

Proposed Lectures on Economic Growth – Vahagn Jerbashian, Ph.D. student in economics

Brief summary

The course covers some advanced topics from modern economic growth theory. These topics primarily include the capital variety models with horizontal product differentiation (Romer, 1990; Jones 1995; Smulders & van de Klundert, 1995; Vavra, 2002).

The course starts from motivating the theory by empirical observations. In the theoretical section, in line with the classical economic paradigm it first introduces the neoclassical models. It briefly covers the Solow-Swan and the Ramsey growth models, which are the keystones of the neoclassical growth theory and are assumed to be well known amongst the audience. The course, then, identifies the weaknesses of these growth models. It suggests ways to overcome those weaknesses and proceeds to growth models which have implemented those ways.

The course starts from the presentation of Romer (1986) model, focal point of which is that there should be non-decreasing returns on capital accumulation due to a learning-by-doing process. Next, the course briefly covers Lucas (1988) model. The basic idea behind this model is that there are non-decreasing returns on human capital accumulation. The course covers this model briefly since it is not much in line with the course, but it is needed in order to understand better the Smulders & van de Klundert (1995) model.

The Romer (1986) model has served as a prototype for variety models of the growth theory. After covering it, the course proceeds to Romer (1990) which is the keystone of the variety models. The basic idea behind this model is that there are non-decreasing returns to research that produces new types of capital varieties which are horizontally differentiated. The course briefly reflects on the weakness of this model, while considering population growth. This weakness is analyzed in Jones (1995).

The course then presents a generalization of Romer (1990) model, while allowing strategic interactions in a sector of the model and product quality improvements. This is done in spirit of Smulders & van de Klundert (1995) and Vavra (2002).

Given the theory, the course proceeds to empirical analysis. In the empirical section the focus of the course is not on a quantitative analysis, but on the ways of devising an empirical specification from the theoretical arguments. The course considers Roller & Waverman (2001) for the empirical section. This paper argues that telecommunication infrastructure adds significantly to economic growth. Its empirical specification is heavily based on the theoretical arguments of Romer (1990). Moreover, this empirical specification may be of a particular interest for the audience since it may be used in various other contexts.

In order to replicate the results of Roller & Waverman (2001), the course briefly covers the 3SLS and GMM techniques. It assumes that the OLS and seemingly unrelated equation systems techniques are very well known amongst the audience. After replicating the results, it highlights the weaknesses of Roller & Waverman (2001), which are only partially eliminated in Koutroumpis (2009) and are in line with some of the arguments of Smulders & van de Klundert (1995).

In the end the course covers some parts of my own research. The ultimate goal of my research is to analyze reform policies in telecommunication industry in former Soviet Union countries. The course makes several observations for Armenia. Then it motivates the necessity of the analysis while referring to Roller & Waverman (2001) and many other empirical papers. Based on these empirical papers it argues that a growth

model should be used to assess those policies and makes very brief comments on the model which is already derived.

Outline of the Course

1. Brief introduction to growth theory, Solow-Swan and Ramsey models and their weaknesses (2 lectures, 2 hours each)
2. Romer (1986) and Lucas (1988) endogenous growth models (2 lectures, 1.5 hours each)
3. Romer (1990) and Jones (1995) models (2 lectures, 2 hours each)
4. Smulders and van de Klundert (1995) model (2 lectures, 1.5 hours each)
5. Empirical section - the empirical specification of Roller & Waverman (2001), 3SLS and GMM techniques, replication of Roller & Waverman (2001), and its weaknesses (3 lectures, 1.5 hours each)
6. Concluding remarks - my own research (1 lecture, 1.5 hours)

Minimal requirements for the Course

The audience is expected to be familiar with modern macroeconomic theory, Solow-Swan and Ramsey models, continuous time dynamic optimization algorithms (Hamiltonian), basic econometric techniques such as OLS and seemingly unrelated equation systems, and with STATA software. Moreover, since the course heavily employs mathematical techniques and delivers the content in English the audience is expected to have a good grasp of mathematics and to know English.

Materials for the Course

Lecture notes will be distributed for certain parts of the course. These lecture notes will cover the main points of the respective lectures and part of the mathematics involved.

References

- Jones, I., C. (1995). R&D-based models of economic growth. *The Journal of Political Economy*, 103(4), 759-784.
- Koutroumpis, P. (2009). The economic impact of broadband on growth: A simultaneous approach. *Telecommunications Policy*, 33, 471-485.
- Lucas, R., E., Jr. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22, 3-42.
- Roller, L.-H., & Waverman, L. (2001). Telecommunications infrastructure and economic development: A simultaneous approach. *The American Economic Review*, 91(4), 909-923.
- Romer, M., P. (1986). Increasing returns and long-run growth. *The Journal of Political Economy*, 94(5), 1002-1037.
- Romer, M., P. (1990). Endogenous technological change. *The Journal of Political Economy*, 98(5), 71-102.
- Smulders, S., & van de Klundert, T. (1995). Imperfect competition, concentration and growth with firm-specific R&D. *European Economic Review*, 39, 139-160.
- Vavra, D. (2002) Strategic interactions, social optimality and growth. CERGE-EI Working Papers, wp199, The Center for Economic Research and Graduate Education - Economic Institute, Prague.