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University of Toronto  
Department of Economics

# ECO2103H

Quantitative Macroeconomics with Heterogeneity

2018 Winter

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This course covers the topics at the nexus of **macro** and **labor** economics with an emphasis on **household heterogeneity**. The main goals of this course are to expose students to research questions at the current frontier, discuss a variety of open questions in this area that can lead to research papers (or possibly to a dissertation), and familiarize with the tools necessary to tackle these questions. We cover the research that links theoretical models to the data in a serious manner using **quantitative** and **empirical** methods.

This class is built upon 1st year Phd Macro sequence. Thus, students are expected to know basic models (e.g., standard incomplete markets model or RBC) and concepts (e.g., recursive competitive equilibrium). Furthermore, as Prof. Sebastian Dyrda teaches computational methods in the Fall semester (that are required to do research in quantitative macroeconomics), I will assume that you are already familiar with these techniques. There will be not any computational assignments but most papers in this literature employ these techniques.

Every week we will cover one topic from the reading list below. I have listed more topics than we can actually digest over a 12-week semester. We will decide which ones to focus on depending on my own and students' research interests.

## Course Requirements

**Weekly Referee Report.** Every week you will write a no longer than 1 page referee report on one **\*\*\*-paper** from that week's reading list. In one third or half of the report you will summarize the main contribution of the paper. In the rest of the report you will discuss its main weakness(es) and/or strength(s) to justify your recommendation to the editor. As an economist, it is very important that you can communicate your ideas clearly and concisely. Thus, you will also discuss your referee report in the class in not more than two minutes.

**Literature Review.** You will present a topic from the reading list which you're particularly interested in and consider doing research in (if your area of interest is not included in the tentative reading list you can talk to me). In particular, you will introduce the key stylized facts and important questions and issues in this literature and critically discuss 3 or 4 of the most important papers. Finally, and more importantly, you will talk about open questions by explaining why they are still not satisfactorily answered, what the limitations are in addressing these questions. In your presentation, you will take questions from the class and answer them. While preparing for this assignment you will meet with me regularly at least once a week.

**Research Proposal.** The research proposal should outline a clear research question and describe how you intend to answer the question posed (which data set you would use, a description of the model, the algorithm for solving it, etc). The proposal will be judged based on the originality of the idea (or the importance of the contribution), the feasibility of the exercise and how specific and detailed the proposal is. An ideal proposal would be one where someone else could take it and follow the steps you describe to answer the question.

# Tentative List of Topics and Reading List

## I. Quantitative Macro Methodology, Widely Used Data Sources, Standard Incomplete Market Model

- “Quantitative Macroeconomics with Heterogeneous Households,” Jonathan Heathcote, Kjetil Storesletten, and Gianluca Violante, *Annual Review of Economics*, 2009.
- Krusell, Per, and Anthony A. Smith. "Quantitative macroeconomic models with heterogeneous agents." *Econometric Society Monographs* 41 (2006): 298.
- “Macroeconomics with Heterogeneity: A User’s Guide,” Fatih Guvenen, Federal Reserve Bank of Richmond *Economic Quarterly*, 2011.
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- Cristiano, Lawrence, Martin Eichenbaum and Mathias Trabandt (2017). "On DSGE Models"
- 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.
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- Gourinchas, P.-O. and Parker, J. A. (2002). Consumption over the life cycle. *Econometrica*, 70(1):47–89

