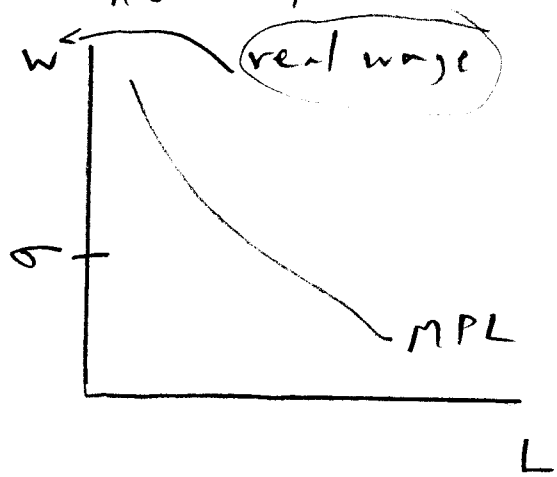
Overview of Models

Economic growth: real variables, focus on LRSS
(though model may also describe deviations from LRSS)

Malthusian model

Endogenous population growth

"Dismal science": in LR, TFP growth or land acquisition causes population increase, no improvement in living standards.



Solow model

Exogenous popn. growth,
exogenous TFP growth,
exogenous savings rate s.

nothing about utility, preferences

Constant returns to scale, diminishing MPL.

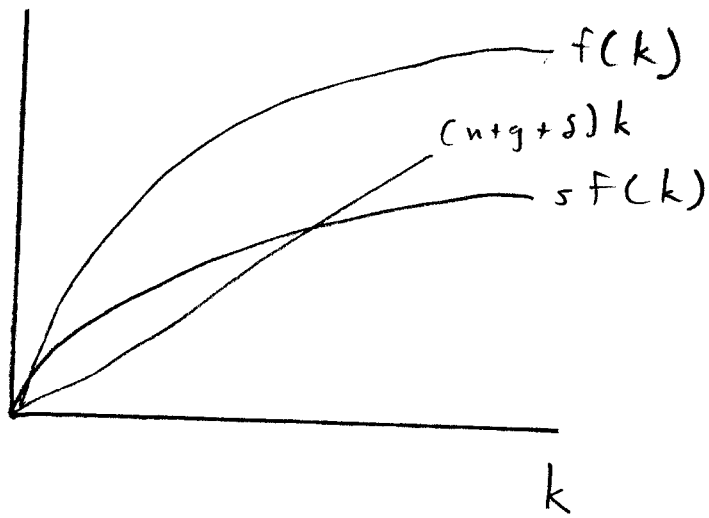
result: in LR, s affects level of Y, K
but not growth rates of Y/L, K/L.

Add fixed s^H (vs. s^K) in "human capital":
get MRW.

Overview of Models

Economic growth...

Solow model (cont.)



Concepts:

k, y vs. K/L, Y/L

per efficiency-unit of labor

k, y may or may not be LRSS

k^*, y^* LRSS, may or may not be "golden rule"

k^{GR}, y^{GR} Golden rule, LRSS that maximizes $\frac{C}{L}$.

How you know if you're at golden rule:

