ECON 402 Exam 2 Review

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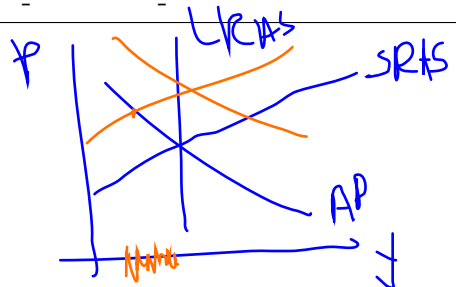
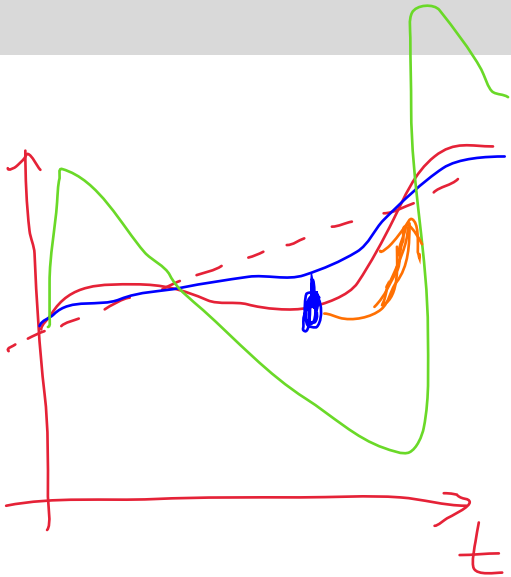
Business cycle fluctuations

	US data		Some model...	
$\heartsuit$	st dev	corr($\heartsuit$, Y_t)	st dev	corr($\heartsuit$, Y_t)
Y_t	1.7	1		
C_t	0.8	0.7		
I_t	8.2	0.9		
L_t	1.6	0.8		
A_t	-	-		





Business cycle fluctuations

- Three main goals

    1. Explain sources of "fluctuations" in output around trend growth (aka recessions/booms)
    2. Explain cyclicality and correlations between variables
    3. Study the effects of government policies aimed at "smoothing" the business cycle

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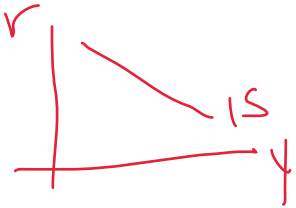
- Examples of government policies

  1. Fiscal policy = government spending G and taxation T (Congress)
  2. Monetary policy = regulate money supply M via changes to short-run interest rates r (or vice versa)
  3. Some other policy?

Investment Savings-Liquidity Preference Money Supply (IS-LM) model

(i) Investment Savings (IS) curve, or goods market equilibrium:
combination of (r, Y) that equates actual expenditures with planned ones

- $Y = C(Y - T) + I(r) + G$
- $I(r) = Y - C(Y - T) - G := S$



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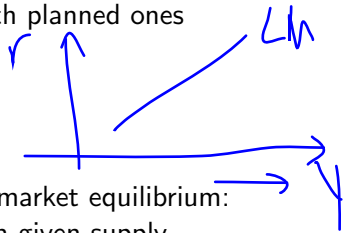
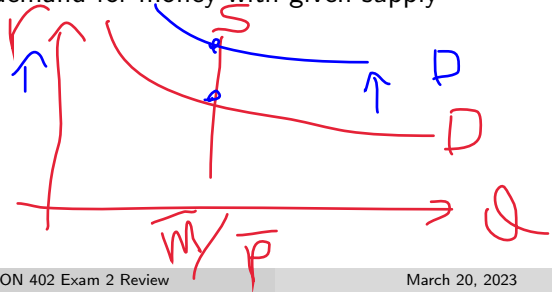


(ii) Liquidity Preference Money Supply (LM) curve, or money market equilibrium:
combination of (r, Y) that equates demand for money with given supply

- $\left(\frac{M}{P}\right)_D = L(y, r + \pi_E)$
- $\left(\frac{M}{P}\right)_S = \overline{M/P}$



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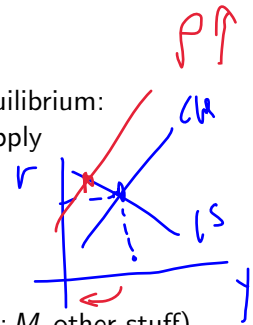

(iii) Short-run equilibrium, or aggregate demand (AD) curve: $Y = f(P; M, \text{other stuff})$
combination of (r, Y) that leads to equilibrium in the goods and money markets