## II. Nature of Idiosyncratic Income Risk and Income Processes

- MaCurdy, Thomas E. "The use of time series processes to model the error structure of earnings in a longitudinal data analysis." *Journal of econometrics* 18, no. 1 (1982): 83-114.
- Storesletten, Kjetil, Chris Telmer and Amir Yaron (2004): “Cyclical Dynamics in Idiosyncratic Labor-Market Risk,” *Journal of Political Economy*, vol. 112 (3), pp. 695-717.
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- Guvenen, Fatih, Serdar Ozkan and Jae Song (2012): “The Nature of Countercyclical Income Risk,” NBER Working Paper No 18035.
- \*\*\*Guvener, Fatih, Fatih Karahan, Serdar Ozkan and Jae Song (2012): “What Do Data on Millions of U.S. Workers Reveal about Life-Cycle Earnings Dynamics?”
- \*\*\*Arellano, M., Blundell, R. and Bonhomme, S. (2017). “Earnings and Consumption Dynamics: A Nonlinear Panel Data Framework.” ECMA
- Karahan, Fatih, and Serdar Ozkan. "On the persistence of income shocks over the life cycle: Evidence, theory, and implications." *Review of Economic Dynamics* 16.3 (2013): 452-476.
- Guvenen, Fatih. "An empirical investigation of labor income processes." *Review of Economic dynamics* 12.1 (2009): 58-79.
- \*\*\*Altonji, Joseph G., Anthony A. Smith, and Ivan Vidangos. "Modeling earnings dynamics." *Econometrica* 81, no. 4 (2013): 1395-1454.
- 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* 13, no. 1 (2010): 15-51.

- \*\*\*Browning, Martin, Mette Ejrnaes, and Javier Alvarez: “Modelling Income Processes with Lots of Heterogeneity,” *Review of Economic Studies*, 2010.
- Abowd, John, and David Card (1989): “On the Covariance Structure of Earnings and Hours Changes,” *Econometrica*, Vol. 57, pp.411-445.
- Baker, Michael (1997): “Growth-rate Heterogeneity and the Covariance Structure of Life-Cycle Earnings,” *Journal of Labor Economics*, Vol. 15, pp. 338-375
- Baker, Michael and Gary Solon (2003): “Earnings Dynamics and Inequality Among Canadian Men, 1976-1992: Evidence from Longitudinal Tax Records,” *Journal of Labor Economics*, Vol 21, pp. 289- 321.
- Haider Steve J. (2001): “Earnings Instability and Earnings Inequality of Males in the United States: 1967-1991, *Journal of Labor Economics*, Vol. 19, pp. 799-836.
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- Meghir, Costas, and Luigi Pistaferri (2004): “Income Variance Dynamics and Heterogeneity,” *Econometrica*.
- Topel, Robert H. (1990): “Specific Capital, Mobility and Wages: Wages rise with Job Seniority,” NBER Working Paper No. 3294

### III. Wage Inequality Over the Life Cycle

- Huggett, Mark, Gustavo Ventura, and Amir Yaron (2007): “Sources of Lifetime Inequality,
- Andreas Hornstein, Per Krusell, and Giovanni L Violante. Frictional wage dispersion in search models: A quantitative assessment. *AER*
- Bagger, Jesper, et al. "Tenure, experience, human capital, and wages: A tractable equilibrium search model of wage dynamics." *The American Economic Review* 104.6 (2014): 1551-1596.
- Karahan, Fatih, Serdar Ozkan, and Jae Song (2017), “Sources of Inequality in Earnings Growth Over the Life Cycle”, Working Paper
- Kuhn, Moritz, and Philip Jung. "Earnings losses and labor mobility over the lifecycle", *Journal of the European Economic Association*, 2017
- Abowd, John M., Francis Kramarz, and David N. Margolis. "High wage workers and high wage firms." *Econometrica* 67, no. 2 (1999): 251-333.
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- G. Becker. (1993) *Human Capital*, 3rd ed. Chicago: University of Chicago Press, pp. 1-66.
- Kuruscu, Burhanettin (2006): “Training and Lifetime Income, *American Economic Review*, Vol. 96
- Kambourov and Manovskii (2009): “Occupational Mobility and Wage Inequality,” *Review of Economic Studies*.
- Audra Bowlus and H. Liu, "The Contributions of Search and Human Capital to Earnings Growth Over the Life Cycle," *European Economic Review*, 64: 305-331 (2013)
- Bronson, Mary A and Peter S Thoursie, *The Lifecycle Wage Growth of Men and Women: Explaining Gender Differences in Wage Trajectories*, 2017

- Casanova, Maria. "Revisiting the hump-shaped wage profile." Unpublished mimeo, UCLA (2013).
- Hagedorn, Marcus, Tzuo Hann Law, and Iourii Manovskii. "Identifying Equilibrium Models of Labor Market Sorting." *Econometrica* 85, no. 1 (2017): 29-65.