$f'(k) = n + g + \delta$

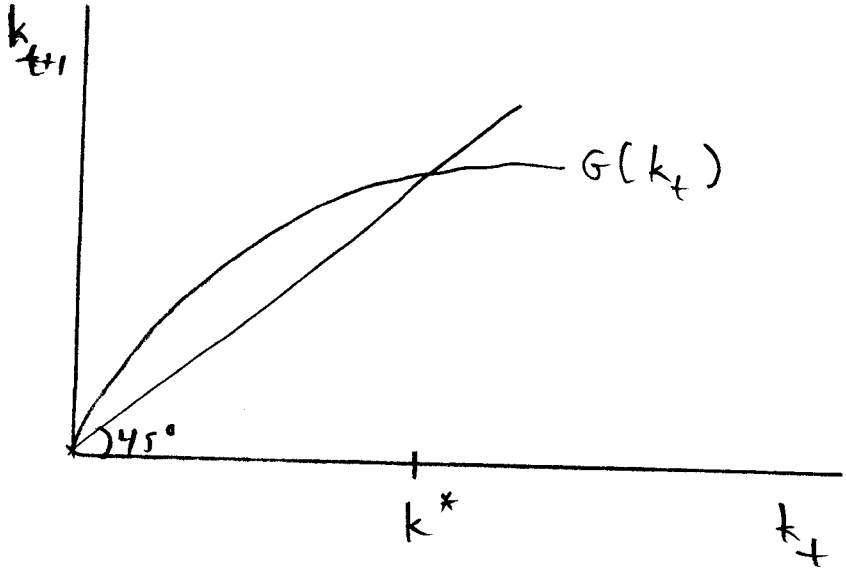
$$s = \frac{k f'(k)}{y}$$ "Capital's share of income"

Overview of Models

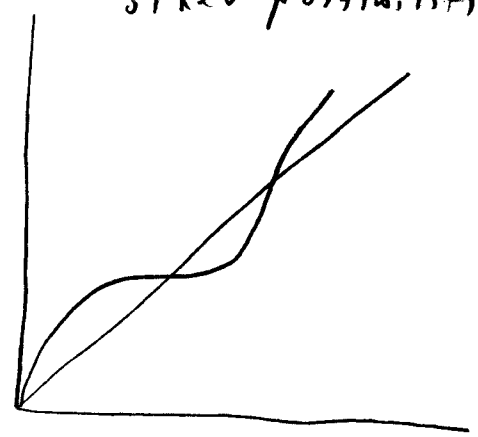
Economic growth....

OLG (Diamond) model

Solow production, but endogenous s from preferences of utility-max'ing agents with finite (two-period) lifetimes and "life-cycle saving."



Here there is a unique stable LRSS, BUT other possibilities....



k^* may or may not be $\leq k^{GR}$.

If $k^* > k^{GR}$, LRSS is not Pareto optimal: social engineering (e.g. Social Security scheme) could make all generations better off.

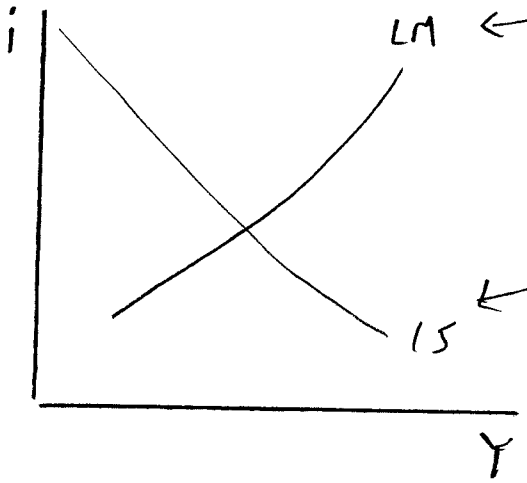
Overview of Models

Old-fashioned Keynesian

(not derived from dynamic optimization)

IS/LM, AS/AD

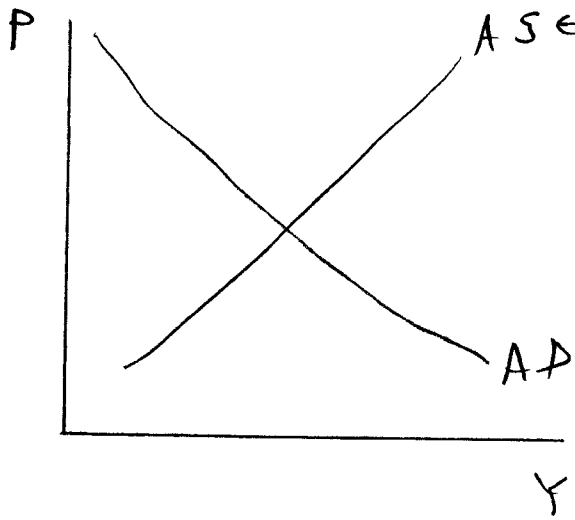
Closed economy, central bank fixes M^s.



