

### Course Description

Macroeconomics and inequality are a two-way street: Macroeconomic shocks and policies affect inequality and inequality affects macroeconomic aggregates. In this course we explore this rich interaction between inequality and the macroeconomy that characterizes our world. The goal is to introduce the frameworks (heterogeneous agents models) for thinking about this interaction. At the core of these frameworks there will be a distribution of households that differ in wealth, productivity, and consumption-savings behavior. These models will be micro-founded, i.e., we will model macroeconomic aggregates as consequences of optimizing individual decisions. We will also test the predictions of these models with the data. The types of questions we will study include: What is the role of household heterogeneity in the transmission of monetary and fiscal policy? What are the distributional macroeconomic effects of Covid-19 pandemic? How do government policies affect inequality? This is an advanced undergraduate course in macroeconomics. Thus, an intermediate level macroeconomic theory course is prerequisite. We will also use the language of mathematics to write down our models. A fair amount of knowledge of (dynamic) optimization techniques is required. We will also get our hands dirty with micro-datasets and solving the quantitative models computationally.

### Course Information

**Lecture Hours:** Wednesdays, 10-12noon. Online via Zoom synchronously.

**Tutorials:** Wednesdays, 9-10am. Online via Zoom synchronously.

**Teaching Assistant:** Alexander Hempel **Office hour:** Thursday 10-11am [alex.hempel@mail.utoronto.ca](mailto:alex.hempel@mail.utoronto.ca)

**Prerequisites:** ECO200Y1/ECO204Y1/ECO206Y1; ECO202Y1/ECO208Y1/ECO209Y1; ECO220Y1/ECO227Y1/ (STA237H1, STA238H1)/ (STA247H1, STA248H1)/ (STA257H1, STA261H1); at least 1.0 FCE in ECO at the 300+ level.

### Reference Materials

Unfortunately, there does not exist a textbook with the proper level and focus for this course. Instead, I will rely on journal articles and my own slides, for which I will benefit from teaching material of Greg Kaplan. There are a number of articles that review the academic literature on heterogeneous agent macroeconomics that you will find useful.

- Quadrini, V and J. V. Rios-Rull (2015) Inequality in Macroeconomics, Handbook of Income Distribution, 2B 1229-98
- Heathcote, J., K. Storesletten and G. Violante (2009) Quantitative Macroeconomics with Heterogeneous Households, Annual Reviews of Economics, 1:319-54
- Guvenen, F. (2011) Macroeconomics with Heterogeneity: A Practical Guide, Federal Reserve Bank of Richmond Economic Quarterly, 97 (3), 255-326
- Attanasio, O. and G. Weber (2010) Consumption and Saving: Models of Intertemporal Allocation and Their Implications for Public Policy, Journal of Economic Literature 48: 693-751

- Krusell, Per, and Anthony A. Smith. "Quantitative macroeconomic models with heterogeneous agents." *Econometric Society Monographs* 41 (2006): 298.
- Browning, M., L. P. Hansen, and J. J. Heckman (1999): "Micro data and general equilibrium models," in *Handbook of Macroeconomics*, ed. by J. B. Taylor, and M. Woodford.

## Evaluation

- Assignments: 30% + Midterm: 30% + Final: 40%
- The assignments must be handed in on the pre-specified dates. No late submissions will be accepted. If a problem set is not handed in on time, for a justified and documented reason, the weight shifts to the final exam.
- The midterm test will be held during class time on a date to be determined later. There will be no make-up exam for the midterm test. If you provide appropriate and timely documentation for missing the midterm, the weight will be transferred to the final exam.
- The final exam will include all the material covered in the course. The final exam will be held at a date and location to be set by the University.

## Course Website

- TEACHING.serdarozkan.me
- The website will be used extensively for posting announcements, lecture notes, problem sets, and solutions. Please consult it on a regular basis. The documents on the website are password protected.
- Documents are password protected. Please contact me for the password.

## Academic Integrity

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

In papers and assignments:

- Using someone else's ideas or words without appropriate acknowledgement.
- Submitting your own work in more than one course without the permission of the instructor in all relevant courses
- Making up sources or facts
- Obtaining or providing unauthorized assistance on any assignment

On tests and exams:

- Using or possessing unauthorized aids
- Looking at someone else's answers during an exam or test
- Misrepresenting your identity

In academic work:

- Falsifying and altering institutional documents or grades or any documentation required by the University, including (but not limited to) doctor's notes

All suspected cases of academic dishonesty will be investigated following procedures outlined in the *Code of Behaviour on Academic Matters*. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, please reach out to me. Note that you are expected to seek out additional information on academic integrity from me or from other institutional resources (for example, the University of Toronto website on Academic Integrity).

