Advanced Macroeconomics Syllabus

INSPER
PhD in Business Economics

Course Overview	
Course:	Advanced Macroeconomics
Professor:	Tomás R. Martinez
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Course website:	https://tomasrm.github.io/teaching/advmacro/
Lectures:	Thursday at 15h00-18h00
Location:	TBD

1 Objective and Course Description

The course has two main objectives: (i) familiarize the student with cutting-edge research in macroeconomics with heterogeneous agents, and (ii) provide the necessary tools to solve these models computationally.

The course will be divided into two major "modules". In the first module, we will study heterogeneity at the household level. We will use models with incomplete markets where the distribution of wealth in the economy is endogenous, and individual economic shocks (income, employment, health) have strong implications for household consumption. Public policies such as taxation, unemployment insurance, and social security will have first-order impacts on the well-being of families. We will also discuss how income and wealth heterogeneity of families interacts with monetary policy/nominal rigidity in HANK models (*Heterogeneous Agent New Keynesian*).

In the second module, we will study heterogeneity at the firm level. We will use models of *firm/industry dynamics* and entrepreneurship to study decisions related to employment, investment, innovation, market entry, etc., and their macroeconomic implications.

Finally, we will discuss how to bring these models to data. The course content is adaptable, and we can dedicate more or less time to a topic depending on the interests of enrolled students.

2 Grading

The course dynamics will be as follows: the professor will present the models and computational methods to solve them. Students will submit the problem sets where they will solve basic models on the computer (using a programming language of their choice), give a presentation on a chosen article, and, at the end of the course, submit a research proposal.[1]

1. Three problem sets (in group) (30%)
2. Presentation (individual) (30%)
3. Research Proposal (individual or in pairs) (40%)

The prerequisites is to have completed an introductory course in Macroeconomics at the graduate level and to have a basic understanding of dynamic programming. Knowledge of the 3-equation New-Keynesian Model is useful.

[1] Examples of possible articles for presentation in the "other applications" section of the syllabus. Students can also suggest a paper that may or may not be accepted by the professor.

3 Textbooks

The course will be based on papers, with mandatory readings marked with an asterisk (*). Some textbooks may be useful for specific topics in computational methods.

- **Ljungqvist, Lars and Thomas J. Sargent. 2004.** ***Recursive Macroeconomic Theory***: Basic reference for dynamic programming. It includes a chapter dedicated to the Huggett-Aiyagari model.
- **Sargent, Thomas and John Stachurski. 2021.** ***QuantEcon***: Open-source introduction to learning Python and Julia programming. https://quantecon.org/
- **Heer, Burkhard and Alfred Maussner. 2008.** ***Dynamic General Equilibrium Modeling***: Excellent reference for methods applied to heterogeneous agent models.
- **Fehr, Hans and Fabian Kindermann. 2018.** ***Introduction to Computational Economics using Fortran***: For those interested in exploring Fortran. Useful even if you program in another language, as the algorithms are clear and well-explained.

Other books may be useful for different applications: Judd (1998) is the basic encyclopedia of computational economics. Canova (2007) is excellent for DSGE and time series. Miranda and Fackler (2002) is a good reference for solutions in Matlab.

4 Course Content

1. **Household Heterogeneity**

   (a) Income and wealth inequality: The Bewley-Huggett-Aiyagari-Imrohoroglu model. Ljungqvist and Sargent (2012)* - Cap. 16 e 17 Aiyagari (1994), Huggett (1993), Guvenen (2011), Heathcote et al. (2009), Achdou et al. (2022).

   (b) Consumption, income and wealth inequality over the life cycle. Storesletten et al. (2004)*, Huggett et al. (2011), Kaplan and Violante (2010).

   (c) Beyond the Stationary Equilibrium: Transition dynamics and aggregate shocks. Auclert et al. (2021)*, Krusell and Smith (1998)*, Boppart et al. (2018)*, Krueger et al. (2016), Algan et al. (2014).

   (d) Heterogeneous Agent New Keynesian Models. Auclert et al. (2023b)*, Kaplan et al. (2018)*, Kaplan and Violante (2018), Auclert (2019), McKay et al. (2016), Mckay and Wolf (2023), Auclert et al. (2023a).

   (e) Computational Methods: Endogenous Grid Method; Tauchen & Rowenhorst; Non-stochastic simulation of the Stationary Distribution; Krusell-Smith algorithm; Reiter's method Método de Reiter. Fella (2014); Kopecky and Suen (2010); Heer and Maussner (2009); Bayer and Luetticke (2020).

