

# Macro&Public Finance

## Module 10 hours: Dynamic Fiscal Policy

MAY 2024

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### Aims

This module aims to provide students with essential tools for analyzing modern fiscal policies. Through thorough examination of recent research findings, students will develop the skills necessary for the design of optimal fiscal policies. Certain topics will require the utilization of advanced quantitative methods, particularly dynamic programming, which will be referenced in class sessions. The course will also foster discussions on the main steps in analytical developments and potential enhancements or extensions of the papers under study.

### Description

This research-oriented course delves into the normative aspects of dynamic fiscal policy. Fiscal policies are explored within the context of a benevolent government seeking to maximize the happiness of its citizens. The course begins with an examination of a representative agent model, assuming government chooses fiscal policies under full enforcement and taxation is linear. Subsequent steps introduce more realistic features, including heterogeneity among individuals and non-linear taxation. Additionally, political constraints are introduced to reflect the limitations on optimal fiscal policies. The course is then structured into three main steps:

- Optimal linear fiscal policies under full enforcement;
- Optimal non-linear fiscal policies under unobserved heterogeneity;
- Optimal non-linear fiscal policies under limited enforcement.

### Learning outcomes

Upon successful completion of this course, students will have acquired a deep understanding of the main issues, theories, and tools in dynamic fiscal policy. They will be able to critically assess research on optimal taxation in multiperiod settings, considering individual heterogeneity and enforceability constraints.

### Learning and teaching methods

The course will consist of five 2-hour lectures spread over 2 weeks. These sessions will involve the derivation of analytical results and computational problems. Assessment will be based on either a carefully crafted referee report of one paper (chosen from the list provided) with replication of the main findings or a solid research proposal on a topic related to the course content.

### Course Material

Slides for each lecture will be sent to students attending the course. Useful supplements are a number of suggested readings for each topic (see list below) and the following books:

- Ljungqvist and Sargent (2012): Recursive Macroeconomic Theory. 3th Edition
- Kocherlakota (2010). "The New Dynamic Public Finance." Princeton University Press

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## Optimal (linear) Ramsey Taxation

- Albanesi, Stefania, and Roc Armenter, "Understanding Capital Taxation in Ramsey Models," <http://www.columbia.edu/sa2310/Papers/RamseyNote.pdf>
- Atkeson, A., V. V. Chari and P. J. Kehoe. 1999. "Taxing capital income: a bad idea," Quarterly Review, Federal Reserve Bank of Minneapolis, 23: 3–17
- Chamley, Christophe. 1986. "Optimal Taxation of Capital Income in General Equilibrium with Infinite Lives." *Econometrica*, 54(3): 607–22
- Chari, V. V., Christiano, L. J. and P. J. Kehoe. 1994. "Optimal Fiscal Policy in a Business Cycle Model," *Journal of Political Economy*, 102: 617–52
- Conesa, Juan Carlos, Sagiri Kitao, and Dirk Krueger. 2009. "Taxing Capital? Not a Bad Idea after All!" *American Economic Review*, 99(1): 25-48
- Erosa, A. and M. Gervais. 2002. "Optimal Taxation in Life-Cycle Economies," *Journal of Economic Theory* 105: 338–369
- Judd, Kenneth. 1985. "Redistributive Taxation in a Simple Perfect Foresight Model," *Journal of Public Economics*, 28(1)
- Lucas, R. Jr. and N. L. Stokey. 1983. "Optimal Fiscal and Monetary Policy in an Economy without Capital," *Journal of Monetary Economics*, 12: 55–93
- Stantcheva, S. 2020. "Dynamic Taxation," *Annual Review of Economics*, 12:801–831
- Straub, L. and I. Werning. 2020. "Positive Long-Run Capital Taxation: Chamley-Judd Revisited," *American Economic Review*, 110: 86–119

## Optimal (non-linear) Mirrlees Taxation

- Albanesi, Stefania, and Christopher Sleet. 2006. "Dynamic Optimal Taxation with Private Information." *Review of Economic Studies*, 73(1): 1-30
- Diamond, Peter A., and James A. Mirrlees. 1971. "Optimal Taxation and Public Production I: Production Efficiency." *American Economic Review*, 61(1): 8-27
- Diamond, Peter A. 1998. "Optimal Income Taxation: An Example with a U-Shaped Pattern of Optimal Marginal Tax Rates." *American Economic Review*, 88(1): 83-95
- Golosov, Mikhail, Narayana Kocherlakota, and Aleh Tsyvinski. 2003. "Optimal Indirect and Capital Taxation," *Review of Economic Studies*, 70(3)
- Golosov, M. and A. Tsyvinski. 2007. "Optimal Taxation with Endogenous Insurance Markets, *Quarterly Journal of Economics*." 487-534.
- Golosov, Mikhail, Aleh Tsyvinski, and Ivan Werning. 2007. "New Dynamic Public Finance: A User's Guide." *NBER Macroeconomics Annual 2006*, pp. 317–363
- Gruber, Jon, and Emmanuel Saez. 2002. "The Elasticity of Taxable Income: Evidence and Implications." *Journal of Public Economics*, 84(1): 1-32
- Kocherlakota, Narayana. 2005. "Zero Expected Wealth Taxes: A Mirrlees Approach to Dynamic Optimal Taxation." *Econometrica*, 73(5): 1587–1621
- Mankiw, N. Gregory, Matthew Weinzierl, and Danny Yagan. 2009. "Optimal Taxation in Theory and Practice." *Journal of Economic Perspectives*, 23 (4): 147-74.
- Mirrlees, James A. 1971. "An Exploration in the Theory of Optimal Income Taxation." *Review of Economic Studies*, 38(114): 175-208
- Stantcheva, Stefanie. 2017. "Optimal Taxation and Human Capital Policies over the Life Cycle." *Journal of Political Economy* 125 (6)
- Weinzierl, Matthew. 2011. "The Surprising Power of Age-Dependent Taxes." *The Review of Economic Studies*, 78(4), 1490-1518