(shifted by $\Delta \frac{M^s}{P}$, "money-demand shock"

(for r_t

(shifted by $\Delta G, \Delta T, {}_t\pi^e_{t+1}$ "spending shock"



(shifted by $\Delta_{t-1}P^e_t$, "AS shock"

From $P_t = {}_{t-1}P^e_t + \alpha(Y-\bar{Y})_t + \varepsilon^{AS}_t$

(shifted by $\Delta M^s, \Delta G, \Delta T, {}_t\pi^e_{t+1}$,

money-demand shock,

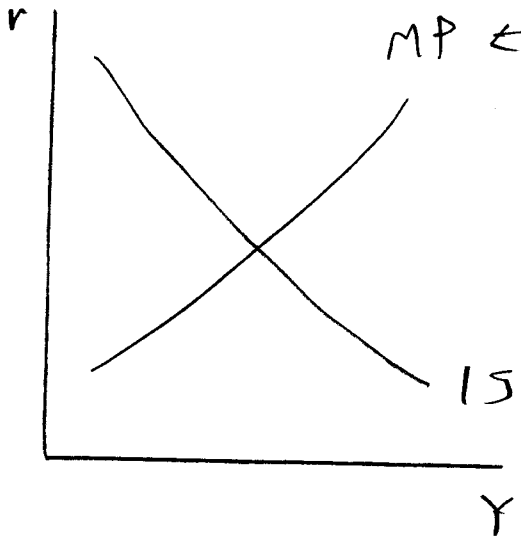
spending shock.

Overview of Models

Old-fashioned Keynesian (cont.)

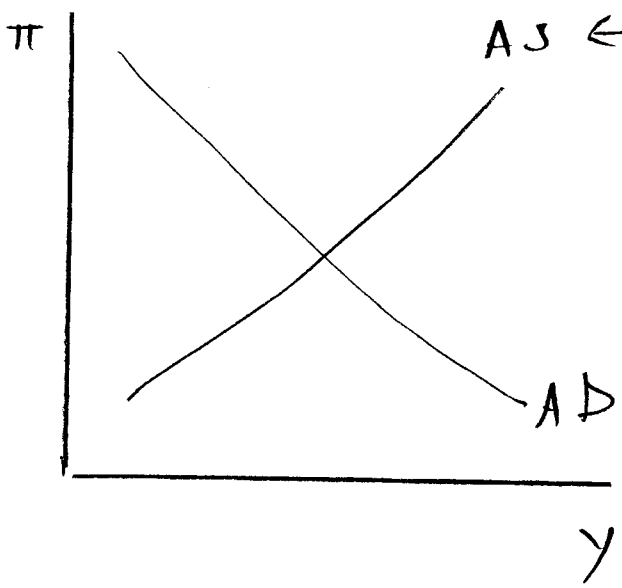
IS/MP, AS/AD (in π)

Closed economy, central bank follows $r(\overset{+}{\pi}, \overset{+}{Y})$



MP ← (shifted by π, or any change in monetary policy rule

IS ← (shifted by ΔG, ΔT, spending shock
<u>not</u> by π^e



AS ← (shifted by $\Delta \pi^e$, AS shock
from $\pi_t = {}_{t-1}\pi_t^e + \alpha(Y-\bar{Y})_t + \varepsilon_t^{AS}$

AD ← (shifted by ΔG, ΔT, spending shock, change in monetary policy rule.

