14.02 PRINCIPLES OF MACROECONOMICS
Spring 2002- Final Exam Answers

T/F questions:

1. **True**. The current US social security system is "pay-as-you-go". Therefore, the expected increase in the dependency ratio, in part due to the baby boom, requires increase in taxes and/or cut in social benefits. Otherwise, the system will run a fiscal deficit.

2. **False**: We can't be sure that b shows causality, only that it shows correlation. (In this case we should be particularly worried about omitted variables like expected wealth.)

3. **False**: Inflation can have real, harmful effects, including: poor decisions based on money illusion and/or uncertainty created by high variability in inflation, distortions created through interactions with the tax code (imperfect indexation), and shoe leather/menu costs.

4. **True**: See graphs in the slides. Variations in GDP get amplified in variation in capital (acceleration model) and smoothed in variations in consumption (permanent income hypothesis).

5. **False**: In accounting for the capital stock, depreciation adjusts for the fact that physical capital (real production assets) gets obsolete or "used up" over time (e.g., it is like negative production).

6. **True**. See page 17 in the International Growth and Crises slides.

7. **False**. Technological advances are the main source of long run growth.

8. **True**. By the parity condition, $i-i^* = (E_{t+1}-E_t)/E_t$ = expected devaluation of domestic currency.

MC questions:

1. **Answer A**. Note, that more efficient ships and faster computer chips have direct effect on the goods market, not financial market.

2. **Answer C**. There is no effect on the long run rate of growth. You can also show that in a graph and derive the function.

3. **Answer C**: The workers' bargaining power will be lower.

4. **Answer E**. Switching to system financed by actual savings will increase capital accumulation (compared to a pay-go system, which is financed by intergenerational transfers, not savings), and therefore increase the level steady-state output in the long-run. Relying on savings rather than intergenerational transfers reduces vulnerability to demographic shifts (e.g., if everyone is saving for their own retirement), and the costs of switching from a pay-go to funded system can in be shifted in part to future generations via public borrowing. This last point is relevant for intergenerational equity (i.e., "fairness" considerations), since it is future generations that are likely to benefit most from a funded system (since the transition to the new steady-state will be long and costly).

5. **Answer: B**. Consumers should spend more immediately if they feel/expect to be richer in the future, and if they care about smoothing consumption to some extent, and the life cycle theory of consumption assumes.

6. **Answer: E**: In the long run, unemployment will be equal to the NAIRU in both cases.

7. **Answer: B** The economy will cycle to full-employment GDP at an unchanged NAIRU, but a possible higher or lower GDP depending on the investment and hence productivity reverberations of the fiscal policy change.

8. **Answer D**: All those were factors in the crisis (see the slides).

9. **Answer A**: We know that from the yield curve or term structure of the interest rates. See also Blanchard, chapter 15.1.

10. **Answer E**: The Okun's law: states: $\mathbf{RU_t = - \beta\ [RY_t - (RY)_{avg}]}$**.** There is a cyclical relation between unemployment and real growth: The change in the unemployment is **half** the growth rate difference between potential and actual GDP growth. Or, the level of unemployment is **half the % gap** between potential and actual GDP.

Analytical questions

1.