## Optimal (non-linear) Taxation with Limited Enforcement

- Acemoglu, Daron, Mikhail Golosov, and Aleh Tsyntviski. 2010. "Dynamic Mirrlees Taxation under Political Economy Constraints" *Review of Economic Studies*, 77(3): 841-881
- Acemoglu, Daron, Mikhail Golosov, and Aleh Tsyntviski. 2011. "Political Economy of Ramsey Taxation" *Journal of Public Economics*, 95(7): 467-475
- Chari, V. V. and Patrick Kehoe. 1990. "Sustainable Plans" *Journal of Political Economy*, 98. 616-636
- Lancia, Francesco, Alessia Russo, and Tim Worrall. 2024. "Intergenerational Insurance", *Journal of Political Economy*, forthcoming
- Ligon, E., J. P. Thomas, and T. Worrall. 2000. "Mutual Insurance, Individual Savings and Limited Commitment." *Review of Economic Dynamics*, 3, 216–246.
- Ligon, E., J. P. Thomas, and T. Worrall. 2002. "Informal Insurance Arrangements with Limited Commitment: Theory and Evidence from Village Economies." *Review of Economic Studies*, 69, 209–244.
- Kocherlakota, Narayana. 1996. "Implications of Efficient Risk Sharing without Commitment", *Review of Economic Studies*, 63
- Scheuer, F., and A. Wollitzky. 2016. "Capital Taxation under Political Constraints." *American Economic Review*, 106(8), 2304-2328
- Sleet, C., and S. Yeltekin. 2008. "Politically Credible Social Insurance." *Journal of Monetary Economics*, 55(1), 129-151

# MACRO & PUBLIC FINANCE

Module: 10 hours

Topics in nonlinear and dynamic empirical macroeconomics

April 2024

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<https://sites.google.com/site/giovannicaggiano72/home>

## Aims

This module aims to introduce students to three classes of models in empirical macroeconomics that have been used to analyze the impact of macroeconomic shocks in nonlinear and data-rich frameworks. Students will familiarize with nonlinear models and factor models and will go through recent applications of these tools in macroeconomics. Previous knowledge of basic time series concepts and of Structural VAR models is needed.

## Description

This module will cover three macroeconometrics models that allow to study the impact of shocks in different circumstances. The first topic will cover Smooth Transition VAR (STVAR) models. Differently from other nonlinear VARs, STVAR models allow the economy to move smoothly from one regime (eg. recessions, financial stress, high uncertainty, low interest rates, etc) to another (eg. expansions, financial boom, low uncertainty, high interest rates). The model will be presented, estimation issues will be discussed, as well as identification of shocks and calculation of impulse response functions. The model will then be applied to analysis of the impact of fiscal shocks in different phases of the business cycle. The second topic will deal with dynamic factor models (DFM). DFMs start from the idea that the common dynamics of a large set of time series variables is driven by a relatively small number of unobserved factors. Students will be introduced to the concept of DFMs and their estimation. The focus will then be on Structural DFMs, ie. how to identify shocks in structural DFMs. An application will be presented. Recent extensions (multi-layer factor models, quantile factor models, and factor models for nonstationary time series) will be briefly discussed. The third topic will cover quantile regression models. Quantile regressions allow to study the impact of a given shock on the entire distribution of future economic outcomes. We will cover a recent contribution on the analysis of the impact financial markets on the likelihood of extreme recessions.

## Learning outcomes

At the end of this module, students will be able to critically assess the use of econometric models that allow to study the potentially nonlinear impact of macroeconomic shocks and their identification in a data-rich environment.

## Learning and teaching methods

The course will consist of five two-hour lectures spread over two weeks in April. Assessment will be based either on the discussion of a paper in the style of a referee report, with replication of the main findings.

## Reading list

### Topic 1: STVAR models and applications

Auerbach, A., and Y. Gorodnichenko (2012). Measuring the Output Responses to Fiscal Policy. *American Economic Journal: Economic Policy*, Vol 4(2), 1-27.

Caggiano, G., Castelnuovo, E., Colombo, V. and G. Nodari (2015). Estimating Fiscal Multipliers: News from a Nonlinear World, *Economic Journal*, 125: 746-776.

Hubrich, K. and T. Terasvirta (2013), Thresholds and Smooth Transitions in Vector Autoregressive Models, in "VAR models in macroeconomics—New developments and applications: Essays in honor of Christopher A. Sims", 273-326, Emerald Publishing Limited.

Terasvirta, T., Tjostheim, D., and C. Granger (2010), Modelling Nonlinear Economic Time Series, Oxford University Press (Chapters 3, 15 and 16).

### Topic 2: Dynamic factor models

Caggiano, G. and E. Castelnuovo (2023), Global Financial Uncertainty, *Journal of Applied Econometrics*

Chen, L., Dolado, J., and J. Gonzalo (2021), Quantile Factor Models, *Econometrica*, 89(2): 875-910

Hamilton, J., and J. Xi (2024), Principal Component Analysis for Nonstationary Time Series, mimeo.

Moench, E., Ng, S., and S. Potter (2013), Dynamic Hierarchical Factor Models, *Review of Economics and Statistics*

Stock, J., and M. Watson (2016), Factor Models and Structural Vector Autoregressions in Macroeconomics, mimeo.

### Topic 3: Quantile regressions and applications to macro-finance

Adrian, T., Boyarchenko, A., and D. Giannone (2019), Vulnerable Growth, *American Economic Review*, 109: 1263-1289

Further reading will be suggested during the course