April 6: Liquidity Traps

Okun's Law: $\tilde{Y}_t = \frac{Y_t - \bar{Y}_t}{\bar{Y}_t}$

Okun's Law: $u_t - u^* = -\frac{1}{2}\tilde{Y}_t$

IS Curve: $\tilde{Y}_t = \bar{a} - \bar{b}(R_t - \bar{r})$

MP Curve: $i_t = R_t + \pi_t$

Policy Rule: $R_t - \bar{r} = \bar{m}(\pi_t - \bar{\pi})$ — Taylor Rule: $R_t - \bar{r} = \bar{m}(\pi_t - \bar{\pi}) + \bar{n}\tilde{Y}_t$

AD Curve: $\tilde{Y}_t = \bar{a} - \bar{b}\bar{m}(\pi_t - \bar{\pi})$

Phillips Curve / AS Curve: $\pi_t = \pi_t^e + \bar{v}\tilde{Y}_t + \bar{o}$

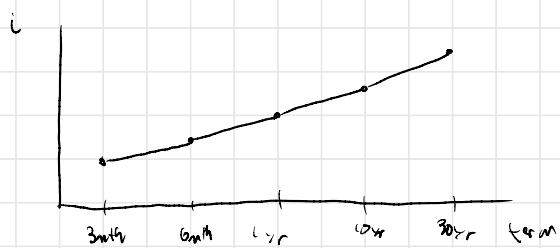
Liquidity trap:

- unable to lower interest rate below zero, even if conditions necessitate it
- prime example: 2008 recession

Key Question: how do/should central banks stimulate the economy?

First, yield curve:

- Nominal interest rate depends on term of loan:



i ↑ as term ↑ as it's riskier to borrow over longer horizons

What else todo to stimulate economic activity?

- Quantitative Easing: buying long term bonds to affect long term interest rates

Long term interest rates are a function of future short term rates, plus risk premium

Forward guidance: commitment by central bank to keep ST rates low for a long period of time

In class practice exercises on Automatic Stabilizers

$\tilde{Y}_{\downarrow} \rightarrow G \uparrow$

$\tilde{Y}_{\uparrow} \rightarrow G \downarrow$

$\frac{G_t}{Y_t} = \bar{a}_g - \bar{d}\, \tilde{Y}_t$

Date: Apr 5

Professor Andy Jalil

Group Exercise: Automatic Stabilizers in our Short-Run Model

Background: Government spending tends to increase naturally when an economy slips into a recession, even without any legislated changes in fiscal policy. Why? When an economy is in recession, unemployment increases and the government automatically increases its spending on unemployment insurance and the social safety net. By contrast, government spending tends to decrease automatically when an economy enters a boom: When the economy is in a boom, unemployment decreases and the government automatically reduces its spending on unemployment insurance and the social safety net.

Government spending that automatically responds to the business cycle is referred to as "automatic stabilizers." Why? When the economy weakens, the increase in government spending that automatically occurs helps to counteract the fall in output, thereby stabilizing the economy.

a. How could you incorporate automatic stabilizers into our short-run model? Starting with our baseline model from class, what equation(s) would you change? Why?

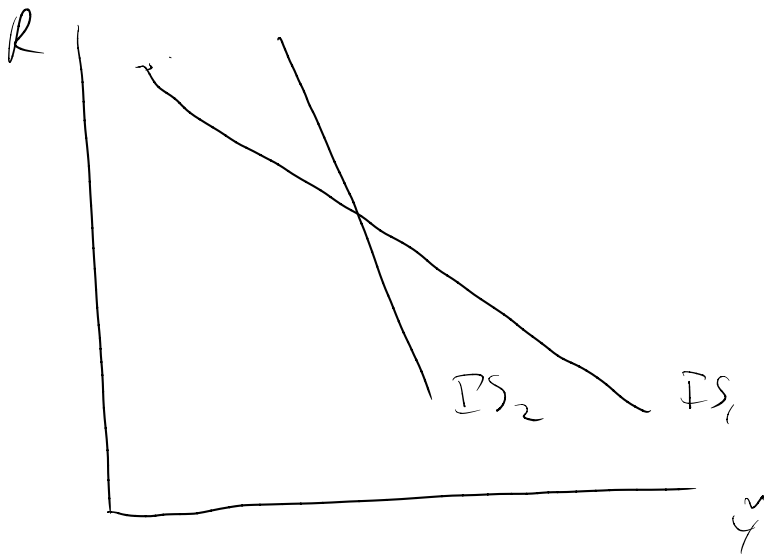
$$\frac{G_t}{\bar{Y}_t} = \bar{a}_G - \bar{d}\,\tilde{Y}_t$$

b. Derive the IS curve in this economy.

$$\tilde{Y}_t = \bar{a} - \bar{b}(R_t - \bar{r}) - \bar{d}\,\tilde{Y}_t$$

$$\tilde{Y}_t = \frac{\bar{a} - \bar{b}(R_t - \bar{r})}{1 + \bar{d}}$$

c. Graph the new IS curve you derived in part (b) and show how it is different from the standard IS curve considered in class. Specifically, show how the slope of this new IS curve differs from the slope of the standard IS curve considered in class. What is the economic interpretation of the difference? (Assume that $\bar{r}$ is the same across both IS curves.)



d. Which IS curve shifts by more in response to a given aggregate demand shock (i.e. a given change to $\bar{a}$): the new IS curve (from part b) or the standard IS curve considered in class? Does your answer depend on whether the shock is a positive or negative aggregate demand shock (i.e. whether $\Delta\bar{a} > 0$ or $\Delta\bar{a} < 0$)? Explain, either mathematically or graphically.

The original IS curve shifts more, since
ΔY + unit multiplied by the $\frac{1}{1+\bar{r}}$ term

e. Now, assume that the Federal Reserve follows a particular policy rule:

$$R_t - \bar{r} = \bar{m}(\pi_t - \bar{\pi}) + \bar{n}\tilde{Y}_t$$

Does this policy rule reflect the dual mandate of the Federal Reserve? Why or why not?

Yes, it seeks to keep inflation under control and maintain output close to potential

f. Using the IS curve you derived in part (a) and the policy rule from part (d), derive the new AD curve for this economy.

$$\tilde{Y}_t = \frac{\bar{a} - \bar{b}\bar{m}(\pi_t - \bar{\pi}) - \bar{b}\bar{n}\tilde{Y}_t}{1+\bar{d}}$$

$$Y_t\left(1 + \frac{\bar{b}\bar{n}}{1+\bar{d}}\right) = \frac{\bar{a} - \bar{b}\bar{m}(\pi_t - \bar{\pi})}{1+\bar{d}}$$

$$Y_t = \frac{\bar{a} - \bar{b}\bar{m}(\pi_t - \bar{\pi})}{1+\bar{d}+\bar{b}\bar{n}}$$

g. Suppose consumers suddenly become optimistic and increase their spending. You can interpret this as an increase in $\overline{a}_c$. Illustrate how the economy will behave over time in an AD-AS diagram. Also, please assume that eventually, after many periods, $\overline{a}_c$ returns to its original level once the burst in consumer optimism subsides.