ECON 365
Spring 2007

Exam 1 Key

1) \( Y = k^2 \) (given in handout)
   \[
   \begin{align*}
   \frac{Y - k^2}{k^2} & = \frac{Y}{k^2} - 1 \\
   \Delta \lambda & = 2 \Delta k - (k+1)k \\
   & = 2 \Delta k - (k^2 + k)
   \end{align*}
   \]

2) At BGP all variables grow at constant rates, i.e.
   \( Y, L, L, \text{ etc.} \text{ constant} \)

On in modified system we have a steady state when
\( \Delta \lambda = 0 \) or \( \hat{\lambda} = 0 \)

\( \Delta Y = \Delta Y \)

\( \hat{L} = L \) at BGP (or at S. state of modified)

Output system

3) At BGP \( \hat{Y} = 0 \) per worker growth
   \[
   \begin{align*}
   (k) & = 0 \\
   \text{then } \hat{Y} = \frac{Y - 1}{4} & = 0
   \end{align*}
   \]
(4) \( f \neq (\alpha \rightarrow \beta) \Rightarrow \) AT S.T. \( \lambda^*_A > \lambda^*_B \)

AND SINCE

\[ y^*_A - \alpha \lambda^*_A \quad y^*_B = \beta \lambda^*_B \]

\[ y^*_A > y^*_B \]

However:

\[ \lambda^*_A = (1 - \alpha) \lambda^*_A \quad \lambda^*_B = (1 - \beta) \lambda^*_B \]

And a higher \( \alpha \Rightarrow \) higher \( \lambda^*_A \)

But a lower \( (1 - \alpha) \)

i.e.

\[ \alpha \lambda = (1 - \alpha) \beta \lambda \]

Therefore we can't decide whether

\[ \lambda^*_A \geq \lambda^*_B \]

It will depend on what the golden rate of savings \( \alpha \) is.

(5)

\[ f \rightarrow 1 \]

\[ \frac{f + n}{n} \lambda \]

\[ \lambda = \frac{k}{2} \]

(1) \( f \neq \alpha \Rightarrow \lambda \rightarrow \lambda \quad \text{i.e. capital per worker (3) } \)
At $y = h_1$, $\lambda^*$ drops to $h_1$

Summary: At $t = \bar{t}$: $\lambda^*$ drops to $h_1$
At following periods: $h^*$

Since $y = h_1$, $\lambda^* = h^* \Rightarrow y^*$

Output per worker ($y$) is growing in the periods immediately following the arrival.

After adjustment ends $\lambda^*$ goes back to $h^*$ and therefore $y^*$ goes back to $y_1 = h_1^*$.

So the level of output per worker goes back to its previous level.

$\lambda^* = 0$ when system returns to $h^*$, rate of growth of $\lambda^*$ is again zero (see diagram).
(6) \[ y = \frac{(t + 1) y}{(s + n)(s + n + 1)} \]

(i) \( y \) ↑ in periods 100, 101, etc. since \( a_0 \to 0 \) (see diagram)

(ii) \( y \) ↓ in periods 100, 101, etc.

But stochastic rate of growth is decreasing.

(iii) After adjustment takes place

\[ y \to y^{*+1} \Rightarrow y^{*+1} = a \cdot y^{*+2} \Rightarrow y^* = a \cdot y^* \]

i.e. output per worker ↑ at BGP

(iv) Growth rate of capital per worker at BGP is \underline{zero}

(Since \( y^{*+1} \) is constant once we get there)
(4) Grow without Tech. change

\[ \hat{y} = 0 \implies \begin{cases} \gamma = 0 \\
\gamma < 0 
\end{cases} \]

Not enough output per worker.

Grow at rate of tech. change (not needed)

\[ \hat{y} = \gamma = 0 \implies \gamma = 0 \]

(3)

\[ y = A \lambda \alpha (1 - \lambda) \implies \hat{y} = \hat{A} + \lambda \hat{\alpha} + (1 - \lambda) \hat{\alpha} \]

\[ \hat{\lambda} = \hat{y} - \lambda \hat{\alpha} - (1 - \lambda) \hat{\alpha} \]

Lugares: \[ \hat{A} = 0.3 - \frac{0.53 \times 0.474 - (1-0.53) \times 0.249}{0.25 \times 122} = -0.0684 \]

\[ \hat{\alpha} = 0.294 - \frac{0.38 \times 0.374 - (1-0.38) \times 0.108}{0.14 \times 122} = 0.0892 \]

(2) \[ \hat{A} = n.A*A* \quad \text{local + foreign tech} \]

\[ \hat{\lambda} = \hat{\mu} + \hat{\alpha} \]

\[ \hat{\mu} = \hat{A} - \hat{\alpha} \]

Therefore: \[ \hat{\mu} = -0.07 - 0.08 < 0 \quad \text{"falling behind"} \]

\[ \hat{\mu} = 0.00492 > 0 \quad \text{"catching up"} \]
(1) WEAK FINANCIAL SYSTEM: WHY? (ONLY A COUPLE REASONS)
- Lack of regulation + availability of foreign funds
  -> Unsupervised institutions taking big risks
- Long term investment financed by short term funds
- Fixed exchange rate + easy access to foreign capital = domestic credit boom
- Closed ties between government officials & banking business owners
  - Non-performing loans as a % of total loans (comparison)
(2) Poor world trade (given in perspective 2005-1998)
- Income
- England main power
- Availability of foreign capital