

Chapter 5 (pp 208-243)

February 20, 2017

Take-Home Test

- Question 1.
 - What is different about this model?
 - What is the most important way that it will affect the specification of the decentralized model?
 - Will I even see this utility function in research literature?
- Question 2.
 - What margins does a consumption tax distort?
 - What margins does a labor tax distort?

from lermavi <lermavi@ugtomx.onmicrosoft.com>

- Estimados Profesores de la Licenciatura en Economía:
- Por este medio se les hace una cordial invitación para asistir junto con su grupo, en la medida de sus posibilidades, a la Conferencia "Servicios de Información del **Banco de México**" a cargo de los expositores **María Guadalupe Castro Suárez** e **Isaac Vivas Escobedo**, representantes de dicha institución. El evento se llevará a cabo el próximo **miércoles 22 de Febrero a las 13:00 hrs. en el Auditorio B-1 de la DCEA.**
- Se agradecerá el que hagan extensiva la invitación a sus alumnos, con el fin de que aprovechen esta excelente oportunidad.
- Atentamente

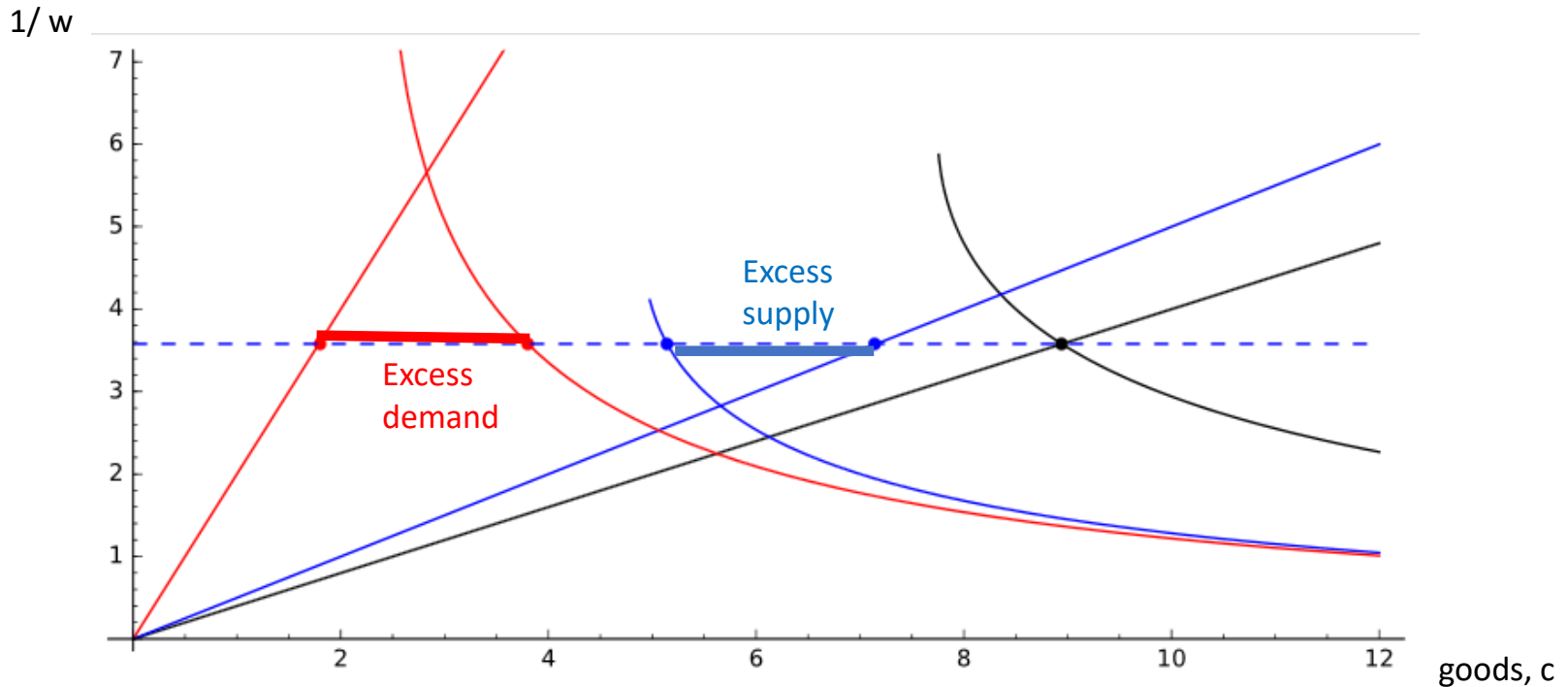
Questions for the Bank of Mexico representatives