## Code of Conduct in an Online Environment

- Adhere to the same standards as you would in the classroom. For example, respect your peers. Use proper and respectful language and refrain from any insults, threats or bad jokes. Give other students the opportunity to join in the discussion and present their ideas. Be forgiving of mistakes. Do not point out insignificant errors of other students in front of the whole class. Challenge the idea and not the student directly. Remember the purpose of a discussion is to increase your knowledge base.
- When you have to ask a question, please use the chat function to que your answer. Before you send messages through the chat function, please re-read your response or question carefully and check for errors. It is okay to make minor errors so long as you are understood. Be mindful of internet language, e.g. the interpretation of all cap letters is that you are shouting.
- If someone posts information that you think may have been posted accidentally, let them know about it privately. Do not spread the accidental post to your peers. Remember we all make mistakes.

## Zoom Recordings

- This course, including your participation, will be recorded on video and will be available to students in the course for viewing remotely and after each session.
- Course videos and materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation and are protected by copyright. In this course, you are permitted to download session videos and materials for your own academic use, but you should not copy, share, or use them for any other purpose without the explicit permission of the instructor.
- For questions about the recording and use of videos in which you appear, please contact your instructor.

## Ongoing Learning Disabilities or Accommodation Requirements

Students with diverse learning styles and needs are welcome in this course. If you have an acute or ongoing disability issue or accommodation need, you should register with Accessibility Services (AS) at the beginning of the academic year by visiting <http://www.studentlife.utoronto.ca/as/newregistration>. Without registration, you will not be able to verify your situation with your instructors, and instructors will not be advised about your accommodation needs. AS will assess your situation, develop an accommodation plan with you, and support you in requesting accommodation for your course work. Remember that the process of accommodation is private: AS will not share details of your needs or condition with any instructor, and your instructors will not reveal that you are registered with AS. Students cannot petition to re-write a quiz/test once the test has begun. If you are feeling ill, please do not start the online or in-class test, seek medical attention immediately, and the policy on Missed Term Work will apply.

# Preliminary (and Tentative) List of Topics and Reading List

## Introduction and Why Should We Care About Inequality in Macroeconomics?

- Prescott E.C., The Transformation of Macroeconomic Policy and Research, 2004 Nobel Prize Lecture.
- Imrohoroğlu, Ayşe. "Welfare costs of business cycles." *The New Palgrave Dictionary of Economics*, (2008).\*\*\*
- Storesletten, Kjetil, Chris I. Telmer, and Amir Yaron. "The welfare cost of business cycles revisited: Finite lives and cyclical variation in idiosyncratic risk." *European Economic Review* 45, no. 7 (2001): 1311-1339.
- Ahn, SeHyoun, Greg Kaplan, Benjamin Moll, Thomas Winberry, and Christian Wolf. "When inequality matters for macro and macro matters for inequality." *NBER macroeconomics annual* 32, no. 1 (2018).
- Krueger, D., K. Mitman and F. Perri (2016) *Macroeconomics and Household Heterogeneity*, *Handbook of Macro*.

## Trends in Earnings Inequality

- Per Krusell, Lee Ohanian, Jose-Victor Ríos-Rull and Gianluca Violante (2000). *Capital-Skill Complementarity and Inequality: A Macroeconomic Analysis*, *Econometrica*\*\*\*
- Acemoglu, Daron, and David Autor. "Skills, tasks and technologies: Implications for employment and earnings." In *Handbook of labor economics*, vol. 4, pp. 1043-1171. Elsevier, 2011.\*\*\*
- Acemoglu, Daron (2002) "Technical Change, Inequality and the Labor Market." *Journal of Economic Literature*.
- Guvenen, Fatih, Greg Kaplan, Jae Song, Justin Weidner. *Lifetime Incomes in the United States over Six Decades*
- Song, Jae, David J. Price, Fatih Guvenen, Nicholas Bloom, and Till Von Wachter. *Firming up inequality*. No. w21199. National Bureau of Economic Research, 2015.
- Heathcote, Jonathan, Fabrizio Perri, and Giovanni L. Violante. "Unequal we stand: An empirical analysis of economic inequality in the United States, 1967–2006." *Review of Economic dynamics* (2010): 15-51.
- Lawrence Katz and David Autor (1999) "Changes in the Wage Structure and Earnings Inequality," in O. Ashenfelter and D. Card, eds., *Handbook of Labor Economics*, vol. 3A, pp. 1463-1555.
- Atkinson, Anthony B., Thomas Piketty, and Emmanuel Saez, "Top Incomes in the Long Run of History," *Journal of Economic Literature*, 2011, 49 (1), 3–71.
- Juhn, C., Murphy, K. M., & Pierce, B. (1993). Wage inequality and the rise in returns to skill. *Journal of political Economy*, 101(3), 410-442.
- D. Acemoglu (1998) "Why Do New Technologies Complement Skills? Directed Technical Change and Wage Inequality," *QJE* 113 (November), 1055-1089.
- Rosen, Sherwin. "The economics of superstars." *The American economic review* 71, no. 5 (1981): 845-858.

