one with the data in the Greenspan Era (1987Q4 2006Q4)

Problem 5: Make a list of the important ways in which the economy is different now, than it used to be. “Important” may be a reference to the t-values, but it may also be a reference to “the story of the economy.”

Problem 6: Make one graph that accurately captures one of your answers to problems 5. This should be free-standing as your answers to Problem 2 were and not easily misinterpreted.