- Does the Bank of Mexico adjust interest rates when the Federal Reserve in the United States changes its policy rate?
 - Does the Bank of Mexico react to changes in Federal Reserve policy actions?
 - Does the Bank of Mexico react to changes in 'the world' interest rate?
 - Does the Bank of Mexico follow the lead in U.S. policy?
- Why is the Mexican peso declining so much against the dollar?
 - Is inflation higher in Mexico than in the United States?
 - Does the Bank of Mexico target the Peso/dollar exchange rate?
- What is the Bank of Mexico's inflation target?
 - What happens when inflation becomes higher than the target?
 - What happens when inflation falls below the target?
- Mexico is unusual because consumption in the GDP accounts is more volatile than GDP itself. This is not the case for the United States or Europe. Do you know why this is the case? Is it related to problems measuring business investment spending?
 - Do you know of a data source for domestic investment? All we can find is net foreign direct investment.

Homework for Feb 20

- Set up and solve the 2-Agent Model of trade
 - Two agents {A, B} as in example 2.3-2.6: $T = 24$; $\alpha = 1$; $\gamma = 0:5$;
 - $A_G=1$ for Agent A and $A_G=2$ for Agent B
 - Write out the MRX_{c_x} for each agent
 - What is the labor supply for each agent?
 - What is consumption for each agent?
 - Write out the utility function and the profit maximization equation for the decentralized agents. Compute the wage and consumption demand for each agent.
- Read chapter 5 (pages 208-234) and take home test

Figure 4.3 Goods Market with Trade (AD/AS)



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plot((4/5)*(c-(c^2-60)^.5), 0, 12, color='black')+ plot(c/2.5, 0, 12,
color='black')+point(( 8.94,3.578), size=30, color='black')+plot((c-(c^2-24)^.5),
0, 12)+ plot(2*c, 0, 12, ymax=7, color='red')+point(( 5.14,3.578), size=30)+
plot(c/2, 0, 12, ymax=7)+ plot((4*c-4*(c^2-6)^.5), 0, 12, color='red')
+plot(3.578, 0, 12, linestyle='--')+point(( 7.14,3.578), size=30)+point((
3.80,3.578), size=30, color='red')+point(( 1.80,3.578), size=30, color='red')

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Quiz 9. Begin Chapter 5 Savings and Investment

1. Why was there no saving or investment in our baseline model in chapters 2 through 4?
2. How would you modify the utility function to solve problems involving saving and investment?
3. In chapter 2, we kept capital fixed to make the problems (solutions) less complicated. What do we do in Chapter 5?
4. What is intertemporal consumption smoothing?
5. Why does the baseline model of chapter 5 include an endowment of output in period 1?

Another 'Toy' Model?

- The FOC for this problem is known as the 'consumption Euler equation' and it is sometimes used as the IS relation in the small New Keynesian model.
- The centralized problem includes an agent that lives two periods, consumes part of the endowment in period 1 and uses the other part as capital in a production function to create more consumption for period 2.

What are the constraints faced by the Agent?

- Write down the utility function. What is the role of the beta parameter, β ?
 - Period 0 is today, Period 1 is tomorrow.
- What is the budget constraint for the household in period 0? In period 1?
- Consumption in period 1 is equal to profit plus the 'gross' interest rate earned on the capital (which is savings from the period 0).
- The production of consumption for the second period is constrained by the technology embodied in the production function. What is k_1 ?

