

Final Exam

Directions: Answer all questions; points for each question are given in parentheses. For full credit, you must provide complete explanations for your answers.

1. (5) Timothy Geithner is seeking your advice on assessing the interest rate risk of some of the troubled banks that are currently undergoing a "stress" test. Geithner's assistant is arguing that the FGAP is the most relevant measure. Do you agree?
2. (10) Use the expectations hypothesis to answer the following questions:
 - (a) The yield curve typically has a positive slope. What does this imply about the predicted behavior of short-term interest rates? Does this suggest a problem with the expectations hypothesis?
 - (b) If the interest rates on one- to five-year bonds are currently 4%, 5%, 6%, 7% and 8%, predict what the one-year interest rate will be two years from now?
3. (5) In Brunnermeier's analysis of the credit crisis, the TED spread played a critical role. Why?
4. (15) In the model of banks as providers of liquidity insurance, explain **precisely** why the existence of banks can yield a Pareto optimum. Why is the *Law of Large Numbers* relevant?
5. (20) One of the implications of the financial accelerator model (i.e. the model presented in the article by Gertler and Hubbard) is that investment may behave asymmetrically over the business cycle. Explain why this is the case. A good answer will be supported by graphical analysis similar to that presented in the article.
6. (15) Suppose agents derive utility from income as given by the function: $U(y) = \ln y$. Answer the following:
 - (a) Prove that this function implies that agents' measure of relative risk aversion is constant. What is it equal to?
 - (b) Suppose agents are faced with two possible income levels: $y_1 = 100$ and $y_2 = 50$ and assume that the probability of the low income state is 20%. If actuarially fair insurance was offered to an agent, what would the premium for insurance cost (assuming zero expected profits for insurance companies).
 - (c) Show that the utility of agents from purchasing insurance is greater than the expected utility from no insurance (using the functional form for utility given above).
7. (20) In discussing the modern version of the IS curve, we showed that the linearized Euler equation has the form:

$$\tilde{c}_t = E_t [\tilde{c}_{t+1}] - \sigma \tilde{r}_t$$

where c_t is consumption and rr_t is the **one-period** real interest rate (the tildes imply that the terms are expressed as deviations from full employment levels). In their article, Gali and Gertler stress that it is the **long term** real interest rate that is critical for aggregate demand movements. How do you reconcile Gali and Gertler's statement with the above representation of the Euler equation?

8. (10) The Taylor rule is often expressed as:

$$r_t = \pi_t + \alpha (\pi_t - \pi^*) + \beta (y_t - \bar{y}_t) + rr$$

where r_t is the short term interest rate (i.e. the Fed Funds rate), π_t is the current inflation rate, π_t^* is the target inflation rate chosen by the monetary authorities (i.e. the Fed), y_t is GDP, \bar{y}_t is full employment GDP, and rr is the real interest rate consistent with full employment. Explain why a value for $\alpha < 0$ is considered problematic for stable monetary policy.