

EC6012 Problem Set 1

Answers

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Marking Scheme

There are 4 questions, and 1 extra credit question. Each question is scored out of 10. Maximum marks are 40. Credit earned in the extra credit question will carry over to the final exam.

Any attempt = 2 marks. OK attempt (tried but didn't get the essence of the question) = 4 marks. Good attempt (tried, got the essence, missed the details) = 6 marks. Very good attempt (tried, got the essence, got the details, missed something small) = 8 marks. Perfect = 10 marks. Perfect, *and* taught me something I didn't know = 12 marks.

Question 1: ISLM

1. IS: $Y = 3000 - 50r$
2. LM: $Y = 3000 + 100r$
3. $Y = 3000, r = 0, I = 800, C = 1200, Y - T = 2000.$
4. $\Delta Y = +666.66$
5. $\Delta Y = +500.$

Question 2: Multiplier Accelerator

Form the accelerator equation as in the lecture notes, pp. 5-6. Slot $I(r)$ in to obtain:

$$Y^* = \frac{c_0 + I_0 + I(r)}{1 - c}. \quad (1)$$

The investment function is relevant because r influences both financial and real economic activity and is a policy lever for governments. Including it is therefore important, as inclusion of r implies

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an acceptance of feedback (and feed-forward) effects in the economy due to changes in the interest rate.

Changing r downward would boost economic activity in theory, exactly as now, when we are in recession and require more economic activity through increased lending.

Question 3: Goodwin (Extra Credit)

Let $du/dt = \dot{u}$, let $dv/dt = \dot{v}$. In equilibrium, \dot{u} and \dot{v} are equal to 0. In turn, set u and v equal to zero to find their isoclines.

When $u = 0$ and $\dot{u} = 0$, $9v - 3v^2 - 0 = 0$, so $v = 3$.

When $v = 0$ and $\dot{v} = 0$, $4u - 0 - u^2 = 0$, so $u = 4$.

The equilibrium values are thus $v = 3$, $u = 4$.

Now slot these into the two equations to get the following:

In equilibrium: $u(4 - 2v - u) = 0$, so $-2v - u = -4(-1)$, and $2v + u = 4$. Solving for u and v , respectively, it must be that either $u = 4 - 2v$ or $v = 3 - \frac{u}{2}$.

Similarly $v(9 - 3v - 3u) = 0$, so $9 = 3v - 3u = 0$, and either $v = 3 - u$ or $u = 3 - v$.

Slot in numbers for these equations to graph them. Pick a value for u , say, 1. Then using both equations for u , we obtain 1 = and you'll see, for example:

$u = 1$, $v = 1.5$ and $v = 2$

$u = 2$, $v = 1$ and $v = 1$

and so forth, defining a cycle, which can be plotted in u .

Similarly:

$v = 1$, $u = 2$, $v = 2$

$v = 2$, $u = 0$, $u = 1$

this also defines the cycle.

I'll draw this phase diagram out in class but I was looking for something like figure 1 below. When u , the worker's share of output increases, and v , the capitalist's share, decreases. When v increases though, u decreases at a faster rate, causing a stable oscillation over and over again. This is *not* a particularly realistic model of the business cycle.

Question 4: Data Work

Kaldor's stylised facts basically relate to: growth rate of output per capita, mean stationarity of capital/output ratio, return on capital is mean stationary, share of output to capital is stationary, etc. I'm looking for a graph of a stable *relationship* between capital, say, and labour, or capital and

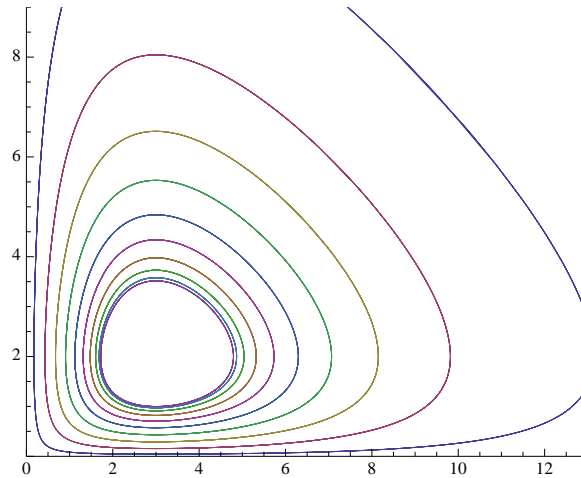


Figure 1: Solution(s).

output, etc. A graph of one economic fundamental, like the real wage, won't be enough, because Kaldor's facts don't focus on this exclusively. Here I list the stylised facts below, and the type of graph I was looking for, rather than an exclusive list.

1. Growth at a steady trend rate of aggregate production and labour productivity (graph of industrial production with estimated marginal productivities in industry)
2. Continued growth of capital per unit of labour (graph of K/L)
3. A steady state of profit on capital (Stationarity of profit rate in one or many industries over time)
4. Steady, long period values of capital–output ratios; (Again, GDP/K would be sufficient)
5. High correlation between the share of profits in income and the share of investment in output; (Scatterplot of K relative to I)
6. Constancy of the functional shares in output in periods when the share of investment is constant; (Over Celtic Tiger period, contrast returns to Labour and Capital as a scatterplot)
7. Wide variation in output growth and growth in labour productivity across countries. (Pick 5-10 countries using Penn world tables, show $\Delta Y/\Delta MP_L$ for each of them, compute σ).

Question 5: Policy

Any coherent answer will score well. Some discussion of the recapitalisation/ reformed banking sector/Minsky moment/Swedish model for the bailout/etc is expected. An unjustified rant will not score well because you are asked for your *considered* opinion. I'm the only one in the class allowed to rant. Extra marks for new ideas.