The agent's maximization problem

$$u(c_0, c_1) = \ln c_0 + \beta \ln c_1$$

$$y_0 = 100 = c_0 + k_1$$

$$c_1 = A_G(k_1)^{1-\gamma}$$

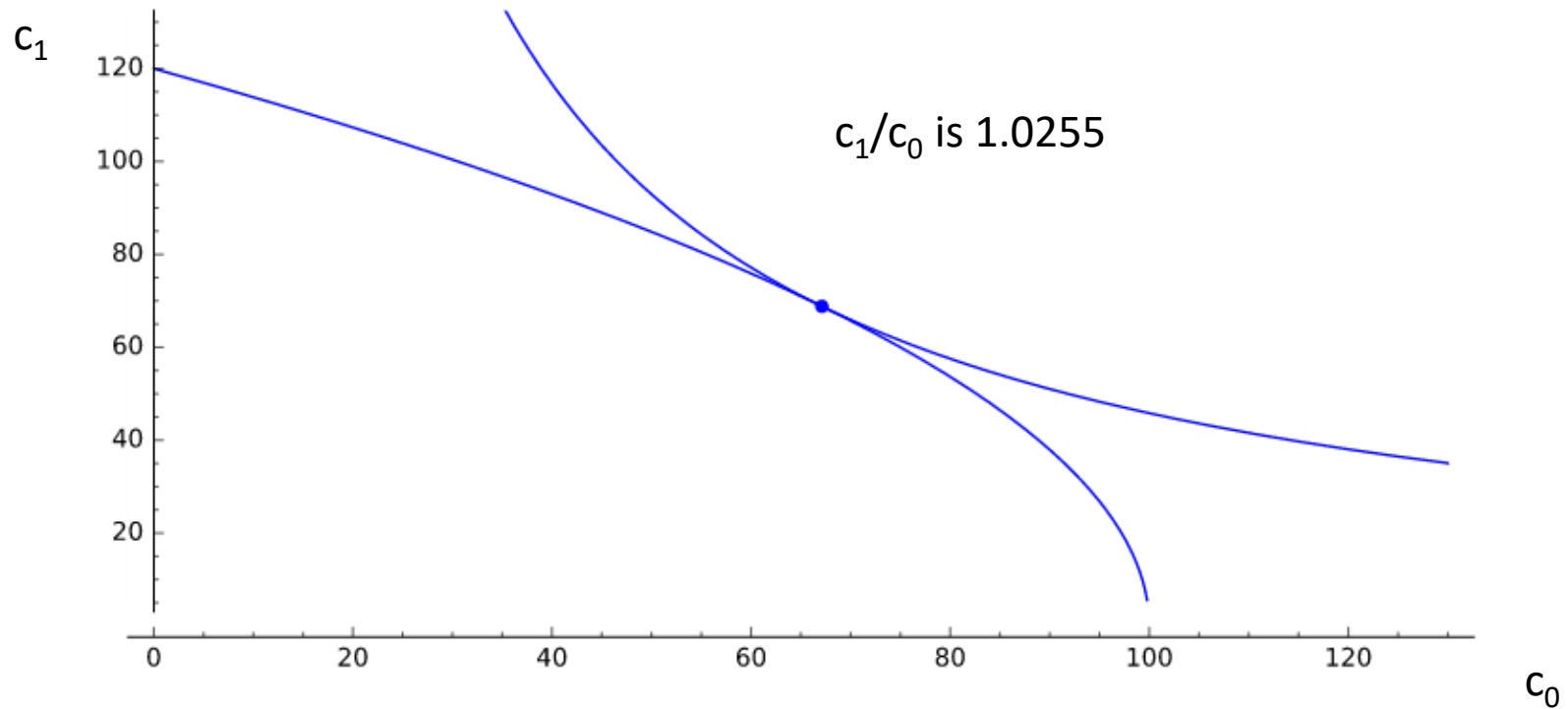
We are treating labor and leisure as fixed and the initial endowment of output is exogenous.

Capital depreciation rate is 100%. It is completely used up in the production process.

List the steps needed to graph the equilibrium

- Calibrate the model, assuming values for the productivity factor, the discount factor and the capital share in the Cobb-Douglas production function.
- Solve for the first order conditions in terms of the capital stock.
- Compute the expression for the capital stock and use it to express utility in terms of c_0 and c_1 .
- Use it to express the production function for c_1 in terms of c_0 .