Aggregate Supply-Aggregate Demand (AS-AD) model

(i) Aggregate Demand (AD) curve, or short-run equilibrium

- (IS-LM) $Y = f(\bar{P}; M, \text{other stuff})$
- (simple) $Y = \frac{MV}{P}$

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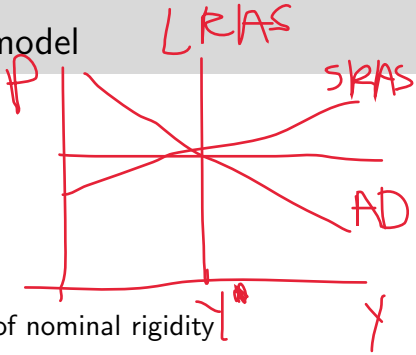
(ii) Short-run Aggregate Supply (SRAS) curve from theories of nominal rigidity

- (fully sticky) $P = E[P] + \varepsilon$
- (partial sticky) $P = E[P] + \frac{1}{\alpha}(Y - Y^*) + \varepsilon$

Aggregate Supply-Aggregate Demand (AS-AD) model



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(iii) Long-run Aggregate Supply (LRAS) curve from flexible-price general equilibrium (GE)

- (real side) $Y = Y^* = F(K, L^*; A)$

Question 1

$C = a + \frac{1}{2}(Y - T)$
$I = I_0 - 200 \cdot r$
$\frac{M}{P} = Y - 600 \cdot r$
$G = 10$
$T = 0$

LM: $\frac{10}{1} = Y - 600 \cdot r = 80 - 400r - 600r$

$\Rightarrow r = 0.07$

A) Find (r, Y) if $a = 10, I_0 = 20, M = 10, P = 1$ assuming economy is at potential.

$Y \overset{!}{=} C + I + G = [10 + \frac{1}{2}(Y - 0)] + 20 - 200 \cdot r + 10$

$= 40 + \frac{1}{2}Y - 200r$

$\Rightarrow IS: Y = 80 - 400r$

$80 - 400(0.07) = 52 = Y$

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$C = a + \frac{1}{2}(Y - T)$
$I = I_0 - 200 \cdot r$
$\frac{M}{P} = Y - 600 \cdot r$
$G = 10$
$T = 0$

$r = 0.07, Y = Y^{*} = 52$

A) Find (r, Y) if $a = 10, I_0 = 20, M = 10, P = 1$ assuming economy is at potential.

B) If covid shock brings potential down to 50, and $a = 5, I_0 = 15$ what level of money M is needed bring output to new potential and keep prices stable?

IS: $Y = 60 - 400r \Rightarrow 50 = 60 - 400r \Rightarrow r = 0.025$

LM: $\frac{M}{1} = 50 - 600(0.025) \Rightarrow M = 35$

Question 1

$C = a + \frac{1}{2}(Y - T)$
$I = I_0 - 200 \cdot r$
$\frac{M}{P} = Y - 600 \cdot r$
$G = 10$
$T = 0$

C) Suppose $a = 5, I_0 = 15$ still, but now potential back up to 52. What level of money is needed to get back to old potential now?

IS: $52 = 600 - 400 \cdot r \Rightarrow r = 0.02$

LM: $\frac{M}{P} = 52 - 600 \cdot (0.02) \Rightarrow \boxed{M = 40}$

Question 1

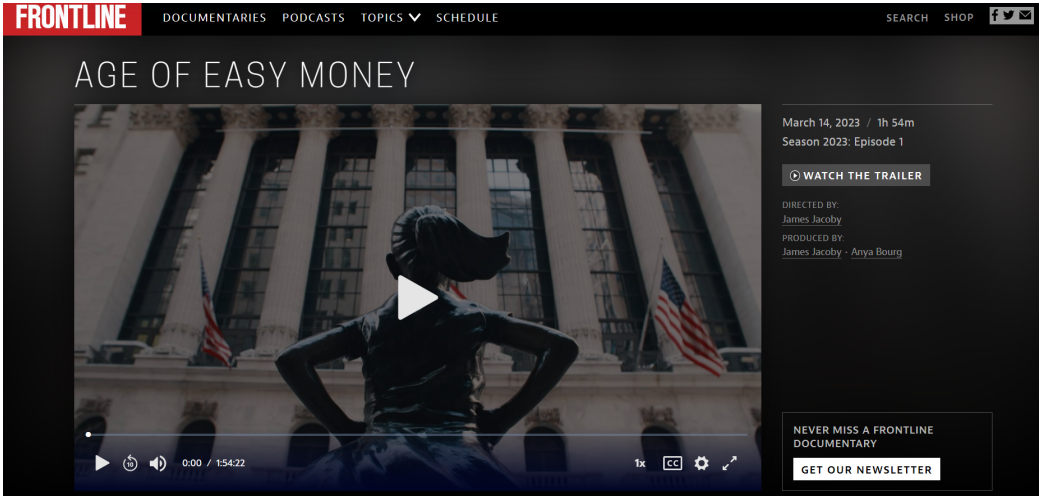
$C = a + \frac{1}{2}(Y - T)$
$I = I_0 - 200 \cdot r$
$\frac{M}{P} = Y - 600 \cdot r$
$G = 10$
$T = 0$