Note: IS/MP is an attempt to depict "Taylor rule"

Overview of models

Old-Fashioned Keynesian

Open economy models

Combinations of six factors

Int'l capital markets

Perfect capital mobility, uncovered interest-rate parity

$$r = r^* + \frac{\dot{\varepsilon}^e}{\varepsilon}$$

and CF can take <u>any</u> value

$$i = i^* + \frac{\dot{e}^e}{e}$$

needed to balance $CF + NX + KG = 0$

vs

Imperfect capital mobility

$$CF\left(r - r^* - \frac{\dot{\varepsilon}^e}{\varepsilon}\right)$$

This defines a value of CF

$$CF\left(i - i^* - \frac{\dot{e}^e}{e}\right)$$

e-rate policy

Fixed vs Floating

Monetary policy

Fix M^s vs interest-rate policy (e.g. $r(\pi, Y)$)

Overview of Models

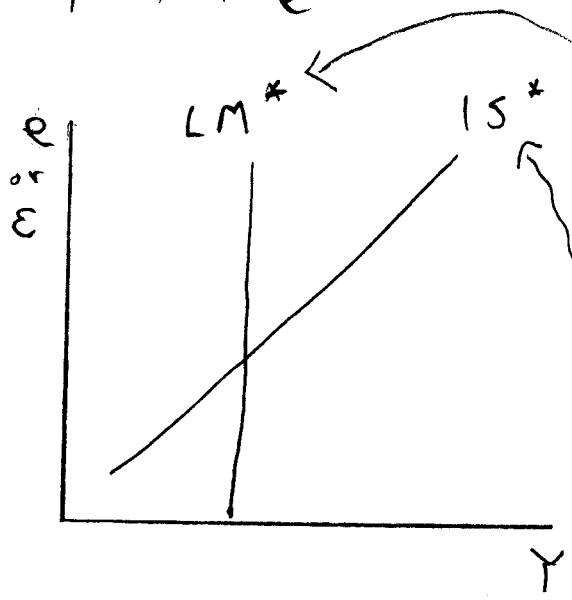
Old-Fashioned Keynesian

Mundell-Fleming

Open economy, perfect capital mobility or

$r = r^* + \frac{\dot{\varepsilon}^e}{\varepsilon}$ uncovered interest-rate parity

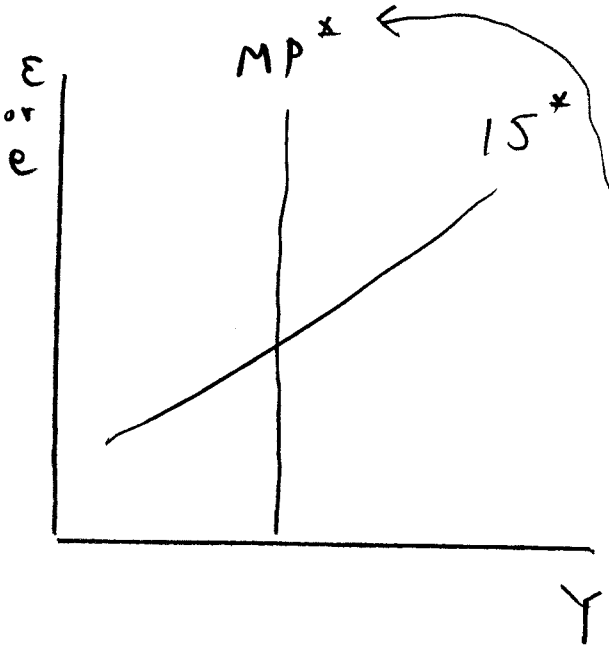
$i = i^* + \frac{\dot{e}^e}{e}$ in nominal terms



If c.b. fixes M^s

(from $\frac{M^s}{P} = L\left(\underbrace{i^* + \frac{\dot{e}^e}{e}}_{i}, Y\right)$

from $Y = E\left(Y, \underbrace{r^* + \frac{\dot{\varepsilon}^e}{\varepsilon}}_{r}, \varepsilon, \ldots\right)$



If c.b. Follows $r(\pi, Y)$

(from $r^* + \frac{\dot{\varepsilon}^e}{\varepsilon} = r(\pi, Y)$)

Note! assumption about $\frac{\dot{\varepsilon}^e}{\varepsilon}$ or $\frac{\dot{e}^e}{e}$ is key:

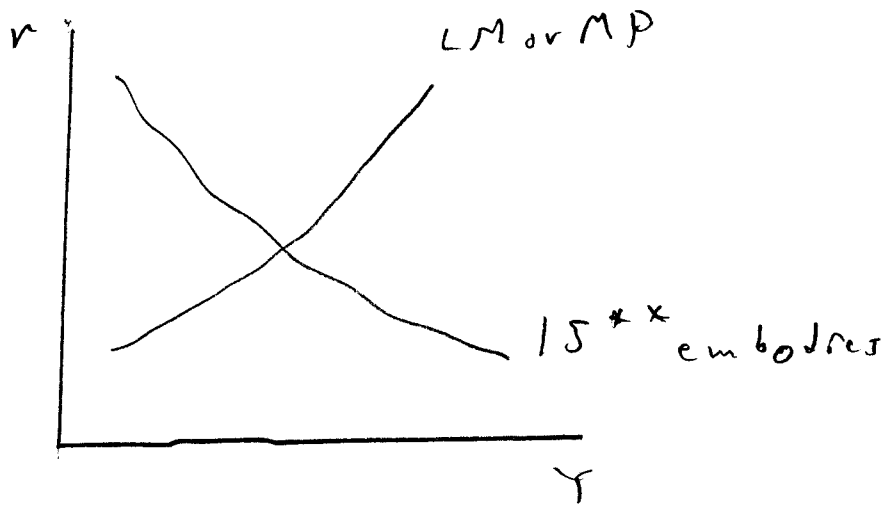
often assume "static e-rate expectations"

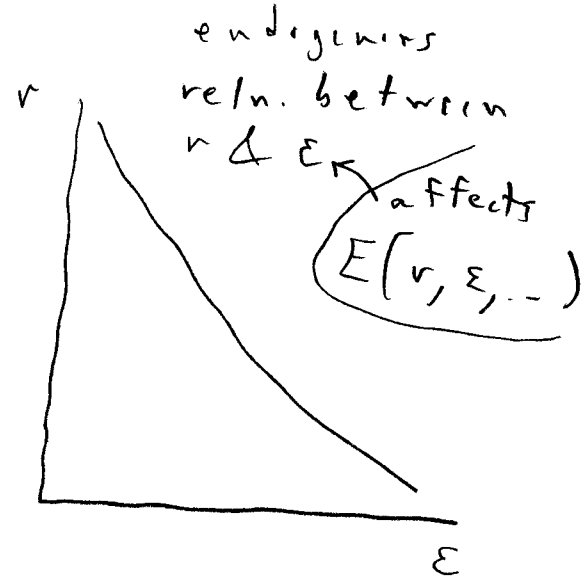
Overview of Models

Old-Fashioned Keynesian

Imperfect KM

$CF\left(r - r^* - \frac{\dot{\varepsilon}}{\varepsilon}\right)$





If foreign-exchange intervention,

$$CF(\quad) + NX(\quad) - RG = 0$$

govt. purchase of foreign assets

In LR, $RG \geq 0$, defines

$$CF(r_0, \ldots) + NX(\quad) = RG \geq 0$$

minimum, floor value of r, needed to keep $RG \geq 0$.

A constraint on monetary policy.

Overview of Models

Old-Fashioned Keynesian Applications

Using one or more of assumptions

$$(y-\bar{y})_t = -\beta(r-\bar{r}) + \varepsilon_t^{IS}$$

could be lag

$$\pi_t = {}_{t-1}\pi_t^e + \alpha(y-\bar{y})_t + \varepsilon_t^{AS}$$

$$(m-p)_t = a y_t - b i_t + \varepsilon_t^{MD}$$

we examined monetary-policy issues

1) Seignorage & hyperinflation

2) Additive vs. multiplier (Brainard) uncertainty

3) How to get stable inflation:
real interest-rate condition, "Taylor principle"

4) Taylor rules

5) Central bank that minimizes loss function
- Dynamic inconsistency
- Responsible behavior, "as if" loss function
- π-targeting
- π-Forecast targeting