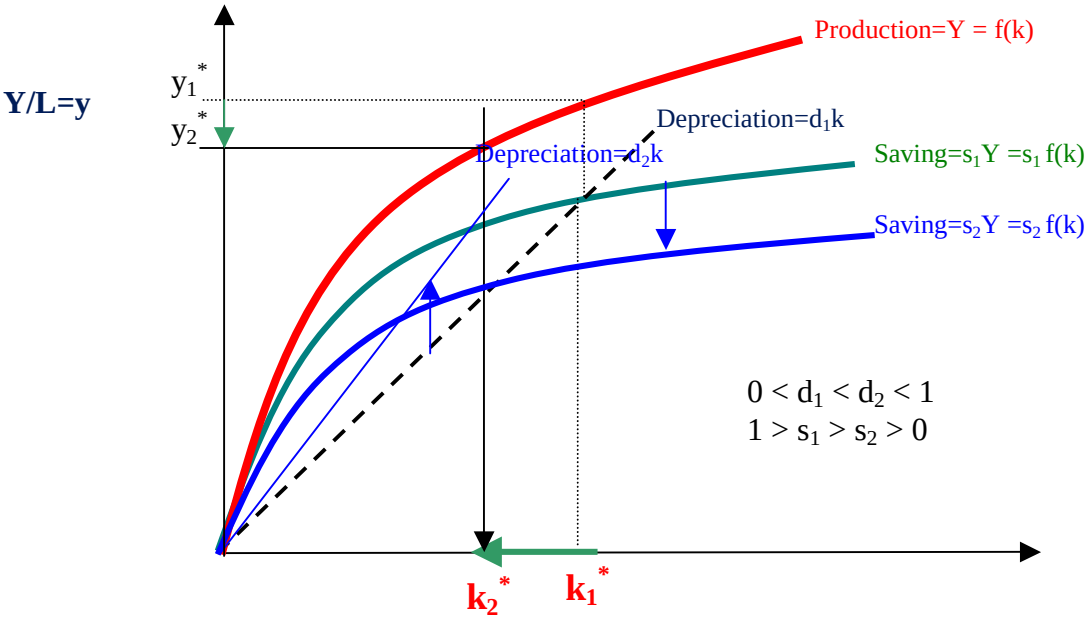
A. $W/P = MPL$, $\Rightarrow W/P = (1-B)\, AK^{B}L^{(-B)} = (1-B)Y/L \Rightarrow L = (1-B)YP/W$.

B. The equilibrium share of wage income in total income $\equiv [W*L]/PY$, therefore, $\Rightarrow [W*\{(1-B)YP/W\}]/PY=(1-B)$. This is one of the Cobb-Douglas properties. Note also, the equilibrium share of capital income in total income is B.

C. $AK_2^{B}L^{(1-B)} = 2\, AK_1^{B}L^{(1-B)} \Rightarrow K_2 = 2^{1/B} K_1$

D. From the model we learned, the steady-state k (K/L) depends on the depreciation rate and the saving rate. Of course, labor and productivity growth also affect the steady-state capital/labor ratio, but the question assumes they are zero.

E.



2.

A. The IS curve shifts up-right, the LM curve shifts down-right in order to stay at the same level of interest rate, while the inflation-unemployment curve does not shift.

B. First: low inflation. Second: low unemployment and output stabilization.

C. $\downarrow$C because ($\downarrow Y^d$, $\uparrow$r), $\downarrow$I because (=Y,$\uparrow$r); $\uparrow$IM because (=Y,$\downarrow$e), $\downarrow$E because $\uparrow$r.

3.

A. (1) $RW = - A_1 * (U - U^{VOL})$

B. Involuntary unemployment ($U - U^{VOL}$**)**.

C. Expected inflation (RP^e).

D. (2) $RW = RP^e - A_1 * (U - U^{VOL})$

E. Expected inflation (RP^e).

F. If we substitute equation (2) into the given equation for the price inflation (3) RP = RW – RQL, then we get that **(4) $RP – RP^e = - RQL – A_1 * (U- U^{VOL})$.**

G. There is a trade off between the ***change*** in the inflation rate and the involuntary unemployment rate.

Notes:

1. The original Phillips model does not include A (productivity) in the equation for the wage inflation, but we did not penalize students who had it in their equation.

2. Having RP_{-1} as a proxy for expected inflation instead of having RP^e is also an answer.

3. The following answer is also acceptable for part (E): (3) $P= \kappa*(W/A)$, $\Rightarrow$ (3') $RP = R\kappa + RW – RA$, (4) $R\kappa = B_0 - B_1 * (U- U^{VOL})$, therefore, (5) $RP – RP^e = (B_0 –RA) – (A_1 + B_1)* (U- U^{VOL})$.

4.

		Direction of short-run change	**Size of short-run change relative to the long-run impact**
(I)	**Real exports:**	Rise/Fall/No change	Smaller/Larger/Same
(II)	**Nominal exports:**	Rise/Fall/No change	Smaller/Larger/Same
(III)	**The trade deficit denominated in the depreciating country's currency at actual prices:**	Rise/Fall/No change	Smaller/Larger/Same (absolute value)

		Direction of long-run change	**Size of variable relative to the pre-depreciation status**
(I)	**Real exports:**	Rise/Fall/No change	Smaller/Larger/Same
(II)	**Real imports:**	Rise/Fall/No change	Smaller/Larger/Same
(III)	**Real employment GDP:**	Rise/Fall/No change	Smaller/Larger/Same