   (f) **Other applications**: Consumption and Income Inequality (Krueger and Perri, 2006); Long Run Trends in Hours and Income Inequality (Heathcote et al., 2010); Social Security (Conesa and Krueger (1999), Fuster et al. (2007)); Labor and Capital Taxation (Conesa et al. (2009),Guvenen et al. (2014);); Wealth Inequality (De Nardi and Fella (2017), Quadrini (2000)) Fiscal Policy and the Wealthy hand-to-Mouth (Kaplan and Violante, 2014); Human Capital and Education (Lochner and Monge-naranjo (2011), Abbott et al. (2019)); Family Economics (Greenwood et al. (2016), Barczyk and Kredler (2018), Voena (2015)); Progressive Taxation (Heathcote et al. (2020), Boar and Virgilu Midrigan (2020)); Risk and Income Dynamics (De Nardi

et al., 2020); Consumer Default (Chatterjee et al. (2007), Livshits et al. (2007); Welfare/ Cash Transfer Policy (Low et al. (2010), Wellschmied (2021)); Volatility Shocks and Consumption over the Business Cycles (Bayer et al. (2019), McKay (2017)); Labor Market Frictions (Krusell et al. (2010), Bils et al. (2011), Nakajima (2012), Ravn and Sterk (2021), Broer et al. (2021)); Fiscal Policy and Automatic Stabilizers (Hagedorn et al. (2019), (McKay and Reis, 2016)). Open Economies (Auclert et al., 2021); Heterogeneous Porfolios (Luetticke, 2021; Cui and Sterk, 2021); Estimation of HANK models (Bayer et al., 2023; Auclert et al., 2020; Acharya et al., 2023);

2. **Firm Heterogeneity**

   (a) Firm dynamics and productivity heterogeneity. Hopenhayn (2014)*, Hopenhayn and Rogerson (1993)*, Hopenhayn (1992).

   (b) International Trade. (Melitz, 2003).

   (c) Misallocation. Restuccia and Rogerson (2017)*, Restuccia and Rogerson (2008)*, Hsieh and Klenow (2009).

   (d) Entrepreneurship. financial frictions and development. Midrigan and Xu (2014)*, Buera et al. (2011).

   (e) Shocks, adjustment costs, and aggregate fluctuations. Clementi and Palazzo (2016)*, Khan and Thomas (2008), Bachmann and Bayer (2013).

   (f) Product and labor market power. Edmond et al. (2015)*, Berger et al. (2019), De Loecker et al. (2020).

   (g) Computational Methods: Projection Methods; Discrete Choice; Terry (2017), Winberry (2018).

   (h) **Other applications**: Innovation and Quality Ladders (Klette and Kortum (2004), Atkeson and Burstein (2019), Akcigit and Kerr (2018)); Uncertainty Shocks (Bloom et al. (2018), Bloom (2009)); Trade Liberalization (Cosar et al. (2016), Kambourov (2009)); Development and Firm Size (Poschke (2018), Bento and Restuccia (2017), Hsieh and Klenow (2014)); Informality (Ulyssea (2018), D'Erasmo and Moscoso Boedo (2012)); Start-ups and Firm Growth (Sterk et al. (2021), Sedláček and Sterk (2017)); Entrepreneurship and Inequality (Allub and Erosa, 2019); Size-dependent Policies (Guner et al. (2008), Garicano et al. (2016)), Microfinance (Buera et al., 2021); Large Firms and Granularity (Carvalho and Grassi (2019), di Giovanni and Levchenko (2012)); Firm and Employment Dynamics (Decker et al. (2014), Bachmann et al. (2020)); Consumer Capital (Gourio and Rudanko, 2014); Manager Heterogeneity (Guner et al. (2018), Akcigit et al. (2021)); Wealth Taxation (Guvenen et al., 2019); Banking Industry Dynamics (Corbae and D'Erasmo, 2021).

3. **Data in macro models: *calibration*, *estimation*, and other topics.**

   (a) A (honest) discussion about *calibration*, *estimation*, and *indirect inference* in macro models. Nakamura and Steinsson (2018)*, Canova (2007, ch. 7).

   (b) Income and productivity processes, the wealth distribution, and MPCs. Kaplan and Violante (2022), Guvenen et al. (2021), Blundell et al. (2008).

   (c) Regional causal evidence and *missing intercept problem*. Chodorow-Reich (2020), Wolf (2019), Guren et al. (2021).

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