Figure 5.1 Equilibrium in the Centralized Model

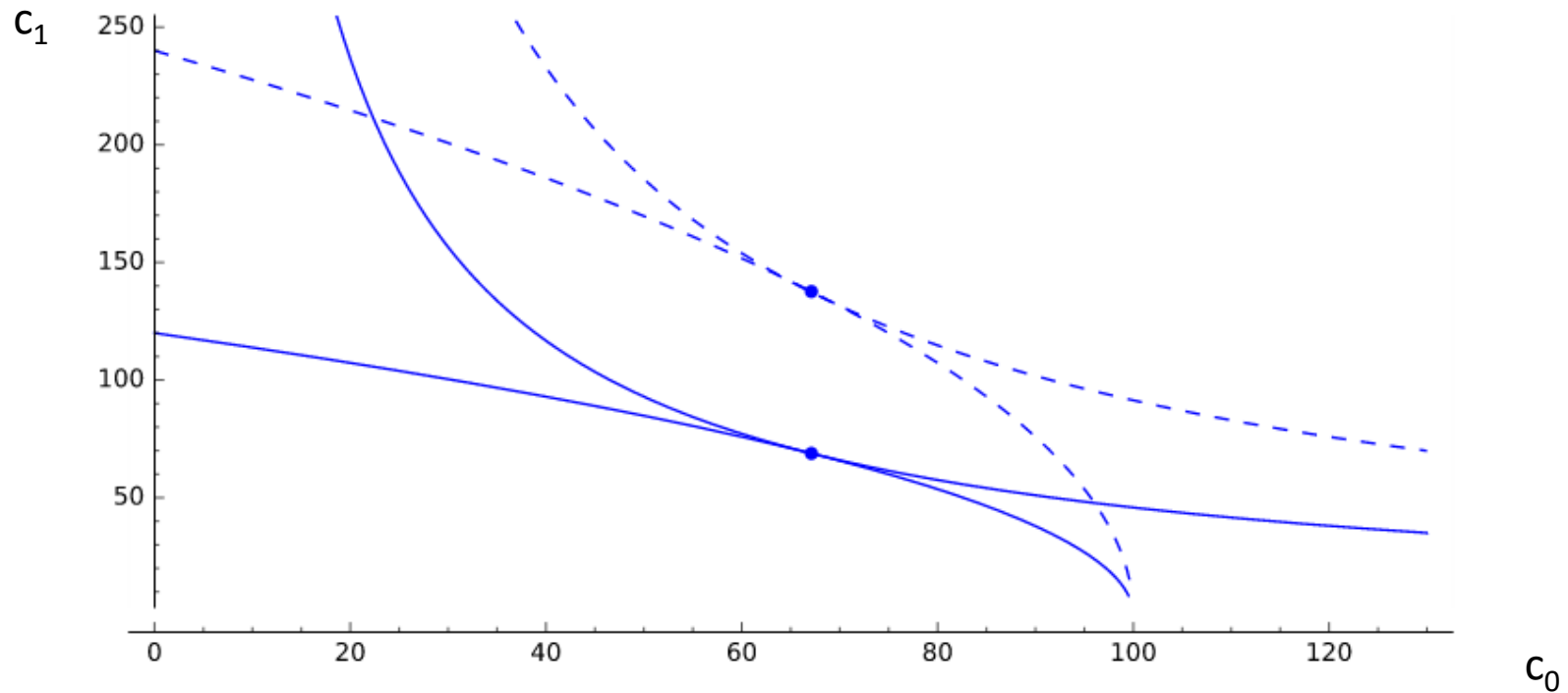


```
plot(((e^8.3532)/c0)^(1/.98), 0, 130, ymax=130)+plot(12*(100-c0)^.5, 0, 130)+point((67.114,68.816), size=30)
```

Assume that A_G doubles

- How do the equilibrium graphs change?
- What happens utility?
- What happens to the capital stock?
 - What happens to c_0 ?
 - What happens to c_1 ?