#### IV. Wage Inequality over Time

- 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.\*\*
- Jones, Charles I., and Jihee Kim. A Schumpeterian model of top income inequality. No. w20637. National Bureau of Economic Research, 2014.\*\*\*
- Acemoglu, Daron (2002) "Technical Change, Inequality and the Labor Market." *Journal of Economic Literature*.\*\*\*
- 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.\*\*\*
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## Job Polarization

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- Autor, David and David Dorn, "The Growth of Low-Skill Service Jobs and the Polarization of the US Labor Market," *American Economic Review*, 2013, 103, 1553–97.\*\*\*
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- Goos, Maarten, Alan Manning, and Anna Salomons. "Explaining job polarization: Routine-biased technological change and offshoring." *The American Economic Review* 104, no. 8 (2014): 2509-2526.\*\*\*
- Cerina, Fabio, Alessio Moro, and Michelle Rendall. "The role of gender in employment polarization." (2017).\*\*\*
- Daron Acemoglu and Pascual Restrepo (2017), "Low-Skill and High-Skill Automation", NBER Working Paper\*\*\*
- Acemoglu, Daron, and Pascual Restrepo. *The race between machine and man: Implications of technology for growth, factor shares and employment*. No. w22252. National Bureau of Economic Research, 2016.\*\*\*
- Acemoglu, Daron and Pascual Restrepo, (2018), "Artificial Intelligence, Automation and Work" NBER working paper #24196\*\*\*
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- Aguiar, Mark, Mark Bilz, Kerwin Kofi Charles, and Erik Hurst. *Leisure luxuries and the labor supply of young men*. No. w23552. National Bureau of Economic Research, 2017.
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## V. 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.
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- Barkai, Simcha. "Declining labor and capital shares." *Stigler Center for the Study of the Economy and the State New Working Paper Series* 2 (2016).

- Alvarez-Cuadrado, Francisco, Ngo Van Long, and Markus Poschke. "Capital labor substitution, structural change, and the labor income share." (2014).
- Eden, Maya, and Paul Gaggl. "On the welfare implications of automation." (2016).
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## VI. Decline in Worker Fluidity

- Coen-Pirani, D., "Understanding Gross Worker Flows across U.S. States," *Journal of Monetary Economics* 57 (2010), 769–84.
- Karahan, Fatih, and Serena Rhee. "Population aging, migration spillovers, and the decline in interstate migration." (2014).
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- Decker, Haltiwanger, Jarmin, and Miranda (2014) "The Secular Decline of Business Dynamism in the United States." WP.
- Engbom, Niklas. Firm and Worker Dynamics in an Aging Labor Market. Working Paper, 2017.
- Salgado, Sergio. "Technical Change and Entrepreneurship." (2017).
- Joonkyu Choi (2017), "Entrepreneurial Risk-Taking, Young Firm Dynamics, and Aggregate Implications"

## VII. Macro Health

- Case, A., & Deaton, A. (2017). Mortality and morbidity in the 21st century. *Brookings Papers on Economic Activity*, 23-24.
- Case, Anne and Angus Deaton, "Suicide, Age, and Wellbeing: An Empirical Investigation," NBER Working Paper, 2015, 21279.
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### VIII. Housing and Macroeconomics

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## **IX. Heterogeneous Agents New Keynesian (HANK) Models**

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## **X. Great Recession and Secular Stagnation**

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