ECON 4350: Growth and Investment
Excercises for seminar 1

Spring 2007

1 The economics of new goods (Group exercise)

Group 1 holds a 10-15 minute talk summarizing Bresnahan and Gordon (1997).

2 The Penn-World tables

The following exercise is divided in two parts. The first part is supposed to be done by all students. **The second part is done by Group 2** as agreed in class.

2.1 General exercises (to be done by everybody)

NB: Short (to the point) answers are requested. It is more important that you work with the exercises than that you put effort in how to answer them in writing. Not all questions have clear-cut answers, but are mainly raised in order to make you think about them.

Visit the web-site of the Penn World Table (`http://pwt.econ.upenn.edu/php_site/pwt_index.php`). Get familiar with the main features on the site. Find the answers to the following questions:

1. What is the country code for Greece?
2. What is the variable code for the measure of real GDP per capita (current prices)?
3. What is measured/reflected by the variable with code: 'openc'?
4. What is the base-year in PWT6.2, what about PWT5.1?
5. What are the grades assigned to the quality of the data for Norway, China, Germany, Zimbabwe, Iraq?

In addition, do the following exercises:

1. Find the annual growth rate of GDP per capita for China 1960-1980, and 1980-2000
2. Which variables do, in your opinion, correspond best to Y, y and s in the Solow-model?
3. Find an estimate of the order of magnitude of the variation in y and s across countries? (I.e. how much higher is y in some countries than in others? And how much higher is s in some countries than in others?)
4. Does a high s correspond to a high y?
5. When finding the share of investments in GDP we use the same price index to deflate both total production (GDP) and investments. Can you see this leading to any problems with comparing these shares across countries?

2.2 Group exercise: Group 2

Give a 10-15 minutes overview of the construction of the PPP adjusted GDP-measures included in the Penn World Tables. You can base your presentation on Summers and Heston (1991), and/or the documentation you find online. In particular, you might find the technical documentation useful (`http://pwt.econ.upenn.edu/Documentation/Doc-tech.pdf`).

Sketch some of the problems associated with this method, and the pitfalls for the use of data. You might want to consider another (short) article by Heston and Summers (1996) on this issue. (Available online at `http://links.jstor.org/sici?sici=0002-8282%28199605%2986%3A2%3C20%3AIPAQCP%3E2.0.CO%3B2-B`)

3 Additional individual exercises

1. Denote the capital stock in 1950 by $K(1950)$, and the annual investments by $I(1950), I(1951), \ldots I(2004)$. Capital depreciates with an annual rate of δ. Show that

$$K(2005) = \sum_{j=1}^{55} (1-\delta)^{j-1} I(2005-j) + (1-\delta)^{55} K(1950)$$

   Set $\delta = 0.07$, how much of $K(1950)$ is still in place in 2005? Suppose you are not able to observe capital stocks directly (i.e. neither $K(1950)$, nor $K(2005)$), but that you know the stream of annual investments. How would you go about estimating $K(2005)$?

2. Exercise 1.4 in BSiM.

References

Bresnahan, Timothy F. and Robert J. Gordon, "The Economics of New Goods: Introduction," in Timothy F. Bresnahan and Robert J. Gordon, eds., *NBER Studies in Income and Wealth*, number 58. In 'The economics of new goods.', Chicago and London: University of Chicago Press, 1997, pp. 1–26.

Heston, Alan and Robert Summers, "International Price and Quantity Comparisons: Potentials and Pitfalls," *American Economic Review*, May 1996, *86* (2), 20–24.

Summers, Robert and Alan Heston, "The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950-1988," *Quarterly Journal of Economics*, May 1991, *106* (2), 327–68.