Figure 5.2 Equilibrium when productivity doubles



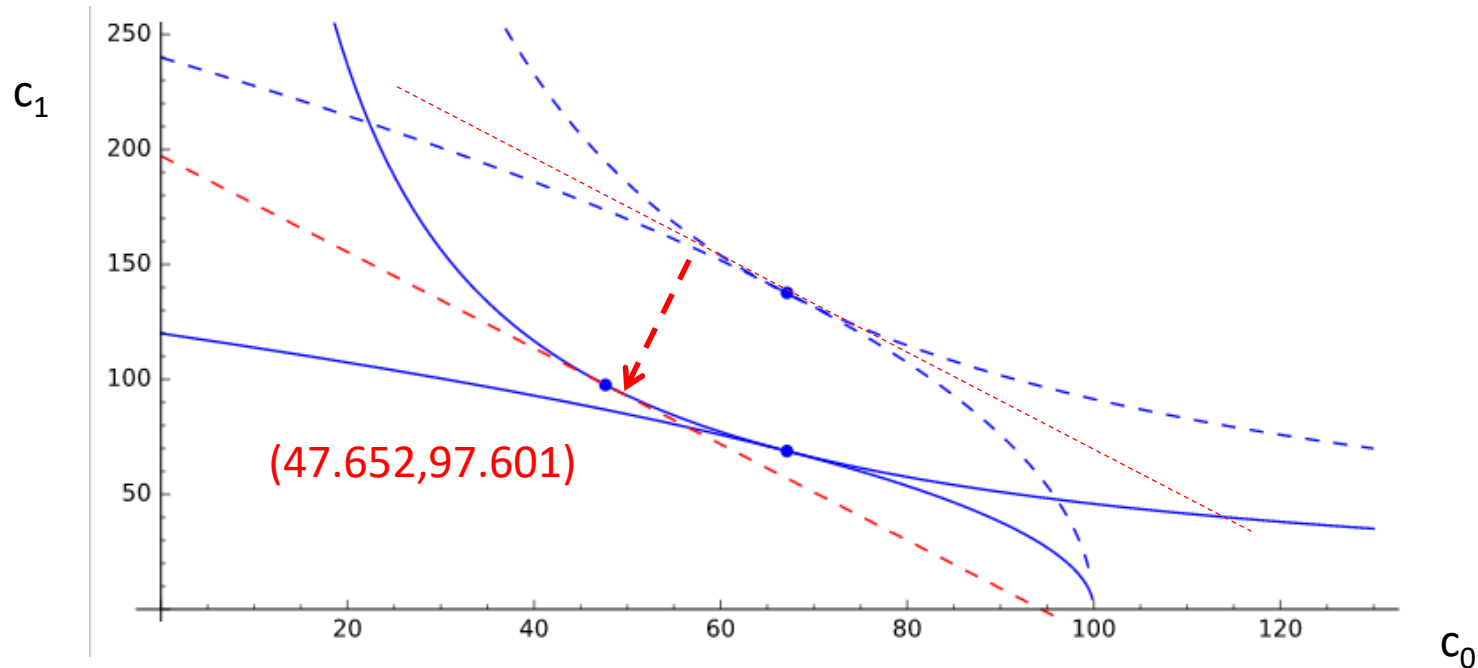
```
plot(((e^8.3532)/c0)^(1/.98), 0, 130, ymax=130)+plot(12*(100-c0)^.5, 0,
130)+point((67.114,68.816), size=30)+plot(((e^9.03)/c0)^(1/.98), 0, 130,
ymax=250, linestyle='--')+plot(24*(100-c0)^.5, 0, 130, linestyle='--
')+point((67.114,137.64), size=30)
```

Class discussion

- Write the solution for the k_1 in terms of the model parameters.
- What do we know about the income and substitution effects AG on capital for the second period and consumption in the first period?
- Explain how to calculate the substitution effect on c_0 . Hint:
 - MRS for B is the ratio of $1/c_0$ to $\beta/c_1 = 2.09$
 - Utility of A is the $\log c_0 + \beta \log c_1$
 - At point of substitution effect MRS for A is 2.09

Figure 5.3

Substitution and Income Effects



```

plot(((e^8.3532)/c0)^(1/.98), 0, 130, ymax=130)+plot(12*(100-c0)^.5, 0,
130)+point((67.114,68.816), size=30)+plot(((e^9.03)/c0)^(1/.98), 0, 130,
ymax=250, linestyle='--')+plot(24*(100-c0)^.5, 0, 130, linestyle='--
')+point((67.114,137.64), size=30)+point((47.652,97.601), size=30)+plot(-
2.09*c0+2.09*47.652+97.601, 0, 130, ymin=0, linestyle='--', color='red' )
    
```


Homework for Feb 22

- Finish reading Chapter 5
- Replicate figures 5.7, 5.8, and 5.9
- Prepare questions for Bank of Mexico.