## Decline in Labor Income Share

- Karabarbounis, L., & Neiman, B. (2013). The global decline of the labor share. *The Quarterly Journal of Economics*, 129(1), 61-103.
- Chen, Peter, Loukas Karabarbounis, and Brent Neiman. "The global rise of corporate saving." *Journal of Monetary Economics* (2017).

- Piketty, T., & Zucman, G. (2014). Capital is back: Wealth-income ratios in rich countries 1700–2010. *The Quarterly Journal of Economics*, 129(3), 1255-1310.
- Elsby, M. W., Hobijn, B., & Şahin, A. (2013). The decline of the US labor share. *Brookings Papers on Economic Activity*, 2013(2), 1-63.
- Rognlie, M. (2016). Deciphering the fall and rise in the net capital share: accumulation or scarcity?. *Brookings papers on economic activity*, 2015(1), 1-69.
- David, A., David Dorn, Lawrence F. Katz, Christina Patterson, and John Van Reenen. "Concentrating on the Fall of the Labor Share." (2017).
- De Loecker, Jan, and Jan Eeckhout. The rise of market power and the macroeconomic implications. No. w23687. National Bureau of Economic Research, 2017.
- Barkai, Simcha. "Declining labor and capital shares." *Stigler Center for the Study of the Economy and the State New Working Paper Series 2* (2016).
- Krusell, Per, and Anthony A. Smith Jr. "Is Piketty's "Second Law of Capitalism" Fundamental?." *Journal of Political Economy* 123, no. 4 (2015): 725-748.
- Eggertsson, Gauti B., Jacob A. Robbins, and Ella Getz Wold. Kaldor and Piketty's Facts: The Rise of Monopoly Power in the United States. No. w24287. National Bureau of Economic Research, 2018.
- Karabarbounis, Loukas, and Brent Neiman. "Accounting for factorless income." In *NBER Macroeconomics Annual 2018*, volume 33. University of Chicago Press, 2018.\*\*\*

### **Economies with Heterogenous Households: Permanent Income Hypothesis (PIH) and Standard Incomplete Markets (SIM) Models**

- Hall, Robert E. (1978): "Stochastic Implications of the Life-Cycle/Permanent Income Hypothesis: Theory and Evidence," *Journal of Political Economy*, 96, 971–87
- Huggett, M. (1993): "The Risk-Free Rate in Heterogeneous-Agent Incomplete-Insurance Economies," *Journal of Economic Dynamics and Control*, 17, 953–969.
- Aiyagari, S. R. (1994): "Uninsured Idiosyncratic Risk and Aggregate Saving," *The Quarterly Journal of Economics*, 659–684.

### **Wealth Inequality**

- Kuhn, Moritz, and José-Víctor Ríos-Rull. "2013 Update on the US earnings, income, and wealth distributional facts: A View from Macroeconomics." *Federal Reserve Bank of Minneapolis Quarterly Review* 37, no. 1 (2016): 2-73.
- Quadrini, Vincenzo, and José-Víctor Ríos-Rull. "Inequality in macroeconomics." In *Handbook of Income Distribution*, vol. 2, pp. 1229-1302. Elsevier, 2015.
- Benhabib, Jess, Alberto Bisin, and Mi Luo. "Earnings inequality and other determinants of wealth inequality." *American Economic Review* 107, no. 5 (2017): 593-97.
- Hubmer, Joachim, Per Krusell, and Anthony A. Smith Jr. "Sources of US wealth inequality: Past, present, and future." In *NBER Macroeconomics Annual 2020*, volume 35. University of Chicago Press, 2020.
- Jones, Charles I. "Pareto and Piketty: The macroeconomics of top income and wealth inequality." *Journal of Economic Perspectives* 29, no. 1 (2015): 29-46.

## Lifecycle Inequality

- Huggett, Mark, Gustavo Ventura, and Amir Yaron. "Sources of lifetime inequality." *American Economic Review* 101, no. 7 (2011): 2923-54.
- Y. Ben-Porath. (1967) "The Production of Human Capital and the Life Cycle of Earnings," *Journal of Political Economy*, 75 (August), 352-65.
- Topel, Robert H., and Michael P. Ward. "Job mobility and the careers of young men." *The Quarterly Journal of Economics* 107.2 (1992): 439-479.
- G. Becker. (1993) *Human Capital*, 3rd ed. Chicago: University of Chicago Press, pp. 1-66.
- Acemoglu, Daron, and David Autor. "Skills, tasks and technologies: Implications for employment and earnings." In *Handbook of labor economics*, vol. 4, pp. 1043-1171. Elsevier, 2011.