C) Suppose $a = 5, I_0 = 15$ still, but now potential back up to 52. What level of money is needed to get back to old potential now?

D) Suppose everything back to normal (potential at 52, $a = 10, I_0 = 20$) except money now at 40 from part c. Find long-run price level.

$r = 0.07$ } $\frac{40}{P} = 52 - 600(0.07) \Rightarrow \boxed{P = 4}$

Age of “easy money” documentary, Frontline (2023)



Question 2

$\pi = \pi_E + \frac{Y - Y^*}{Y^*} = \pi_E + y$

$u_N = 0.03$

Okun's law $\quad u \uparrow 1\% \quad \Rightarrow \quad y \downarrow 2\%$

A) Derive the Phillips curve.

$$\pi = \pi_E + y$$
$$= \pi_E - 2(U - U_N)$$
$$= \pi_E - 2(U - 0.03)$$

Question 2

$\pi = \pi_E + \frac{Y - Y^*}{Y^*} = \pi_E + y$

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Okun's law $\quad u \uparrow 1\% \quad \Rightarrow \quad y \downarrow 2\%$

$\pi = \pi_E - 2(U - 0.03)$

$\pi_{E,t} = \pi_{t-1}$

A) Derive the Phillips curve.

B) Find the path of $\{\pi, y\}$ over the first three periods if policy-makers wish to keep $u = 0.02$, expectations are adaptive, and assuming $\pi_E = 0.02$ in the first period.

	1	2	3
π	$= 0.02 - 2(0.02 - 0.03)$ $= 4\%$	$= 0.04 - 2(0.02 - 0.03)$ $= 6\%$	$= 8\%$
y	$= 2\%$	$= 2\%$	$= 2\%$

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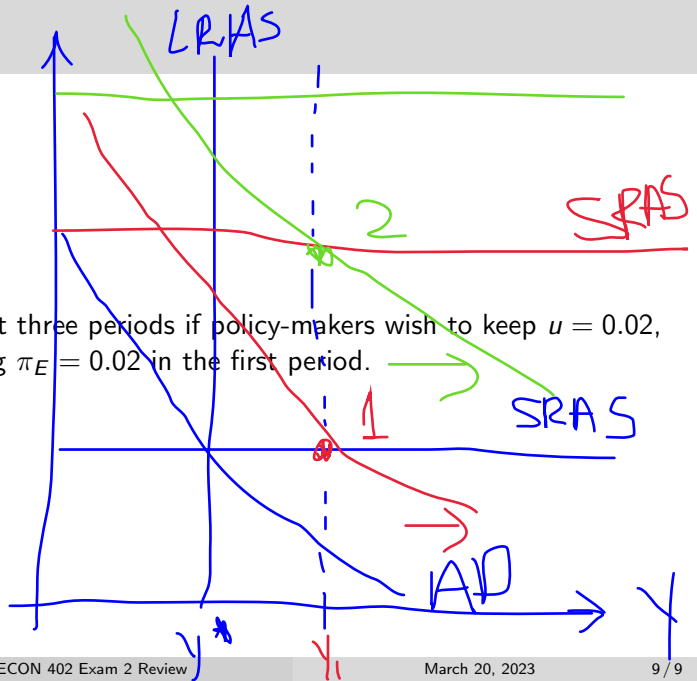
C) Illustrate this in AS-AD diagram.



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Jeremy Rudd (2021)

A) Derive the Phillips curve.

B) Find the path of $\{\pi, y\}$ over the first three periods if policy-makers wish to keep $u = 0.02$, expectations are adaptive, and assuming $\pi_E = 0.02$ in the first period.

C) Illustrate this in AS-AD diagram.

D) What if the public expects this behavior? → $Y = 0\%$, higher π

rational expectations! (make correct predictions about pi... instead of adaptive)