**Topics in Growth Theory**

The course presents some canonical endogenous and semi-endogenous growth models and uses them to investigate some policy issues of particular current relevance.

We start with two basic variants of the Ramsey-Cass-Koopmans model in which technological progress is due to R&D leading to a never ending expansion in the number of different goods produced or to an improvement in their quality. We show how endogenizing technical progress requires giving up the assumption of convexity of the aggregate production set, so that the market equilibrium cannot be efficient.

We then move to semi-endogenous growth theory, in which the elasticity of the production function of ideas with respect to their current stock is less than unity. Another limit to growth we consider is the non homotheticity of preferences and related possibility of satiation. We also look at a model of skill-biased technical change and its consequences for inequality.

The second part of the course analyzes some effects of capital income taxes, labor income taxes, and consumption taxes in the endogenous and semi-endogenous growth models introduced in the first. We show how results obtained adopting the dynamic neoclassical model are reversed. For example we show how status effects ( in consumption and wealth) which represent externalities, calling for Pigouvian taxes in a static/ exogenous growth framework, may also be an engine of growth thus creating a trade-off for policy. Shifting the tax burden from workers to capitalists may be beneficial through market size effects and aggregate demand externalities. This is enough to upend the validity of the celebrated "Chamley- Judd" result.

The final part of the course focuses on the relationship between growth and its volatility. The slow down in productivity growth since the 2007 crisis presents prima facie evidence against the traditional dichotomy in macroeconomics between growth and business cycles analysis and suggests that temporary shocks may have permanent effects. We present some models in which uncertainty and growth affect each other and show how monetary policy has to be rethought in their context ( for instance as regards the optimality of zero trend inflation). We will focus in particular on the uncertainty generated by climate change and environmental policies.

The course requires a working knowledge of optimal control and dynamic programming methods and will make some use of Matlab and Dynare.

Lecture notes and an extensive set of readings will be provided during the course.

There is no single recommended textbook but useful texts are Daron Acemoglu Modern Economic Growth, Princeton University Press, 2009, Jordi Galí Monetary Policy, Inflation, and the Business Cycle: An Introduction to the New Keynesian Framework and Its Applications - Second Edition 2009 Princeton University Press and Burkhard Heer and Alfred Maußner Dynamic General Equilibrium Modelling Computational Methods and Applications Second Edition 2009 Springer-Verlag.

**Contents:**

A look at the data
A Horizontal Innovation Model
A Schumpeterian Model

Semi-endogenous Growth
Skill-Biased Technical Change
Factor Income Taxes in the Endogenous and Semi-endogenous Growth Literature.
Growth and Volatility